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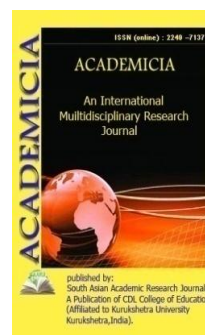
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111.	A REVIEW PAPER ON BIO FERTILIZERS AND ORGANIC AGRICULTURE Mr Durgesh Nandan	728-736	10.5958/2249-7137.2021.02168.6
112.	CULTURE OF LAGOXILUS PLANT IN LABORATORY Dilafruz Alisher kizi Mustafoeva, Mubarak Pirmatovna Pulatova, Bakhrom Nurillayevich Babayev, Akmal Khushvakovich Islamov, Matchanov Alimjon Davlatboevich	737-744	10.5958/2249-7137.2021.02158.3
113.	CURRENT LITERARY PROCESS AND LITERARY CRITICISM A.Xolmurodov	745-748	10.5958/2249-7137.2021.02159.5
114.	THE ASSESSMENT OF DOMESTIC AND FAMILY VIOLENCE BETWEEN SAME-SEX COUPLES Dr. Arminder Kaur	749-756	10.5958/2249-7137.2021.02167.4
115.	AN OVERVIEW OF BIG DATA IN EDUCATION Dr. Ajay Rana, Dr Tarun Kr. Sharma	757-764	10.5958/2249-7137.2021.02119.4
116.	ELECTROCHEMICAL DETERMINATION OF PLATINUM (IV) WITH SOLUTIONS OF DIETHYLAMINO-4-METHYL-HEXINE-2-OLA-4 IN AQUEOUS AND MIXED MEDIA Rakhmatov Xudoyor Boboniyozovich, Safarova Guljakhon Eshtemirovna, Smanova Zulaikho Asanalievna	765-768	10.5958/2249-7137.2021.02160.1

117.	DEVELOPING THE CRITICAL THINKING OF PRIMARY SCHOOL STUDENTS Rustamova Davlathon Toyirjon qizi, Mamajonova Feruzakhon Mamirjon qizi	769-772	10.5958/2249-7137.2021.02169.8
118.	AN ANALYSIS OF PLANT TISSUE CULTURE Dr Ashok Kumar	773-780	10.5958/2249-7137.2021.02164.9
119.	SPOUSE OR PARTNER CONFLICT IN SAME-SEX GUY MARRIAGE Ms. Shiwangi	781-788	10.5958/2249-7137.2021.02166.2
120.	ETIOLOGICAL FACTORS CAUSING PURULENT DISEASES OF CATTLE HOOVES, AND THEIR CLINICAL SIGNS Niyozov Kh.B, Nuridinov B.Ya, Yuldashev Yu. Sh, Ruzimov V.Yu	789-794	10.5958/2249-7137.2021.02170.4
121.	ON THE PUBLICATION OF THE MONOGRAPHY DEVOTED TO NATURAL GEOGRAPHY M.K.Ergasheva, D.D.Kalandarova	795-798	10.5958/2249-7137.2021.02171.6
122.	AN OVERVIEW OF MACHINE LEARNING FROM THEORY TO ALGORITHMS Mr Mrinal Paliwal	799-807	10.5958/2249-7137.2021.02181.9
123.	AN OVERVIEW ON ISSUES AND ENABLING TECHNOLOGIES IN IOT MIDDLEWARE Ms Anuska Sharma	808-819	10.5958/2249-7137.2021.02182.0
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127.	AN ANALYSIS OF EMBEDDED SYSTEM DESIGN ASPECTS Mr Mrinal Paliwal	837-844	10.5958/2249-7137.2021.02184.4
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129.	LINGUISTIC-PARADIGMATIC FEATURES OF POLITICAL IDEOLOGY Mokhira Eshanova Yuldashbaevna	850-855	10.5958/2249-7137.2021.02175.3
130.	A SYSTEMATIC REVIEW OF INTERNET OF THINGS APPLICATIONS Ms Anuska Sharma	856-862	10.5958/2249-7137.2021.02185.6

131.	SOIL STABILIZERS MADE OUT OF DIFFERENT PLASTIC WASTES Mr. Ponnu Rangam	863-871	10.5958/2249-7137.2021.02186.8
132.	LEXICO-SEMANTIC FIELDS OF “EYE” IN ENGLISH AND UZBEK LANGUAGES Gadoeva Mavlyuda Ibragimovna	872-879	10.5958/2249-7137.2021.02176.5
133.	DISTRIBUTION OF HELMINTOSIS DISEASES OF ONE-HOIED ANIMALS Haqberdiyev Pardaql Subxonovich, Goyipova Motabar Ergashevna, Khojakhanov Shohruzkhon Idiriskhoja ogli	880-883	10.5958/2249-7137.2021.02177.7
134.	DETERMINATION OF ADULTERANTS IN HONEY Dr Vishal Balramnavar	884-892	10.5958/2249-7137.2021.02187.X
135.	MOBILE AD-HOC NETWORK (MANET) ROUTING PROTOCOLS: A COMPARATIVE ANALYSIS Ms Anuska Sharma	893-901	10.5958/2249-7137.2021.02188.1
136.	COGNITIVE DISSONANCE AND PRAGMATIC INFLUENCE Qobilova Nargisa Sulaymonbekovna, Ibragimova Gulshan Raimovna	902-908	10.5958/2249-7137.2021.02178.9
137.	TREATMENT OF PATIENTS WITH CHRONIC PURULENT MEDIUM OTITIS Hamrakulova Nargiza Orzuevna, Khushvakova Nilufar Zhurakulovna, Isakova Yulduz Nuriddinovna, Istamova Etibor Bahodirovna	909-916	10.5958/2249-7137.2021.02179.0
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139.	A TAXONOMIC STUDY OF STRATEGY APPROACHES Sh Sachin Gupta	926-933	10.5958/2249-7137.2021.02190.X
140.	PROCEDURE FOR DEVELOPMENT OF ENTERPRISE FINANCIAL STRATEGY Saidnazarov Firdavs Abdulloevich	934-940	10.5958/2249-7137.2021.02180.7
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143.	AN ANALYSIS OF DEEP LEARNING FOR RENEWABLE ENERGY FORECASTING Dr. Kashif Qureshi	953-961	10.5958/2249-7137.2021.02192.3

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158.	EFFECTS OF ALCOHOL AND CANNABIS ON DIFFERENT TYPE OF SENSORY MEMORY Dr. Anil Ahuja	1061-1070	10.5958/2249-7137.2021.02211.4
159.	A BRIEF REVIEW ON THE INDIAN HEALTH SYSTEM Ms. Shiwangi	1071-1076	10.5958/2249-7137.2021.02212.6
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172.	FOREIGN EXPERIENCE IN THE USE OF MODERN INFORMATION AND COMMUNICATION TECHNOLOGIES IN THE INVESTIGATION PROCESS OF THE CRIMINAL PROCEEDINGS Primov Bakhtiyor Olim ugli	1154-1160	10.5958/2249-7137.2021.02228.X
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174.	SECURE IOT AND CLOUD COMPUTING INTEGRATION Ms Anuska Sharma	1164-1171	10.5958/2249-7137.2021.02219.9
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176.	METHOD OF EXPERIMENTAL STUDY OF SHEAR STIFFNESS OF PROFILED FLOORING DIAPHRAGM Rahimov Qaxxorovich, Choriyev Anvar Dzhumayevich, Mirkamol Polatov Rasuljonovich	1180-1183	10.5958/2249-7137.2021.02230.8
177.	THE IMPORTANCE OF THE INTERNATIONAL HASSP SYSTEM IN THE PRODUCTION OF QUALITY AND SAFE CONFECTIONERY PRODUCTS Fayziboev Pirmamat Nurmatovich, Raximova Durdona Jurakulovna	1184-1186	10.5958/2249-7137.2021.02231.X
178.	AN OVERVIEW ON SOMA CLONAL VARIATION Mr Krishnaraj Singh	1187-1194	10.5958/2249-7137.2021.02221.7
179.	THE DEVELOPMENT OF INSECT FARMING Dr Pramod Kumar	1195-1202	10.5958/2249-7137.2021.02222.9
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181.	PROFESSIONAL SOCIALIZATION OF YOUTH AS A PEDAGOGICAL PROBLEM Begmatova Dilnoza Mukhtarovna	1207-1212	10.5958/2249-7137.2021.02233.3
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183.	THE BROWN PLANT HOPPER AS A RECURRENT DANGER TO HIGH-YIELDING RICE CULTIVATION Dr. Pramod Kumar	1221-1229	10.5958/2249-7137.2021.02224.2
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198.	A BRIEF STUDY ON AZADIRACHTAINDICA (NEEM) Dr. Prasanna	1336-1342	10.5958/2249-7137.2021.02245.X
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211.	USE OF GAMES IN LEARNING FOREIGN LANGUAGE AT THE UNIVERSITY Sodikova Yulduz Furkatovna	1423-1427	10.5958/2249-7137.2021.02261.8

212.	THE PROBLEM WITH THE FOUR CONDITIONALS OR CAUSALITY IN ENGLISH Khamraeva Z.Kh	1428-1433	10.5958/2249-7137.2021.02262.X
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214.	"SHAJARAYI TURK"-AS A HISTORICAL SOURCE Mehroj Isaev, Abduraimov Ruziboy	1438-1440	10.5958/2249-7137.2021.02264.3
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218.	PEDAGOGICAL AND PSYCHOLOGICAL FACTORS OF THE ORGANIZATION OF SCIENCE CIRCLES Dilnoza Dusmat kizi Boymakhmatova	1463-1469	10.5958/2249-7137.2021.02268.0
219.	HUMANITARIAN POLICY OF UZBEKISTAN IN PROVIDING THE WELL-BEING OF OUR PEOPLE Fakhriddin Joylovovich Yormatov, Anvar Abdurashidovich Abdurashidov	1470-1476	10.5958/2249-7137.2021.02269.2
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221.	THE STRUCTURE OF PROFESSIONAL COMPETENCE OF PEDAGOGUES AND PSYCHOLOGICAL REQUIREMENTS Saydullayev Jamoliddin Yaxshiboevich	1487-1489	10.5958/2249-7137.2021.02295.3
222.	NECESSARY CONDITIONS FOR THE IMPLEMENTATION OF THE DIVERSIFICATION STRATEGY IN THE ECONOMY Yusupova Raushan Edilbekovna	1490-1493	10.5958/2249-7137.2021.02294.1
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226.	STUDY AND ANALYSIS OF THE CONVERSION PROCESS OF PROPANO-BUTANN MIXTURE IN HIGH SILICATE CEOLITIC CATALYSTERS OF DIFFERENT SILICATE MODULES AND DIFFERENT STRUCTURES Javharov Jonibek Joraqul ogli, Xolliyev Shamsiddin Xudoyberdiyevich, Tursunova Nargiza Samariddinovna	1506-1525	10.5958/2249-7137.2021.02299.0
227.	RESULTS OF AN EXPERIMENTAL SAMPLE TEST OF AN ADVANCED PERFORATED DEEP SOFTENER Fazliddin Urinovich Zhuraev, Yarash Zhabborovich Rajabov, Umidjon Yarashevich Rajabov, Saidali Sohibugli Turaev, Azamat Zhalilugli Zhuraev	1526-1530	10.5958/2249-7137.2021.02270.9
228.	OBTAINATION OF CARBOXYMETHYLCHITOSAN FROM INANIMATE BEES AND STUDY OF ITS PROPERTIES BY CONDUCTOMETRY, UV-SPECTROSCOPY Gulnora Akmalovna Ikhtiyarova, Feruza Nurullaevna Kurbonova	1531-1535	10.5958/2249-7137.2021.02271.0
229.	MENTAL THINKING IN A LITERARY TEXT Jaloliddin Jamolidinovich Yodgorov	1536-1542	10.5958/2249-7137.2021.02272.2
230.	LABORATORY PARAMETERS OF ENDOGENOUS INTOXICATION SYNDROME AND LIVER MORPHOLOGY IN CHRONIC HBV-INFECTION Khayrullo Norkulovich Fayzullaev, Allabergan Kadirovich Bayjanov	1543-1547	10.5958/2249-7137.2021.02273.4
231.	PROBLEMS OF FINANCING INVESTMENTS IN UZBEKISTAN'S ECONOMY Lutfullo Ubaydullaev	1548-1552	10.5958/2249-7137.2021.02274.6
232.	EVALUATION ON DEVELOPING OF NEW VARIETIES AND LINES OF BREAD WHEAT TOLERANT TO DROUGHT AND HEAT ON THE RAINFED AREAS OF UZBEKISTAN Mamatkul Abdurahmanovich Juraev	1553-1560	10.5958/2249-7137.2021.02275.8
233.	A STUDY ON FACTORS CAUSING CAREER BREAK AND ITS IMPACT ON WOMEN REENTRANTS IN DAKSHIN KANNADA DISTRICT Cryshal C.M, Dr. Catherine Nirmala	1561-1571	10.5958/2249-7137.2021.02301.6
234.	IMPROVEMENT OF INNOVATIVE MECHANISMS IN ECONOMIC DEVELOPMENT Marifatkhon Khakimovna Ahunova	1572-1576	10.5958/2249-7137.2021.02276.X
235.	IMMUNIZATION PROBLEMS IN POULTRY FARMS IN SAMARKAND REGION Mirsaidova R, Abdullaev Sh, Ruzikulov R.F	1577-1581	10.5958/2249-7137.2021.02277.1
236.	METHODOLOGY OF MONITORING AGRICULTURAL LAND OF BULUNGUR DISTRICT AND CREATION OF ELECTRONIC DIGITAL CARDS FOR CADASTRE OBJECTIVES Nurali Shermatovich Umarov	1582-1590	10.5958/2249-7137.2021.02278.3

237.	COMPARATIVE EFFICIENCY OF THE PREPARATION "NODINORM" IN COMPLEX TREATMENT OF FIBROCYSTIC MASTOPATHY Shoxista Sharofiddin qizi Meliboyeva, Mizrob Mavlonovich Boltayev, Elvina Midatovna Sharipova, Riboba Gulomaliyevna Sharipova	1591-1596	10.5958/2249-7137.2021.02279.5
238.	DIDACTIC PRINCIPLES OF GUIDING THEORETICAL KNOWLEDGE FROM STEAM SCIENCE INTO PRACTICE Shoxrux Razzoqovich Turdiyev	1597-1601	10.5958/2249-7137.2021.02280.1
239.	THE ESTABLISHMENT OF SMART LIVESTOCK SYSTEMS Ulugbek Norkulovich Sadullaev, Halyknazar Kurbanbaevich Kalimbetov, Bakhit Urazbaevich Abdrakhmanov	1602-1609	10.5958/2249-7137.2021.02281.3
240.	METHODS OF USING INFORMATION ABOUT THE ART OF MUSIC IN THE TEACHING OF HISTORY OF UZBEKISTAN TO STUDENTS OF 6-7 GRADES OF SECONDARY SCHOOLS Zilola Azamovna Zakirova	1610-1613	10.5958/2249-7137.2021.02282.5
241.	THE IMPORTANCE OF BIOLOGICAL AND PSYCHOPHYSIOLOGICAL FACTORS IN THE DEVELOPMENT OF EDUCATIONAL AND COGNITIVE ACTIVITIES Zokir Toshtemirovich Rakhimov	1614-1623	10.5958/2249-7137.2021.02283.7
242.	COMPETITION IN THE MARKET OF BANKING SERVICES: THEORY AND PRACTICE Malika Lutfullaevna Yadgorova, Dilafruz Elshodovna Akhmedova	1624-1630	10.5958/2249-7137.2021.02284.9
243.	CLINICAL CURRENT AND ANTI-VIRAL THERAPY OF ADENOVIRAL KERATOCONJUNCTIVITIS Kamila Makhsudovna Imomaliyeva, Shahnoza Allaberganovna Bayjanova	1631-1637	10.5958/2249-7137.2021.02290.4
244.	PATHOMORPHOLOGICAL CHARACTERISTICS OF THE THYMUS IN SEPSIS IN CHILDREN Shokhrukhmirzo Abdumannopovich Ziyaev	1638-1642	10.5958/2249-7137.2021.02285.0
245.	USE OF MULTIMEDIA TOOLS IN THE DEVELOPMENT OF SPEECH COMPETENCE Sanobar Khayotovna Kuldashaeva	1643-1648	10.5958/2249-7137.2021.02286.2
246.	A STUDY OF VERBAL LEARNING DISABILITY AMONG PRIMARY SCHOOL STUDENTS Prof. Jaswinder Singh	1649-1657	10.5958/2249-7137.2021.02302.8
247.	USE OF PRECEDENT NAMES IN UZBEK ART JOURNALISM Mukhlisakhon Bakhtiyor kizi Saydaliyeva	1658-1663	10.5958/2249-7137.2021.02287.4
248.	DIVERGENT ASSIGNMENTS USED IN INTEGRATED TRAINING Jahongir Tilakmurodovich Yuldashev	1664-1668	10.5958/2249-7137.2021.02288.6

249.	IMPROVING THE QUALITY OF SECONDARY FIBER RAW MATERIALS STUDYING A PROCESS Anvar Abdumalikovich Abdumajidov, Abdumalik Abdumajidovich Miratayev, Iroda Abdusamatovna Nabiyeva, Farrux Sultanovich Xusanov	1669-1676	10.5958/2249-7137.2021.02289.8
250.	EFFECTS OF MINERAL AGRO ORES ON WINTER WHEAT GROWTH AND DEVELOPMENT Ismaylov Uzakbay Embergenovich, Elemesova Nargiza	1677-1679	10.5958/2249-7137.2021.02291.6
251.	FIELD CONDITIONS FOR PLANTING RE-CROPS WITH MINIMUM TILLING Primkulov Bekzod Sheraliyevich, Boboniyozov Ergash Aminboy ogli	1680-1685	10.5958/2249-7137.2021.02292.8
252.	INFLUENCE OF THE HEATING TEMPERATURE ON THE PROPERTIES OF STEEL D.M. Berdiev, A.A. Yusupov, A.Kh. Abdullaev, B.K. Abdullaev	1686-1691	10.5958/2249-7137.2021.02293.X
253.	DETERMINATION OF IODINE CONTENT IN SOME MEDICINAL PLANTS THROUGH POTENTIOMETRIC AND IODOMETRIC TITRATION Ibrohim Askarov, Azizbek Khadjikulov	1692-1699	10.5958/2249-7137.2021.02303.X
254.	TRADITIONS AND SKILLS IN ENGLISH, RUSSIAN AND UZBEK STORYTELLING Ataullayeva Sitorabonu	1700-1703	10.5958/2249-7137.2021.02304.1
255.	CORONAVIRUS PANDEMIC AND WESTERN BALKANS Davirova Sh, Ruziyev K	1704-1710	10.5958/2249-7137.2021.02305.3
256.	THE IMPORTANCE OF PERSONAL VALUES OF ELEMENTARY SCHOOL STUDENTS IN LEARNING Shabbazova Dilfuza Ruzikulovna	1711-1715	10.5958/2249-7137.2021.02306.5
257.	THEORETICAL BASES OF PROFESSIONAL DEVELOPMENT OF FUTURE PEDAGOGICAL PERSONNEL Normuminov Bahodir Umarovich	1716-1720	10.5958/2249-7137.2021.02307.7
258.	APPROACHES TO LEXICAL CONNOTATIONS Navruzova Nigina Xamidovna	1721-1726	10.5958/2249-7137.2021.02308.9
259.	PUBLICATION OF TRANSLATED WORKS IN THE MAGAZINE "EDUCATION AND TEACHER" (BASED ON NUMBERS FROM 1925-1927) Soatova Gulzoda Nurmamat kizi	1727-1733	10.5958/2249-7137.2021.02309.0
260.	'LISTEN TO ME PLEASE!' –A CLARION CALL OF NATURE FOR RESCUE: AN ECOCRITICAL STUDY ON DR. INDIRA GOSWAMI'S THE MAN FROM CHINNAMASTA Dr. Daisy Gohain	1734-1741	10.5958/2249-7137.2021.02310.7
261.	VERBALIZATION OF THE CONCEPT OF FRIENDSHIP IN ENGLISH AND UZBEK Zatulloeva Fariza Xikmatilloevna	1742-1745	10.5958/2249-7137.2021.02311.9

262.	THE ROLE OF VENTURE CAPITAL IN THE INNOVATIVE DEVELOPMENT OF A TRANSFORMED ECONOMY Chulliyev Suhrob Rabbonaqlovich	1746-1752	10.5958/2249-7137.2021.02312.0
263.	THE ART OF POETRY IN "GULSHANI DILAFGOR" Sobir Mansurov	1753-1756	10.5958/2249-7137.2021.02313.2
264.	THE IMPORTANCE OF TRAINING CONSULTATION IN HORSES Asqarxujayev S, Kasimov S, Khurramova D	1757-1761	10.5958/2249-7137.2021.02314.4
265.	SPIRITUAL AND MORAL EDUCATION OF THE YOUNG GENERATION IN TEACHING RUSSIAN AS A FOREIGN LANGUAGE (TEACHING - TO EDUCATE) Inobat Mirkamilovna Tursunova, Naima Khabibullaevna Khaitbaeva	1762-1765	10.5958/2249-7137.2021.02315.6
266.	COMPUTER-AIDED DESIGN RADIO EQUIPMENT ASSEMBLIES FOR EMC Sobirova U.Sh, Shoyusupova X.X	1766-1769	10.5958/2249-7137.2021.02316.8
267.	THE RELATIONSHIP BETWEEN ABULKHAIRKHAN AND THE RULERS OF TEMURIDS Bekzod Nuraliyevich Mirzayev, Sardorbek Bahridinugli Roziyev	1770-1773	10.5958/2249-7137.2021.02321.1
268.	INTERPRETATION OF OPINIONS ON SOCIAL AND POLITICAL TERMS IN QUTADGHU BILIG Ostonov Utkir Yangiboevich	1774-1777	10.5958/2249-7137.2021.02317.X
269.	INDUCTION OF SUPEROVULATION IN CATTLE Shavkat Dosumbetovich Avezimbetov, Mansur Salomatovich Togaymuradov, Aynura Alievna Bazarbaeva	1778-1781	10.5958/2249-7137.2021.02319.3
270.	PHYSICO-CHEMICAL ANALYSIS OF POLY VINYLETHYNYLTRIE TO XYSISILANE Firuz Fazlidinovich Rakhimov, Vohid Nizomovich Akhmedov	1782-1787	10.5958/2249-7137.2021.02320.X
271.	INTERPRETATION OF TERMS USED TO DIVIDE WORDS INTO CERTAIN GROUPS IN THE STUDY OF VOCABULARY AS A SYSTEM IN THE WORK OF QUTADGHU BILIG Ostonov Utkir Yangiboevich, Imomov Navruz Pattakulovich	1788-1793	10.5958/2249-7137.2021.02318.1
272.	CYTOKINE DIAGNOSTICS IN THE PROGNOSIS OF CRITICAL CONDITIONS IN NEWBORNS BORN TO MOTHERS INFECTED WITH COVID-19 Navruzova Shakar Istamovna, Baratov Sunnat Samiyevich	1794-1802	10.5958/2249-7137.2021.02322.3
273.	PATHOGENETIC ASPECTS OF ABNORMAL UTERINE BLEEDING IN TEENAGE GIRLS Rasulova Saodat Xalimovna, Ashurova Nigora Gafurovna	1803-1808	10.5958/2249-7137.2021.02323.5
274.	A STUDY OF ACADEMIC ACHIEVEMENT OF SENIOR SECONDARY SCHOOL STUDENTS IN RELATION TO THEIR CREATIVITY Dr. Suresh Kaushal, Meenu Yadav	1809-1816	10.5958/2249-7137.2021.02324.7

275.	THE NATIONAL NATURE OF THE IMAGE IN ABDULLA ARIPOV'S POEMS CREATED ABROAD Gulrux Khudoyorova	1817-1822	10.5958/2249-7137.2021.02325.9
276.	DIDACTIC FACTORS AFFECTING IMPROVEMENT B. N. Khushvaqtov	1823-1826	10.5958/2249-7137.2021.02326.0
277.	PECULIARITIES OF HEMORHEOLOGICAL DISORDERS IN THE PATHOGENESIS OF MICROCIRCULATOR DISORDERS OF THE LIVER DURING THE DEVELOPMENT OF HYPOXIC HYPOXIA Khamrakulov Tulkinjon Zokirovich, Shermatov Rasuljon Mamasiddikovich, Khasanov Fazlidin Sharobitdinovich	1827-1834	10.5958/2249-7137.2021.02328.4
278.	PSYCHOPHYSIOLOGICAL CHARACTERISTICS OF PUPILS OF PRIMARY SCHOOL AGE WITH LEARNING DIFFICULTIES Davurova Guzal Akbarovna	1835-1839	10.5958/2249-7137.2021.02329.6
279.	STATE OF MILITARY TERMS IN GERMAN LANGUAGE Rahmonkulova Dilshoda Murodkozievna	1840-1844	10.5958/2249-7137.2021.02330.2
280.	THE WAYS OF IMPLEMENTING VOCABULARY ACTIVITIES IN TEACHING PROCESS Shakhnoza Musurmanova	1845-1848	10.5958/2249-7137.2021.02331.4
281.	PRINCIPLES AND METHODOLOGY OF CREATING A KNOWLEDGE BASE IN AUTOMATED VARIANT DESIGN Abdukhamidov A.Ya, Abdukadyrova Kh. A	1849-1852	10.5958/2249-7137.2021.02332.6
282.	NEW APPROACHES TO ENSURING QUALITY EDUCATION ON THE EXAMPLE OF LASER PHYSICS Islom X. Xamidjonov, Durdona F. Xomidova, Iroda I. Ergasheva	1853-1860	10.5958/2249-7137.2021.02333.8
283.	THE INTEREST OF JUNIOR SCHOOL AGE STUDENTS AND THEIR IMPACT ON SPEECH PERFORMANCE Olimova Nilufar Kasimjon qizi, Maftuna Alijonova Mahammadjon qizi	1861-1864	10.5958/2249-7137.2021.02334.X
284.	LINGUISTIC MORPHOLOGICAL MEANS OF EXPRESSING AN ANALYTIC ATTITUDE Shuxratova Yulduzxon Shakarbekqizi	1865-1868	10.5958/2249-7137.2021.02336.3
285.	DICTIONARY IN TEACHING VOCABULARY COMPOSITION OF LANGUAGE TO JUNIOR SCHOOL AGE STUDENTS WAYS TO WORK Sodiqova Mohlaroyim Shavkatjon qizi, Buvajonova Mohirakhon Usmonali qizi	1869-1872	10.5958/2249-7137.2021.02335.1
286.	DEVELOPMENT OF PRACTICAL ACTIVITY SKILLS OF STUDENTS IN MATHEMATICS IN E-LEARNING ENVIRONMENT Mamadiyrov Jamol Bahodirovich	1873-1877	10.5958/2249-7137.2021.02327.2

287.	AMIR TEMUR AND THE DEVELOPMENT OF NATIONAL-MILITARY GAMES Negmatov B.M, Xodjaeva D. Yu	1878-1881	10.5958/2249-7137.2021.02338.7
288.	GOMPHERNA GLOBOSA: THE POTENTIAL NATURAL FOOD GRADE BETACYANIN Lavanya V, Thamaraiselvi SP	1882-1894	10.5958/2249-7137.2021.02347.8
289.	ANALYSIS OF DIGITAL BANKING SERVICES IN UZBEKISTAN AND WAYS OF ITS DEVELOPMENT Otabek Maxmadaminovich Melikov	1895-1903	10.5958/2249-7137.2021.02339.9
290.	THE IMPACT OF DIFFERENT FERTILIZER STANDARDS AND PLANTING TIMES ON GRAIN QUALITY OF AUTUMN SOFT WILLOW VARIETIES Azimova Muhayyo Egamberdiyevna, Jononov Berdinazar Xudoynazarovich	1904-1910	10.5958/2249-7137.2021.02340.5
291.	THE EVALUATION OF HEALTHFUL PROPERTIES OF PUMPKIN FRUIT EXTRACT THROUGH THE ANTIOXIDANTIC INDICATOR Ibragim Askarov, Azizbek Khojikulov, Qobuljon Otakhonov	1911-1915	10.5958/2249-7137.2021.02337.5
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294.	COMPARATIVE ANALYSIS OF RISK PERCEPTION AND RISK MANAGEMENT STRATEGIES AMONG VEGETABLE GROWERS IN PUNJAB STATE, INDIA AND NAKURU COUNTY, KENYA Carolyn Cherotich, Dr. Manmeet Kaur	1925-1942	10.5958/2249-7137.2021.02342.9
295.	THE EDUCATIONAL DESIGN OF THE MULTIMEDIA LESSON Inagamova Nargis Abdullaevna	1943-1948	10.5958/2249-7137.2021.02346.6
296.	THE CONCEPT AND APPLICATION OF "ABBREVIATION" IN ENGLISH AND UZBEK Khudaykulova Sevara Saidakbarovna	1949-1952	10.5958/2249-7137.2021.02345.4
297.	GRAMMAR AND STYLISTIC CHARACTERISTICS OF PAIR WORDS IN MODERN GERMAN AND UZBEK LANGUAGES Imyaminova Shukhratkxon, Shaxnoza Bekmurotova	1953-1956	10.5958/2249-7137.2021.02344.2
298.	METHODOLOGY OF ORGANIZATIONAL CAPACITY DEVELOPMENT IN GIFTED CHILDREN Abdullaeva Zuxro Ismoilovna	1957-1961	10.5958/2249-7137.2021.02348.X
299.	A REVIEW ON NETWORKING AND INNOVATION Dr. Manjula Jain	1962-1969	10.5958/2249-7137.2021.02358.2

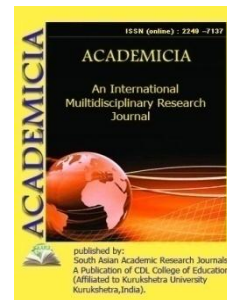
300.	ENVIRONMENTAL POLLUTION BY CHEMICAL SUBSTANCES USED IN THE SHALE GAS EXTRACTION: A REVIEW Dr. Amit Sharma	1970-1976	10.5958/2249-7137.2021.02359.4
301.	A REVIEW ON NETWORKING AND INNOVATION: THE POTENTIAL ROLE OF INNOVATION POLES Dr. Vipin Jain	1977-1983	10.5958/2249-7137.2021.02361.2
302.	YOGA THERAPY DURING CANCER TREATMENT: A REVIEW Dr. Prithpal Singh Matreja, Dr. V K Singh	1984-1990	10.5958/2249-7137.2021.02362.4
303.	ARTISTIC PSYCHOLOGY ON THE EXAMPLE OF THE WORK "SPRING DOES NOT RETURN" Achilova Emina Sadulloyevna	1991-1994	10.5958/2249-7137.2021.02349.1
304.	THE ROLE OF PARENTS IN THE UPBRINGING OF CHILDREN Alimova Nargiza Usmanovna	1995-1999	10.5958/2249-7137.2021.02350.8
305.	A REVIEW ON ENZYMOLOGY, USES AND BIOTECHNOLOGY OF PHYTASE K K Sharma, Mayur Porwal, Arinjay Jain	2000-2005	10.5958/2249-7137.2021.02364.8
306.	REVIEW ON ENVIRONMENTALLY FRIENDLY FERTILIZERS Kusum Farswan	2006-2011	10.5958/2249-7137.2021.02365.X
307.	AN OVERVIEW ON BUILDING ENERGY USAGE INFORMATION Dr. Amit Sharma	2012-2018	10.5958/2249-7137.2021.02363.6
308.	A BRIEF REVIEW ON THE INTELLIGENT BRAKING SYSTEM Harish Kumar	2019-2024	10.5958/2249-7137.2021.02366.1
309.	ESSENTIAL PROBLEMS OF TEACHING ENGLISH LEXICOLOGY Azimbayeva Ranohon Yuldashevna	2025-2030	10.5958/2249-7137.2021.02351.X
310.	CREATION OF THE LEGAL BASIS OF STATE AWARDS IN INDEPENDENT UZBEKISTAN Karimjonov Jasurbek Mukhtorjonovich	2031-2037	10.5958/2249-7137.2021.02352.1
311.	PRODUCTION OF HYDROGEN USING ALUMINUM AND ALUMINUM ALLOYS: A REVIEW Dr. Amit Sharma	2038-2043	10.5958/2249-7137.2021.02360.0
312.	A STUDY OF IDENTITY THEFT: INTENTIONS, CONNECTED FRAUDS, METHODS AND AVOIDANCE Sushil Kumar	2044-2050	10.5958/2249-7137.2021.02367.3

313.	A BRIEF REVIEW ON THE RUSTIC CUSTOMER'S WHILE SELECTING MOBILE PHONE Manoj Agarwal	2051-2056	10.5958/2249-7137.2021.02368.5
314.	OPEN SPACES IN THE PERIPHERY OF MADRID AND ITS METROPOLITAN AREA (SPAIN), SUSTAINABLE URBAN PLANNING AND ENVIRONMENTAL VALUES Piyush Mittal, Neelanchal Trevedi, Rahul Arora	2057-2062	10.5958/2249-7137.2021.02369.7
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317.	REVIEW ON OZONE DEPLETION AND GLOBAL WARMING Dr. S.R. Ali	2072-2078	10.5958/2249-7137.2021.02370.3
318.	SMART PHONE ADDICTION AND MINDFULNESS: A REVIEW Dr. Amit Sharma	2079-2085	10.5958/2249-7137.2021.02371.5
319.	A REVIEW ON TRANSGENIC ANIMALS PRODUCE HUMAN ANTIBODIES Milind Pandey, Ashish Singhai, Rajesh Sharma	2086-2092	10.5958/2249-7137.2021.02372.7
320.	DETECTION AND SPATIAL MAPPING OF MERCURY CONTAMINATION IN WATER SAMPLES USING A SMART-PHONE Dr. Pavan Kumar Singh	2093-2099	10.5958/2249-7137.2021.02373.9
321.	ANALYSIS OF THE BASIC PRINCIPLES OF ENERGY SAVING REGIMES IN ASYNCHRONOUS ELECTRIC POWERS Rustamov Suhrob Shuhrat oglu, Norboyev Abbas Askar oglu	2100-2103	10.5958/2249-7137.2021.02355.7
322.	DEVELOPMENT OF UZBEKISTAN TRANSLATION SCHOOL FROM UZBEK TO RUSSIAN LANGUAGE IN THE BEGINNING OF XXTH CENTURY (ON THE BASIS OF UZBEK WRITERS' WORKS) Kamilova Saodat Ergashevna, Xaitbaeva Naima Xabibullaevna	2104-2108	10.5958/2249-7137.2021.02356.9
323.	SAYYID AMIR KULOL-BAHAUDDIN NAQSHBAND'S TEACHER Navruzova Gulchehra Nigmatovna	2109-2116	10.5958/2249-7137.2021.02357.0
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326.	RESISTANCE OF CEMENT AND CONCRETE TO CHEMICAL AND AGGRESSIVE FACTORS Egamberdiev Murad Saidovich, Mirzayev Ulugbek Telmonovich, Qurbonova Xurshida Idiyevna, Gadoyev Asliddin Oktamovich	2129-2134	10.5958/2249-7137.2021.02385.5
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329.	AN OVERVIEW ON CARDIOVASCULAR DISEASE Dr. S K Gupta, Dr. Sadhna Singh, Dr. Anish Prabhakar	2144-2149	10.5958/2249-7137.2021.02376.4
330.	AN OVERVIEW ON THE POTENTIAL OF ANTIBIOTICS Dr. S Nagendran, Dr. Prerana Gupta	2150-2155	10.5958/2249-7137.2021.02377.6
331.	PRACTICAL ACTIVITY OF THE STUDENT IN PERFORMANCE OF LABORATORY WORKS IN PHYSICS Eshkaraev U. Ch	2156-2160	10.5958/2249-7137.2021.02388.0
332.	PRACTICAL STUDY OF THEORETICAL INFORMATION IN PRIMARY SCHOOL MOTHER TONGUE LESSONS Tajbenova Saule Sarsengalieva	2161-2167	10.5958/2249-7137.2021.02389.2
333.	INFORMATION ON THE ECOLOGY OF GLOSSY IBIS-(PLEGADISFALCINELLUS L.1766) ANDEURASIAN SPOONBILL-(PLATALEA LEUCORODIA L.1758) ‘S SOUTH-KYZYLKUM WATER DISTRIBUTION Turaev Muxtor Murodovich	2168-2176	10.5958/2249-7137.2021.02390.9
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335.	A REVIEW ON GLOBAL GENDER DIFFERENCES IN OBESITY Sandeep Verma	2184-2190	10.5958/2249-7137.2021.02379.X
336.	“ABOUT HOW CHEAP (ACTUALLY VERY EXPENSIVE) LOANS MAY NOT ENRICH THE POOR” Abdurazzokov Shokhzod Otabek ugli, Nabijonov Otabek Ganiyevich, Yuldashaliyev Sanjarbek Zokhidjon ugli, Khasanov Rakhmonali Alisher ugli	2191-2193	10.5958/2249-7137.2021.02391.0
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ASANAS AND POSTURES IN YOGA AND IMPACT ON PHYSICAL GROWTH AND HEALTH

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ABSTRACT

Originally and still used as a generic word for a seated meditation pose, an asana is a bodily posture that may be in any position, including lying down, standing, inverted or twisting. According to Patanjali's Yoga Sutras, "asana" means "[a posture that is] stable and pleasant. One of Patanjali's eight limbs is the capacity to sit for long periods of time. In English, asanas are referred to as yoga poses or yoga postures. Some 84 asanas are included in the Goraksha Sataka and Hatha Yoga Pradipika from the 10th and 11th centuries, respectively, and the 17th and 18th centuries, respectively, in the Hatha Ratnavali. Due to the effects of colonialism, Indian nationalism favoured physical culture in the 20th century. A new method of yoga asanas was developed by pioneers like Yogendra, Kuvalayananda, and Krishnamachari in that setting (incorporating systems of exercise as well as traditional hatha yoga). Pattabhi Jois, the father of Ashtanga vinyasa yoga, and B.K.S. Iyengar, the creator of traditional Iyengar yoga, were both Krishnamacharya's students. Together, they penned hundreds of more asana descriptions, rekindled interest in yoga, and exported it to the West. Since Iyengar's Light on Yoga in 1966, which detailed around 200 asanas, many more have been created. Dharma Mittra drew hundreds more of them.

KEYWORDS: *Yoga Asanas, Asanas, Yoga and Key Advantages*

INTRODUCTION

In mediaeval hatha yoga literature, asanas were said to provide both spiritual and bodily benefits. There has been more recent research showing that they may help with health problems including asthma and diabetes by increasing flexibility, strength, and balance, as well as by reducing stress and the ailments that go along with it.

Many centuries have passed since asanas first appeared in literature. Figures of the Buddha, Jain tirthankaras, and Shiva are shown on meditation chairs such as lalitasana and other traditional meditative positions in religious Indian art. Asanas are more prevalent in literature and cinema, thanks to the growing popularity of yoga as a form of fitness.

Usage in Ancient times



Figure 1 : Mould of Pashupati seal with pose resembling Mulabandhasana

As Sir John Marshall pointed out in 1931, a central figure in the Indus Valley Civilization's Pashupati seal, dating from around 2500 BC, resembles Shiva. This is because he is three-faced, in a yoga position like Shiva's Mahayogin, has four animals like Pashupati, the Lord of Beasts, and has deer beneath his throne, as seen in mediaeval Shiva depictions. He also has a three-part headdress like Shiva's t This would be the earliest known asana if the information is accurate. With no evidence to support Shiva's Indus Valley ancestry anywhere and many conflicting interpretations of the Pashupati seal with no apparent means to choose between them, the seal's depiction of a yoga position cannot be relied upon. It might be anything.

India is where asanas got their start. According to Patanjali's Yoga Sutras, asana practise is the third of Patanjali's eight limbs (Sanskrit: astanga, from asht and anga, respectively) of classical or raja yoga (c. 2nd to 4th century CE). English speakers have been using the term asana since the 19th century to refer to a sitting position or a meditation seat, both of which are derived from the Sanskrit verb asana, which means "to sit down" in Sanskrit.



Figure 2 : Key Postures

Yamas, niyamas, asana, pranayama, pratyahara, sense withdrawal, concentration, dhyana, and meditation are the eight limbs in that order: social behaviour, self-observance, asana, and pranayama are the breath exercises (realization of the true Self or Atman, and unity with Brahman, ultimate reality).

There are physical motions known as asanas in hatha yoga, and breathing exercises known as pranayama in contemporary yoga. The sitting positions employed for pranayama and meditation, where meditation is the route to samadhi, transpersonal self-realization, are referred to as asanas by Patanjali as "stable and pleasant postures".

A good asana has the following qualities, which are not mentioned in the Yoga Sutras by name: The name of the god is Sthira, and his name is Sukha. The term "asana" refers to a pleasant and stable position. A commentary on Patanjali's Yoga Sutras known as the Bhasya commentary,

which contains the Sutras, has led some academics to speculate that the commentary is also by Patanjali.

Padmasana and Siddhasana, the two sitting asanas described in the Goraksha Sataka, are utilised for meditation and pranayama, respectively. For the first time, in the tenth or eleventh century, the text Vimanarcanakalpa mentions an asana that isn't seated: the balancing position Mayurasana (peacock). Poses like this were adapted by the Nath yogins after they were developed outside of Shaivism, the tradition's birthplace, by the scholar James Mallinson, and were linked with austerity.

According to the Goraksha Sataka (10th–11th century), or Goraksha Paddhati, an early hatha yoga book, the 84 classical asanas came to be as a result of a revelation made by Lord Shiva, the Hindu god.

According to the text, there are 84 lakh[b] or 8,400,000 species in all. This means that Lord Shiva created one asana for each lakh. The book names and explains just two of them in detail: Siddhasana and Padmasana. Because of its symbolic nature, the number 84 represents completion and sanctity. [c]

There is a relief statue at Hampi's Achyutaraya temple depicting an unnamed asana that seems to be balancing on one's hands. According to the Hatha Yoga Pradipika (15th century), the first four sitting postures, Siddhasana, Padmasana, Bhadrasana, and Simhasana, are the most essential. There are many relief sculptures of yogins in asanas on the pillars of the Achyutaraya temple in Hampi, dating from the 16th century, including Siddhasana on a stick, Chakrasana, Yogapattasana, and a hand-standing inverted position with a stick, among others.

More non-seated postures emerge in Hatha yoga practise by the 17th century, when asanas had become an essential part of the discipline. Srinivasa's Hatha Ratnavali from the 17th century is one of the rare books to make an effort to include all 84 asanas[e], but four of them are incomprehensible in Sanskrit and at least 11[f] are just listed without any explanation, their presence having been previously documented.

This assertion is repeated in the late 17th-century Gheranda Samhita, which says Shiva taught 84 lakh asanas, of 84 being the most important, and "32 are helpful in the realm of humans."

"Asana was seldom (if ever) the main element of the important Indian yoga traditions," says yoga instructor and researcher Mark Singleton after studying ancient texts. According to the historian Norman Sjoman, there is no evidence of a continuous yoga tradition dating back to the mediaeval texts, whether via asana practise or research.

In Los Angeles, Paramahansa Yogananda founded the Self-Realization Fellowship in 1925 and taught yoga to tens of thousands of Americans, including asanas, breathing, chanting, and meditation, according to his 1946 autobiography, *Autobiography of a Yogi*.

A combination of Hatha Yoga, Wrestling Exercises, and Modern Western Gymnastic Movement was created by Tirumalai Krishnamacharya (1888–1989) in the 1930s under Kavalayananda. It was unlike anything seen previously in the yoga tradition.

Sjoman asserts that Krishnamacharya based the Mysore Palace yoga method on the Vyayama Dipika, a gymnastic training textbook. According to Singleton's theory, Krishnamacharya was well-versed in the gymnastics culture of his time, which was heavily influenced by Scandinavian

gymnastics. His asana experiments and innovative use of gymnastic jumping between poses may explain the similarities between modern standing asanas and Scandinavian gymnastics, Singleton suggests. People like Russian Eugenie V. Peterson (aka Indra Devi), Pattabhi Jois (who founded Ashtanga Vinyasa Yoga in 1948), B.K.S. Iyengar (who founded Iyengar Yoga), T.K.V. Desikachar (his son), Srivatsa Ramaswami (who continued his Viniyoga tradition), and A G Mohan (co-founder of Svastha Yoga & Ayurveda) Together, they helped resurrect yoga's appeal and introduce it to the West.

In 1959, Vishnudevananda Saraswati released a book including 136 variations on the fundamental poses of yoga, which he called The Yoga Sutras.

The physical practise of asanas was systematised by Iyengar in his book Light on Yoga: Yoga Dipika, released in 1966 and accompanied with 600 photos of Iyengar performing about 200 asanas. Three million copies of the book were sold, and it was translated into 17 other languages.

A list of 1,300 asanas and their variants, published in 1984, by Dharma Mittra included pictures of himself in each position to illustrate the list's ancient and contemporary origins; the Dharma Yoga website indicates that he generated approximately 300 of them.

History of Asanas

Headstand (Kapala Asana) from the Joga Pradipika text, dating from the early 19th century. Some of the asanas date back to antiquity, while others are from the mediaeval period, and a rising number are more contemporary creations.

There are a few poses that seem classic, such Virabhadrasana I (Warrior Posture I), although they are really very contemporary. That pose was presumably created by Krishnamacharya about 1940 and popularised by his student, BKS Iyengar. Certainly newer is Pattabhi Jois' Yoga Mala (Revolved Side Angle Pose) Parivritta's Parsvakonasana (Revolved Side Angle Pose). Even though Viparita Virabhadrasana (Reversed Warrior Pose) is very new, it may have been invented as recently as the year 2000, according to some sources. Asanas like Dog Pose and Trikonasana (the triangle pose) initially emerged in the twentieth century as did the Surya Namaskar series of asanas (the sun salutation) (Salute to the Sun). The Aditya Hridayam, a distinct sun salutation, is mentioned in the Ramayana's "Yuddha Kaanda" Canto 107 as being old. The current version of Surya Namaskar was developed by the Raja of Aundh, Bhawanrao Shrinivasrao Pant Pratinidhi;

K. Pattabhi Jois described the Ashtanga Yoga variant forms of Surya Namaskar A and B, probably derived from Krishnamacharya. A contemporary, physical culture-oriented version of the ancient ritual of prostrating one's self to the sun may be found in Surya Namaskar. Light on Yoga, by B.K.S. Iyengar, published in 1966, described more than 200 asanas (postures), with approximately 50 basic poses and their variants. In contrast to many traditional asanas, which are named after objects (like Vrikshasana, tree pose), legendary figures (like Matsyendrasana, the sage Matsyendra's pose), or animals (like Kurmasana, tortoise pose), "an overwhelming eighty-three" of Iyengar's asanas have names that simply describe the body's position Shatkonasana, or "Six Triangles Pose," was named after this design and first documented in 2015. In his Master Yoga Chart from 1984, Mittra depicted 908 different postures and modifications, and since then, many more have been developed. There has been "amalgamation and borrowing," according to Sjoman, in the history of the names of asanas for millennia, making it difficult to trace their origins.

Because a name may refer to a different posture, and a pose may have had many names at various points in time, the existence of matching names is not evidence of continuity.

As a result, the figures shown here are derived from descriptions of the asanas themselves.

No. of asanas	Author	Date	English
2	Gorakshanatha	10th-11th century	Goraksha's Century
15	Svami Svatmarama	15th century	Light on Hatha Yoga
32	Gheranda	17th century	Gheranda's Collection
52	Srinivasa	17th century	A Treatise On Hatha Yoga
84	Ramanandi Jayatarama	1830	Light on Yoga
37	Yogi Ghamande	1905	Stairway to Yoga
c. 200	B. K. S. Iyengar	1966	Light on Yoga
908	Dharma Mittra	1984	Master Yoga Chart

Traditional and Modern Approach

There are many different yoga schools that agree that asanas are best practised after having had a bath, when the body is relaxed and the stomach is empty. Using asanas for physical rehabilitation means doing them on both sides equally, starting with the stronger side, according to sports medicine. Asanas are active stretches that help prevent muscles from damage.

Salutations to the Sun God

In Surya Namaskar, the Salute to the Sun, the downward-facing dog posture, Adho Mukha Svanasana, is done at least once and frequently twice.

Surya Namaskar, or the Salute to the Sun, is a dynamically articulated yoga sequence that may include up to twelve asanas. There are two sets in the series in a round; the second set advances the opposite leg first. Although Adho Mukha Svanasana (downward dog) is part of the sequence, it varies by school, with some schools having students choose between upward dog and cobra for one position in the series. As for the sequence itself, schools take different methods to it. For instance, in Iyengar Yoga, modifications such adding Marichysana I and Pascimottanshanasana are recommended..

Styles

Asanas are taught in a variety of ways by different yoga schools in the West. Some asanas, like Trikonasana, are done in the identical manner by all of them. Here are a few methods that have been verified by other sources.

In Iyengar Yoga's Utthitha Trikonasana, which is a crucial posture, a yoga block is used as a support. The posture necessitates working various portions of the body in a variety of ways.

Rather of stressing quantity over quality, Iyengar Yoga "emphasises accuracy and alignment" and emphasises proper movement above quantity. This style of yoga holds poses for far longer than others, which enables the muscles to relax and stretch as well as promotes concentration on

the posture. Props, such as belts, blocks, and blankets, are available to students free of charge to help them in doing the asanas correctly. Standing postures are taught to new students from the very beginning, and each one is meticulously performed. It's not uncommon to see the feet spread wide in Trikonasana, with the front foot turned out and its centre of heel perfectly aligned with its arch, in order to achieve a broad stance.

Sivananda Yoga utilises hatha yoga asanas as a component of raja yoga in order to help students "sit in meditation for an extended period of time." Individual postures aren't given much attention; instructors stick to Sivananda and Swami Vishnu-fundamental devananda's teachings. Instead of reaching straight up in Trikonasana, the upper arm may be extended forward, parallel to the floor. According to Sivananda Yoga, the fundamental asanas are a collection of 12 poses. These aren't the simplest positions, nor are they the ones that every class does. In some schools, Trikonasana is the first of the 12 postures and is used to relax the hips before moving on to the next one.

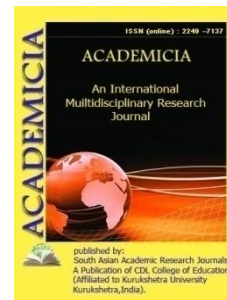
CONCLUSION

As eugenics and Lamarckism gained popularity in the 1850s, India created a culture of physical activity to combat the colonial stereotype of alleged "degeneracy" among Indians in comparison to the British. Indian nationalists like Tiruka, who taught exercises and unarmed fighting methods as yoga from the 1880s through the early 20th century, adopted this tradition. K. V. Iyer at his Bangalore gym, on the other hand, intentionally mixed "hata yoga" [sic] with bodybuilding as a proponent of Indian physical culture. Niels Bukh's *Grundgymnastik eller primitiv gymnastik* describes a number of postures that are similar to Parighasana and others like it (known in English as Primary Gymnastics). Their origins may be traced back to Pehr Ling, a 19th-century Scandinavian gymnastics tradition that made its way to India in the early twentieth century. In 1919, Yogendra, known as "the Father of the Modern Yoga Renaissance," introduced yoga asanas to the United States with his method, which was inspired by Max Müller's physical culture. Swamiji established the Kaivalyadhama Health and Yoga Research Center in Maharashtra in 1924 with the help of Swami Kunalayananda. His "profound" influence on the development of yoga, according to historian Joseph Alter, came from combining asanas with Indian methods of training and contemporary European gymnastics.

REFERENCES

1. Iyengar, B. K. S. (2006). *Light on Life: The Yoga Journey to Wholeness, Inner Peace, and Ultimate Freedom*. pp. xvi–xx. ISBN 978-1-59486-524-4.
2. Mohan, A. G. (2010). *Krishnamacharya: His Life and Teachings*. Shambhala. p. 11. ISBN 978-1-59030-800-4.
3. Pages Ruiz, Fernando (28 August 2007). "Krishnamacharya's Legacy: Modern Yoga's Inventor". *Yoga Journal*. 26 November 2018.
4. Vishnu-devananda 1988.
5. Stukin, Stacie (10 October 2005). "Yogis gather around the guru". *Los Angeles Times*. 9 January 2013.
6. "Yoga.com". *Yoga.com*. 27 February 2005. Archived from the original on 6 September 2010. 29 October 2011.

7. "About Sri Dharma Mittra". Dharma Yoga. 19 January 2019. Over 300 of these now-popular posture variations were created by Sri Dharma, though he will always say they only came through Divine intuition.
8. "What's behind the five popular yoga poses loved by the world?". BBC. 5 December 2018.
9. Dowdle, Hillary (11 November 2008). "5 Experts, 1 Pose: Find New Nuances to Warrior I". Yoga Journal. 2 December 2018.



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COMPARATIVE ANALYSIS OF NEMATOLOGICAL SITUATION IN UCHKIZIL AND SOUTH SURKHAN RESERVOIRS

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ABSTRACT

The article provides a comparative analysis of the nematological situation in the Uchqizil and South Surkhan reservoirs. According to the results of the analysis, 119 species of free-living and phytoparasitic nematodes were identified in the reservoirs, 94 species in the Uchqizil reservoir, 93 species in the South Surkhan reservoir, and 66 species of nematodes in common for both reservoirs.

KEYWORDS: *Reservoir, Nematode, Soil, Root, Fauna, Uchqizil Reservoir, South Surkhan Reservoir.*

INTRODUCTION

Today, the biological potential of inland water bodies around the world requires rational use. This requires special attention to nematodes, which make up 58% to 90% of all invertebrates in the upper sedimentary layers of water bodies [9]. Nematodes are very common multicellular animals on Earth and are in an active biological development stage. They are actively involved in the utilization of organic matter in water bodies. Therefore, the development of measures to manage the diversity, specificity and quantity of biological species of nematodes is of great scientific and practical importance.

Free-living nematodes are a poorly studied group of invertebrates that have not been well studied theoretically and practically. They play an important role in the balance of organic matter in water bodies.

Free-living nematodes in the watersheds of Uzbekistan have not been studied to date, and we are studying it for the first time.

MATERIALS AND METHODS

Samples from coastal soils and coastal vegetation of the Uchqizil and South Surkhan reservoirs serve as research material. Sampling of nematodes was carried out in 2010-2020. During the study, samples were taken from a total of 800 coastal soils and 700 peripheral soils and plant roots by the route method.

The collected samples were brought to the problematic laboratory of phytohelminthology of Termez State University and nematodes in soil samples were isolated using the washing method. Samples taken from the top (1-2 cm) layer of soil to 1/4 m², with a total volume of 50-100 cm³, were placed in a special polyethylene bag and brought to the laboratory for research. To separate the nematodes from the soil mass, the samples were placed in a crystallizer, shaken, and the resulting fraction was poured into another crystallizer. This process was repeated several times. As a result, the nematodes floated to the surface of the water and were poured into another container. The molten fraction was passed through a gaseous sieve under a weak stream of water. The sediment left in the sieve was washed in a Peter bowl. The tip of the nematode was collected using a slightly bent entomological needle. Isolated nematodes were anesthetized in 4% formalin solution (fixation). The nematodes in the vial were treated with 7 parts glycerin, 23 parts 96% alcohol, and 70 parts distilled water. The solutions help to keep the nematodes for many years, and the glycerin in them helps to clear the nematode from the cuticle [1]. Permanent drugs were prepared by the method of Sainhorst [8].

Berman's funnel method was mainly used to separate nematodes from soil and plant tissues.

Samples of soil (20 cm³) and cut root (length 0.5–1cm, weight 20g) were placed in metal nets with milk filters, then in a 15 cm long glass funnel, filled with water by placing a clamped rubber on the narrow end, and 24 hours in summer, autumn and left at room temperature (10-200) for 48 hours in spring and 72 hours in winter. During this period, the nematodes emerge from the soil and roots into the water and settle in a rubber tube. Nematodes were fixed with 4% formalin.

The species composition of nematodes was studied under a light microscope MBR-3. Morphometric parameters of the De Man formula [104; 104 p.], Modified by Micoletzky [7], were used to determine the species.

RESEARCH RESULTS

Taxonomic analysis of the identified nematodes shows that in the Uchqizil and South Surkhan reservoirs of Surkhandarya region, 119 species of free-living and phytoparasitic nematodes were found in reservoir soils, hawthorn, taron aquatic plants and coastal reeds and sedges. It belongs to 18 subfamilies, 10 large families, 41 families, 40 subfamilies, 64 generations.

The identified nematodes belonged to 3 subclasses (Adenophorea, Chromadoria, Rhabditia), from which representatives of the subclass Adenophorea were found in large numbers in both reservoirs (Table 1).

TABLE 1 COMPARATIVE ANALYSIS OF NEMATODES DETECTED IN UCHQIZIL AND SOUTH SURKHAN RESERVOIRS

Subclasses	Families		Generation		Species		Individuals	
	Number	%	Number	%	Number	%	Number	%
Uchqizilreservoir								
Adenophorea	15	41,7	25	46,3	51	54,4	5701	54,3
Chromadoria	11	30,5	15	27,8	23	24,4	4106	39,1
Rhabditia	10	27,8	14	25,9	20	21,2	693	6,6
Total	36	100	54	100	94	100	10500	100
South Surkhan reservoir								
Adenophorea	15	40,6	22	40,9	43	46,4	2402	48,7
Chromadoria	10	27,0	13	24,0	21	22,5	1438	29,1
Rhabditia	12	32,4	19	35,1	29	31,1	1096	22,2
Total	37	100	54	100	93	100	4936	100

In the South Surkhan reservoir, the Rhabditia subclass included 12 (32.4%) nematodes belonging to the family, while in the Uchqizil reservoir, 11 (27.8%) nematodes belonging to the family were found.

Adenophorea subclass in the Red Reservoir 5701 individuals (54.3% of the total identified individuals), Chromadoria subclass 4106 (39.1%), Rhabditia subclass 693 (6.6%), and Adenophorea in the South-Surkhan reservoir junior class 2402 (48.7%), Chromadoria subclass 1438 (29.1%) and Rhabditia subclass 1096 (22.2%) individuals. According to the analysis, members of the subclass Adenophorea and Chromadoria are more common in the Uchqizil Reservoir than in the South Surkhan Reservoir.

"Floristic spectra" are widely used in botany, representing the main features of the systematic composition of floristic complexes. Analysis of the structure of faunistic complexes, especially helminths, has been developed by foreign scientists [1,2, 3,4].

The nematodes identified in the Uchqizil and South Surkhan reservoirs were distributed among the families as follows (Table 2).

TABLE 2 DISTRIBUTION OF NEMATODES IDENTIFIED IN THE UCHQIZIL AND SOUTH SURKHAN RESERVOIRS BY FAMILIES

№	Families	Uchqizil reservoir		South Surkhan reservoir	
		Number of species	%	Number of species	%
1	Alaimidae	2	2,1	1	1,1
2	Enoplidae	1	1,1	1	1,1
3	Oxystominidae	1	1,1	1	1,1
4	Prismatolaimidae	2	2,1	1	1,1

5	Tripylidae	8	8,5	5	5,3
6	Tobrilidae	8	8,5	10	10,9
7	Dorylaimidae	7	7,4	7	7,5
8	Qudsianematidae	2	2,1	2	2,1
9	Aporcelaimidae	2	2,1	1	1,1
10	Nyqolaimidae	1	1,1	1	1,1
11	Paradorylamidae	1	1,1	1	1,1
12	Thornidae	2	2,1	1	1,1
13	Ironidae	3	3,1	2	2,1
14	Mononchidae	8	8,5	7	7,5
15	Mylonchulidae	3	3,1	2	2,1
16	Chromadoridae	1	1,1	1	1,1
17	Cyatholaimidae	2	2,1	2	2,1
18	Ethomolaimidae	1	1,1	-	-
19	Microlaimidae	2	2,1	1	1,1
20	Monhysteridae	2	2,1	3	3,2
21	Leptolaimidae	2	2,1	2	2,1
22	Cylindrolaimidae	1	1,1	1	1,1
23	Axonolaimidae	2	2,1	2	2,1
24	Chronogasteridae	2	2,1	2	2,1
25	Rabdolaimidae	2	2,1	2	2,1
26	Plectidae	6	6,5	5	5,3
27	Rhabditidae	3	3,1	3	3,2
28	Panagrolaimidae	-		4	4,3
29	Teratocephalidae	1	1,1	1	1,1
30	Cephalobidae	6		10	10,9
31	Aphelenchididae	-		1	1,1
32	Paraphelenchidae	-	-	2	2,1
33	Aphelenchoididae	2	2,1	1	1,1
34	Tylenchidae	-		1	1,1
35	Tylodoridae	2	2,1	1	1,1
36	Neotylenchidae	1	1,1	-	-
37	Anguinidae	1	1,1	-	-
38	Pratylenchidae	2	2,1	-	-
39	Criconematidae	1	1,1	1	1,1
40	Paratylenchidae	1	1,1	1	1,1
41	Hoplolaimidae	-	-	3	3,2
	Total families	36		37	
	Types	94	100	93	100

The data in the table show that all nematode families are represented by a small number of species. Some of them include 8-10 species, others 3 species, and the rest 1-2 species. Analysis of

the “Faunistic Spectrum” of nematodes in the Uchqizil and South Surkhan reservoirs allows to divide them into at least 3 families (dominant, subdominant and recessive).

The group of dominants includes families with 5-10 species. Representatives of 6 families (Tripylidae, Tobrilidae, Mononchidae, Dorylaimidae, Plectidae, Cephalobidae) in the South Surkhandarya reservoir and 6 families (Tripylidae, Tobrilidae, Mononchidae, Dorylaimidae, Plectidae, Cephalobidae) in the Red Reservoir.

The group of subdominants includes representatives of the family, which includes 2-4 species. There are 13 in the South Surkhandarya Reservoir (Qudsianematidae, Ironidae, Mylonchulidae, Cyatholaimidae, Monhysteridae, Leptolaimidae, Axonolaimidae, Chronogasteridae, Rabdolaimidae, Rhabditidae, Panagrolaimidae, Paraphelenchidae, Apavida, Hoplolaimidae, Hoplolaimidae), Ironidae, Mylonchulidae, Cyatholaimidae, Mikrolaimidae, Monhysteridae, Leptolaimidae, Axonolaimidae, Chronogasteridae, Rabdolaimidae, Rhabditidae, Aphelenchoididae, Tylogasteridae, Pratylenchidae).

The group of residents consists of representatives of the family, which includes 1 species. There are 18 (Alaimidae, Enoplidae, Oxystominidae, Pristionchidae, Aporcelaimidae, Nygolaimidae, Paradorilaimidae, Thornidae, Chromadoridae, Misrolaimidae, Cyndrolaimidae, Teratocephalidae, Aphelenchidae, Aphelenchidae, Aphelenchidae, Aphelenchidae) in the South Surkhan reservoir. (Enoplidae, Oxystominidae, Nygolaimidae, Paradorilaimidae, Chromadoridae, Ethomolaimidae, Cyndrolaimidae, Teratocephalidae, Neotylenchidae, Anguinidae, Criconematidae, Paratylenchidae).

According to the results of faunistic studies in the Red Reservoir, 94 species (10,500 individuals) of nematodes were identified, of which 65 species (8,771 individuals) were free-living nematodes, 17 species (433) in the *Chara fragilis* plant, and 12 species (311) torons. (*Polygonum hydropiper*) was found in the root and stem part of the plant, 28 species (533) in the root and root soil of reeds (*Phragmites australis*) and 19 species (452) in the root and root soil of the plant (*Typhalatifolia*).

Of the total 65 species of nematodes identified in the Trinity Reservoir, 23 species (*Enoploides fluviatilis*, *Paramphidelus dolichurus*, *Odontolaimus chlorurus*, *Tripylaglomerans*, *T. steineri*, *T. brevisetosis*, *T. longicaudatus*, *T. longus*, *T. abberans*, *Laimydrus flavomaculatus*, *Aquatides aquatus*, *Ironustenuicaudatus*, *I. americanus*, *Miconchus niddensis*, *M. tunbridgensis*, *M. trionchus*, *Punctodorasalinarius*, *Aphanolaimus aquatus*, *A. viviparus*, *Axonolaimus spinosus*, *Paraphanolaimus behningi*, *Plectus parainquirendus*, *Teratocephalus sossatus*) for the fauna of Uzbekistan.

According to the results of faunistic studies in the South Surkhandarya reservoir, 93 species (4936 specimens) of nematodes were identified, including 60 species (2963 specimens) of free-living nematodes, 18 species (336) in the plant *Chara* (*Chara fragilis*), 25 species (547). Toron (*Polygonum hydropiper*) plant root and stem part, 27 species (596) reed (*Phragmites australis*) plant root and iliac soil, and 19 species (494) maple (*Typhalatifolia*) plant root and rhizome soil.

Of the 60 species of nematodes identified in the soils of the South Surkhandarya Reservoir, 20 species (*Enoploides fluviatilis*, *Paramphidelus dolichurus*, *Odontolaimus chlorurus*, *Tripylaglomerans*, *T. steineri*, *T. brevisetosis*, *T. longicaudatus*, *T. longus*, *T. abberans*, *Ironustenuicaudatus*, *Miconchus niddensis*, *M. tunbridgensis*, *M. trionchus*,

Punctodorasalarim, *Aphanolaimusaquatus*, *A. viviparus*, *Axonolaimusspinosus*, *Paraphanolaimusbehningi*, *Teratocephalussostatus*, *Mononchoidesstriatus*) were recorded for the first time in Uzbekistan.

CONCLUSION

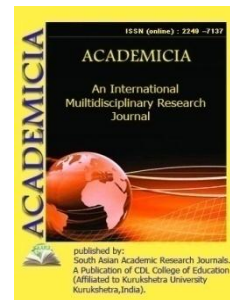
Of the 119 species of nematodes identified in the study, 66 species were common species and were found in both reservoirs. *A. primitivus*, *P. intermedius*, *T. affinis*, *T. papillata*, *T. cornuta*, *L. flavomaculatus*, *L. conurus*, *E. acuticauda*, *A. superbus*, *A. aquatus*, *P. macrolaimus*, *I. americanus* in the Trinity Reservoir, *M. aquaticus*, *M. signaturellus*, *E. pratensis*, *M. globiceps*, *M. filiformis*, *P. parietinus*, *R. filiformis*, *A. karakalpakensis*, *A. dasylocercus*, *C. hexalineatus*, *H. viviparus*, *D. intermedius*, *P. wescolagricus*, *P. pratensis* nematode species have been recorded and not found in the South Surkhandarya reservoir, *T. medius*, *T. allophusis*, *D. tepidus*, *E. centrocerus*, *M. attenuates*, *N. brachyuris*, *M. africana*, *M. palidicola*, *R. longicaudata*, *P. rigidus*, *P. subelongatus*, *D. rivalis*, *M. striatus*, *E. mucronatus*, *E. oxyuroides*, *E. striatus*, *A. maximus*, *P. batavicus*, *P. myceliophthorus*, *T. davainei*, *H. erythrinae*, *H. multicinctus*, *H. tylenchiformis* nematode species have been identified in the South Surkhandarya reservoir.

According to the analysis, the population density of nematodes in the Uchqizil reservoir is higher than in the South Surkhan reservoir. This situation can be explained by the low annual average turbidity in the Red Reservoir, the average annual mineralization, the high content of nitrogen in the water and the high phytobiomass. The Uchqizil reservoir is explained by the similarity of the nematode fauna to the South Surkhan reservoir, as well as the fact that the Surkhandarya water flows into the Uchqizil reservoir through the Zang canal.

REFERENCES

1. Kiryanova E.S., Krall E.L. Plant parasitic nematodes and control measures. - M.: Nauka, 1969. - Vol. 1. - 447 p.
2. Tokobaev M.M. Helminths of wild mammals Central Asia. - Frunze: Ilim. 1976. - 178 p.
3. Smogorzhevskaya LA Experience of analysis of the structure of helminthocenosis of the Black Sea population of long-nosed cormorant. V.kn.: Results of the prospects for research on parasitocenology in the USSR. - M.: Nauka, 1978. - S. 161-174.
4. Smogorzhevskaya LA Structural analysis of the helminth fauna of waterfowl and wading birds of Ukraine: Author's abstract. dis ... doct. biol. sciences. Alma-Ata. 1980. -- 49 p.
5. De Man J.G. Die einheimischen, frei in der reinen Erde und im Süßwasser lebenden Nematoden. - Tijdschr. Nedrl. Dierk. Vereen, 1880. - V.5.-104 p.
6. Kisielska K. Parasite ecology and the problem "Man and his environment". - Wiadomosci Parazytologiczne, 1974.- No.20.- P.775-786.
7. Micoletzky G. Die freilebenden Erd-Nematoden, mit besonderer Berücksichtigung der Steiermark und der Bukowina, zugleich eine Revision sämtlicher nicht mariner, freilebender Nematoden in Form von Beschreibungen und Bestimmungsschlüsseln // Arch. Naturgesch. -1922. Ant. A. - Vol. 87. - 650 p.

8. Prejs K., Lazarek S.. Benthic nematodes in acidified lakes: case of a neglected grazer // Hydrobiologia, Sweden, 1988. - Vol.169. - P.193-197.
9. Seinhorst J.V. Быстрый способ перевода нематод из фиксатора в безводный глицерин // Nematologica. 1959. Т.4. - С. 67-69.



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HARD REALISTIC INTERPRETATION OF SOCIETY AND SPIRITUAL AND MORAL SUNSET (ON THE EXAMPLE OF SHUKUR KholmIRZAEV'S NOVEL "OLABODZHI")

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ABSTRACT

The article examines the ruthless realistic interpretation of the novel "Olabodzhi" by the people's writer of Uzbekistan Shukur Kholmiraev, in particular, the decline of society and the new artistic trajectory of the decline of personality. The author analyzes in detail the ugliness of the rotten Soviet system in Uzbekistan, which in the early 90s was part of the former Soviet Union, in a detailed descriptive manner, internal checks of the protagonist, keeping secrets, revealing secrets in an artistic way.

KEYWORDS: *Novel, Spiritual And Moral Perspective, Ruthless Realistic Interpretation, Society, Personality, Shukur Kholmiraev.*

INTRODUCTION

The famous writer Shukur Kholmiraev is one of the great writers who made a great contribution to the development of modern Uzbek literature. The author entered literature in the 60s of the last centuries. One of his first stories, "Waves", attracted the attention of the creative teacher Abdullah Kakhhor. Shukur Kholmiraev actively worked in various genres of Uzbek prose. In particular, a novel (4, 1 unfinished), a story (about 10), a story (3 volumes), essays (about 20), literary articles and conversations (1 volume), a drama (2), etc. Created by genre.

The life and work of Sh. Kholmiraev are constantly studied by our critics and are in the center of their attention. In particular, U. Normatov, O. Togaev, I. Gafurov, A. Kattabekov, H. Boltaboev, H. Dustmukhammad, H. Karimov, Sh. Doniyorova, G. Tilovova, O. Toshboev, M. Kochkarova, M. Khamidova ... Many literary scholars and young researchers, such as O. Safarov, studied it. Shukur Kholmiraev wrote such novels as "The Last Stop" (1976), "The

Bridge” (1984), “The Passenger” (1987), “Olabodji” (1992), The Dinosaur (Book 1, 1996). In Shukur Kholmiraev's novels "The Last Station", "Passenger" and "Olabodzhi", vivid artistic images reflected the beginning of the collapse of Soviet society in the 70s and 80s.

The novel "Olabo'ji" was published in 1, 2, 3, 4 issues of “Shark Yulduzi” magazine in 1992 with some abbreviations. Under the final chapter of the novel, the magazine notes that the author finished writing the work in 1991. After the magazine version of the novel "Olabodzhi" literary scholars U. Normatov, Kh. Karimov, K. Yuldashev, Sh. Doniyorova, O. Tashbaev, M. Khamidova, K. Shakhobov analyzed and interpreted the dissertation in print [5; 4; 2; 1; 6; eleven; 7.].

While in the novel "Olabodzhi" the author reveals the spiritual depravity and immorality of the individual, society and society in a brutal realistic artistic picture, the author examines in detail dozens of problems of the life of society. In particular, the repair of rural schools, the hypocrisy of officials, the moral depravity of people speaking different languages, the same problems, environmental problems (environmental pollution, garbage processing, mine exploration, damage to the mountain fauna), illegal extermination of animals from the Red Book, destruction of shrines and traditional national values, misinterpretation of the national repressive movement in Soviet history, torture of talented and honest people by officials, destruction of people, human lives and destiny outside many problems were resolved, such as management and acting under the direction of officials, preserving historical sites, and accusing ordinary people of libel in robbing the state.

“Olabodzhi” described the genre of the novel in the magazine as "a story more than a novel." In our opinion, the writer symbolizes the scale of the social, spiritual and moral problem underlying the novel, and calls the genre “a story more than a novel” because of his great love for the “story” genre. Therefore, in an interview with Olim Toshbaev, the author explains why he defined the genre of the novel in this way: “... my opinion about the novel is such that I have not yet written such an ideal work. I have tricked me into relative perfection. I called it a "story." When a story is told, the person does not restrain himself, but speaks succinctly and limits himself in relation to the image.

I mean, there is neither arrogance nor humility in this. If you're lucky, one of the publishers might want to publish the novel. Then it comes out completely. And this is declared a direct novel "[6. 453-454.].

The protagonist of the novel is Ulton Sultanov, a young man who graduated from the Faculty of History and Archeology, but teaches natural sciences at a rural school. He is extremely honest, a martyr of nature and deeply concerned about environmental pollution. That is why he often participates in the press with serious articles on environmental topics. He considers himself the guardian of nature, loves creatures with boundless love, Alatag and mother nature in his chest. But his love for nature and society, his work goes on without any ambition. The main storyline of the novel is based on the script of Tokliboy Kochkarov, a play about the life and fate of a young and honest youth Ulton. Tokliboy Kochkarov was actually a teacher. He also taught the history to Ulton. Tokliboy Kochkarov loves literature and history of Mashrab, he loves his work and even writes poetry. To please the official, amateur singers will perform poems by the secretary of the district committee Tokliboy Kochkarov. Tokliboy Kochkarov, an official who graduated from pedagogy, hires a young writer Bakhor to the polyclinic. Bakhor, which sees

drinking and smoking as a sign of modernity, wants to marry Ulton. To make this wish come true, the official Tokliboy Kochkarov, according to his own scenario, chases Ulton, deliberately arranges a meeting of young people, jointly calculates how much it will cost to renovate the old school, and sends them both to the school to write a report.

In the novel, this plot becomes the main event. Pure volunteer Ulton and Tokliboy Kochkarov, who had caught him in a trap, Bakhor and his henchmen rushed to the wedding of the young bride and groom and immediately arranged a wedding. The "tolerant man" Tokliboy Kochkarov will personally come to the wedding. When Ulton thinks of Bakhor, a beautiful modern girl who has suddenly entered his peaceful life, he thinks, "She suits me, she is an angel." The acquaintance and close connection with Bakhor are gaining momentum so much that Ulton is amazed that these romantic and family events in his life have accelerated so much. Even with his inner experiences, he understands that there is some kind of mystery in these events. But the well-known secret is that all people, even those close to Ulton Karava, know that Bakhor was the death of Tokliboy Kochkarov for many years. But nobody discloses this "secret" to Ulton. Until Ulton returns home after the wedding, hoping to leave for Alataga and stay there, the "sinister secrets" will only be revealed when he catches two naked. Tokliboy Kochkarov forced young Ulton to go to a psychiatric hospital because he witnessed embarrassment. On the whole, in this psychiatric hospital, most of the patients are healthy, honest people who have witnessed the secrets of officials, or those who were ceremoniously interfered with by officials, are "crazy" and die from moral torture. Bakhor will help Tokliboy Kochkarov hospitalize these talented people. Bakhor writes a medical report stating that her legal husband Ulton should be immediately hospitalized due to her mental disorder. We can say that Shukur Kholmiraev approaches society and personality from a moral point of view through the novel "Olobodzhi" and the example of dozens of images in the work. That is, society has become so ugly and polluted that it symbolizes not only that the planet is overflowing with garbage, but also human spirituality has become even more dirty and morally degraded than dirty garbage.

The writer himself tells the interlocutor about the character of the protagonist of the novel Tokliboy Kochkarov: "You said in one of your conversations: 'Tokliboy Kochkarov is a man struck by God, the soul of Mashrab is crippled.'"

- Right! Tokliboy Kochkarov is a fan of Mashrab.

He also reads his poems about his wife according to his mood. As you know, in a number of verses of Mashrab, Allah is meant when he speaks of help. That is, love for the earth is love for Allah.

It is also beautiful because the light of Allah shines. To love the earth is to love Allah. At the end of the play, I think I didn't mind. Mashrab hits him! If he is lucky enough to write a sequel to the novel, it will lead to a great tragedy.

May be?! Ulton and Tokliboy Kochkarov will share their places in the next performance! "[6. 454.].

Thus, from the conversation between the author and Olimboy Toshbaev, it is clear that the writer still plans to continue the novel "Olobodzhi". Indeed, at the end of the novel, Ulton becomes Olobodzhi. However, the real "olobodzhi" in the work are Tokliboy Kochkarov and his henchmen. We know that Shukur Kholmiraev was full of great creative plans and creative

ideas. Olabodja has a lot of groundbreaking artistic thought, new dimension and groundbreaking challenge. According to the author's plan, in the second part of the novel, Ulton was to return to society, to the people, and the real giant Tokliboy Kochkarov had to be taken to Alatag(Olatog'). Because the author himself admitted in the conversation above. But, unfortunately, the writer was not lucky enough to write the second new part of the novel.

In the novel, Ulton's personal tragedy turns into a social tragedy. In the novel, the author embodies the image of dozens of officials, Soviet activists represented by Tokliboy Kochkarov, Tarakanov, Butaboy Sopi, Odil Mirshab, Makhfirat Egamkulov. K. Shakhobov studied the characters of the novel "Olabodzhi" as a transitional generation [7. 15.].

The volume of the novel is quite large, almost six hundred pages. It involves about fifty large and small images. Of course, a novel can be approached and analyzed on a variety of scientific issues. In particular, the aforementioned young researcher K. Shakhobov approaches the novel on the basis of "heroes of the transition period" and "events of the transition period".

The novel has an extremely deep analysis of the problem of personality and society. The drama of events, "an ominous secret" and "disclosure of secrets", the casting of the protagonist in an insane asylum, Ulton's escape with the help of an honest doctor Berdy Urdikulov, an attempt to shoot Tokliboy Kochkarov, one-on-one conversations with the participants, analytical sheets of the work done were extremely impressive. But, deciding the fate of each event and the main characters of the novel, the writer immeasurably accelerates the events. Tokliboy Kochkarov lost his job and became an ordinary school teacher. Bahor could not forgive Ulton for his injustice and impersonality, drank the acid, and her throat burned out. Ulton's father, Sultan, promised to hold his son's wedding, and several flocks of sheep in the state's flock went into debt and disappeared without a trace. Ulton tries to shoot Tokliboy Kochkarov, but misses the target and falls into a trap. Ulton goes to a psychiatric hospital for the second time. The second time, when he manages to escape from the hospital, at the insistence of the doctor, he leaves this community, this village and makes Alatag his home. His hair grows like fluff and turns into a wild man. Sometimes the villagers see it. The villagers call him Olabo'ji. In fact, Olabodji is not Ulton. In fact, in the novel, Tokliboy Kochkarov and his henchmen, distinguished by ugliness, spiritual and moral depravity, impersonality and arrogance, are Olabodzhi. Ulton cannot live in this society filled with Olabodji with his honest and pure heart. He is not allowed to live and breathe as he wants in this society. In this sense, Ulton is a pure image that embodies the feeling of honesty, purity, pure love. In fact, the aesthetic ideal of the writer manifested itself in this frank image of Ulton. Unfortunately, a young man with a pure heart like Ulton does not fit into this enlightened society. Rather, they do not fit.

In this regard, we came to the conclusion that as a result of K. Yuldashev's essay "Loneliness" attached to the article "Life of Freedom of Speech" about Shukur Kholmiraev and our personal observations, certain parts of the author's psyche and personality are embodied in the Image of Ulton. Consequently, the scientist who worked together for months at the Dormon resort of the Writers' Union had a long conversation and closely followed the spirit and worldview of the writer, writes: "In fact, this is a person who by nature loves loneliness, strives for it and is more able to talk with grass and birds than with people. For there is no greed in anything, except for a person" [6. 486.].

In addition, it can be concluded that the image of Ulton was created on the basis of a close friend of the author-archaeologist Mengziyo Safarov. Some of the human qualities of Mengziyo Safarov's character, including patriotism, love of nature, nationalism, were transferred to the image of Ulton. After all, the famous essay "On the soil of ancient Bactria" about a friend of the writer was created. This essay was first published in 1973 in "Sharq Yulduz" magazine under the title Look Back. In the essay, the writer mentions Mengziyo Safarov: "... After university I stayed in Tashkent. A year later, I went to Boysun. I met Mengziyo Safarov in Termez. (This young man studied at the Faculty of History and Archeology of the University and loved to discuss. He often turned to history, and I turned to literature) "[9. 48.]. As you can see, both Ulton and Mengziyo Safarov graduated from the Faculty of History and Archeology. In our opinion, Shukur Kholmiraev was amazed by Mengziyo Safarov's deep knowledge of Russian history, archaeological research, hard work and devotion to nature. We are far from claiming that the life of Mengziyo Safarov was completely passed on to Ulton. But the positive qualities in this person were transferred to the image of Ulton. According to Sayera Kholmiraeva, who compiled the author's 5-volume "Selection" for publication, the essay "He was not like us", which was not published in the writer's personal archive, was dedicated to Mengziyo Safarov. Mengziyo Safarov, unique, unlike ordinary people and beyond reasonable dreams, implies that the protagonist of the novel "Olobodzhi" in some sense served as a partial prototype for the image of Ulton.

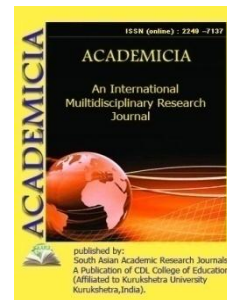
In the novel "Olobodzhi" there is another important socio-political problem, a great artistic and philosophical idea that cannot be artificially developed, history, human life and destiny. This great idea is skillfully revealed in the novel using vivid examples of the wounds inflicted by the Soviet era, the limitations of national history, values, traditions and discrimination against the nation. Tokliboy Kochkarov tried to use his position to give Ulton an artificial, fake love and family. But when the "sinister secrets" were revealed, Ulton realized that his head was at a dead end, that his life had become hell. After all, his life and fate are playing in someone's hands, like a toy. He knew that a fate built on such deceit, conspiracy and deceit did not interest him. That is why Ulton Tokliboy Kochkarov, Bakhor and their comrades rebelled. Unfortunately, his rebellion ends in alienation from society. A closer look at the hero's life and rebellion reveals that Ulton has chosen a natural, not artificial, lifestyle.

In addition, the novel presents the first sketches of the author's later stories "Freedom" and "Caught eagle" (Bandi burgut). The conclusion suggests itself that, as Shukur Kholmiraev himself admits, "Olobodzhi" is the most perfect of the writer's novels. In the novel, the writer very effectively used the possibilities of traditional realism in a detailed description of the individual, society, and moral problems. In the novel, the decline of the individual and the decline of society are presented as extremely artistic studies from the point of view of the moral ideal.

REFERENCES:

1. Doniyorova Sh. National spirit and hero of Uzbek novels of the period of independence. - Tashkent: Classic Word, 2011.
2. Yuldashev K. Spiritual images // Voice of Uzbekistan. June 20, 2000:
3. Yuldashev K. The word flames. - Tashkent: Gafur Gulom Publishing House, 2018.

4. Karimov H. Features and principles of our modern prose // Shark yulduzi. 2010. No. 3. - 156-163;
5. Y. Normatov Puzzle Man // Literature and Art of Uzbekistan. 2001. Release of January 19;
6. Toshboev O. Eternal Contemporary. - Tashkent: Gafur Gulom Publishing House, 2018.
7. Shaksobov K.B. Artistic interpretation of the transitional period in modern Uzbek prose (on the example of the works of Shukur Kholmiraev): thesis abstract for the degree of Doctor of Philosophy (PhD) in Philology. - Fergana, 2019.
8. <https://yuz.uz/news/hikoya-yozmoq-hasratingni-aytishdir>.
9. Tulaganova S. Artistic concept and aesthetic ideal. International Scientific Journal Theoretical & Applied Science Year: 2021 Issue: 10 Volume: 102Published: 09.10.2021
10. Kholmiraev Sh. Choice. Essays. Volume IV. - Tashkent: Shark, 2007.
11. Kholmiraev Sh. Olabo'ji //Shark yulduzi . 1991. No. 1; # 2; No. 3; No. 4.
12. Khamidova M. Spiritual revolution // Shark yulduzi. 2000. No. 5-6. - B. 114-116.
13. Studying the life and work of Shukrullo in uzbek-turkish literature (based on research by Numonjon Rakhimjon and Shuayib Karakash)//Academia: An international multidisciplinary research journal. Vol 11, Issue 9, September 2021



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DEVELOPMENT OF STUDENT ARTISTIC THINKING IN THE TEACHING OF LITERATURE WITH SOCIAL SCIENCES IN HORIZONTAL(SYNCHRONIC), VERTICAL (ASYNCHRONIC) FORM, METHOD AND MEANS

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ABSTRACT

This article describes the development of students' artistic thinking in the teaching of literary studies in the horizontal and vertical connection with the social sciences: the form, methods and means are logically consistent, consistent and scientifically described.

KEYWORDS: Teaching, Process, Cognition, Mastery, Management, Activity, Knowledge, Skill, Competence, Competence, Form, Method, Tool, System, Goal, Task, Theory, Idea, Concept, Exercise, Statement, Thinking, Problem.

INTRODUCTION

The teaching process is a process in which the learning objectives are achieved through the interaction of the student's learning activities aimed at mastering a particular teaching material, learning methods and pedagogical activities of the teacher based on the organization and management of this process.

The development of students' artistic thinking in the horizontal and vertical connection of literature with the social sciences requires the use of various innovative forms of teaching. A course that is a form of teaching that fulfills the requirements of the program, in connection with which excursions, homework, extracurricular and extracurricular activities should be used in a timely and effective manner. These forms of teaching form a system of teaching literature by connecting the social sciences horizontally and vertically.

In-class, out-of-class, out-of-class, and out-of-school activities, combined with the horizontal and vertical linking of literature with the social sciences, provide general learning objectives as well as the development of student artistic thinking. Mastering the learning material by the student serves to analyze the results obtained. In the teaching of literature in the horizontal and vertical connection with the social sciences, certain methods and tools are used, depending on the selected educational content, purpose, task in different forms of organizing the process of developing students' artistic thinking.

Therefore, the choice of forms of teaching by the teacher in this process is important. The content of education should take into account the purpose, tasks, role of these forms in the educational process, their relevance to specific goals. For example, if the subject is related to teaching aids, as well as artistic content, theory, ideas, laws, exercises, essays, essays, then it is necessary to choose a course that is the main form of teaching.

In addition to the lesson, extracurricular and extracurricular activities play an important role in the development of concepts related to artistic thinking. With regard to the problems of artistic thinking, the use of laws is important.

Pedagogical experience - the preparation of didactic and handout materials with the correct understanding of the goals and objectives of the forms of teaching by students involved in the experimental work, based on the principle of demonstration of didactics. Thus, the forms of development of students' artistic thinking in teaching literature, social sciences horizontally and vertically: lessons, excursions, homework, extracurricular and extracurricular activities form a certain system, they acquire knowledge, skills, competencies and competencies defined by the student, the scientific worldview. expansion, the formation of a conscious attitude towards nature and society through the development of artistic thinking, the acquisition of methods of cognitive activity and the increase of the effectiveness of teaching.

Textbook is the main form of teaching, its structure, organization, in which the organization, management and activation of the student's cognitive activity is the main problem of the methodology of teaching literature. Ensuring continuity and continuity of education in accordance with the requirements of the curriculum, expanding the student's scientific outlook through the effective use of teaching methods and tools in this process, developing artistic thinking, the formation of educational content and its components, inculcating national ideas in students is increased. The quality and effectiveness of teaching and learning depends on the organization of the lesson, the organization, management and activation of the student's learning activities. In order to study the content standardized by the curriculum, literature is organized in the classroom on the basis of a strict schedule, within a specified time in groups (classes) of students of the same age, level of preparation, with a permanent content.

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Depending on the content of the topic being studied, lessons can be organized in literature museums. The content of education in the literature curriculum is given taking into account the age and psychological characteristics of the student, the knowledge base. The content of the

study of literature is divided into separate parts, chapters, topics in a logical sequence and sequence. As the study of the content of each topic is done in the lessons, the lessons also form a specific system and are logically connected.

Teaching in the classroom is organized on the basis of a curriculum that is common to the student. The teacher carries out pedagogical activities aimed at organizing, managing and activating students' learning activities in accordance with the content of the studied topic, educational, pedagogical and developmental goals. Thus, the student's activity in the classroom is his educational activity, and the teacher's activity is a pedagogical activity aimed at organizing, managing and activating this activity. Educational goals can be achieved in the classroom only when the student's learning activities are organized in accordance with the student's pedagogical activities.

Each lesson serves to build a conscious attitude to the environment through the acquisition of knowledge, skills, abilities and competencies of the student on the subject, broadening his scientific outlook, intellectual development, upbringing as a person, the development of artistic thinking. The teacher contributes to the fulfillment of the general goals and objectives set forth in the teaching of literature.

The following didactic requirements are set in the course of teaching literature synchronously and asynchronously with the social sciences:

- Clearly define the educational, pedagogical, developmental goals of each lesson and their place in the system of lessons;
- The level of preparation of students, the objectives of teaching, the optimal choice of educational content in accordance with the didactic requirements of the curriculum;
- To identify ways to develop artistic thinking on the basis of the concepts of general and formed fiction, which are developed in the course, the knowledge, skills, abilities and competencies;
- Activation of student learning through the identification and coordination of effective teaching aids, tools, methods of control and motivation for the implementation of each stage of the lesson;
- To set clear educational goals, taking into account the knowledge of the student, the expansion of the scientific worldview of the subject, the possibility of spiritual, moral, intellectual, hygienic, physical, sexual, economic education, aesthetic sense, diligence, artistic culture;
- to meet the needs of students for independent acquisition of knowledge, skills, competencies and competencies, the study of literature, synchronous and asynchronous connection with the social sciences, the development of interest, encourage creative activity and initiative in student activities;
- Development of a scientifically-methodical design of the subject on the basis of the plan;
- creation of handouts and didactic materials in the context of the development of artistic thinking, educational tasks for monitoring and evaluation of student knowledge, a set of differential tasks;
- create a technological map of the lesson to ensure the efficient use of time.

Lessons are studied systematically in the development of students' artistic thinking in the teaching of literature in synchronous and asynchronous connection with the social sciences.

Therefore, the teacher must know the types and types of lessons, the specifics of modern educational technologies used in them.

It is necessary to know the peculiarities of modern educational technologies used in the classroom in the teaching of literature in the horizontal and vertical connection with the social sciences.

Modern educational technologies used in the horizontal and vertical connection of literature with the social sciences are organized on the basis of questions and assignments in the context of artistic thinking.

1. The use of conference creative game, game exercises of didactic game technology in cases where the tasks of artistic thinking are of a reproductive and productive nature:
2. The use of problem-based learning technology brainstorming, conflict of ideas in cases where the tasks of artistic thinking are productive and creative in nature:
3. The use of individual modular curricula of modular educational technology in cases where the tasks of artistic thinking are of a reproductive, productive and partially exploratory nature.
4. The use of methods of collaborative learning technology, such as team teaching, when the learning tasks in the context of artistic thinking are reproductive, productive, partially exploratory and practical in nature.

Homework is inextricably linked with the lesson, which is a logical continuation of the topic studied in the lesson and a factor in the independent learning of students.

According to the teacher's assignment and instructions, students do exercises, dictation, narration, study of additional literature in essay writing, preparation of lectures or abstracts on specific topics, do their work. The student prepares the ground for mastering the methods of cognitive activity by completing learning tasks.

In the lesson, the teacher implies teaching through a combination of educational content, teaching methods and tools that prepare the ground for the interdisciplinary development of students' artistic thinking. However, not all topics can be studied in class, for example, dictation, essays, essays are used in extracurricular activities.

Extracurricular activities are a form of compulsory education performed by a student under the guidance of a teacher. According to the requirements of the program, the student must perform extracurricular activities individually or in small groups. The student's extracurricular activities are, by their very nature, a means of thinking and reasoning. Because the information received in extracurricular activities is perceived, processed. On this basis, new knowledge is created. The student engages in extracurricular activities and engages in certain interactions with different learners. They face different situations. Therefore, the more diverse the student's extracurricular activities, the wider the range of his or her attitudes and the more effective his or her spiritual growth will be.

Extracurricular activities include discussion nights, art evenings on specific topics, teaching aids, and preparation of visual aids. Depending on the content of extracurricular activities, poetry readings, various competitions can be held in the literature classroom.

The summer assignments on the subject of literature include questions and assignments on artistic thinking, the results of which will be used in the future in the form of visual materials. It is an important form of excursion-educational process for the development of artistic thinking, which allows students to get acquainted with the objects, phenomena, laws, basic theoretical ideas of social life, to apply theoretical knowledge in practice, to master the methods of knowing and understanding the art world. During the excursion on the development of artistic thinking, the knowledge acquired by students is used to connect the acquired knowledge from the literature, to consolidate, complete, systematize and generalize the knowledge in the process of learning a new topic.

Excursions also provide an opportunity to activate and develop students' independent learning activities. During the excursion, students acquire new knowledge through the use of previously acquired knowledge, skills, competencies and competencies in the process of completing learning tasks individually or in small groups.

The above-mentioned forms of developing students' artistic thinking in the teaching of literature in the horizontal and vertical connection with the social sciences: there is a constant consistency, continuity, coherence and connection between lessons, lessons and extracurricular activities, which ensure the integrity of the educational process.

In the horizontal and vertical connection of literature with the social sciences, the control of students' educational and creative activity in accordance with the requirements of the State Educational Standards (SES) focuses on the protection of students' attention and personal views, if their opinions are evaluated and encouraged. As a result, new ideas are put forward. Only in the case of a positive approach to these issues in the teaching of general subjects, the problem of forming a conscious attitude of students to fiction will be solved.

The results of pedagogical experiments conducted in general secondary schools for 2019-2021 confirmed that the organization of the lesson in such a way has a positive character.

Comprehensive development of students mentally, spiritually, physically and practically, it is desirable to use a complex of interactive methods in the process of interdisciplinary teaching of literature. In the educational process organized in this way, there was an opportunity to increase the interest of students in fiction, to teach them to work mentally, to direct them to the profession and to prevent stress.

The results of pedagogical experiments confirm that in order to activate the cognitive activity of the student during the lesson, a gradual transition from one source of knowledge to another, from one type of activity to another is envisaged. For example, the quality and effectiveness of education is high in lessons organized on the basis of independent practice of listening to the lecture, dictation, narration, writing an essay, then discussing the results of the experiment, listening to the teacher's brief opinion, and then choosing practical exercises and their independent implementation. will be.

The use of commentary, etc. is an acceptable way. These methods serve to motivate the student, to show his interest and ability to learn. The main purpose of the integration of education is to give students a good idea of nature and society at school and to form their own attitudes to the laws of development. The study of literature and social sciences and the establishment of interdisciplinary links are the methodological basis of the approach to the integration of

education. This can be achieved by going back many times to the concepts of different lessons, deepening and enriching them, identifying important signs that are understandable at this age.

Thus, any lesson that includes a well-formed group of concepts should be based on integration.

The article divides the integration of sciences into the following components:

- object integration - an object is included in a topic, section or course in different disciplines;
- Integration of theory is studied in the literature in general;
- methodological integration - the implementation of integration of specific methods of scientific knowledge;
- problematic integration - interdisciplinary problems are covered and solutions are developed;
- Integration of activities - discussion of problem solving, work in small groups, development of interdisciplinary action plans, preparation of projects, etc .;
- creation of technical products on the basis of processes that are important in practical integration.

In the process of teaching literature horizontally and vertically by connecting it with the social sciences, connections in form, content, object, concept, problem, activity, and practical connections were used. Educational integration is a high level of interdisciplinary communication, a tool that allows you to create a whole integrated knowledge. Definitions of the concept of integration are different. The common denominator of these definitions is that integration is about achieving a holistic view of the being around us. The basis of integration is interdisciplinary connection and finds its development in the idea of integration. The study of disciplines with integrative content is considered as the knowledge of future professionals, the employment factor.

LITERATURE

1. Mahmudov. G`.Yu.,Toshpulatov A.X. Dadiiytafakkurnishakllantirishninguziga hos psihologikjihatlari.//School and life.2020. № 4. 15-17pp
2. Mahmudov. G`.Yu.,Toshpulatov A.X.Sub`ektbadiiytafakkuriklasifikatsiyasi. Collection of materials of the Republican scientific-practical conference.-Tashkent: TVMI, 2021. 30 March.p.154-156.



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ROLE AND MEANING OF THE ROLE-PLAYING METHOD IN ENGLISH TEACHING

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ABSTRACT

This article deals with role playing games, which are practical and capable of attracting students to teach foreign languages, mainly English. We are talking about the thematic features of the method, its uniqueness, how much it can attract students, and its practical aspects. In particular, the objective side of this method, different from other methods, is that during classes, the student, putting himself in free behavior, allows him to easily express his opinion through his actions, gestures, facial expressions. In turn, it will be easier for a student to feel in the environment of the English language, showing role playing games, various actions during classes, and at the same time acquire skills incomplete understanding of the language.

KEYWORDS: *Role-Play, Modern Worldview, Opinion, Practical, Educational Technologies, Discussion, Classes, Teaching*

INTRODUCTION

The current era, which is taking place with every moment full of news, requires us to be swift in this area. Learning foreign languages is part of this accelerated process. Foreign languages contribute to forming a modern worldview, the aesthetic education of contemporary youth, while young people reach adulthood, can think and enter into discussion quickly. That's certain.

The decision of the President of the Republic of Uzbekistan Sh.M.Mirziyoyev "On measures to bring activities to popularize the study of foreign languages in the Republic of Uzbekistan to a qualitatively new level" from 19.05.2021 PQ-5117 was another critical step in support of the study of foreign languages.

Let us pay attention to one of the methods of teaching English, which is now raised to a high level of demand in almost all areas of our time.

The main results and findings

The question arises: what is the central aspect you need to pay attention to in creating an English language environment?

The practical organization of the training environment is associated with educational technologies, methods used in the educational process. At the same time, the psychological state, the ability and attitude of the language student to study the language, his intellectual potential are considered. Suppose the student is in a free language environment. In that case, the opportunity to be in this language environment is created using various interesting methods, then the student's interest in the language is formed independently. The teacher, who managed to summarize the above two aspects, considers the lesson to be high-quality and effective and contributes to the formation of language learning skills in the student [1].

Teachers should pay attention to the following matters:

- a) Consider students prior knowledge;
- b) View learning as a process of transformation which led to them; the conception of conceptual change in students self;
- c) Engage students in science through experimental activities for conceptual change or knowledge, which is constructed through the active participation of students in hands-on activities and mind;
- d) pay attention to social interaction by involving students in group or class discussions.

The person, first of all, has to have a care and interest in learning languages and formation of abilities to learn languages. It will be obligatory to depend on external factors. It is required to harmonize more English-speaking literature, create friends from foreign countries, and communicate quickly with them in a foreign language. One of the most effective learning methods is obtaining language skills through roleplaying games that are a part of Game-based Learning. It is a social space that develops speaking and listening skills. It gives children the opportunity to reflect on and expand their knowledge of a topic while sparking and enhancing creativity and imagination.

- In what features of roleplaying games are reflected?

What is role-play? Role-play is any speaking activity when you either put yourself into somebody else's shoes, or when you stay in your own shoes but put yourself into an imaginary situation!

Imaginary people - The joy of role-play is that students can 'become' anyone they like for a short time! The President, the Queen, a millionaire, a pop star the choice is endless! Students can also take on the opinions of someone else. 'For and Against' debates can be used and the class can be split into those who are expressing views in favour and those who are against the theme. Imaginary situations - Functional language for a multitude of scenarios can be activated and practised through role-play. 'At the restaurant', 'Checking in at the airport', 'Looking for lost property' are all possible role-plays.

Why use role-play? It is widely agreed that learning takes place when activities are engaging and memorable. Jeremy Harmer advocates the use of role-play for the following reasons:

- It's fun and motivating
- Quieter students get the chance to express themselves in a more forthright way
- The world of the classroom is broadened to include the outside world - thus offering a much wider range of language opportunities

In addition to these reasons, students who will at some point travel to an English-speaking country are given a chance to rehearse their English in a safe environment. Real situations can be created and students can benefit from the practice. Mistakes can be made with no drastic consequences.

Tips on successful classroom role-play Prepare for success Role-play is possible at elementary levels providing the students have been thoroughly prepared. Try to think through the language the students will need and make sure this language has been presented. Students may need the extra support of having the language on the board. I recently did a 'lost property office' role-play with elementary adults and we spent time beforehand drilling the structures the students would need to use. When the role-play began the students felt 'armed' with the appropriate language. At higher levels the students will not need so much support with the language but they will need time to 'get into' the role.

The role of the teacher Some of the possible teacher roles are:

- Facilitator - students may need new language to be 'fed' in by the teacher. If rehearsal time is appropriate the feeding in of new language should take place at this stage.
- Spectator - The teacher watches the role-play and offers comments and advice at the end.
- Participant - It is sometimes appropriate to get involved and take part in the role-play yourself [2].

- What purpose of the application of this method?

In answer to these questions, we pay attention first of all to objective aspects:

1. Roleplay will promote an increase in interest in language, which is learned first of all by the linguist
2. At students skills of friendly work in collective are formed
3. Provides to student's presence in the English environment.
4. Helps students to have a mental state
5. Strengthens trust in the student
6. Provides tranquility and tranquility
7. Talab in English-speaking times will be had by an opportunity to speak fluently.

Now I want to add here several vital purposes of role plays that can help:

- To convey-share information

- To elaborate specific skills
- To develop a situation for analysis
- To boom understanding of points of view of others
- To increase insight into a typical way of dealing with an issue
- Provides an opportunity for social interaction among members;
- To develop communication skills
- To involve everybody to work cooperatively for a common goal
- To try new behaviors in the presence of co-learners
- To encourage thinking as well as creativity
- To create motivation (more important purpose)

Roleplay is a classroom activity in which learners take on roles and act in an imagined or real scenario. It helps to boost all domains of learning, cognitive, psychomotor, and affective skills [3-6]. The second thing I should mention is that roleplays are extremely useful for building interpersonal skills. What's more, the roleplay method elaborates a greater understanding of the complexity of professional practice. Role-playing games are a vital source for reflection by students of English-speaking grammatical times. As an example in The present continuous Tense, it is possible to organize the next roleplaying games:

- What are they doing?

Students, entering for a role, show the state provided as a task without voting, using actions of parts of a body, and answers can be:

Jane is dancing

My mother is cooking my favorite national cook

This role play will proceed in the following state, and since the same processes, students' interest in this method will grow.

What aren't they doing?

They aren't playing football at the moment

Students can study keywords in advance and use them during this game.

So, it follows from these examples that thanks to this method, the students at the same time gain knowledge of the structure of the time of Present continuous tense, of the system of keywords, forms of a tree, interrogation, seek to understand the present employing the movement in a visual home look.

One more example is that small stories in the form of texts that well-read stories are issued to readers. After their reading, realizing a situation, execute heroes of the story in the form of roleplaying. What an authentic way! As a result

- They are in a very pagan environment

- Because they represent themselves as heroes of the work, they form responsibility for how they cope with a task
- It will give them pleasure
- Are in a friendly situation
- People will have a culture of behavior

The next crucial thing I can mention is that role plays can help students explore emotive culprits like smoking, engaging in mobile phones, or other cultural issues by showing their attitude. Now, let us turn our thoughts to several opinions about this method:

1. Hirsch argues that role play consists of the critical elements of the experimental learning
2. David Kolb defined role to play as a "process whereby knowledge is created through the transformation of experience."

RESULTS AND DISCUSSIONS

From this point of view, if through roleplaying games the English studies, then at the researcher the technique of visual judgment will be created that is the significant aspect. Unlike other methods, the whole human body participates in role scenes that, first of all, improve the researcher's mood. It, in turn, leads to the excellent development of a subject by the student. It will surely provide a perfect mental condition for students.

It is irrefutable that role plays promote leadership in any age. To be a leader, the learner should have strong knowledge of the field of science as well they must have a sense of self-reflection, indeed. In that case, students can achieve the goals which they expected from this vital, effective method. It is impossible to deny the role of this method information of leader abilities at students.

CONCLUSION

In general, I believe that role plays give students the opportunity to demonstrate how to use English in real-life situations and make them focus more on communication than on grammar. They will learn how to become more sociable in any position of our fast-paced life, become more attentive in any case, show on attitude fast, and have more effective speech. Role-plays are important in the communicative approach because they allow students to practice communicating in various social contexts.

REFERENCES

1. J.Djumabayeva Teaching methods of special subjects, Tashkent 2019, p.22
2. *Role Play* - Gillian Porte Ladousse (Oxford 1987), *The Practice of English Language Teaching* - Jeremy Harmer (Longman 1989) <https://www.teachingenglish.org.uk/article/role-play>
3. U.Khoshimov, Method of teaching English, Tashkent 2003, p.58
4. S. Kouvava, K. Antonopoulou, S. Zioga, C. Karali. (2011). The influence of musical games and role play activities upon primary school children's self-concept and peer relationships. *Procedia-Social and Behavioral Science*, 29, 1160-1167.

5. M.R. Salaberry and J. Scholes. (2011). Strategic role-plays in a paired-testing format: putting a language lab into a rational pedagogical use. *Texas Papers in Foreign Language Education*, 15 (1).[Online]. Available:https://studentorgs.utexas.edu/flesa/TPFLE_New/Issues/Summer%202011/5.%20Salaberry%20and%20Scholes.pdf
6. H.D. Brown. (2011). *Teaching by Principles-An Interactive Approach to Language Pedagogy*. NY: Addison Wesley Longman.
7. Abdurashidovna, K. D. (2020). Specific Characteristics Of Uzbekistan In The X Century In David Fund Collections. *Crossroads of Cultures*, 4 (2).
8. Kurbanova, D. A. (2016). Ancient Pearls In Great World Museums Which Belong To The History Of Uzbekistan And Learning Them. *Coquocpepa*, (3), 55-61.
9. Kurbanova, D. (2020). Tent Of The Emir Of Bukhara (Second Half Of The 19th Century)(History Of One Exhibit From The Collection Of The State Hermitage). *The American Journal of Social Science and Education Innovations*, 2(12), 180-183.
10. Sayfullaev, N. (2021). The Name Of Our Country Will Be Praised By The Followers Of KamoliddinBekhzod. *The American Journal of Social Science and Education Innovations*, 3(04), 402-408.
11. Sayfullaev, N. (2019). Current Issues on Fine ARTS Education: Continuity and Prospects for Development. *Religación*, 4, 192-194.



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FAMILY TRADITIONS IN VOCATIONAL GUIDANCE, A GUARANTEE OF PREPARING YOUNG PEOPLE FOR INDEPENDENT LIVING

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ABSTRACT

This article is devoted to one of the most pressing problems of family pedagogy - the preparation of young people in the family for an independent family and their professional orientation. The article clearly shows the issues of preparing young people for independent family life on the basis of family traditions, taking into account the requirements of family upbringing, ways to achieve the correct organization of vocational training, first of all, to prepare for family life in family and educational institutions.

KEYWORDS: *Upbringing, Upbringing Of Boys, Spiritual And Moral Upbringing, Preparation For Family Life, Family Traditions, Customs, Values.*

INTRODUCTION

Preparing well-rounded, intellectually gifted young people for independent family life is becoming one of the urgent tasks of today. In order to fully fulfill such important tasks, our country has introduced the use of material and technical base and advanced forms of educational technology in accordance with world standards at all stages of the current education system. However, a deeper study of the laws of physical and psychological development of young people, the identification of future professional and intellectual potential of each of them in the form of abilities, talents and abilities, as well as individualization of educational processes based on these opportunities cannot be called modern requirements.

For everyone, the family is the beginning of life. After all, the family is an educational center that ensures the eternity of life, the continuity of generations, passing our national traditions and customs to future generations, as well as directly affecting their development as human beings.

THE MAIN FINDINGS AND RESULTS

Along with the mother, the role of the head of the family, that is, the father is great in the strength of the family, in its material support, in maintaining its socio-pedagogical, spiritual and spiritual balance, as well as in the upbringing of children. In particular, it is necessary to determine the role of vocational guidance in preparing young people for family life and increase the role of family and educational institutions in the effectiveness of the work done.

Establishment of psychological services in the education system is a tool for effective implementation of the educational process, creating a healthy socio-psychological environment in pedagogical communities, protecting the psychological health of students and teachers, ensuring the priority of personal interests of students in the process. it is safe to say that it stems from the need to prepare for family life. Therefore, in the course of lectures and practical classes on economics in secondary schools, thrift, entrepreneurship, business, financial management of the family, sex education in hygiene classes, the rules of cleanliness, spiritual and moral maturity in spiritual hours, respect for spouses, diligence, psychological maturity in psychology, In addition to the above disciplines, it is necessary to carry out professional orientation work in order to be alert, to behave in any situation, not to be overly emotional, to understand the role and place of himself and his family in the development of society, and to form such qualities. Because of the strong feelings of boys in grades 8-9 during adolescence and its effective effect on mental and emotional development, the height of feelings of justice and truth, their importance in the family and social environment, the desire for beauty and the need for aesthetic taste in future family life, self-management issues that he sees as the owner of his chosen profession are of particular importance.

Today, based on the requirements of the National Training Program, it is expedient to carry out large-scale reforms aimed at further improving the education system, inculcating national values and traditions in the content of continuing education, especially secondary special, vocational education. The issue of invaluable spiritual heritage created by our ancestors over the centuries, the restoration of forgotten values, the understanding of national identity has risen to the level of state policy. As a result of the re-establishment of national traditions and values, pedagogical activity in vocational education is aimed not only at equipping future highly qualified specialists with knowledge, skills and abilities on the basics of science, but also at meaningful organization of leisure time outside the classroom. should be involved in professional work, taking into account the presence of Indeed, the concept of "Family, educational institution and society" is invaluable in educating a person ready for a high level of independent family life. In preparing modern youth for family life on the basis of this concept, it is noteworthy to revitalize the close, sincere, rational relationship of parents with a career-oriented educator. The concept is not only the exchange of information between the two subjects on preparation for independent family life, but also the conclusion: on the basis of what qualities and qualities to organize career guidance, how to apply the results in practice, what goals and ideas to practice, etc. in harmony with similar issues of spiritual and enlightenment education. Thus, in today's relationship between the family and educational institutions, the emphasis on the preparation of young people for family life in the right direction of vocational guidance is a unique and important feature. It is even a

special phenomenon that the focus is on the proper organization of work to prepare young people for independent family life and its further improvement - the spiritual maturity of future family owners.

In today's world, where global relations are developing and various ideas and opinions are rapidly gaining popularity, it is natural that the focus on professional development of young people is more important than ever, and modern pedagogy faces a number of challenges. Preparing young people for the family and all its functions, which are an important part of society, requires that they have a deep knowledge of the profession - in harmony with spiritual maturity. Family traditions play an important role in cultivating professional skills in young people, increasing their spiritual and enlightenment potential, research, creativity, in short, in the formation of a comprehensively mature personality. Another characteristic feature of family traditions is that it develops the child's self-confidence, accurate assessment of the situation and willpower, and most importantly, his social activity is under the control of parents. The greatest duty of every family is to prepare intelligent, intelligent and capable people for independent living who can make a worthy contribution to the development of the country. In order for every parent to fully prepare their children for independent family life so that they can find their place in the future, they must first have professional potential, spiritual maturity, a broad outlook and common sense. In the ancient family traditions, our ancestors not only gave guidance to their children, but also prepared them for independent living and allowed them to pass on their professional experience, abilities and skills from generation to generation. In career guidance, family traditions should be based on a specific program, plan, or manual. In this regard, the older generation of parents and parents in the process of education with young people should adhere to the following: - to equip young people with experience in accordance with the requirements of the times, the laws of society in the educational impact; - to teach to strive for a single goal, to see the future; - be able to have a positive impact on the psyche, spirituality of young people and be demanding in their place; - habit of self-respect and respect for others; - move forward with the goal of success; - establishing a positive feedback; - pay attention to the use of different methods of vocational training; - In the process of upbringing, the older generation and parents should be exemplary in all respects: spiritual, moral, professional; - to form a sense of duty, responsibility, responsibility, etc.

CONCLUSION

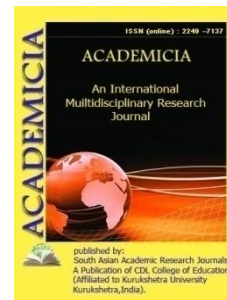
As noted above, the preparation of young people for independent family life on the basis of family traditions in career guidance will help to increase the effectiveness of education will provide the desired effect of preparing them for independent living. According to the ideas of pedagogical doctrine, practical skills and abilities are formed through direct training, ie the direct performance of a particular activity. Career guidance in preparing young people for independent family life in the family is important in that it creates a favorable environment for young people to work directly, to take into account their individual characteristics, to further develop their existing talents in the chosen profession or occupation. Such situations nurture young people not only a responsible approach to independent living, but also spiritual and moral qualities such as honest work, pride in the effectiveness of work. In the upbringing of children, special attention should be paid to the effective use of the national educational system of our people in the observance of the traditions, customs and morals of the ancient ancestors, and educators should not spare their strength and intelligence in this regard. From the above considerations, it is clear

that in the current environment of comprehensive democratic reforms, educating the next generation as a high-level future owner and owner who can contribute to the development of the country has become a requirement of the time. In this regard, the effective use of family traditions in the education system is important.

REFERENCES

1. Islamova F.Sh. (2019) Pedagogical and psychological methods of preparing boys for marriage on the basis of national traditions. "Education, Science and Innovation". Spiritual-enlightenment scientific-methodical journal. – Tashkent. Issue 3. (Исламова Ф.Ш. Миллий анъаналар асосида ўғил болаларни оилага тайёрлашнинг педагогик-психологик усуллари. "Таълим, фан ва инновация". Маънавий-маърифий илмий-услубий журнал. Тошкент. 2019/3-сон.)
2. Ashurov N.R; Rakhmonova F.Sh; Fayazova F.Sh. Pedagogy as a science of education and personal development. Published by: TRANS Asian Research Journals AJMR: Asian Journal of Multidimensional Research (A Double Blind Refereed & Reviewed International Journal) Impact Factor: SJIF 2020 = 6.882 MARCH 2020 .
3. Haydarov M.E. (2001) Theoretical and practical bases of the use of folk traditions through labor education (on the example of young schoolchildren): Autoref. dis.ped. fan. nom. – Tashkent: UzRDTDK. – p. 47.
4. Rakhmanova F.Sh. (2012) Pedagogical views of interstitial thinkers in preparing boys for family life based on national traditions. YoungScientistNo. 4. Founder and publisher: Publishing House Perm. 39. (Рахманова Ф.Ш. Педагогические воззрения восточных мыслителей в деле подготовки мальчиков к семейной жизни на основе национальных традиций. Молодой ученый № 4. Учредитель и издатель: ООО «Издательство Перм. 39) / 2012 г.)
5. Niyozov G., Abdullaeva B. (2010) The role of folk pedagogy in preparing students for family life and improving modern education. – Tashkent: Science and technology. – p. 43.
6. Fayazova F. Methodology Of Vocational Training And Pedagogical Practice As The Main Factors In The Preparation Of A Future Teacher Of Vocational Training //The American Journal of Social Science and Education Innovations. – 2021. – T. 3. – №. 03. – C. 27-31.
7. Utanova U. A. et al. Scientifically-Philosophical Analysis Of Cultural And Spiritual Heritage //International Journal on Integrated Education. – 2019. – T. 2. – №. 1. – C. 53-55.
8. Alimov N. Y. Architectural project-As an object of copyright //Asian Journal Of Multidimensional Research. – 2021. – T. 10. – №. 4. – C. 914-918.
9. Rakhmonova F.Sh. "Oriental upbringing in the preparation of son children for family life". "SCIENCE, RESEARCH, Development" Philology, Sociology And Culturology. V.2. Rotterdam (The Netherlands). 30.03.2019-31.03.2019.
10. Машарипова Г. The role of spiritual factors in the development of ideological immunity in young people // Scientific-practical journal Newsletter Of The National Art And Design Institute Named After Kamoliddin Behzod. - 2021. - T. 5. - №. 01.

11. Marufbaev B. Sh. Ethnocultural Thinking-Criterion Of National-Spiritual Development // Actual scientific research in the modern world. - 2018. - No. 2-4. - S. 60-64.
12. Utanova U. A. Folk Culture Is A Socio-Historical Phenomenon //International Engineering Journal For Research & Development. – 2020. – T. 5. – №. 9. – C. 5-5.
13. Sayfullaev, N. (2019). Current Issues on Fine ARTS Education: Continuity and Prospects for Development. *Religación*, 4, 192-194.
14. Kurbanova, D.A. (2015). About the history of the applied arts of Uzbekistan of the nineteenth century and about the items of the State Museum of Art of the Peoples of the East of the Russian Federation. *Young Scientist*, (10), 1513-1515.
15. Kurbanova, D.A. (2015). To The Question About Objects Summarizing The Ancient History Of Uzbekistan, Presented In The Museum Of Anthropology And Ethnography Named After. Peter The Great (Kunstkamera) Of The Russian Federation. Fundamental and applied research in the modern world, (10-5), 42-46.



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THE ROLE OF GAMING TECHNOLOGIES IN TEACHING STUDENTS AT THE MIDDLE STAGE

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ABSTRACT

The modern education system provides teachers with many opportunities and resources to improve the effectiveness of the educational process. One of the more effective methods is gaming activity. In turn, it is also relevant in teaching students of higher educational institutions. Games stimulate interaction and successful communication of students and provide consistency to continue learning efforts, create conditions for meaningful use of language, reduce anxiety and allow students to study in a relaxed and pleasant atmosphere. Another advantage of using games in the process of learning a foreign language is the clarification of stressful moments.

KEYWORDS: *Gaming Activity, Gaming Technology, Business Game, Didactic Games, Role-Playing Game, Cognitive, Social And Creative Function Of The Game.*

INTRODUCTION

A stress-free environment should be provided in the atmosphere of language learning. At this stage, the games are very useful, because students do not feel any anxiety, their positive emotions are enhanced, and their self-confidence increases, because they are not afraid of punishment or criticism when they practice the language fluently. In many games, students have to cooperate to achieve a goal, and most students enjoy cooperation and social interaction. It is believed that when cooperation and interaction are combined with fun, successful learning becomes more possible. No matter how differently games are described, one should not underestimate their pedagogical value both in teaching and in learning a foreign language.

In the game, a person completely immerses himself in the role assigned to him and reveals all his possibilities. Therefore, gaming activity is given great importance in the system of teaching students. Game activity is recreated in the classroom with the help of game methods and conditions, which are called game technologies and are aimed at organizing the activities of

students. Game technology is a set of psychological and pedagogical methods, methods of teaching techniques, educational tools. The development of game technologies by a teacher is of great importance. Traditional education, first of all, concentrates on the transfer of knowledge of a basic theoretical nature and pays much less attention to applied ones. Students may have difficulties in social adaptation, delays in social development, perception of future social roles due to lack of knowledge and skills of applied and practical level. Unlike other technologies, it gives the student the right to be personally involved in the functioning of the phenomenon being studied, as well as the opportunity to live for some time in real life circumstances [1, 13-16].

However, in order to introduce game technology into the educational process, it is necessary to find out the following: what competencies need to be formed, what educational material it is desirable to study using game technology, how to connect the game with other methods of education and training, what game technology needs to be chosen for a specific topic of the lesson and how to find time in the curriculum for its implementation and implementation.

The educational process based on the game must be organized correctly. To do this, you need to know the following:

- The model of the learning process based on the game is the inclusion of students in the game modeling of the studied phenomena, their living a new experience in the game;
- game-based learning provides an opportunity for students to make decisions independently, involves students in modeling complex situations, makes learning very interesting, intense, sometimes even stressful;
- Students have role-playing activities;
- a game situation is introduced and a problem situation is created through it, which is lived by student participants in the form of a game, the basis of their activities is game modeling, part of the students' activities takes place in a conditional game plan;
- teach students act according to the rules of the game;
- The teacher performs several roles: organizer, assistant and partner in the overall process of the game;
- The game has two levels: substantive and socio-psychological.

Game technology is a holistic education that covers a certain part of the learning process and is united by a common content, plot, characters. Each teacher, in order to build an educational process based on a game, can make up various game technologies from individual games and elements. The implementation of gaming technology solves an important task: everyone who takes part in it must find a way to self-expression, get to know themselves, as well as other participants, so that everyone in the game is easy and comfortable. Not every teacher is a master at creating games. Naturally, there are teachers who use game teaching techniques, and often make mistakes and blunders in this. In order to apply various game technologies in their activities, the teacher must know the general techniques for organizing work with the group, the methodology of the game library, understand the importance of presentation, communication skills, dynamics in the game. The ability to build this game is also important. The teacher himself should be ready to play, involve, participate, help all other participants. There are an unimaginable number of different types of games. The business game is widely known to

everyone as a kind of role-playing game. A business game is a joint activity of a group of students and a teacher under his control.

This type of game makes it possible to evaluate the ability to analyze and solve typical professional tasks. The peculiarity of business games is the high emotional mood of its participants, they always have a healthy competitive spirit [4, 169-172].

The psychological and pedagogical principles of organizing a business game:

- the principle of simulation modeling of specific conditions;
- the principle of game modeling of the content and forms of activity;
- the principle of joint activity, through the involvement of several participants in cognitive activity, requires the developer to select and characterize roles, determine their powers, interests and means of activity;
- the principle of comprehensive collective discussion of educational material by students allows them to achieve a comprehensive presentation of professionally significant processes and activities;
- the principle of the problematic content of the simulation model and the process of its deployment in gaming activities.

The signs of a business game:

- activity is modeled, certain tasks, roles are performed, and ways to solve the problem are found as a result;
- the game is not limited to solving one problem, but requires a “chain of solutions”;
- roles are distributed among the participants of the game;
- role goals begin to differ when finding solutions that contribute to the emergence of contradictions between participants, conflicts of interest;
- there is a controlled emotional tension;
- participants interact, perform certain roles;
- there is a common game goal for the whole team;
- the whole team develops solutions;

There are many alternatives to solve the problem. The goals of the business game are diverse:

- it has a positive effect on the modeling of the problem and makes it possible to consider different solutions and find the most effective ways to solve them;
- conveys a holistic view of professional activity, taking into account emotional and personal perception;
- teaches collective thinking and practical work, forms skills and abilities of social interaction and communication, as well as skills of individual and joint decision-making;
- educates a responsible attitude to business, respect for social values and views of the collective and society as a whole.

The essence of the business game is the creative activity of participants who need to find a problem and ways to solve it. A business game is a kind of training used in an educational institution that helps to achieve a goal. When applying this active method, modern university education will "absorb" everything new and progressive that arises in pedagogical theory and practice in order to increase the cognitive activity of students [2, 190-192].

Didactic games in foreign language lessons are used primarily to consolidate the skills of listening, reading, speaking and writing. Didactic communicative game involves such an organization of joint communicative activity of the teacher and students, during which the peculiarities of the speech behavior of schoolchildren are simultaneously manifested and foreign language communicative skills are formed. Creative role-playing games are one of the ways to learn foreign languages. Concepts such as role-playing, simulation, drama and play are often used interchangeably, but in fact they have different meanings. The difference between role-playing games and simulations is the authenticity of the roles performed by students. When simulating, students play their natural role, in other words, the role they play in real life (for example, the role of a buyer or booking transport tickets). In a role-playing game, students play a role that they do not play in real life (for example, a popular actor, judge, prosecutor, director, etc. A role-playing game can be considered as one of the components or an element of simulation.

Thus, in a role-playing game, participants assign roles that they play out within the script. In the simulation, attention is focused on the interaction of one role with other roles, and not on playing individual roles. One way or another, role-playing prepares students for social interaction in a different social and cultural context. This game is a very flexible learning activity that has a wide range of possibilities for diversity and imagination. Various communicative techniques are widely used in role-playing games, thereby developing fluency in language, interaction in the classroom and increasing motivation [3]. Role-playing improves the conversational skills of students in any situation, because almost all the academic time in the role-playing game is devoted to speech practice, while not only the speaker, but also the listener is as active as possible, since he must understand and remember the partner's remark. As for shy students, role-playing helps by providing a mask with which students with communication difficulties are released. Also, it's fun, and most students will agree that fun leads to better learning. In turn, role-playing games can be classified as follows:

1. Short-term role-playing game, which is the simplest and fastest type of game lasting from 10 to 30 minutes. It can be built on the basis of text or dialogue. An example of this game can be presented in the form of an interview. Students are divided into pairs, after which they are given pictures depicting various problematic situations. One of the students takes the role of the interviewer, the other the role of the respondent. The task is to describe the problem and propose its solution. The game component consists in the fact that experts are also appointed among the students, whose task is to draw up a criterion for evaluation and subsequently evaluate all the speakers and point out the mistakes made. During this game, there is a high motivation and desire of students to show themselves, because one of the evaluation criteria may be artistry [3].
2. A full-fledged role-playing game in which students are given a description of the situation and their roles. The duration of this type of games takes an average of one or two lessons. As an example, consider verbal role-playing games. This archetype of games occurs through the verbal

interaction of participants describing the actions of their game characters, and a mentor, in whose role a teacher can act, describing the realities of the game world.

Game learning is a form of educational process in created conditional situations, which is aimed at recreating and assimilating social experience in knowledge, skills, abilities and emotional evaluation activities. It is important for the teacher to master game technologies and use them in the classroom, because the use of game technologies in the educational process helps prepare students for important social roles, gives them the opportunity to personally participate in the functioning of the phenomenon being studied, allows them to live for some time in “real” life conditions.

CONCLUSION

Thus, the article proves the role of a foreign language, which acts as a means of intercultural interaction in social and professional spheres, is increasing every year in the modern world. This explains the need to rethink not only the concept of higher professional education, but also language education in new conditions. The new pedagogical paradigm presupposes the creation of an education system focused on humanization, productivity, creative and developing nature of the pedagogical process, which determines the interest of researchers in the problem of constructing such a process of teaching foreign languages, in which the main emphasis would be on the development of professionally significant competencies among students and which could contribute to a high level of formation of the main significant personality qualities. In many ways, the conditions in which universities could ensure that graduates achieve new effective results in learning a foreign language are determined precisely by the choice of pedagogical technologies, active methods and forms of education that organize creative and independent activity of students, involving the inclusion of elements of problematic, scientific search in the educational process. One of the teaching technologies that is becoming more and more widespread in the pedagogical process of teaching a foreign language is the game.

USED LITERATURE:

1. Aleshugina E.A., Vaganova O.I., Prokhorova M.P. Methods and means of assessing the educational results of university students // Problems of modern pedagogical education. 2018. No. 59-3. - S. 13-16.
2. Kostylev D.S., Kutepova L.I., Trutanova A.V. Information technologies for assessing the quality of educational achievements of students // Baltic Humanitarian Journal. 2017. Vol. 6. No. 3 (20). - S. 190-192.
3. Krechetnikov K.G., Kovylyina E.V. Model of the use of role-playing games in teaching foreign languages with a culturological approach / K.G. Krechetnikov, E.V. Kovylyina [Electronic resource]. - Access mode: www.econf.rae.ru/pdf/2010/04/996a7fa078.pdf
4. Loshkareva D.A., Aleshugina E.A., Vaganova O.I., Kutepova L.I. Contextual approach to vocational education // Problems of modern pedagogical education. 2018. No. 58-3. - S. 169-172.



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METHODOLOGICAL PRINCIPLES OF DEVELOPING SPEAKING SKILLS AT DIFFERENT LEVELS OF TEACHING FOREIGN LANGUAGES

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ABSTRACT

The article considers an urgent problem of modern methodology – the formation of speaking skills in a foreign language. Learning to speak a foreign language and the formation of speaking skills is the ultimate goal of teaching a foreign language. This is the relevance of the conducted research. The paper thoroughly examines the content of teaching speaking and examines the difficulties that arise in this complex and long process. The question of effective ways to overcome language barriers in the process of learning to speak a foreign language is interesting.

KEYWORDS: *Speaking, Teaching Process, Language Barrier, Formation, Difficulties, Facilities.*

INTRODUCTION

The main purpose of a foreign language as a subject area of education is seen in mastering the ability of students to communicate in a foreign language. We are talking about the formation of communicative competence, i.e. the ability and willingness to carry out both direct communication (speaking, listening comprehension) and indirect communication (reading with understanding of foreign texts, writing). The formation of communicative competence is the main and leading goal of training. Today it is especially popular. Experience shows that the greatest difficulties in foreign language communication a person experiences, perceiving speech by ear. However, oral communication, the role of which has now become especially significant, is impossible without understanding the interlocutor's speeches, since in the process of speech interaction everyone acts both as a speaker and as a listener. Speaking is an extremely multidimensional and complex phenomenon. Firstly, it performs the function of a means of communication in a person's life. Secondly, speaking is one of the types of human activity.

Thirdly, it is important to remember that as a result of the activity of speaking, its product arises - an utterance. Both as an activity and as a product, speaking has certain characteristics that serve as a guide in learning, because they suggest what conditions need to be created for the development of speaking, and are also criteria for evaluating learning outcomes.

Dialogue is considered to be one of the most effective means of developing and forming speaking skills in teaching foreign languages according to the rule. Many teachers have long appreciated the wide possibilities combined with minimal time and objectivity of results. A unique predisposition to speech, the plasticity of the natural mechanism of speech assimilation, as well as a certain independence of this mechanism from the action of hereditary factors related to belonging to a particular nationality - all this gives the learner the opportunity, under appropriate conditions, to successfully master a foreign language. With age, this ability gradually fades. Therefore, any attempts to teach a second foreign language (especially in isolation from the language environment) to older learners are usually associated with a number of difficulties.

The changes in social and economic life that have recently taken place in our country have led to radical transformations in various spheres, including in the education system and, in particular, in the field of teaching and learning foreign languages. The expansion of international contacts and cooperation at all levels, entry into the world educational space, set the school the task of organizing school education at such a level that students will be able to participate in intercultural communication in the language being studied and independently improve in the foreign language-speech activity they master. Therefore, the search for ways to improve the effectiveness of teaching foreign languages has become more active in the last decade. This is the shift of the beginning of education to school childhood (elementary grades), and the use of a number of intensive methods, and the introduction of new into the traditional, as well as the recognition of the need to take into account the individual psychological characteristics of schoolchildren, individualization and differentiation of learning.

The degree of knowledge of the problem. The above topic was studied by many leading methodologists, such as: Bim I.L., Biboletova M.Z., Galskova N.D., Nikitenko Z.N., Mirulid R.P., Maksimova I.R., Rogova G.V., Firdman L.M. and many others. They studied the problem of the formation of speaking skills at any particular stage of training. In this paper, the problem was investigated at all stages of foreign language teaching, starting from kindergarten to higher education.

The aim of the article is to determine the scientific basis and methodology for the formation of speaking skills based on the analysis of methodological literature on this topic, to collect the necessary scientific data that are directly or indirectly related to the issue under study. In addition, it is important: 1) describe and analyze early achievements in the field of teaching speaking and skill development; 2) determine the degree of applicability of sample dialogues as one of the types of training exercises in the process of learning foreign languages at a specific stage; 3) to reveal the basic concepts of the terminology of the speaking skill and its criterion of automatization.

In the course of the work, the following research **methods are used**: 1) critical analysis of scientific and methodological literature on the problem; 2) study and generalization of positive experience of teachers; 3) observation of the supervising activities of teachers and students during pedagogical practice; 4) experimental verification of composite speech tasks.

Results and discussion

The oral speech of any literate person is quite different from written speech. It would be a mistake to think that the communicative method of learning English is intended only for a light small talk. Those who want to be a professional in a particular field regularly read publications on their subject in a foreign language. Having a large vocabulary, they easily navigate in a foreign text, but it costs them enormous efforts to maintain a conversation with a foreign colleague on the same topic.

The communicative method of learning English is designed, first of all, to remove the fear of communication. A person armed with a standard set of grammatical constructions and a vocabulary of 600-1000 words will easily find a common language in an unfamiliar country. The main purpose of this method of learning English is to teach the student to speak English fluently first, and then to think in it. It is also important that mechanical reproducing exercises are also absent: their place is taken by game situations, work with a partner, tasks for finding errors, comparisons and comparisons that connect not only memory, but also logic, the ability to think analytically and figuratively. English textbooks often contain excerpts from the English-English dictionary. The whole complex of techniques helps to create an English-speaking environment in which students should "function": read, communicate, participate in role-playing games, express their thoughts, draw conclusions in English. English is very closely intertwined with the cultural characteristics of the country, therefore, the courses certainly include a country-specific aspect. The British consider it necessary to give a person the opportunity to easily navigate the multicultural world, and this is easily done with the help of such a powerful unifying factor as English.

This is followed by work with the English text (the presentation characteristic of English textbooks is small numbered paragraphs), and reading is also diverse (scan reading, reading for gist, summary reading, etc.). Work on the text is usually preceded by classes in pairs, answers to questions in English, filling in tables. All this orients the student well to the perception of subsequent information, stimulates interest in reading in English. An English lesson usually ends with an audio part, which is also preceded by various exercises that make it easier to perceive new material.

So, if we summarize, or, to put it in English, make a summary, British methods of learning English have a number of distinctive features. Most of them are developed based on the integration of traditional and modern teaching methods. Differentiation by age groups and a multi-level approach make it possible to develop an individual human personality, affect its worldview, value system, self-identification, and ability to think. Simply put, the individual approach, which is now popular, is put at the forefront. Without exception, all British methods of learning English are aimed at developing four language skills: reading, writing, speaking and listening.

At the same time, great emphasis is placed on the use of audio, video and interactive resources. Due to the variety of methodological techniques, among which language technologies occupy one of the leading places, British English courses contribute to the formation of skills necessary for a person in modern business life (the ability to make a report, make presentations, conduct correspondence). The undeniable "advantages" of authentic material, great attention to stylistics,

the desire to teach "situational" and "live" English through "life" examples of semi-real characters.

Useful tips for the formation of speaking skills

Practice your language wherever you can. Any practice is good - whether to tell you who is a native English speaker or not.

It is important to build your trust. If possible, use simple sentence structures that you know are correct so that you can focus on your rightness.

Try experimenting with what you know. Use words and phrases that you know in new situations. Native English speakers are likely to correct you if you use words and grammar incorrectly. Experimenting with the dictionary is also a good way to get feedback.

Try to answer what people are telling you. You can often get a clue to what people are thinking by looking at their body language. React to them naturally.

Try not to translate in your native language. It will take too much time and make you more reserved.

If you have forgotten the words, try to get out of the situation and 'fill in' the conversation. This is better than maintaining complete silence.

Don't talk too fast! It is important to use a natural rhythm when speaking English, but if you speak too fast, it will be difficult.

Try to relax when you talk. When you speak English at a normal speed, you will discover the connection between the words, and it will happen automatically.

Try to speak more confidently. Don't be shy to say - the more you do it, the more confident you will become. Remember to be polite – use "please" and "thank you".

Speech-thinking activity - a single process of generating speech and thought - forms the material basis of communication. Mastering the basics of communication by students is the main practical goal of teaching foreign languages at school. This leads to the need for a deep study of speech thinking and the search for its possible implementation.

When teaching speaking at the initial stage, the teacher must clearly understand what the final result he wants to get. The final speech product of speaking will be a message about yourself, about your friend, your family. The speech situations created in the lessons help in this task.

The exercises of speech activity at the middle stage of training include educational situations, speech exercises, games, including role-playing, conversations on topics related to the interests of children, their life experience, and the immediate environment. The educational situation should be, if possible, adequate to the real situation of communication, extremely clear to students, should stimulate the motivation of learning, arouse students' interest in the task. The task of a foreign language teacher is to ensure the active activity of each student throughout the lesson, maximizing the speaking time of each student. The group form of work allows to realize this task. It also contributes to the formation of skills and abilities of independent work, students in mastering a foreign language.

Senior classes are a qualitatively new stage in mastering oral speech, which forces the use of new techniques aimed at the creative use of language material. These techniques are carried out on the basis of the existing teaching complex, with the involvement of additional materials: oral language manuals, adapted books for reading in English, magazines "Foreign languages at school", "Club", "Clockwork", "Class out".

Speaking is a speech activity, it has specific features.

1) Motivation - a person, as a rule, speaks because he has a motive for this. The basis of communicative motivation is the need of two types: the need for communication as such, characteristic of a person as a social being; the need to commit this particular speech act, the need to "intervene" in this speech situation. The first type can be called general communicative motivation, the second is situational motivation, the level of which is determined by how we teach, i.e. how we create speech situations, how we use material, techniques, etc.

2) Activity - speaking is always an active process, because it shows the attitude of the speakers to the surrounding reality, but not only when a person speaks, but also when listening to the interlocutor (internal activity). It is activity that ensures the initiative speech behavior of the interlocutor, which is so important to achieve the goal of communication.

3) Purposefulness - any statement pursues some goal: to convince the interlocutor, to support, to anger, etc. Such goals can be called communicative tasks. Behind each of the communicative tasks that arise in individual speech situations, there is a common goal of speaking as an activity: influencing the interlocutor in the sense of changing his behavior (verbal or non-verbal).

4) Connection with activity - speaking is largely dependent on the general activity of a person. Firstly, the content aspect of speaking is completely determined by the spheres of human activity. Secondly, the need, say, to convince someone arises only if the situation that caused such a task is a consequence or subject of events in which the interlocutor is involved.

5) Communication with the communicative function of thinking - mental activity is aimed at performing a speech act, subordinated to it.

6) Connection with personality - speaking is largely conditioned by the components of personality. Personality is always individual, and manifests itself in communication. The development of speaking should take place in conditions of maximum connection of all spheres of consciousness, all components of personality, which is what the communicative method strives for.

7) Situateness - it manifests itself in the correlation of speech units with the main components of the communication process. Thus, any speech unit uttered by one interlocutor can affect the further course of communication development, if it meaningfully "fits" into the context of the other interlocutor's activity. This speech unit can change the communicative task and influence motivation. When a speech unit is unable to "promote" a speech situation, it is non-situational, does not cause a reaction from the interlocutor.

8) Speech activity cannot be fully memorized and predicted. Such unpredictability is a heuristic. Communication situations are constantly changing, their options are numerous, and the speaker must be ready to work in such constantly changing conditions.

9) Independence.

10) Temp.

All the qualities of speaking as an activity provide the conditions for creating a speech product (utterance of any level), which also has certain qualities: structurality, logic, informativeness, expressiveness, productivity. The communicative method is based on the fact that the learning process is a model of the communication process. Like any model, the learning process is simplified in some aspects compared to the real communication process, but it is adequate to it in basic parameters. The methodological significance of this adequacy is explained by two main factors:

- 1) the phenomenon of transference, which is provided by awareness of the adequacy of learning conditions and conditions for the application of learning outcomes;
- 2) the phenomenon of motivation, which is provided by how fully the nature of communication is modeled in the learning process.

CONCLUSION

Everyone knows that there are 4 ways to learn a language, these are listening, speaking, reading and writing. All of them together allow the student to achieve good results in language learning. When learning English, listening (listening) can noticeably improve speaking skills. Despite the fact that this is the very first of the skills, it is neither the simplest nor meaningless. We must learn to hear different English and must listen to it constantly if we want to understand the language well and speak it correctly, fluently and meaningfully. It would be a mistake to think that the communicative method of learning English is intended only for light small talk. Those who want to be a professional in a particular field regularly read publications on their subject in English. Having a large vocabulary, they easily navigate the English text, but it costs them enormous efforts to maintain a conversation with a foreign colleague on the same topic. The communicative method of learning English is designed, first of all, to remove the fear of communication.

LITERATURE:

1. Methods of teaching foreign languages in primary school: Lecture notes. – Irkutsk: Publishing house of Irkut. State ped. univ., 2006. – 58 p.
2. Mirul'd R.P., Maksimova I.R. Modern conceptual principles of communicative teaching of foreign languages // Foreign languages at school. – Moscow, 2000. - No. 4. - PP. 9-15
3. Kharlamova M.V. The use of "ideological nets" in foreign language lessons // Foreign languages at school. – Moscow, 2005. - No.1 – P.3 – 9.
4. Sholpo I.L. How to teach a preschooler to speak English: A textbook on the methodology of teaching English for pedagogical universities, colleges and colleges in the specialty "Teacher of a foreign language in kindergarten". - St. Petersburg: "Book", 2005. – 345 p.
5. Elkonin D.B. Development of oral and written speech of students // Ed. Davydova V.V., Nezhnova T.A. – Moscow: INDOR, 2003. – 112 p.



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TERMINATION OF EMPLOYMENT AGREEMENT DUE TO LACK OF PROFESSIONAL QUALIFICATIONS

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ABSTRACT

In this article, the author, based on the analysis of national legislation and scientific literature, highlights the some issues of termination of the employment agreement due to lack of professional qualifications of employee. In particular, the concepts "lack of qualifications", "Non-performance of work duties" were given the definition of authorship and proposals were made to improve the Labor Code of the Republic of Uzbekistan.

KEYWORDS: *Termination Of Employment Agreement (Contract), Lack Of Qualifications, Qualification, Skill, Skill Level, Skill Specialization, Non-Performance Of Work Duties, Capability, Attestation,*

INTRODUCTION

According to Article 176 of the Labor Code of the Republic of Uzbekistan employees must perform their duties honestly and conscientiously. It should be mentioned that simply establishing this rule is insufficient to ensure the quality and completeness of the job performed in a given business. Employees must be educated, as well as have certain professional training, skills, and specialized knowledge, in order for an organization to achieve its objectives. Accordingly, labor law sets out the grounds for termination of an employment contract on the grounds that the employee is unfit for the job he or she is performing.

Article 100 (paragraph 2, part 2) of the Labor Code of the Republic of Uzbekistan stipulates that an employment contract may be terminated due to the state of health of the employee and in case of lack qualifications.

A comprehensive list of grounds for declaring an employee unfit for the job they perform is based on the above two reasons; broad interpretation is not permitted, that is, the employment

contract cannot be terminated on the grounds that the employee is unfit for the job he is performing for reasons other than these two.

Agreeing with the opinion of Russian scientists, we highlight that the dismissal on this basis is caused by reasons related to the personal aspects and qualities of the employee, and this determines the redundancy (uselessness) of the employee for the organization¹. We also note that this is not related to the employee's culpable behavior².

In this case, although the reason for the termination of the employment relations is the inability to perform labor duties, it is not the result of the employee's fault. This has been pointed out by many legal scholars, in particular, the legal scholar M.Yu.Ghasanov explains this situation as follows: "If non-performance or unsatisfactory performance of work obligations is not related to the misconduct, this occurred perhaps due to the inability to perform them properly or the employee's inability to do so, then it is not possible to assess it as a violation of labor duties by the employee, moreover, the employee cannot be held liable for disciplinary action. The employee's inability or incapacity to perform the work tasks assigned to him to the required level may be caused due to various circumstances. Such cases may occur as a result of the lack of the necessary conditions for the proper performance of their duties, the employee's lack of qualifications or the state of health that prevents the employee from performing the duties properly"³.

Let's look at the essence of the concept of "lack of qualifications".

ILO International Standards for the Classification of Occupations (ISCO-08) defines employee qualification (or skill) as "the ability to carry out the tasks and duties of a given job", and is divided into two groups: the level of qualification determined by the complexity and scope of duties and responsibilities (Skill level);

qualification in the field of required knowledge to work with the machines, tools and materials used in the work and the type of goods and services produced (Skill specialization)⁴.

So, we can say that, "Lack of qualification" means that an employee lacks the necessary knowledge, skills, preparedness, and other professional characteristics to accomplish their work obligations, or that they have been unable to learn new skills as job features have changed through time.

In addition, the employment contract concluded with the employee may be terminated on the grounds of insufficient qualification, if it does not have the labor characteristics (business qualities) required to perform labor duties in a quality and qualified manner, notwithstanding the employee has documents on education in the relevant specialty, and trying to perform work duties in a disciplined manner.

For example, an employee who has worked in an enterprise for several years has not been able to master the new software introduced at work and he could not develop the skills to work in this program, this circumstance may be the basis for declaring him unfit for the position for lack of qualifications.

"Non-performance of work duties" is a broader concept, regardless of whether the failure was due to the employee's misconduct or other circumstances (health condition, lack of skills, etc.), it refers to all cases which the labor tasks remained unfulfilled.

It is very important to understand the difference between the failure of the employee to perform work duties as a result of culpable actions (inaction) and the employee is unworthy of the position. It should be noted that failure to perform work duties as a result of irresponsibility, negligence is not a basis for finding an employee "unworthy for the position." Because, in these cases, it is only possible to talk about the unwillingness of the employee to do the job, which has nothing to do with his inability to execute the job. In this case, there is a violation of labor duties by the employee, and therefore the above cases should be considered as a violation of labor discipline. For this, it would be appropriate to apply disciplinary action to the offending employee.

Failure to perform work duties or failure to perform to the required extent is not related to the misconduct, but if they are not performed to the required extent or are due to the employee's lack of ability to do so, then it may not be assessed by the employee as a violation of work duties, moreover, it is not possible to bring him to disciplinary penalty.

Furthermore, only if the employee is unable to accomplish the task that he is obligated to undertake under the employment contract is it permissible to terminate the employee's employment relationship on the basis of incompetence. Because the employee's job is not specified in the employment contract, if an employee is temporarily unable to perform work without his consent due to the need for production or at the employer's initiative at the time of termination, the employment contract with him may not be terminated on the grounds of incapacity for work.

British labor law, as in many instances, establishes only the basic rules on the topic under consideration. In particular, according to Article 98 of the Employment Rights Act (ERA 1996), it is legal to dismiss in connection with an employee's ability or qualifications. In addition to this, both of these qualities must be relevant to the duties performed by the employee in the employment ("relates to the capability or qualifications of the employee for performing work of the kind which he was employed by the employer to do"). The third part of this article defines the concepts of "capability" and "qualification". "Capability" refers to a skill, ability (ability), state of health, physical or mental quality ("capability assessed by reference to skill, aptitude, health or any other physical or mental quality"). The term "qualification" refers to the suitability of a position for education, diploma or other scientific, technical or professional qualification ("any degree, diploma or other academic, technical or professional qualification relevant to the position which he held")⁵.

In this regard, when it comes to the legislation of the Republic of Uzbekistan, Paragraph 28 of the Resolution No. 12 of the Plenum of the Supreme Court of Uzbekistan "On the application by courts of the laws governing the termination of the employment contract" (17 April 1998) states that the incompetence of the employee must be substantiated by concrete facts (inspection reports, notification letter from the immediate supervisor, reports, certification documents and other documents confirming the low quality of work, production of defective products, workload and non-compliance with production standards, etc.) proving that the employee is unable to perform the work that must be performed (assigned), and incompetence according to the state of health must also be confirmed by a medical conclusion.

The traditional reasons why an employee is incompetent or unfit for the position he or she holds due to his or her health condition are still present in the legislation of the CIS countries. In

particular, pursuant to paragraphs 3 and 4 of Part 1 of Article 42 of the Labor Code of the Republic of Belarus, the employment contract may be terminated by the employer due to the employee's health condition or lack of qualifications⁶. Belarusian labor law does not require a medical or attestation report to substantiate the reasons for dismissal. The Plenum of the Supreme Court of the Republic of Belarus (No. 2 of March 29, 2001) filled the gap by the Resolution "On some issues of application of labor legislation by the courts". According to it, the condition that the employee is unable or unwilling to perform his duties due to his state of health must be confirmed by a medical report. In addition, the Resolution states that the conclusion of the attestation is one of the proofs that the qualification of the employee is insufficient, and it must be evaluated by the court on the basis of the sum of all the evidence in the case⁷.

Also in the legislation of Georgia⁸, Ukraine⁹ and Turkmenistan¹⁰ the procedure of dismissal of an employee unworthy of the position is determined in the same order. For many CIS countries, the grounds for dismissal were formulated in accordance with the labor legislation of the former USSR and the 1970 Union Republics.

Paragraph 3 of Part 1 of Article 81 of the Labor Code of the Russian Federation, and paragraph 4 of part 1 of Article 52 of the Labor Code of the Republic of Kazakhstan provide terms of termination of the employment contract at the initiative of the employer, if due to insufficient qualification confirmed by the results of attestation, the employee is found incompetent for the position held or the work performed. Article 81 of the Labor Code of the Russian Federation specifies that the procedure for certification should be established by labor legislation and other normative legal acts, including the norms of labor law, as well as local normative documents adopted through taking into account the opinion of the representative body of employees¹¹. Article 53 of the Labor Code of the Republic of Kazakhstan specifies that according to the results of the attestation, the dismissal of the employee is carried out in accordance with the decision of the attestation commission, which is attended by a representative of the employee, and the procedure, conditions and periodicity of attestation of employees are determined by the collective agreement or a document issued by the employer¹².

In conclusion, it should be highlighted that our national legislation does not provide an objective justification (types and mechanisms) for determining the "lack of qualification" in the termination of an employment contract due to insufficient qualifications of the employee.

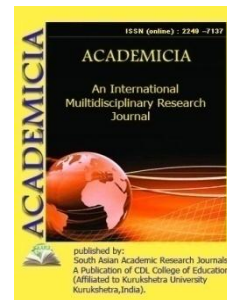
Given the importance of protecting the rights and interests of employees, it is also proposed to determine in the Labor Code of Uzbekistan the terms of the lack of qualifications of the employee through certification, and to include norms on the regulation of the attestation process by local documents.

In addition to the above, it is considered expedient to define in the text of the code the most important priority rules of the process of attestation of employees such as the concept, purpose, principles, types, terms of attestation, types of non-attested employees, rules on obligatory inclusion of a member of the employee representative body in the commission, bases of regular and non-regular attestation, attestation results, etc.

REFERENCES

1. Kiselev I.Ya. Comparative and International Labor Law. Textbook for universities. M., 2006. S. 148.

2. Mironov V.I. Labor law of Russia: Textbook. M. 2005.S. 416.
3. Mironov V.I. Labor law of Russia: Textbook. M. 2005.S. 416.
4. https://www.ilo.org/moscow/information-resources/publications/WCMS_306604/lang--en/index.htm
5. <https://www.legislation.gov.uk/ukpga/1996/18/section/98>
6. https://kodeksy-by.com/trudovoj_kodeks_rb/42.htm
7. http://court.gov.by/ru/jurisprudence/post_plen/civil/labour/fbe3d62ceac9dead.html
8. <https://matsne.gov.ge/ru/document/view/1155567?publication=19>
9. <https://i.factor.ua/law-39/section-183/article-23308/>
10. https://online.zakon.kz/document/?doc_id=31348675#pos=526;-60
11. http://www.consultant.ru/document/cons_doc_LAW_34683/6a7ba42d8fda3a1ba186a9eb5c806921998ae7d1/
12. <https://online.zakon.kz/>



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INSTABILITY SURVEY OF BASALTIC SOIL SLOPES IN MAHARASHTRA, INDIA

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ABSTRACT

Mahabaleshwar regarded as a destination for tourist and is situated in Maharashtra, India's most beautiful and important tourist finish point, suffering frequent slope owing to heavy rain and complex geologic circumstances. The area's litho component is Deccan Trap Basalt, most notable consecutive basaltic flows to Tertiary during late Cretaceous era. The area is extremely susceptible to temperature, different degrees of alteration, soil formation, and presence of bole beds in between two successive basaltic flows. In this region, soil formation cycle is one of most significant reasons for slope disappointment. These deformed soils create instability on slopes, and eventually aggregate into collapses on the slope. During arena studies, petrographic analysis alongside X-ray deflection, five kinds of soils were discovered which show changes in composition and color variations. Geo mechanical characteristics viz. five kinds of soil samples were tested for bulk density, particle size inspection, Atterberg limit, uniaxial compressive power, cohesiveness in addition to internal friction angle; using help of numerical software Slide 6.0, the impacts of various soils on slope stability were shown based on limit equilibrium process.

KEYWORDS: *Basaltic Soil, Soil Formation, Types of Soils, Weathering.*

1. INTRODUCTION

Highways in addition to roads in steep terrain are efficient methods of local transit besides linking from one location to the next. Highway planning in hilly regions is a real tough task. The impact of geo materials and organic heterogeneities includes on grade constancy. In general, a slope disappointment starts from mixes of effects such as mechanical discontinuities (circumstances besides orientations), withstanding besides geo material modifications, poor zone changes, litho logical disturbances, slope settings, heavy rains and considerably more. Geo material weathering and modification promotes litho logical disturbances and also aids in soil formation which adversely impacts stability of slopes. In addition, unanticipated highway projects in these ranges frequently present a major danger to human life, properties in addition resources, while an inventive field evaluation and suitable slope design will prevent loss of life, properties moreover potential unknown coincidences[1].

There are several conventional and numerical techniques used for determining safety factor (FoS) viz. Method of limiting equilibrium (LEM), system of finite elements (FEM), process of finite difference (FDM) and system of different elements (DEM). The current methods involve primarily kinematic analysis and ways of decreasing the equilibrium. LEM is the usual technique used on a daily basis for evaluating loose dirt etc., whereas translation or rotational motions occur when there is a clear failure. The conventional analyzes are performed to incorporate a set of shear asset parameters at failure either using a FoS or, via back-analysis. Over the past three decades, various methods for performing the two-dimensional (2-D) LEM of parts were suggested. Such techniques are (1) method by Fellenius, (2) fundamental method by Bishop, (3) simplified method by Janbu and (4) method by Spencer[2].

The Fellenius method is one of simplest ways of assessing short-term constancy of homogeneous slopes and is based on principles that an inflexible, cylindrical block may collapse by spinning around its center and that angle of friction is 0. So, it is thought that the shear strength is attributable entirely to cohesion. The shortened Bishop method is suggested which also utilizes similar slice technique to negotiate FoS for mass. The simplified Janbu system is a method of slicing non-circular slip exteriors. The system claimed that forces of inter slices were horizontal besides thus shear forces were 0. Two problems of security reckonings were planned, one with respect to moment symmetry and other with regard to straight balance of power. He created a continuous connection between inter-slice shear besides normal powers, and adjusted inter-slice shear-to-normal ratio through an iterative procedure until the two safety factors were the same. This version concerns with geo mechanical characterization of exposed soils along slopes of Maharashtra, India's state highway (SH)-72. Pertinent data were generated through field survey alongside laboratory study, utilizing the simplified Bishop slicing technique to mimic stability of grades using LEM using Slide 6.0 software package[3].

2. LITERATURE REVIEW

The stability of an unsaturated slope in natural terrain was assessed based on the change in the suction stress in the soil layer caused by rainfall. A field monitoring location where landslides have happened in the past was chosen as the research area. To apply the concept of slope stability analysis considering the suction stress in unsaturated soil, the Soil-Water Characteristic Curve (SWCC) and the Suction Stress Characteristic Curve (SSCC) of the unsaturated soil obtained from the study area were estimated using the van Genuchten (1980) model and the Lu

and Likos (2006) model, respectively. The phenomena of ground saturation caused by the penetration of rainwater into unsaturated soil is comparable to the wetting path of the SWCC. The curve-fit parameters obtained from the SWCC wetting route were thus utilized to quantify the matric suction and suction stress in the unsaturated soil. The quantity of rainfall and the volumetric water content of the soil were monitored using a rain gauge and time-domain reflectometer (TDR) sensors, respectively, at the monitoring location. An infinite slope was selected as indicative of the slope of the natural terrain in the research region because the slope length is extremely long yet the depth of the soil layer over the rock is quite shallow.

The stability of this unsaturated slope in natural terrain was assessed based on the safety factor of an infinite slope considering the suction stress in the unsaturated soil layer. The safety factor of the slope abruptly dropped during and shortly after a rainstorm and subsequently restored. Notably, the safety factor of this natural slope showed constant variations due of changes in the suction stress produced by the evaporation and infiltration of water in the unsaturated soil layer. The variation in the suction stress in unsaturated soil induced by rainfall can be estimated from the results of laboratory tests performed to estimate the wetting process based on the SWCC and SSCC in combination with field monitoring data collected by sensors to measure the volumetric water content or matric suction in the soil. Therefore, the infinite-slope stability of a slope in natural terrain may be assessed in real time by calculating the suction stress in the unsaturated soil owing to rainfall while the volumetric water content or matric suction in the soil is being observed in the field[4].

Shallow landslides often occur during brief rainfall infiltration and under partly wet circumstances. However, a thorough study of what causes them, especially in clayey soils, is frequently hampered by the absence of field data. It is rare, in fact, to record their presence in an instrumented natural slope. This article provides findings from an integrated field experiment tracking the soil-water and displacement variables that contribute to the development of a shallow landslide in partly saturated clays. The integration of a range of experimental methods allows for the study of interaction between soil hydrological and mechanical characteristics. This study also analyzes a slope stability model based on the suction stress idea. Since the model was applied after the occurrence of the landslide, the findings are regarded as a hind-casting method for model evaluation.

Nevertheless, the comprehensive field measurements collected during the monitoring activities and the occurrence of a landslide throughout the experiment gave important information on model parameters and data interpretation. The station offers remote satellite monitoring of data on meteorological factors, soil water content and soil suction. A time domain reflectometry wire was placed vertically to detect possible soil failure. The experimental region had a high chance of landslide occurrence. Indeed, slope collapse happened throughout the monitoring period, demonstrating the efficacy of the station in detecting the incidence, timing and depth of landslides. The landslide was caused in consequence of changes in suction stress. The failure plane occurred at a depth of 1.4 m, corresponding to the interface between a surface layers of greater permeability of 1 to 1.45 m thickness, sliding over a compacted substrate with lower permeability. The study allowed for verification of the validity of the model and the description of the triggering mechanisms of the observed shallow landslide under unsaturated circumstances, showing that oscillations in soil matric suction were the main factors causing soil failure[5].

3. METHODOLOGY

3.1. Survey Area:

SH-72(State highway) Maharashtra is a thoroughfare selected for research region between Poladpur and Mahabaleshwar. Mahabaleshwar, positioned in Maharashtra district of Satara, is a famous hill resort, approximately 120 km from Pune and 295 km from Mumbai. Mahabaleshwar is regarded as excellent vacation destination in addition it offers various chances for leisure activities such as fishing, hiking plus boating. The most enticing characteristics of the hill station are beautiful lakes, slopes and waterfalls and this makes the area popular. It also attracts visitors due of its unique visual beauty as well as shrines, natural vistas then historically significant places[6].



Fig.1 Location of the Study Area (Purple-Coloured Rectangle Shows Study Area)

The scope of study extends from latitude 17° 0' to 18° 0' to longitude 73° 26' 15'' to 73° 41' 15''. It lies under topo sheet no. 48G/9 NE, given by the Indian Survey. The highway, NH-27, provides an important connection with Mahabaleshwar connecting it to SH-71, subsequently expanding starting from Mumbai to Solapur and ultimately connected to Mahabaleshwar on the same route (Fig. 1).

3.2. Geology of area:

The scope of research extends to recorded, broad degree of volcanic eruptions documented as the Deccan Trap Basalt between both the late Cretaceous to Tertiary era. About 51,000 km² of Western states like Andhra Pradesh, Maharashtra in addition to parts of Central India had been up extensively. The Deccan Trap Basalt is divided into several sub-groups in Maharashtra, namely. Kalsubai, in addition to Wai alongside Lonavala. The survey region consists of three lower Wai Subgroup formations viz. Poladpur, Ambenali and Mahabaleshwar. These formations

are characterized by minor changes in mineralogy, isotope ratios besides magnetic divergence (Table 1)[7].

Table 1. Simplified Stratigraphy of Deccan Trap Basalt with Formation Thickness

Deccan Trap Basalt	Subgroup	Formation	Thickness (m)	$^{87}\text{Sr}/^{86}\text{Sr}$	Magnetic polarity
	Wai	Desur	~100	0.7072–0.7080	Normal
		Panhala	>175	0.7046–0.7055	Normal
		Mahabaleshwar	280	0.7040–0.7055	Normal
		Ambenali	500	0.7038–0.7044	Reversed
		Poladpur	375	0.7053–0.7110	Reversed
	Lonavala	Bushe	325	0.7078–0.7200	Reversed
		Khandala	140	0.7071–0.7124	Reversed
	Kalsubai	Bhimashankar	140	0.7067–0.7076	Reversed
		Thakurvadi	650	0.7067–0.7112	Reversed
		Neral	100	0.7062–0.7104	Reversed
		Igatpuri–Jawhar	>700	0.7085–0.7128	Reversed

The breadth of study defines two types of basalt based on textures, particularly glomeroporphyrite and plain olivine basalt. The basalt produced by Poladpur is glomeroporphyrite with vesicles, typically tarnished tops. These are combination of fine and course grained, typically grained plagioclase, or plagioclase olivine phenocrysts. Ambenali Development comprises of same kind of rock but low isotopic ratio that rests on Poladpur Formation and is covered by Mahabaleshwar Formation. The rocks of Mahabaleshwar Development in plagioclase laths are fine grained, characteristic unvarying circulation of olivine plus augite. All three types carry iron oxide dispersion uniformly, and nearly equally. The study location typically contains various soil types, usually on the top of the hills. Five kinds of dirt were identified during field survey based on colour and corporeal natures. Analysis of X-ray diffraction identifies minerals contemporaneous in such soils. The information represent differences in mineralogy soils, the presence of different solid components. The short descriptions for each kind of soil were examined using the Mansell soil color map, the soil colors are given. Samples were screened to classify soils furthermore data gathered was presented at log diagrams[8].

3.3. Field Investigations Besides Methodology:

Widespread field surveys were carried out to gather illustrative samples of soil moreover rock according to the code. Testing of dissimilar geoengineering possessions as per American Society for Testing and Materials (ASTM) specifications was conducted in the laboratory. Also, the method was described in full below. Methodology to resolve of geoengineering properties.

3.3.1. Preparation of samples:

Examples is ready according to the test requirement, in accordance with certain ASTM standards. The goods were air-dried moreover fractured into smaller possible pieces previous to the production of the test specimens, care being engaged not to sizes of distinct subdivisions.

3.3.2. Test procedures:

Subsequent checks viz. Parameters of density, sieve analyzes, Atterberg limitations, Uncontained Compressive Strength (UCS) and shaving strength have been computed on disturbed samples for each kind of soil.

3.3.3. Bulk Density:

Density is useful word for geotechnical impact and for assessing slope consistency. Bulk density was examined in this research, and is distinguished as oven-dry heaviness of a unit volume of soil including pore galaxies. A soil's bulk density is ever slighter than its subdivision density. When the texture of the soil gets finer it generally lowers.

3.3.4. Liquid limit determination:

Test of the soil passing through a sieve of 405 mm, weighing 210 g was mixed with aquatic to create a thin comparable paste. The glue was gathered using a groove created inside the apparatus cup of the Casagrande, and number of disappointments to shut it was recorded. In addition, moisture content of each sample checked for liquid limit has been intended[9].

3.3.5. Plastic limit:

Around 18 g of dirt is thoroughly combined, passing through a No. 45 sieve. The dirt is thrashed with the hand on a glass plate until it has a diameter of approximately 5 mm. This mixing in addition to rolling procedure is continued until the ground is exhibiting symptoms of dissolving. The water gratified is calculated from crumpled part of document[10].

4. RESULT AND DISCUSSION

4.1. Bulk density:

Bulk soil densities were determined under both dry besides saturated situations. The result (Fig. 2) indicates the density range for soil samples S-1, S-3 and S-5 about 1.72 and 1.94 g / cc in dry state and 1.82 in addition to 2.11 g / cc in wet condition. In dry and wet conditions, the average sample density S-4 was measured 2.27 g / cc and 2.15 g / cc, respectively.

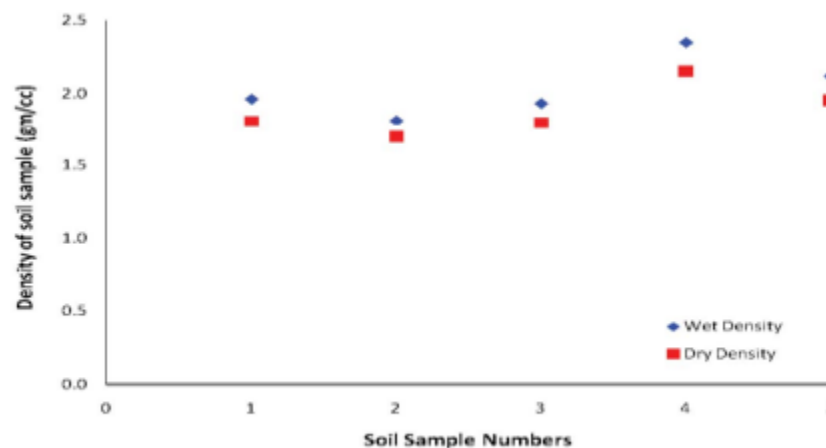


Fig.2 Bulk Density of Soil Samples

4.2. Particle Size Distribution:

For each soil type, uniformity coefficient (Cu) or curvature coefficient (Cc) were computed using plot among % finer versus grain sizes. Based on the test, Cc lies around 1 and 3 of each soil, which indicates that all dusts are marked. Cu of S-2 besides S-5 soil samples are classified as well-graded gravel, whereas S-1 are confidential as well graded clay. Example S-3 assessed as value of Cu less than 3.0 which indicates an unchanging soil delivery.

4.3. Atterberg limits:

The runny maximum worth of five soils varies from 24.27% to 42.03%, while malleable maximum was measured as 14.36% –23.31% (Fig. 3). The spectrum of PI ethics is calculated as 12.90–13.87 on different soils. Soil categorization according to Atterberg, example nos. S-4 alongside S-5 are medium plastic, while sample no. S-2 has a high elastic substance.

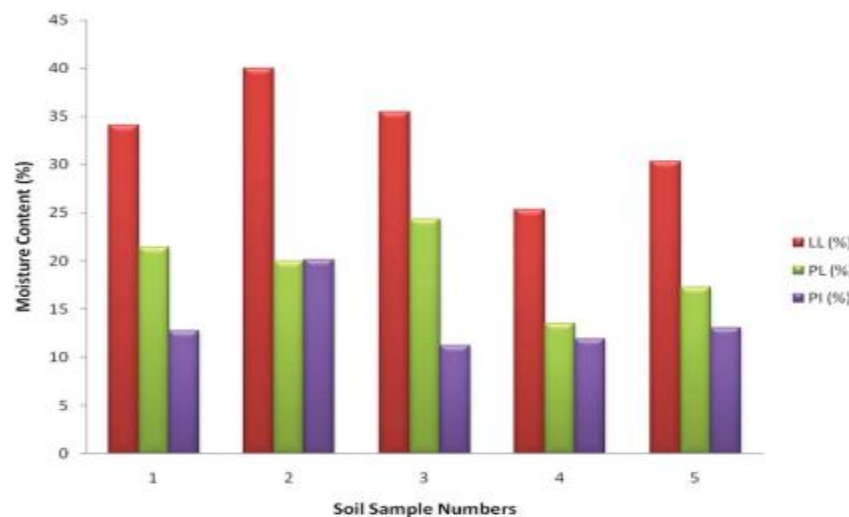


Fig. 3 Atterberg Limits For Different Types of Soil Samples

4.4. Slope stability analysis:

From Poladpur to Mahabaleshwar route hills of SH-72 are disrupting roadways owing to frequent landslides, rock falls among soil failures. High hill areas in specific are especially susceptible to failure at the slope plus their impacts are overpowering. This high hill regions are near to town of Mahabaleshwar and majority of hills blocked off by road have steep viewing hills. A rock fall study was conducted in hill slopes of similar location, and the major reason of rock fall in this region was due to heavy rainfall during rainy season and practically comparable joints to slope facing. The region problematic owing to basaltic soil growth, which causes slope collapse. Many sites wherever slope collapse happened owing to the development of different types of soils from basaltic shocks were discovered during field study. 2-D LEM was used to evaluate consistency of soil slopes that were exposed above basaltic foundation. Due to its forte for soil masses. The simulation utilized geoengineering characteristics of different soils besides basaltic rocks. The possessions of entire rock samples were evaluated in workshop according to ISRM (Table 2). Using the Roc Lab method, the acquired things are transformed to battered and shattered rock.

Table 2. Geoengineering Properties of Intact Basaltic Rock for Dry and Saturated Condition

Sr. no.	Parameters	Dry	Saturated
1.	Average density (g/cc)	2.70	2.85
2.	Average cohesion (MPa)	11.65	8.43
3.	Average friction angle (°)	37	30
4.	Average Young's modulus (GPa)	40.12	36.32
5.	Average Poisson's ratio	0.24	0.22

5. CONCLUSION

This review is a study to investigate physical as well as engineering behavior of basaltic formations, besides its application in SH-72 slopes stability. It derived the following important findings.

- Land tests, petrographic studies and soil X- diffraction (XRD) analysis were breakthrough milestones in the distinction between individual soils.
- From geoengineering property, S-2 shows low forte, whereas S-4 displays tall asset among other kinds of soil. The activities of exceptional soils are essentially identical in addition to having about similar strength.
- Petro typically, S-2 is a relatively thin laterite soil, whereas S-4 is a rather robust, reddish-yellow loam soil. And in danger situation, laterite soil is poor in environment in addition to hazardous.

REFERENCES

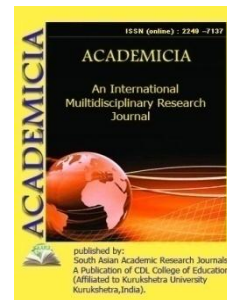
- [1] M. Ahmad, M. K. Ansari, and T. N. Singh, "Instability investigations of basaltic soil slopes along SH-72, Maharashtra, India," *Geomatics, Nat. Hazards Risk*, 2015, doi: 10.1080/19475705.2013.826740.
- [2] F. Cotecchia, C. Vitone, F. Santaloia, G. Pedone, and O. Bottiglieri, "Slope instability processes in intensely fissured clays: case histories in the Southern Apennines," *Landslides*, 2015, doi: 10.1007/s10346-014-0516-7.
- [3] R. C. Sidle and T. A. Bogaard, "Dynamic earth system and ecological controls of rainfall-initiated landslides," *Earth-Science Reviews*. 2016, doi: 10.1016/j.earscirev.2016.05.013.
- [4] Y. S. Song, B. G. Chae, and J. Lee, "A method for evaluating the stability of an unsaturated slope in natural terrain during rainfall," *Eng. Geol.*, 2016, doi: 10.1016/j.enggeo.2016.06.007.
- [5] M. Bittelli, R. Valentino, F. Salvatorelli, and P. Rossi Pisa, "Monitoring soil-water and displacement conditions leading to landslide occurrence in partially saturated clays," *Geomorphology*, 2012, doi: 10.1016/j.geomorph.2012.06.006.
- [6] M. Pirone, R. Papa, M. V. Nicotera, and G. Urciuoli, "Soil water balance in an unsaturated pyroclastic slope for evaluation of soil hydraulic behaviour and boundary conditions," *J. Hydrol.*, 2015, doi: 10.1016/j.jhydrol.2015.06.005.
- [7] G. Rossi, F. Catani, L. Leoni, S. Segoni, and V. Tofani, "HIRESSES: A physically based

slope stability simulator for HPC applications,” *Nat. Hazards Earth Syst. Sci.*, 2013, doi: 10.5194/nhess-13-151-2013.

[8] H. Y. Zhao and D. S. Jeng, “Numerical study of wave-induced soil response in a sloping seabed in the vicinity of a breakwater,” *Appl. Ocean Res.*, 2015, doi: 10.1016/j.apor.2015.04.008.

[9] P. Yang and J. Yang, “Rainfall threshold surface for slopes stability considering antecedent rainfall,” *Yantu Lixue/Rock Soil Mech.*, 2015, doi: 10.16285/j.rsm.2015.S1.028.

[10] G. Pardini and M. Gispert, “Soil Quality Assessment Through A Multiapproach Analysis In Soils Of Abandoned Terraced Land In NE Spain,” *Cuad. Investig. Geogr.*, 2012, doi: 10.18172/cig.1280.



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A REVIEW ON RESOURCE CONSTRAINTS DUE TO RAPID POPULATION GROWTH

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ABSTRACT

The management of population growth is a heated issue in different nations, since population increase has an impact on the availability of resources to the people. Population increase has not only restricted the utilization of existing resources, but it has also posed a threat to the country's overall development. Furthermore, it places additional strain on the country's agricultural industry. Many nations across the globe are experiencing fast population expansion, necessitating the immediate implementation of rules for food security. However, there are certain limitations that must be addressed before the rules for food security can be implemented. Aside from that, fast population expansion causes one nation to become reliant on another for food exports. This article was prepared to investigate the issue of food shortage as a result of population expansion as well as agricultural development in order to boost food production and make the nation self-sufficient in food resources.

KEYWORDS: Agriculture, Employment, Population Growth, Rapid Growth, Scarcity of Food.

1. INTRODUCTION

The world's population has not been constant, fluctuating by a little or large margin depending on the circumstances. These circumstances change from time to time. The population growth rate was not as great 20 to 30 years ago. Many years passed during which population growth was negative and the average number of births per year was fewer than the average number of deaths. The cause for this was the human race's technological exposure. In reality, medical facilities were not very adequate at the time, and more people died as a result of the absence of them.

Medical facilities have improved throughout time, and therapy for many incurable diseases has been discovered, which has shown to be beneficial in saving people's lives[1]–[3]. The realization that the world is on a reasonably smooth road to a near-stationary civilization has an impact on the debates over population, development, and sustainability. The notion that the trend toward ever-increasing population, termed "population explosion," presents a danger to our health and lives is losing hold with the general public. The implications of demographic shifts toward low fertility and population collapse have been a point of contention. These ideas are meant to be the most common developing flaws that will ultimately appear everywhere.

By raising the rate of food grain consumption, population expansion causes food grain shortage. This is an issue that has to be addressed with zeal. It is self-evident that steps should be taken to curb population expansion while also assisting farmers in increasing output in order to meet the impending food grain shortage. Leaving aside the broader topic, one may ask whether these worldwide demographic predictions indicate that agricultural issues linked to the "population boom" are losing a lot of their relevance. The rise in population and scarcity of food grains can be addressed by a concerted effort by various governments, as it is clear that the problem of agriculture and population growth is not a local issue, but rather a global one that requires collaborative action from various governments around the world. For a number of reasons, the basic response is that these issues are still extremely relevant. The idea that many civilizations, many of which have inadequate food intake levels, will be able to sustain rapidly growing populations for a long period is especially significant.



Figure 1: Cyclic Relationship between the Income, Food and Living Standard of an Individual

Figure 1 depicts the connection between a person's diet, income, and level of life. In many developing nations, the difficulties connected with population expansion will continue to

outweigh those associated with fertility declines below replacement levels. The nations impacted have a lot of control about how they cope with the reductions. Of course, it's also important to note the advantages to the nations affected by these reductions, as well as the environment as a whole, such as decreased environmental impact and urban congestion. Many of the nation's presently experiencing population growth have poor agricultural infrastructure or skills that are difficult to utilize because of geographical remoteness from population centers, insufficient infrastructure, high disease incidence, or other reasons. Agriculture plays an important role in their ecosystems, accounting for a substantial percentage of their GDP and exports, as well as a significant number of their population. Those countries will be doomed to a life of poverty if future population increases at the same pace as projected by demographic projections, and urbanization or mass migration to other countries provides no more outlets than indicated by demographic forecasts. The names of the nations considered for the review may be found in Table 1.

For the last 50 years, the 18 nations with the highest population growth rates have been studied. The average annual growth rate has been determined to be 1.8 percentage points or slightly higher. The 1.8 is regarded the limiting criterion for population growth, since growth rates more than 1.8 are considered large, while growth rates less than 1.8 are considered low. In addition to socioeconomic factors, the demographic features of the chosen nations have been linked to food security. According to historical statistics, at least 14 nations have failed to meet the goal of perceived food grain consumption in the previous four decades. A male's daily calorie need is 2500 kcal, whereas a female's requirement is 2200 kcal. Natural crop scarcity in some of these countries does not speak well for agriculture's capacity to reach its full potential and maintain even currently inadequate levels of nutrition. For example, a research finds that the food security situation in Ethiopia is likely to deteriorate despite their positive predictions, and that "the population environment agriculture nexus in Kenya seems to have fallen under the sustainability thresholds."

It is debatable if the projected population increase and ever-increasing rural population of these nations can be sustained. This implies that the assumptions behind the population forecasts (rates of change in fertility, mortality, and, in particular, internal and external migration) will need to be reviewed. There is a significant need to combine the demographic forecasts' theoretical assumptions with additional factors that show the difficulties many of these nations have in maintaining populations that are multiples of their present population size. The focus is on finding apparent discrepancies between demographic projections and improving agronomic potentials, which are essential for development [4]–[6].

2. Characteristics of Agriculture-Dependent Countries with High Rates of Population Growth

18 nations' demographics are projected to increase by a factor of at least 2.6 (Ethiopia, Iraq) and up to just over fivefold in the five decades running up to 2050. (Uganda). Naturally, not all of them are confronted with the prospect of having to depend on their own agriculture for food security and development. A country's capacity to develop is not limited by its ability to produce soil. Japan and many emerging nations with mineral riches are two examples of countries with low agricultural resources but sufficient food consumption and nutrition levels. Several countries in the Middle East and North Africa are among the latter, where oil is the basis for most of the

economic growth that has driven food consumption, as well as the resources to fund large increases in food imports to meet that need.

Yemen, a country with little natural resources and one of the world's fastest-growing populations, relied largely on emigrant remittances to finance huge increases in food imports. However, a case could be made for 12 of the 19 countries in the upper part of the graph that, at this stage in their development, they have insufficient choices and must rely solely on their individual agriculture to increase incomes, food supplies, and provide a foundation for their wider economic growth. Their dependence on agriculture for financial support surpasses 33% of GDP, which sets them apart from the rest of the world. Due to their wealth of natural resources, the other six nations are considerably less dependent on agriculture[7].

The following qualities may be found in these 12 countries:

- They had a high incidence of malnutrition and a low or extremely low per capita food consumption.
- They all score poorly on the Human Development Measure (HDI), a composite index that considers factors including income, life expectancy, and literacy.
- Non-agricultural assets, such as ores and reserves, as well as fuels, do not generate substantial rents.
- They are mostly landlocked, which is a big disadvantage when assessing growth possibilities and potentials.
- They are all classified as Least Developed Countries (LDCs) by the United Nations.
- Agriculture accounts for 30 to 56 percent of gross domestic output in these countries.
- A significant part of the population lives in rural regions. Furthermore, their rural populations are projected to grow, with the rural populations of certain nations more than tripling between 2000 and 2030. These two variables suggest that, barring unforeseen circumstances, the nations' total growth and poverty reduction will be heavily reliant on rural particularly agricultural development. As a consequence, in view of anticipated fast population increase, I consider whether their agricultural resources are sufficient to sustain output growth rates compatible with improved food security.

3. AGRICULTURE-RELATED CONSTRAINTS TO ATTAINING FOOD SECURITY

Examining the nations' water resources, which have the capacity to produce crops under both rainfall and irrigation circumstances, provides a preliminary look. Estimates of these possibilities are based on Food and Agriculture Organization (FAO) and Ecological Zones studies, as well as FAO's irrigation potentials. On a national basis, most nations are still a long way from reaching their agricultural boundaries. However, it's essential to note that national forecasts implying no increased resource scarcities may coexist with severe scarcities at the local level serving as effective development restrictions. Local scarcities are difficult to overcome even when resources from other areas of the nation are available. Chad and the Democratic Republic of Congo (DR Congo) both have ample land resources in relation to their current and projected populations. Despite the fact that a significant part of this land is covered in forest (closed forests comprise 50% of the nation's total land area), the latter country has classified 195 million

hectares (or 82 percent of its total land area) as suitable for producing rain fed crops in various degrees.

These findings suggest that, even if the Congo DR's population more than triples to 177 million by 2050, agricultural scarcity will not be a barrier to the country's severe food security problems. Demographic change will continue in agricultural growth when the capacity for doing so exists if it is consistently followed by poor possibilities for other sources of output, as has been the case in the past. The enormous mineral resources of the nation, of course, offer other development possibilities, decreasing the country's dependence on agriculture[8]. Countries with high rates of population growth and a high dependence on agriculture will have a distinct future. Burundi has the lowest land-to-population ratio. Niger's agricultural growth potential is similarly restricted, a situation that would rapidly deteriorate if the projected population increase of 2050 happens and no other sources of demographic pressure on agriculture are found. Only approximately 13 million hectares (12 percent of the country's total land area) are suitable for rain-fed agriculture, with 45 percent being moderately suitable.

Local agriculture will struggle to provide food, employment, and profits for such a large population while also encouraging general development due to Niger's low agrarian resources and severe agro-ecological environment. Alternative growth options, on the other hand, that would significantly reduce dependence on agriculture are rare, as the country's poverty-reduction plan acknowledges. Niger's uranium-producing industry aided expansion in the 1970s, but development stopped when export prices fell and agriculture was damaged by recurrent droughts. Niger is classified as a "Low-Income, Severely Indebted" country by the World Bank. We'd need a more accurate predictor if we were to use agro ecological capabilities as a proxy for assessing the compatibility between population predictions for nations on the list and the development potential of their natural crops. The closest we can come to such an estimate is to devote each country's land, apart from water contributions, toward future food crop growth. Because it comprises of culturally homogeneous food crops, the cereals group (wheat, coarse grains, and milled rice) lends itself to this role as a yardstick (grains).

Cereals are an essential component of an individual's diet; cereals are also the most significant food intake for children aged one and above, since their increasing age need more food and energy in addition to breast feeding. It has been showing the projected development of possible dairy products in 2050 based on two assumptions: (a) cereals will occupy the same percentage of total farmland suitable for agricultural production as they do now, and (b) crop harvests in 2050 will be double that of today. The development of these dependent characteristics over the past four decades may also be used to determine the validity of these theories. Only two of the 10 nations with data saw yields almost double, with the other seven seeing little to no increase and Niger seeing a decrease. As a consequence, although a doubling in the next 50 years is a bold forecast, it is well within the realm of technical feasibility based on present technology. The theoretical capacity of land available for grain production seems to be great in certain nations, moderate in others, and non-existent in others.

As a consequence, even the most optimistic forecasts show that four nations will not be able to maintain their present per capita production levels in 2050. Given the significance of cereals in their diets, this inability presents a serious danger to Afghan and Niger grain output. In Burundi and Uganda, where vegetables account for just 22–26% of calories while cassava, sweet potatoes, plantains, and mushrooms account for the bulk of the remainder, it may be less

important. The other seven nations, on the other hand, have the potential for higher per capita demand, which is likely to be far above any potential per capita consumption in 2055. It's astonishing to see how much manufacturing potential exists in nations where food security is a problem and agriculture is mainly semi-arid and susceptible to weather fluctuations. This result supports a more in-depth examination of the data, in addition to the assumptions that were used to estimate production potential.

Naturally, many nations' inability to improve land productivity in the past does not preclude them from doing so in the future. The agriculture sector's cornerstone has been yield development, which has resulted in increased agricultural output in most countries that have completed this evolution, particularly those with significant land limitations. Supportive policies, particularly those that supported the age group and technical advances, as well as laws or other circumstances that provided economic incentives for their adoption, seem to be at the core of such achievements. The availability of agro-ecological circumstances (e.g., the capacity to expand irrigation) that enabled for the genetic potential of high yielding crops arising from agricultural progress to be utilized was, of course, a worthy contender.

It is unclear because any kind of synthetic or endogenous "Bose up consequence" of maintainable intensification will play a major role throughout levitation agricultural output at rates directly associated with the challenge posed by fast-growing populations in the absence of substantial even use and agro ecological potentials. The data, particularly from the literature, is divided when it comes to resource depletion and soil deterioration as a consequence of economic pressures in rural regions. Existing research indicates that a plethora of other factors, such as infrastructure development, marketplace access conditions, and supportive policies, play a role in determining whether or not increasing population pressure is related to long-term increases in land production success or disappointment.

Johnson referred to a "political Bose effect." Apart from policy-supported deepening, this provides as a connection between the ideas of endogenous and policy-supported deepening. He argued that rising population densities prompt politicians to place a greater emphasis on agricultural research, with the outcomes leading to better agricultural production. It was attempted to verify this hypothesis, and it was found that rural population numbers and national agricultural research system investments in plant breeding had very positive correlations. His findings for Sub-Saharan Africa, on the other hand, apply to the whole continent. Given the significant difficulties in creating yield-increasing genetic innovations appropriate for dryland agriculture in areas with sometimes low and variable rainfall, it's impossible to say if they'd apply equally to the agro-ecological conditions of most of the nations examined here. It's no wonder that crops suited to these conditions are often referred to as orphan crops owing to the lack of attention they've received via traditional farmer support networks. This isn't to argue that properly focused plant breeding efforts can't assist impoverished regions achieve significant improvements in food security. In Nigeria and Ghana, the effectiveness of enhanced high yielding cassava cultivars in increasing food consumption is instructive. At the same time, the ability of contemporary biotechnology to overcome agro-ecological limitations is well acknowledged.

Concerning property, significant concerns have been expressed that the land area identified in the FAO/IIASA research as having rainfall-fed agricultural production potential is overstated and/or will not be able to be farmed in the near future. It has been suggested that land having agronomic

promise but not yet under cultivation is being systematically exaggerated. As the severe difficulties with settlement and transmigration systems in Ethiopia and elsewhere have demonstrated, land accessibility, illness prevalence, and socio-political variables are possibly more important concerns. The widespread cultivation of moderately suitable and crop failure regions in Ethiopia, as well as recurrent food shortages even during boom crop years, would lead one to assume that the issue is mainly caused by a severe national land scarcity. In the lowlands, however, there remain huge swaths of unused land that may be developed. "There are places where basic infrastructure is missing, presenting significant health risks". Extreme land shortages on a local level, as previously documented, are difficult to address[9]–[11].

4. DISCUSSION

Because of the very restricted development potential offered by their agricultural resource endowments, population projections for almost all of the republics examined here predict increased issues with insufficiency in addition to food insecurity. The assumption that agriculture must be a major mover in overall development for nations with a high reliance on agriculture lies at the core of the alleged incompatibility between demographic purpose and agricultural capital. It was discovered that there is widespread consensus in underdeveloped nations that this is a good concept. The issue of agrarian resource capabilities, which will sustain such an agricultural stance, is often overlooked in both underlying research. It comes to the conclusion that, at the very least in roughly countries with rapid population growth, reserve scarcities may offer significant obstacles to farming's capacity to perform such a role.

5. CONCLUSION

Agriculture's contribution to growth, in any scenario, is dependent on its capacity to produce revenue rather than simply providing food essentials. Any tree cash crop may potentially fill the gap. The issue with these other tropical cash and export harvests is that they consume only a portion of the market's destructive marketing potential: coffee and cocoa, for example, are primarily consumed in manufacturing republics with limited growing potential due to virtually stagnant populations and current resource consumption levels. Palm oil, on the other hand, has been a standout performer in global markets, thanks to rising demand from other emerging nations. As a result, a wide viewpoint is required when choosing crop pattern methods that are compatible with the issue of food shortage while also providing enough income to farmers to sustain them in their daily lives.

REFERENCES

1. S. Gouda, R. G. Kerry, G. Das, S. Paramithiotis, H. S. Shin, and J. K. Patra, "Revitalization of plant growth promoting rhizobacteria for sustainable development in agriculture," *Microbiological Research*. 2018, doi: 10.1016/j.micres.2017.08.016.
2. G. Dercon *et al.*, "Fallout radionuclide-based techniques for assessing the impact of soil conservation measures on erosion control and soil quality: An overview of the main lessons learnt under an FAO/IAEA Coordinated Research Project," *Journal of Environmental Radioactivity*. 2012, doi: 10.1016/j.jenvrad.2012.01.008.
3. E. E. Hassen and M. Assen, "Land use/cover dynamics and its drivers in Gelda catchment, Lake Tana watershed, Ethiopia," *Environ. Syst. Res.*, 2018, doi: 10.1186/s40068-017-0081-x.

4. E. Yearbook of Islamic and Middle East, "Resolution Adopted by the General Assembly," *Yearb. Islam. Middle East. Law Online*, 2016, doi: 10.1163/9789004283688_019.
5. C. Georgescu, "Report of the Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes," *UN Human Rights Council*. 2012.
6. R. E. Howard-Hassmann, "Reconsidering the Right to Own Property," *J. Hum. Rights*, 2013, doi: 10.1080/14754835.2013.784667.
7. FAO, *The State of Food Insecurity in the World 2011 Key messages*. 2012.
8. J. L. Gallup and J. D. Sachs, "Agriculture, climate, and technology: Why are the tropics falling behind?," *Am. J. Agric. Econ.*, 2000, doi: 10.1111/0002-9092.00071.
9. W. . Rivera and M. . Qamar, *Agricultural Extension , Rural Development and the Food Security Challenge*. 2003.
10. SDSN, "Solutions for Sustainable Agriculture and Food Systems.," *Tech. Rep. Post-2015 Dev. Agenda*, 2013.
11. S. F. Ryan *et al.*, "The role of citizen science in addressing grand challenges in food and agriculture research," *Proceedings of the Royal Society B: Biological Sciences*. 2018, doi: 10.1098/rspb.2018.1977.



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INFLUENCE OF NUTRITIONAL REGIMES ON THE GROWTH AND DEVELOPMENT OF COTTON

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ABSTRACT

In the conditions of saline lands of the Republic of Karakalpakstan, field experiments were carried out in 2017 and 2018 for the improvement of saline lands based on the use of local mineral fertilizers. By experience, the study of various rates of organic fertilizers and from local mineral fertilizers glauconite. The results of the study have established a positive effect of the combined use of organic fertilizers at the rate of 20 t / ha and glauconite 1.5-2.0 t / ha on the growth and development of cotton. At the same time, the water-physical properties, nutritional and salt regimes of the soil have significantly improved.

KEYWORDS: *Local Mineral Fertilizer, Glauconite, Improvement, Saline Soils, Organic Fertilization, Cotton Growth And Development, Nutrient And Salt Regimes Of The Soil.*

INTRODUCTION

The main task of agriculture is to constantly increase the production of agricultural products, improve their quality, preservation, and processing.

The intensification of agricultural production, like cotton growing, requires an increase in yields based on the effective use of mineral fertilizers. In addition to the well-known nitrogen, phosphorus and potassium fertilizers, the use of microelement containing (Fe, Cu, Cn, Mo, B, Zn, Co) fertilizers is of great importance, which enhance plant growth, increase the efficiency of

enzymes that contribute to the intensity of photosynthesis, and therefore increase plant productivity by drought, cold and some diseases.

Scientific institutions are required to develop new methods for the production and use of effective mineral fertilizers, as well as the development of technology for their application.

In this, much attention is paid to the problem of the development and use of unconventional fertilizers obtained on the basis of local natural raw materials, which include glauconite, containing up to 15 different microelements.

The use of glauconite sands directly as fertilizer and on the basis of them the preparation of mixed microelements containing fertilizers is of great economic importance for our region, as it leads to a decrease in the cost of mineral fertilizers.

Research methodology

The experiment consists of 10 options, the plot area is 392 m² (2.4x40 m). The area under the experiment is 5760 m², the total area of the site is 1.5 hectares. Cotton variety C-4727.

Scheme of the experiment

Number of variants	Variants
1.	Leaching and pre-sowing treatment in production conditions
2.	Autumn leaching after plowing, pre-sowing glauconite application 1 t / ha
3.	Autumn leaching after plowing, pre-sowing glauconite application 1 t / ha
4.	Autumn leaching after plowing, pre-sowing glauconite application 2.0 t / ha
5.	Autumn leaching after plowing, pre-sowing application of 1.0 t of glauconite +10 tons of manure
6.	Autumn leaching after plowing, pre-sowing application of 1.5 tons of glauconite + 10 tons of manure
7.	Autumn leaching after plowing, pre-sowing application of 2.0 tons of glauconite + 10 tons of manure
8.	Autumn leaching after plowing, pre-sowing introduction of 1.0 tons of glauconite + 20 tons of manure
9.	Autumn leaching after plowing, pre-sowing application of 1.5 tons of glauconite + 20 tons of manure
10.	Autumn leaching after plowing, pre-sowing application of 2.0 tons of glauconite + 20 tons of manure

Note: in variant 1 the norm is N250, P175, K125 kg / ha in variants 2, 3 and 4 without NPK in variants 5, 6, 7, 8, 9, 10 the norm is N185, P130, K90 kg / ha

RESULTS AND ITS DISCUSSION

To determine the effect of various norms of organic fertilizers and glauconite on the growth and development of cotton, we carried out phenological observations on July 1, August 1, and September 1. The height of the main stem, the number of fruit branches and the number of bolls were taken into account.

When taking into account the growth of cotton development on September 1 (tables 1 and 2), it was found that in all variants there were no significant differences in the height of the main stem

and the number of sympodial branches, which was on August 1. The number of bolls has increased. In terms of the number of bolls, variants 2, 3 and 4 (4.8-5.6 pieces) have comparatively low rates where only glauconite was introduced without organic and mineral fertilizers. When applying mineral fertilizers with the rate of N250 P175 K125 kg / ha (variant 1), the number of bolls was 7.6 pcs.

The use of organic fertilizers with glauconite (version 5-10) increased the number of bolls by 2.2-3.8 pcs. The largest number of bolls is observed in variants 7, 8 and 9, where organic fertilizer with glauconite was applied - 8.0-8.3 pcs. The increase in the rate of glauconite did not contribute to the increase in the number of bolls. The increase in the rate of glauconite to 2000 kg / ha, the number of bolls remained almost at the same level with variant 8.

Thus, for the normal growth and development of cotton, a more favorable nutritional regime is created with the combined use of organic, mineral fertilizers and glauconite. Increasing the rate of glauconite is not beneficial, since there is no significant difference in the number of bolls.

TABLE 1 GROWTH AND DEVELOPMENT OF COTTON ON 1.IX

Number of variants	Height of the main stem, cm		Number of sympodial branches, piece		Amount of bolls, piece	
	2017	2018	2017	2018	2017	2018
1	71,5	67,0	10,5	11,1	7,6	8,9
2	60,0	55,0	7,4	7,8	5,1	6,6
3	59,8	58,6	7,9	7,0	4,8	6,7
4	57,6	64,0	7,8	7,8	5,6	6,8
5	70,5	67,5	8,0	9,4	7,0	8,6
6	70,5	66,3	8,0	10,0	7,2	8,3
7	67,1	74,3	9,6	10,0	7,7	8,5
8	75,5	79,8	10,5	11,5	8,0	9,2
9	73,5	77,2	11,6	12,9	8,8	9,8
10	77,5	78,0	11,7	12,0	8,3	9,6

For normal growth and development of cotton, it is necessary to jointly apply mineral (reduced rates by 25%), organic fertilizers (20 t / ha) and glauconite at the rate of 1.5-2.0 t / ha.

TABLE 2 GROWTH AND DEVELOPMENT OF COTTON ON 1.IX (AVERAGE OVER 2 YEARS)

Number of variants	Height of the main stem, cm	Number of sympodial branches, piece	Amount of bolls, piece
1	69,3	10,8	8,2
2	57,5	7,6	5,8
3	59,2	7,4	5,2
4	60,8	7,8	6,2
5	69,0	8,7	7,8
6	68,4	9,0	7,8
7	70,7	9,8	8,1
8	77,7	11,0	8,6

9	75,4	12,2	9,6
10	77,8	11,8	8,0

The nutrient regime of the soil in a particular world affects the growth and development of cotton. When determining the onset of 50% of cotton flowering, it was found that the dynamics of cotton flowering is more intensive in those variants where cotton is provided in sufficient quantities of macro and microelements.

As the data in Tables 3 and 4 show, in terms of the dynamics of cotton flowering, variants 2, 3 and 4 are leading, where only glauconite was used, i.e. by July 11, they amounted to 58.5-61.0, and in other variants 50.0-54.0%. The dynamics of cotton flowering by the last date of observation amounted to 50.0-61.0%. In the variants where organic, mineral fertilizers and glauconite were applied, a more favorable nutritional regime is created. Therefore, the development of plants is slow in those variants (variants 2, 3 and 4) where these elements are insufficient.

TABLE 3 DYNAMICS OF COTTON FLOWERING, 2017.%

Number of variants	Dates of observation					
	1.VII	3.VII	5.VII	7.VII	9.VII	11.VII
1	-	7,5	19,0	36,5	44,0	53,5
2	1,5	11,0	21,0	39,5	47,0	61,0
3	3,0	13,0	24,0	41,0	46,0	60,0
4	1,5	11,0	23,0	40,0	47,0	58,5
5	1,5	6,5	17,5	32,5	37,0	52,0
6	-	5,5	18,0	33,0	41,0	53,0
7	-	7,5	17,0	33,0	39,0	54,0
8	-	7,0	17,0	34,0	39,0	52,0
9	-	7,0	17,0	33,0	38,0	51,0
10	-	7,0	17,0	32,0	37,0	50,0

The obtained data on the dynamics of cotton flowering in 2018 confirm the data of 2017 (table 4).

TABLE 4 DYNAMICS OF FLOWERING OF COTTON VARIETIES S-4727, 2018, %

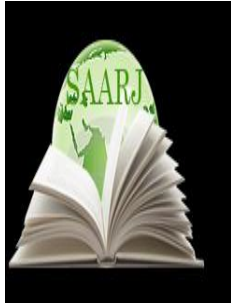
Number of variants	Dates of observation					
	2.VII	4.VII	6.VII	8.VII	10.VII	12.VII
1	-	2,5	9,0	24,5	39,0	50,0
2	2,0	5,5	18,5	37,5	47,5	60,0
3	2,0	5,0	17,5	33,5	47,5	56,5
4	1,5	5,5	20,5	37,0	42,0	58,0
5	0,5	2,5	16,0	32,5	39,5	50,0
6	-	3,5	15,5	32,5	40,0	50,5
7	-	3,0	15,0	33,0	38,0	48,5
8	-	4,5	15,5	32,0	41,0	50,5
9	-	3,0	16,0	32,5	39,5	52,0
10	-	3,0	16,0	33,5	39,5	49,5

CONCLUSIONS

In saline lands, the use of organic fertilizers at the rate of 20 t / ha, mineral fertilizers N185 P130 K90 kg / ha and glauconite 1.5-2.0 t / ha have a positive effect on the growth and development of cotton. At the same time, the water-physical properties, nutrient and salt regimes of the soil are improved.

LITERATURE

1. Ismailov U.E. Scientific basis for increasing soil fertility. Nukus. Bilim. 2004. p-186.
2. Bauatdinov S., Bauatdinov T. Application of glauconites of Karakalpakstan in agriculture. Nukus. Ilim. 2013. p-86.
3. Ismailova A. The use of glauconite for feeding cotton. Nukus. 2019. p-82.



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THE IMPACT OF VIBRATION ON THE HUMAN BODY

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ABSTRACT

Vibration is a set of mechanical movements of elastic bodies, machines, machine tools, mechanisms and devices, repeated at regular intervals and spreading to building structures through supports, floors, etc. Vibration is characterized by amplitude, frequency, speed, and acceleration. These parameters determine the impact of vibration on humans, equipment, and building structures.

KEYWORDS: *Vibration, Determine, Humans, Equipment, Building Structures.*

1. INTRODUCTION

The human body is considered as a combination of masses with elastic elements having natural frequencies, which for the shoulder girdle, hips and head relative to the supporting surface ("standing" position) are 4 ~ 6 Hz, the head relative to the shoulders ("sitting" position) - 25-30 Hz. For most internal organs, natural frequencies are in the range of 6-9 Hz. General vibration with a frequency of less than 0.7 Hz, defined as rolling, although unpleasant, does not lead to vibration sickness. The consequence of this vibration is motion sickness caused by disruption of the normal activity of the vestibular apparatus due to resonance phenomena.[1-9]

When the vibration frequency of workplaces is close to the natural frequencies of internal organs, mechanical damage or even ruptures are possible. The systematic impact of general vibrations, characterized by a high level of vibration velocity, leads to vibration disease, which is characterized by disturbances in the physiological functions of the body associated with damage to the central nervous system. These disorders cause headaches, dizziness, sleep disturbances, decreased performance, deterioration in well-being, and cardiac dysfunctions.

Local vibration of low intensity can have a beneficial effect on the human body, restore trophic changes, improve the functional state of the central nervous system, accelerate wound healing, etc.[10-15]

2. METHODS AND MATERIALS

With an increase in the intensity of vibrations and the duration of their impact, changes occur, leading in some cases to the development of occupational pathology - vibration disease.

Hand-held machines, the vibration of which has maximum energy levels at low frequencies (up to 35 Hz), cause vibration pathology with a predominant lesion of the neuromuscular and musculoskeletal system. When working with hand-held machines, the vibration of which has a maximum energy level in the high-frequency region of the spectrum (above 125 Hz), vascular disorders occur with a tendency to spasm of peripheral vessels. When exposed to low-frequency vibration, the disease occurs after 8-10 years, when exposed to high-frequency vibration - after 5 years or less.

Distinguish between hygienic and technical regulation of vibrations. Hygienic - they limit the parameters of vibration of workplaces and the surface of contact with the hands of workers based on physiological requirements that exclude the possibility of a vibration disease. Technical - limit vibration parameters not only taking into account the specified requirements, but also based on the vibration level achievable for this type of equipment today. Regulatory documents have been developed that establish permissible values and methods for assessing vibration characteristics, which include a special GOST SSBT (Occupational Safety Standards System).[16-22]

The assessment of the degree of harmfulness of vibration of hand-held machines is carried out according to the spectrum of vibration velocity in the frequency range of 11-2800 Hz. For each octave band within the specified frequencies, the maximum permissible values of the root-mean-square value of the vibration velocity and its levels are set relative to the threshold value equal to $5 \cdot 10^{-8} \text{ m/s}$.

The mass of vibrating equipment or parts thereof, held by hands, should not exceed 10 kg, and the pressure force should not exceed 20 kg.

General vibration is normalized taking into account the properties of the source of its occurrence and is subdivided into vibration:

- Transport, which arises as a result of the movement of cars on the ground and roads;
- transport and technological, which occurs during the operation of machines performing a technological operation in a stationary position, as well as when moving around a specially prepared part of the production facility, industrial site or at wholesale depots;
- Technological, which arises during the operation of stationary machines or is transferred to workplaces that do not have sources of vibration

3. RESULTS AND DISCUSSING

High demands are made in the regulation of technological vibrations in rooms for mental labor (management, control room, accounting, etc.). The hygienic vibration standards are established for a working day lasting 8 hours (Table 1).

TABLE 1. INFLUENCE OF VIBRATION ON THE HUMAN BODY

Vibration amplitude, mm	Vibration frequency, Hz	Impact result
До 0,015	different	Does not affect the body
0,016-0,050	40-50	Nervous excitement with depression
0,051-0,100	40-50	Changes in the central nervous system, heart and hearing organs
0,101-0,300	50-150	Possible disease
0,101-0,300	150-250	Causes vibro-disease

The given rates are the same for horizontal and vertical vibrations. The continuity of their impact should not exceed 10-15% of the working time. The amplitude of oscillations, the speed and acceleration of oscillatory movements can be increased no more than three times. Sanitary standards establish the maximum permissible vibration values in the production premises of enterprises (Table 2).

TABLE 2. PERMISSIBLE VALUES OF VIBRATION IN INDUSTRIAL PREMISES OF ENTERPRISES

Vibration amplitude, mm	Vibration frequency, Hz	Oscillatory speed, cm / s	Acceleration of oscillatory movements, cm / c ²
0,6-0,4	До 3	1,12-0,76	22-14
0,4-0,15	3-5	0,76-0,46	14-15
0,15-0,05	5-8	0,46-0,25	15-13
0,05-0,03	8-15	0,25-0,28	13-27
0,03-0,009	15-30	0,28-0,17	27-32
0,009-0,007	30-50	0,17-0,22	32-70
0,007-0,005	50-75	0,22-0,23	70-112
0,005-0,003	75-100	0,23-0,19	112-120
1,5-2	45-55	1,5-2,5	25-40

To reduce the impact of vibrating machines and equipment on the human body, the following measures and means are applied:

- Replacement of tools or equipment with vibrating working bodies for non-vibrating ones in processes, where possible (for example, replacing electromechanical cash registers with electronic ones);
- The use of vibration isolation of vibrating machines relatively basic
- The use of remote control in technological processes (for example, the use of telecommunications to control a vibratory conveyor from an adjacent room);
- Use of automation in technological processes where vibrating machines operate (for example, control according to a given program);
- Use of hand tools with vibration-proof handles, special shoes and gloves.

In addition to technical means and methods to reduce the impact of vibration on a person, it is necessary to carry out hygienic and treatment-and-prophylactic measures. In accordance with the

regulation on the working regime of workers in vibration-hazardous professions, the total time of contact with vibrating machines, the vibration of which complies with sanitary standards, should not exceed 2/3 of the working day. Production operations should be distributed among workers so that the duration of continuous exposure to vibration, including micropause, does not exceed 15-20 minutes. At the same time, two regulated breaks are recommended (for active recreation, industrial gymnastics according to a special complex of hydro procedures): 20 minutes - 1-2 hours after the start of the shift and 30 minutes - 2 hours after the lunch break [23-28]

Persons who are at least 18 years of age, who have received the appropriate qualifications, who have passed the technical minimum according to safety rules and who have passed a medical examination, are allowed to work with vibrating machines and equipment.

Working with vibrating equipment, as a rule, should be carried out in heated rooms with an air temperature of at least 16 ° C, with a humidity of 40-60% and an air speed of no more than 0.3 m / s. If it is impossible to create such conditions (work in the open air, underground work, etc.) for periodic heating, special heated rooms with an air temperature of at least 22 ° C, a relative humidity of 40-60% and an air speed of 0.3 m / s.

4. CONSOLATION

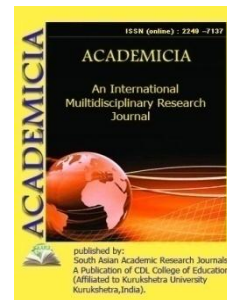
To increase the protective properties of the body, working capacity and labor activity, special complexes of industrial gymnastics, vitamin prophylaxis (2 times a year a complex of vitamins B, C, nicotinic acid), special food should be used. It is also advisable to carry out in the middle or at the end of the working day, 5-10-minute hydrotherapy, combining baths at a water temperature of 38 ° C and self-massage of the upper extremities.

REFERENCES

1. Bakhriddinova N.M., Sulaimonov S.S. "Safety of life" Bukhara-2021
2. Bakhriddinova N.M., Sadikov I.Sh., Avizov S.R. Ways and solutions to information security problems. International scientific journal "Global science and innovations 2020: Central Asia", Nur-sultan, Kazakhstan, June-july 2020. P. 118-123
3. Bakhriddinova N.M., Sadikov I.Sh., Analysis of epidemic safety of drinking water of the Bukhara region. *Academicia An International Multidisciplinary Research Journal*. Volume 10 - Issue 4, April 2020. Impact Factor: SJIF - 6.549. P. 33-38
4. Bakhriddinova N.M., Tursunova N.N. First aid measures organization. *International Journal of Innovations in Engineering Research and Technology (IJIERT)*. Volume 7 - Issue 4, April 2020. P. 243-245
5. Bakhriddinova N.M. Psychology and Economic Aspects of Life Safety. *International Journal of Academic and Applied Research (IJAAR)*, Vol. 4, Issue 7, July - 2020, Pages: 32-37
6. Baxriddinova N.M., Zaripova M.Dj. PROTECTION OF PRODUCTION SHUMA I VIBRATION *European ScholarJournal (ESJ)* Available Online at: <https://www.scholarzest.com> Vol. 2 No. 5, MAY 2021, ISSN: 2660-5562.
7. K.S.Rakhmonov. Influence of leavens of spontaneous fermentation and phytoadditives on the provision of microbiological safety of bread //T. I. Atamuratova, N. R. Djuraeva, I. B. Isabaev, L. N. Haydar-Zade//*Journal of Critical Reviews* //2020, Vol.7, Issue 5, pp. 850-860.

8. S.K. Jabborova. Application of products of processing mulberries and roots of sugar beet in the production of cupcakes//I.B. Isabaev., N.R. Djuraeva., M.T. Kurbanov., I.N. Khaydar-Zade., K.S. Rakhmonov//Journal of Critical Reviews //2020, Vol.5, Issue 5, pp. 277-286.
9. K.S. Rakhmonov. Application of phito supplements from medicinal vegetable raw materials in the production of drugs//T. I. Atamuratova., M.E. Mukhamedova., N.K. Madjidova., I.Sh. Sadikov//Journal of Critical Reviews //2020, Vol.7, Issue 12, pp. 934-941.
10. Djurayeva N, Mixtures of Vegetable Fat as a Potential Raw Material for Bakery// Barakayev N, Rakhmonov K, Atamuratova T, Mukhamedova M, Muzaffarova Kh. // International Journal of Current Research and Review// october 2020, Vol.12, Issue 19, pp. 140-148. DOI: <http://dx.doi.org/10.31782/IJCRR.2020.12192>
11. Djurayeva N, Plant-fat mixtures as a potential raw material for bakery production// Rakhmonov K, Barakayev N, Atamuratova T, Mukhamedova M, Muzaffarova Kh. // Plant Cell Biotechnology and Molecular Biology 2020 21(45-46), pp. 29-42
12. Ravshanov S.S, The impact of ultrasonic activated water on hydrothermal processing of wheat grains grown in dry climate conditions // Rakhmonov K.S., Amanov B.N. // Plant Cell Biotechnology and Molecular Biology 2020 21(45-46), pp. 29-42
13. Kuliev N.S.H, Udk 664.8 baking properties and quality expertise wheat flour// Rakhmonov K.S. // *European Journal of Molecular & Clinical Medicine*, 2020, Volume 7, Issue 2, Pages 6333-6340
14. Ravshanov S.S, The Effect Of Drinking And Activated Water On Field Scales Of Wheat Grains Grown In Arid Climatic Conditions// Rakhmonov K.S. Ergasheva H.B., Yuldasheva Sh. J. // *European Journal of Molecular & Clinical Medicine*, 2020, Volume 7, Issue 3, Pages 3065-3070.
15. Rakhmonov K.S., Confectionery Products for Therapeutic and Preventive Purpose with Medicinal Herbs Uzbekistan// L.N. Khaydar-Zade., N.S.H. Kuliev, G.H. Sulaymonova // *Annals of the Romanian Society for Cell Biology*, Vol. 25, Issue 2, 2021, Pages. 4126 – 4140.
16. Ravshanov S.S., Influence of the Use of Activated Water during Hydrothermal Treatment on the Quality of Bread// Rakhmonov K.S., Radjabova V.E., Pardayev Z.T. // *Annals of the Romanian Society for Cell Biology*, Vol. 25, Issue 2, 2021, Pages. 4091 – 4102
17. Barakaev, N., Justification of the parameters of parts of a walnut cracking machine// Mirzaev, O., Toirov, B., Alimov, A.// *Journal of Physics: Conference Series*, 2021, 1889(2), 022061.
18. Azim Oltiev., The role of catalysts in fat transesterification technology// Matluba Kamalova., Kakhramon Rakhmonov., Orifjon Mamatqulov// IOP Conf. Series: Earth and Environmental Science 848(2021) 012220
19. Rakhmonov KS, Spontaneous fermentation starter cultures - an effective means of preventing the potato disease of bread // Isabaev IB. // *Journal "Storage and processing of agricultural raw materials"* .- M., 2011.- No. 12.- P.23-25.

20. Rakhmonov KS, Influence of the substrate of the nutrient medium on the composition of the populations of microorganisms in the starter cultures of spontaneous fermentation // Isabaev IB, Akhmedova ZR // Journal "Storage and processing of agricultural raw materials". M, 2012 ..- No. 9.- P.40-43
21. Rakhmonov KS, Analysis of typical sources of microbial contamination of bread // Buxorodavlatuniversitetiilmiyaxboroti. // 2014.- No. 3.- P.37-43.
22. Rakhmonov K.S. Potato Bread Disease and a Method for Its Prevention // T.I. Atamuratova // Russian Bakery Magazine. M, 2014.- No. 5.- P.37-38.
23. Rakhmonov KS, Biotechnological aspects of ensuring the microbiological purity of bread // E. Muratov, T.I. Atamuratova // Kimyovakimyotexnologiyasi. 2015.- No. 2.- P.64-68.
24. Rakhmonov K.S. Wheaten ferments spontaneous fermentation in biorechnological methods// Isabayev I.B. // Austrian Journal of Technical and Natural Sciences. 2016. - № 7-8. - P. 9-12.
25. Rakhmonov KS, Methods for improving the composition of the nutrient medium of sourdough cultures for bakery products from wheat flour // T.I. Atamuratova. Isabaev I.B. // Bakery of Russia. 2016. –№2. - P.22-24.
26. Rakhmonov KS, Optimization of the recipe composition of wheat breads using spontaneous fermentation starter cultures // Isabaev IB, U.M. Ibragimov, Molchanova E.N. // Bakery of Russia. 2018. –№3. - S. 33-37.
27. I.B. Isabaev, The use of feed flour as a substrate for the nutrient medium of wheat starter cultures in the production of bread // T. I. Atamuratova., Rakhmonov K.S. // Buxoro davlat universiteti ilmiy axboroti.- 2018. No. 2.- P.24-30



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AN OVERVIEW ON THE CULTIVATION AND BREEDING OF MUSHROOM

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ABSTRACT

Mushrooms are a nutrient-dense, environmentally friendly crop with many therapeutic properties. Edible mushroom production is very important in today's world, given the globe's rapidly growing population and severe environmental pressures. However, when compared to other crops, progress in mushroom breeding and production is relatively restricted. This may be owing to a lack of prior understanding of the crop's genetics and breeding system. Due to this fungus's mainly secondarily homothallic life cycle, traditional mushroom breeding has proven challenging. As a result, the genetic diversity of the grown strains is restricted. In addition, establishing an effective genetic transformation method and disease resistance in mushrooms is a difficult job. Knowledge about the gene organization and functions will be accessible when the mushroom genome is sequenced, which will aid in the development of better marker aided

selection breeding systems. This will result in better strains, which, along with improved growing methods, will lead to increased production and quality.

KEYWORDS: *Breeding System, Cultivation, Disease Resistance, Mushrooms, Transgenic Breeding.*

1. INTRODUCTION

Mushrooms have been grown for their nutritional benefits and flavor in far eastern nations since ancient times[1]. Mushrooms have less protein than mammals, but considerably more than other plants. They are low in fat, rich in fiber, and contain all necessary amino acids, as well as all critical minerals (except iron). Mushrooms generate significant quantities of vitamin D when exposed to UV radiation, which is difficult to get from a typical diet. Given the rising rates of cancer in today's society, it's past time for people to become aware of the health benefits of mushrooms and to take advantage of their cancer-fighting properties[2].

This low-cost vegetable is not only high in nutrients like vitamin D, but it also possesses anti-cancer, anti-HIV-1, and anti-AIDS characteristics. It is a low-cost, low-resource, low-area crop that can be produced anywhere over the globe and at any time of year using low-cost starting ingredients. Growing a highly nutritious meal with great flavor from readily available and inexpensive substrates has enormous promise and appeal. It is also extremely environmentally beneficial, since it can transform lignocellulosic waste into food, feed, and fertilizers. Mushroom consumption and output, on the other hand, are low in contrast to other crops, and the mushroom sector receives little investment. The mushrooms have the highest gross value of all protected crops produced in the globe in terms of area grown, but the overall gross value of all protected crops is just a third of the value of the wheat crop. Mushroom research is a relatively young field of study, and the mushroom business is still tiny in comparison to other crops, thus funding is restricted[3], [4].

1.1 Common Cultivated Mushrooms:

Only a few species of mushrooms and similar fleshy basidiomycetes are economically grown, despite the fact that there are over 300 genera of these fungi. This may be because many of them are mycorrhizal, meaning they won't sporulate without the host. Many saprophytic plants, on the other hand, have shown to be cultivable. The button mushroom, *Agaricus bisporus*, was widely cultivated in Europe before being exported to North America by the settlers; the Shiitake mushroom (*Lentinus edodes*), which has been grown in China and other oriental countries for centuries; and the oyster mushroom (*Pleurotus ostreatus*), which was collected as wild specimens from forests in Flanders. The oriental Enoki or velvet stem mushroom (*Flammulina velutipes*), which is mostly cultivated in Japan, as well as the paddy straw mushroom (*Volvaria volvacea*) and the ear fungus (*Auricularia auricula*), are also farmed[5]. Other cultivated mushrooms include the Reishi mushroom (*Ganoderma lucidum*), which is used as an alternative medicine and a flavoring agent in Japan; the Nameko (*Pholiota nameko*), which is grown in the Orient; and Tremella fuciformis, or white jelly fungi, which is grown in Taiwan for use as food supplements. Commercially produced *A. bisporus* varieties include the crimini and portabello. Truffles (*Tuber* species) are mycorrhizal plants that dwell in close proximity to the roots of certain trees. They are considered a delicacy and are among the world's most costly natural foods. Figure 1 illustrates the different types of mushrooms[6].



Figure 1: The above Diagram shows different types of mushroom[7]

1.2 Medicinal Uses of Mushrooms:

Mushrooms include a number of chemical substances that are said to have therapeutic properties. Anti-tumor or immuno-stimulating polysaccharides have been found in 651 mushroom species spanning 185 taxa, inhibiting tumorigenesis. There is evidence that the -D-glycans cause a physiologic response in immune effector cells by attaching to the membrane complement receptor. The anti-tumour effect of a chemical discovered in the lipid component of *Agaricus* was subsequently identified as ergosterol. Similarly, *Grifola*'s lipid fraction has antioxidant properties and inhibits enzymes that cause a variety of chronic illnesses, including cancer. The mushroom components not only slow disease development by causing direct cytotoxicity in tumor cells, but they also upregulate non-immune suppressive mechanisms. These compounds contain cytostatic chemicals that cause apoptosis in leukemia cells, and isolates from mushroom cells have cytostatic compounds that induce apoptosis in leukemia cells. The compounds generated by *Ganoderma* species have antibacterial effects and have been proven to stop germs like *Staphylococcus* from growing. They produce steroid hormones that are active against a wide range of gram negative and gram positive bacteria[8]. *Lentinula* mycelial extracts have antiprotozoal properties against *Paramecium*. Mushrooms also have antiviral capabilities, and many substances identified from *Ganoderma* are potent against HIV-1, as well as influenza virus type 1. Only a few accounts have been included here among the many therapeutic applications of mushrooms.

1.3 Mushroom Breeding Strategies:

Mushrooms have a reputation for being tough to deal with, and it is generally recognized that the *Agaricus bisporus* mushroom, in particular, is difficult to control via breeding. The natural breeding system was not well understood during early efforts at genetic improvement in the farmed fungus *A. bisporus*. The mushroom is currently classified as a "secondarily homothallic" species with just one multiallelic mating type component. This knowledge may be used to assess

past breeding techniques and propose alternatives. Strain selection based on single spores, multispores, or tissue culture may provide short-term benefits, but it is not as successful as techniques involving controlled crossover. Hybrids may be created by crossing viable strains, although they can be difficult to see. Because only hybrids bear fruit, it is preferable to utilize nonfertile isolates. Markers that can only be produced in hybrid cultures may be used to identify hybrids early, and the inclusion of a genetic resistance characteristic is particularly helpful for this[9].

1.4 Mushroom Breeding Goals:

The main objectives of mushroom breeders and mushroom research are to increase crop production and quality, as well as disease resistance. Other objectives include lowering manufacturing costs and maximizing the usage of compost for plant development. Some of the techniques used for this aim include mass selection based on natural chance mutation and planned mutation using ionizing radiations such as γ -rays, X-rays, and chemicals, as well as cross breeding and transgenic breeding. Cross and transgenic breeding, on the other hand, are more effective and have showed more promise and development in recent decades. Problems related with cultivation, distribution, and storage, as well as senescence-induced browning and disease resistance, are all areas of study for mushroom breeding. Another goal of mushroom breeding is to integrate different enhanced crop-growing characteristics, such as shorter growth cycle and spore avoidance. Traditionally, mushrooms release billions of spores into the air, causing health issues including lung allergies and fever episodes. Spores can cause climatic installations to be blocked, resulting in increased energy bills.

1.5 Breeding for Disease Resistance:

The output and productivity of commercial mushroom cultivation may be severely harmed by disease outbreaks. Benzimidazole fungicides are resistant to many mushroom diseases, although prochloraz tolerance is common. Over the years, new diseases including *Trichoderma aggressivum*, *Cladobotryum mycophilum*, and the mushroom virus X have appeared at regular intervals. Pesticides that have been approved have been drastically decreased in Europe owing to consumer and environmental concerns. Furthermore, since the mushroom is a fungus, many fungal infections are difficult to manage. Controlling disease outbreaks in mushrooms is more difficult due to this confluence of factors. Effective hygiene and sanitation are crucial for disease prevention. Growers may get insight into how diseases are transmitted and disseminated by understanding their disease cycle and epidemiology. Controlling the growing environment by controlling temperature and relative humidity has allowed certain airborne fungal infections to be contained without the use of genetic resistance or fungicides. However, the emergence of fungicide-resistant strains as well as pesticide-use restrictions has boosted the need for resistant cultivars.

1.6 Hybrid Breeding:

The hybrid mushroom strains developed in the 1980s were highly accepted and popular, but they restricted the range of production characteristics and environmental and cultural stress tolerance. Since 1983, hybrids of the *Lentinula*, *Pleurotus*, and *Agaricus* mushrooms have been created via cross breeding. Hybrid strains have not only provided mushrooms with disease and pest resistance, but they have also decreased the reliance on and hazards associated with environmental and cultural stressors. Hybrids created by crossing monosporic cultures are grown

and RAPD and RFLP analyses are performed to assess production characteristics. Mushroom breeding requires a significant financial commitment as well as patience on the part of both the breeder and the grower[10]. For the last 30 years, a variety of specialized industry standards have been established to cultivate strains accessible to the general population. For a new strain to succeed, certain changes in growing conditions are necessary for optimum development. To maximize strain performance, farmers have traditionally had to alter growing systems to suit cultural requirements, such as changing flushing regimes, watering schedules, and harvesting methods. For future strain growth to be effective, cultural practices like as watering frequency and timing must be changed.

1.7 *Transgenic Breeding:*

There are currently no commercially marketed transgenic mushroom strains, although many research groups are making excellent progress in this area. The use of recombinant DNA technology to produce transgenic mushrooms has opened up a world of possibilities. Importing genes from unrelated sources is now feasible, and the hunt for favorable genes is no longer limited to inside the species. Other filamentous fungus transformation methods are being developed for the mushroom. DNA has been incorporated into protoplasts, mycelium, and basidiospores using a variety of methods including polyethylene glycol, electroporation, and particle bombardment.

1.8 *Marker Assisted Selection Breeding (MAS) in Mushrooms:*

Breeders now utilize DNA molecular markers to find better characteristics by identifying and selecting particular genes. PCR-based approaches and RAPD methods both utilize repetitive DNA sequences to produce markers. To create genetic maps from experimental data, computer software is employed. For monogenic characteristics that segregate into discrete phenotypes in mushrooms, using genetic markers is simpler. Previously, white and off-white mushroom strains dominated the market, each with its own set of favorable and unfavorable characteristics. The off white strains were superior for mechanical harvesting but discolored when sliced and canned, while the white strains were less prolific but did not discolor when sliced and canned.

1.9 *Agrobacterium-Based Transformation:*

While many other transformation methods are unreliable and unstable, using the soil bacteria *Agrobacterium tumefaciens* for transformation is said to produce stable transformants. Both homokaryons and heterokaryons can be transformed using the *Agrobacterium* system, and both karyotypes of a heterokaryon may be transmitted at the same time. In *Agaricus bisporus*, the utilization of *A. tumefaciens* for effective transformation and activation of its virulence gene using the plant hormone acetosyringone was first attempted. However, this technique had drawbacks in that it was not repeatable, produced false positives, had a poor degree of integration, and required DNA modification after integration. It's also crucial to include redundant DNA in the transformation vector, which serves no use in *Agaricus* but is required for gene transfer alone. Infecting the fruiting gill tissue with *Agrobacterium* strains containing the gene construct of interest and using a vector with homologous promoter resulted in a successful *Agrobacterium*-mediated transformation. In most instances, the multinuclear structure of mushroom mycelia has limited genetic breeding's ability to produce significantly enhanced characteristics. Many transgenic mushroom modifications will need the transfer of the gene to both parental lines, with the progeny bearing double copies of the gene to imitate the normal

inheritance process. In certain cases, a single copy of the gene is enough, although the resultant transgenic line may need to be further screened before being released as commercial strains. Importing cry genes from *Bacillus thuringiensis* for insect resistance and synthetase resistance from *Agrobacterium* for glyphosphate herbicide resistance are two examples of transgenic breeding potential.

2. DISCUSSION

Mushrooms have been eaten since the dawn of time. The term "mushroom" comes from the French words "fungus" and "mould." Mushrooms are a popular nutritious meal nowadays since they are low in calories, carbohydrate, fat, salt, and cholesterol. Mushroom also contains essential nutrients such as selenium, potassium, riboflavin, niacin, Vitamin D, proteins, and fiber. All of this comes with a lengthy history of use as a food source. Mushrooms are valued in traditional medicine for their therapeutic abilities and qualities. It has been shown to have positive benefits on health and the treatment of certain diseases. Mushroom has a variety of nutraceutical benefits, including cancer and anticancer capabilities. Mushrooms have antimicrobial, immune-boosting, and cholesterol-lowering properties. They are also a significant source of bioactive chemicals.

3. CONCLUSION

Mushrooms are a nutrient-dense, environmentally friendly crop with many therapeutic properties. Edible mushroom production is very important in today's world, given the globe's rapidly growing population and severe environmental pressures. However, when compared to other crops, progress in mushroom breeding and production is relatively restricted. Economic considerations linked to need and resources will influence the application of genetic engineering in the mushroom business. Mushrooms are lagging behind other crops in terms of molecular biotechnology development due to financial limitations. Acceptance of genetically engineered foods and increased mushroom consumption may boost research efforts. Single-gene traits like virus and insect resistance, as well as resistance to fungal and bacterial diseases and herbicides, may be targeted initially since they are easier to combat. Complex characteristics like as yield, size, color, shelf-life, and physical stress that are regulated by many genes may be studied in the future thanks to the mapping of the mushroom genome and knowledge of functional genomics in mushrooms. Mushrooms may also be used as bioreactors in the pharmaceutical and biotech industries to synthesize proteins and other chemicals. In a safe confinement facility with the possibility of automation and mechanical harvesting, a greater biomass of mushrooms may be grown on low-cost waste materials. In humans, the proteins generated by mushrooms will have greater specific biological activity than those produced by plants.

REFERENCES:

1. D. Grimm and H. A. B. Wösten, "Mushroom cultivation in the circular economy," *Applied Microbiology and Biotechnology*. 2018, doi: 10.1007/s00253-018-9226-8.
2. G. Cardwell, J. F. Bornman, A. P. James, and L. J. Black, "A review of mushrooms as a potential source of dietary vitamin D," *Nutrients*. 2018, doi: 10.3390/nu10101498.
3. M. Jayachandran, J. Xiao, and B. Xu, "A critical review on health promoting benefits of edible mushrooms through gut microbiota," *International Journal of Molecular Sciences*. 2017, doi: 10.3390/ijms18091934.

4. J. Carrasco, D. C. Zied, J. E. Pardo, G. M. Preston, and A. Pardo-Giménez, "Supplementation in mushroom crops and its impact on yield and quality," *AMB Express*. 2018, doi: 10.1186/s13568-018-0678-0.
5. M. Kozarski *et al.*, "Antioxidants of edible mushrooms," *Molecules*. 2015, doi: 10.3390/molecules201019489.
6. G. Ma, W. Yang, L. Zhao, F. Pei, D. Fang, and Q. Hu, "A critical review on the health promoting effects of mushrooms nutraceuticals," *Food Sci. Hum. Wellness*, 2018, doi: 10.1016/j.fshw.2018.05.002.
7. "types-of-mushrooms-1200x792." <https://gardensnursery.com/different-types-of-mushrooms/> (accessed Aug. 02, 2018).
8. H. Persson, "Mushrooms," *Medicine (United Kingdom)*. 2016, doi: 10.1016/j.mpmed.2015.11.011.
9. J. J. Zhang *et al.*, "Bioactivities and health benefits of mushrooms mainly from China," *Molecules*. 2016, doi: 10.3390/molecules21070938.
10. B. Muszyńska, A. Grzywacz-Kisielewska, K. Kała, and J. Gdula-Argasińska, "Anti-inflammatory properties of edible mushrooms: A review," *Food Chemistry*. 2018, doi: 10.1016/j.foodchem.2017.09.149.



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A BRIEF DESCRIPTION ON BIOFERTILIZERS

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ABSTRACT

The global rise in human population poses a serious danger to each person's food security, since agricultural land is restricted and, in some cases, disappearing. As a result, agricultural production must be substantially increased during the next several decades to satisfy the enormous food demand of the growing population. Not to mention that a heavy reliance on chemical fertilizers for increased output ultimately harms both the environment and human health. Because of its wide potentiality in improving crop productivity and food safety, using microorganisms as biofertilizers is seen as a potential alternative to chemical fertilizers in the agricultural industry. In the agricultural sector, certain microorganisms such as plant growth boosting bacteria, fungus, Cyanobacteria, and others have been found to exhibit biofertilizer-like properties. Extensive research on biofertilizers has shown that they are capable of delivering necessary nutrients to the crop in adequate quantities, resulting in an increase in crop production. The current study elucidates the many methods by which biofertilizers enhance plant development while also providing protection against several plant diseases. The goal of this study is to examine the critical functions and uses of biofertilizers in many industries, such as agriculture, bioremediation, and ecology.

KEYWORDS: Biofertilizer, Crop Production, Ecosystem, Sustainable Agriculture.

1. INTRODUCTION

At the moment, the world's population is estimated to be about 7 billion people, with this figure projected to grow to roughly 8 billion by 2020. As the world's population grows, so does the environmental harm caused by fast industrialisation and urbanization. Furthermore, feeding the current huge population, which will surely grow with time, is a major problem. Regardless, the extensive use of chemical fertilizers in agriculture helps the nation self-sufficient in terms of food supply, but it also significantly harms the environment and has negative effects on living creatures[1]–[4]. Chemical fertilizer is used indiscriminately, posing a serious danger to the environment by contaminating the air, water, and soil. Because these dangerous compounds cannot be absorbed by plants, they accumulate in ground water, and some of them are also responsible for eutrophication of water bodies. These compounds have a negative impact on soil in terms of water holding capacity, soil fertility, increased salinity, and nutrient disparity. Organic farming has arisen as a powerful alternative sector in terms of the increasing need for healthy food supply, long-term sustainability, and worries about environmental contamination, given all of the negative consequences of extended usage of chemical fertilizers. Although the use of chemical fertilizers is necessary in order to satisfy the world's growing food demand, organic farming offers possibilities for some crops and specialized regions to thrive.

1.1 *Bio-fertilizers:*

A biofertilizer is a product that includes live microorganisms that colonize the rhizosphere or inside of plants and stimulate plant development by increasing the availability of nutrients to the host plant when applied to seeds, plants, or soil. Biofertilizers are commonly used to speed up microbial activities that increase the availability of nutrients that plants may readily absorb. They enhance soil fertility by fixing atmospheric nitrogen and solubilizing insoluble phosphates, as well as producing soil-based plant growth promoters. Figure 1 shows use of biofertilizers in plants.



Figure 1: The above diagram shows use of biofertilizers in plants[5]

1.2 Plant growth-promoting bacteria:

Free-living bacteria that establish specialized symbiotic relationships with plants, bacterial endophytes that may colonize at certain parts of plant tissue, and Cyanobacteria are all examples of plant growth-promoting bacteria (PGPB). Despite the fact that each bacterium differs in certain aspects, they all have the same methods for encouraging bacterial development. They may stimulate growth both directly and indirectly by decreasing the inhibitory effects of different pathogenic agents on plant growth and development. Rhizobium, Bradyrhizobium, Sinorhizobium, Azospirillum, Nostoc, Anabaena, Acetobacter, Bacillus megaterium, Azolla, Bacillus polymyxa, and other bacteria that promote crop production and overall plant development are all common plant growthpromoting microorganisms[6].

1.3 Rhizobium:

The Rhizobiaceae (-proteobacteria) family of symbiotic N₂-fixing rhizobacteria infect and form a symbiotic connection with the roots of leguminous plants. This involves a complicated interaction between the host and the parasite, which culminates in the development of nodules in which Rhizobia colonize as intracellular symbionts. Rhizobia includes the bacteria Rhizobium, Bradyrhizobium, Sinorhizobium, Azorhizobium, and Mesorhizobium. Diazotrophs are non-symbiontrhizobacteria that fix nitrogen in non-leguminous plants and are capable of establishing a non-obligate relationship with the host plants. The complex enzyme structure nitrogenase, which comprises of dinitrogenasereductase with iron (Fe) as its cofactor and dinitrogenase with iron (Fe) and molybdenum (Mo) as its cofactor, is responsible for nitrogen fixation.

1.4 Azospirillum:

They are gram-negative, aerobic nitrogen-fixing bacteria that do not form nodules and belong to the Spirilaceae family. Although there are numerous species in this genus, such as Azospirillumamazonense, Azospirillumhalopraeferens, and Azospirillumbrasilense, Azospirillumlipoferum and A. brasilense are the most helpful. Because they develop and fix nitrogen on the organic salts of malic and aspartic acid, Azospirillum establishes associative symbiosis with many plants, especially those with the C₄ dicarboxylic route (Hatch-Slack pathway) of photosynthesis. As a result, it is mostly suggested for maize, sugarcane, sorghum, pearl millet, and other crops. They generate growth promoters (IAA, gibberellins, and cytokinin) and improve root development and N, P, and K absorption in plants. Inoculation with Azospirillum has a significant impact on root growth and exudation[7].

1.5 Blue-green algae (Cyanobacteria) and Azolla:

They are phototrophic in nature and belong to eight distinct families. They stimulate plant development by generating auxin, indole acetic acid, and gibberellic acid, and they fix approximately 20–30 kg nitrogen per hectare in submerged rice fields, where they are plentiful[8], [9]. For low-land rice cultivation, nitrogen is one of the most important nutrients in significant amounts. Soil nitrogen and biological nitrogen fixation (BNF) by related microorganisms are the two main sources of nitrogen. Fungi, liverworts, ferns, and flowering plants establish symbiotic relationships with blue-green algae.

1.6 Role of biofertilizer in photosynthesis:

Because almost 90% of plant biomass is generated from CO₂ absorption via photosynthesis, higher photosynthesis indicates greater plant development. In comparison to the uninoculated control, biofertilizers *R. leguminosarum*, *Rhizobium* sp. IRBG 74, and *Bradyrhizobium* sp. IRBG 271 enhanced the single-leaf photosynthetic rate of the plant. When compared to the uninoculated control plant, the IRBG strain exhibited the greatest increase in photosynthetic activity (14%) of the three candidates examined. Certain *Rhizobia* test strains were found to significantly increase the surface, areas of plant leaves, net photosynthetic rate of plants, stomatal conductance, and water utilization efficiency of rice, implying that rhizobial inoculation of rice can significantly increase the plant's photosynthetic capacity. Water stress produces a number of reactive oxygen species, which damages the plant's photosynthetic machinery.

1.7 Effect of biofertilizer in amino acid synthesis:

The rhizosphere is the zone of soil surrounding the root system, and "rhizobacteria" refers to a group of rhizosphere bacteria capable of colonizing the root environment[10]. Plant roots produce and release a broad range of chemicals, including amino acids, in addition to providing mechanical support and enabling water and nutrient absorption. The substances released into the soil by roots are known as "root exudates". Chemical attractants for a large variety of heterogeneous and extremely varied microbial populations are produced by plant roots. Exudation of various chemical compounds changes the physicochemical characteristics of soil, affecting the organization of the soil microbial community in the immediate vicinity of the root surface. The kind of amino acids, as well as the composition of root exudates produced by the plant, is therefore determined by the plant's species and accompanying microbes. As a result, the kind of amino acids secreted by the plant changes greatly depending on the adhering PGPR microbial population.

1.8 Role of biofertilizer in remediation of pesticides:

To prevent or suppress plant diseases, insecticides, fungicides, herbicides, and nematicides are employed. Pesticides are an essential part of contemporary agriculture since they are required for cost-effective pest control. However, since pesticides may readily penetrate into the tissues of living creatures and cause bioaccumulation, they are harmful to the environment and pose a potential danger to the plant kingdom as well as humans. Nonetheless, owing to their eco-friendliness, cost-effectiveness, and possible removal from the environment, bioremediation methods for treating pesticide contamination have gotten a lot of attention. Furthermore, research on pesticide-degrading bacteria strains is developing as a potential alternative for combating pesticides' negative effects. Numerous studies have been conducted on PGPR, emphasizing on its critical function in agriculture, horticulture, forestry, and environmental protection. As a result, a number of studies have been conducted on the function of PGPR in pesticide bioremediation. Microorganisms such as *Azospirillum*, *Azotobacter*, *Bacillus*, *Enterobacter*, *Gordonia*, *Klebsiella*, *Paenibacillus*, *Pseudomonas*, *Serratia*, and others have been found to have the potential to decrease pesticide toxicity.

1.9 Effect of biofertilizers on ecosystem:

Despite the fact that biofertilizers have been extensively employed in agriculture for many decades, information on their colonization and ecology is lacking. Furthermore, the process

behind their interactions with plants and the local microbial population continues to pique people's interest. The presence of indigenous microflora in the rhizosphere is one of the main variables that determines the effectiveness of a biofertilizer in a natural system. The biofertilizer's survival and plant growth-promoting qualities may be harmed by this highly competitive population of different organisms in the rhizosphere. Furthermore, bacterization of seeds and seedlings or soil additions may alter the structure of native microflora, which must be taken into account when determining the safety of introducing bacteria into the environment. Finally, the non-target impact of microbial biofertilizers on species other than target pathogens, the influence on biogeochemical cycles, the effect on soil texture, soil characteristics such as water-retaining capacity, porosity, and fertility, and erosion avoidance should all be carefully addressed. As a result, before releasing biofertilizers into the environment, it is critical to assess their non-target impacts on resident microflora populations and, as a result, on ecosystems, as well as a thorough study of the effects of biofertilizers before changing agricultural methods.

1.10 Types of biofertilizer formulation:

Biofertilizers are live microbial cells in a viable condition that are used to improve soil fertility. They are made in such a manner that they are both viable and capable of increasing soil fertility, productivity, and plant development at the same time. The biofertilizers are made in multistep procedures that mix several strains with specific chemicals that preserve the cells during storage. Peat, liquid, granules, and freeze-dried powders are the four main kinds of formulation that have been utilized widely so far.

1.10.1 Peat formulations:

Peat is made up of decomposed plants that have collected over time. It offers a nutrient-rich and safe habitat for a broad variety of microorganisms that may grow and form micro colonies on the surface of particles as well as in cervices. The main characteristics of peat formulation are that it must be nontoxic, extremely adsorptive, and easy to sterilize, have a high organic matter content and water holding capacity, and be readily accessible at a reasonable cost. Peat is an ill-defined and complicated substance made up of many sources with varying capacities for supporting cell development and survival.

1.10.2 Liquid formulations:

Aqueous (broth cultures), mineral or organic oils, oil in water, or polymer-based suspensions are all used in liquid formulations. Liquid biofertilizers have grown in popularity due to their ease of use and application on seedlings or in soil. They usually have high cell concentrations and allow for the application of a less amount for the same effectiveness. Furthermore, unlike solid carrier-based biofertilizers, liquid formulation provides for sufficient quantities of nutrients and cell protectants to enhance performance. Furthermore, as compared to peat-based formulations, they are said to have no contamination, a longer shelf life for certain formulations, better protection against environmental stressors, and improved field effectiveness.

1.10.3 Granules:

Peat prill or tiny marble, calcite, or silica grains are wetted with an adhesive and combined with powder-type inoculums to make granules. The target microorganisms are coated or impregnated into the grains. The size of the granules varies, but there is a clear link between the density of the

mother culture population and the quality of the final result. The higher the quality of the mother culture, the higher the quality of the final output.

1.10.4 Freeze-dried powders:

In certain instances, dry biofertilizers made from soil, organic, or inert carriers have been employed.

2. DISCUSSION

Consumer views about the usage of bio fertilisers and food produced acceptability and manufacturing safety for human well-being are quite important. The consequences of chemical fertilisers on the public, the land and the ecosystem are deteriorating. However, development, marketing and their technique of application are under the authority of major businesses and genetic committees. Bio fertilize agro-industrial issues can be solved in a very specific manner. Chemical fertilisers in contemporary farming have decreased soil fertility, rendering it inadequate for the cultivation of crops. Furthermore, these inputs' extensive usage has resulted in serious health and environmental threats such as soil erosion, pollution of the water, pesticide poisoning, decreasing groundwater table, water logging and biodiversity depletion. Bio fertilisers naturally activate the soil's inexpensive, efficient and environmental friendly microorganisms and, as a result, promote plant growth and restore the natural fertility of the soil from drought or soil disease. Further research and development are needed to understand the mechanisms to act for different biofertilizer and find more competent rhizobacterial strains and carrier materials to make agriculture more sustainable and economical. The success of biofertilizer technology requires further research and development. Farmers should be instructed on the environmental and other major favourable impacts on the farming system of biofertilizers to make them more popular among farmers.

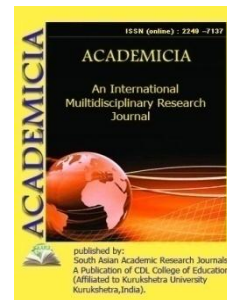
3. CONCLUSION

Environmental stressors are becoming a significant issue, and as a result of their negative impact, agricultural production is decreasing at an unprecedented pace. Because of our over-reliance on chemical fertilizers and pesticides to meet the increasing demand for food, companies have been pushed to develop life-threatening substances as pesticides or fertilizers. These substances are not only harmful to human health, but they also have a negative impact on the environment's ecological equilibrium. In this difficult scenario, biofertilizer may provide a viable alternative that will not only feed the growing population but will also protect agriculture from the effects of different environmental stressors. As a result, it is necessary to comprehend the many essential and advantageous features of biofertilizers, as well as the execution of their use in contemporary agriculture. Extensive study into the development of efficient, temperature-tolerant strains is a must for long-term success in this new sector. The most essential and difficult aspect of the study is that, in addition to identifying different biofertilizer strains and their characteristics, it is also necessary to address the real mechanism of biofertilizers for their effectiveness in sustainable agricultural development.

REFERENCES:

- [1] T. T. Win, G. D. Barone, F. Secundo, and P. Fu, "Algal Biofertilizers and Plant Growth Stimulants for Sustainable Agriculture," *Industrial Biotechnology*. 2018, doi: 10.1089/ind.2018.0010.

- [2] R. Chatterjee and S. Bandyopadhyay, "Effect of boron, molybdenum and biofertilizers on growth and yield of cowpea (*Vigna unguiculata* L. Walp.) in acid soil of eastern Himalayan region," *J. Saudi Soc. Agric. Sci.*, 2017, doi: 10.1016/j.jssas.2015.11.001.
- [3] L. Herrmann and D. Lesueur, "Challenges of formulation and quality of biofertilizers for successful inoculation," *Applied Microbiology and Biotechnology*. 2013, doi: 10.1007/s00253-013-5228-8.
- [4] N. T. Khan, Namrajameel, and M. J. Khan, "Microbial Biofertilizers," *Int. J. Biopharm. Sci.*, 2018.
- [5] "Biofertilizers." <https://byjus.com/biology/biofertilizers/> (accessed Aug. 17, 2017).
- [6] S. Munda *et al.*, "Inorganic phosphorus along with biofertilizers improves profitability and sustainability in soybean (*Glycine max*)–potato (*Solanum tuberosum*) cropping system," *J. Saudi Soc. Agric. Sci.*, 2018, doi: 10.1016/j.jssas.2016.01.008.
- [7] S. Mukhtar, I. Shahid, S. Mehnaz, and K. A. Malik, "Assessment of two carrier materials for phosphate solubilizing biofertilizers and their effect on growth of wheat (*Triticum aestivum* L.)," *Microbiol. Res.*, 2017, doi: 10.1016/j.micres.2017.08.011.
- [8] H. I. Khan, "Appraisal of Biofertilizers in Rice: To Supplement Inorganic Chemical Fertilizer," *Rice Sci.*, 2018, doi: 10.1016/j.rsci.2018.10.006.
- [9] M. A. Deshmukh, R. M. Gade, Y. K. Belkar, and M. D. Koche, "Efficacy of bioagents, biofertilizers and soil amendaments to manage root rot in greengram," *Legum. Res.*, 2016, doi: 10.18805/lr.v0iOF.6772.
- [10] S. Kaewchai, K. Soyong, and K. D. Hyde, "Mycofungicides and fungal biofertilizers," *Fungal Divers.*, 2009.



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PROSPECTS FOR DEVELOPMENT OF INVESTMENT LIFE INSURANCE IN UZBEKISTAN

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ABSTRACT

The article discusses the main components of investment life insurance in order to identify competitive advantages, features and disadvantages that allow assessing the current state and predicting the prospects for its development. Based on the analysis of periodicals, the main advantages and disadvantages of investment life insurance have been identified; the features that should be taken into account in the process of introducing this product on the insurance market have been identified.

KEYWORDS: *Life Insurance, Investment Products, Accumulated Insurance, Mutual Investment Fund, Investment, Profitability.*

INTRODUCTION

Life insurance is of great social and economic importance. On the one hand, it protects the population from the consequences of social risks and serves as an instrument of accumulation, and on the other hand, it acts as a source of long-term investment in the national economy. The growth of the life insurance segment has become more active due to the confident development of investment life insurance - a direction that has become widespread due to the decrease in rates on bank deposits and low demand for them.

Currently, the investment life insurance market is actively developing. Investment life insurance is one of the fastest growing segments of the insurance market. Investment life insurance is one of the types of life insurance, which is a structured product that includes an insurance and investment component.

Investment life insurance is a hybrid financial product that combines accumulative life insurance and a financial instrument that allows you to receive income by investing an insurance premium

in various financial assets offered by the insurer. For the insurance part of the product, the client receives traditional insurance coverage, and for the investment part - the opportunity to receive a sufficiently high expected income with limited risk. Thus, for clients, investment life insurance becomes an attractive investment instrument with a unique combination of insurance and investment guarantees.

The main differences between investment life insurance and endowment life insurance:

1. The ability of policyholders to participate in the investment income of insurers, while taking on part of the risks from investment. If the insurer disposes of the client's funds in the endowment life insurance programs, then in the investment life insurance programs the client assumes all the risks and chooses the directions for investing his funds, or delegates to carry out investments on his own behalf by a professional asset manager.
2. The policyholder knows in advance that the profitability of the contract will be determined only by the price of the acquired shares. In investment life insurance policies, the final amount of savings can only be assumed.

Therefore, it is always better to open these programs for long periods of time - from 10 years. Over such long periods of time, a significant growth in the stock market, where funds are invested, is practically guaranteed.

3. The client can control his investment portfolio on his own (if he understands the basics of investment) or through his financial advisor.
4. The investment portfolio can be revised once, maximum twice a year. Information about the change in funds and the state of the personal investment portfolio can be obtained both on the website of the insurance company and from independent sources.

An investment life insurance program should be part of everyone's financial planning. Investment life insurance programs are suitable for those who are ready to understand the principles of investing and pay more attention to the financial planning of their lives.

This insurance product has a number of other advantages:

1. Special legal status of investments (they are not property and, therefore, are not subject to confiscation, seizure, division; they cannot be penalized by third parties).
2. If the insurance contract establishes beneficiaries in case of death, the insurance payment is not included in the inheritance and is made to the person indicated as the beneficiary within the terms established by the insurance contract (usually 30 days). Thus, this is a way of long-term transfer of capital to someone close to you or relatives, because life insurance is a very secure investment.

TABLE 1. ADVANTAGES AND DISADVANTAGES OF INVESTMENT LIFE INSURANCE

Advantages	Disadvantages
Use of preferential rates when calculating tax liabilities	Low liquidity
Modeling a system for investing insurance premiums	Obligatory long term investment

Preserving your money in the event of a divorce (i.e., when funds are withdrawn, investments are saved for a long time)	Large penalties for early withdrawal of funds
Reliable protection in the event of insured events related to human health	Strictly limited list of available financial assets

Taking into account the considered features, it is possible to assess the relevance of investment life insurance and highlight three main reasons for its popularity:

- 1) Insurers offered the market a “boxed” product that does not require underwriting and can be easily sold through a bank channel.
- 2) In the face of a decrease in their interest income, banks have relied on the sale of investment life insurance policies as a source of additional fee and commission income. About 90% of insurance premiums for investment life insurances come through the banking channel.
- 3) Clients see investment life insurance as an alternative savings instrument to deposits, combining a capital return guarantee and access to various investment products. Each product has its own merits and demerits.

Thanks to investment life insurance, the client gets the opportunity to:

- 1) invest money in the stock market without the risk of losing investments;
- 2) additionally increase and preserve your capital with the help of tax incentives and legal privileges (in particular, funds invested in the insurance program are not subject to confiscation, collection, division in case of divorce);
- 3) receive reliable insurance coverage in case of unforeseen circumstances related to life and health.

However, despite the merits of investment life insurance, there are a number of problems.

First, aggressive sales by banks. Bank employees often impose this product on customers, exaggerate its possible profitability, advertise it as an analogue of a deposit, hiding its specific features.

Secondly, this product is aimed at a consumer with high financial literacy, and in our country it is still insufficient in general.

Third, there must be strict financial discipline on the part of the customer with the installment product. You need to carefully assess your financial capabilities, otherwise there may be losses in case of early termination of the contract. Investment life insurance is aimed at the middle class. Currently, most of the insured under the investment life insurance have an age of 45 and older.

Fourth, there is a risk of loss of investments in the event of the insurer's bankruptcy. After all, guarantees are valid only in relation to deposits, and insurance contracts do not apply. And banks and insurers do not provide such information to customers.

Fifth, insufficient legal regulation. To date, there is no normative legal act in which the term "investment life insurance" would appear, and this does not provide an opportunity for effective control over the mechanism and implementation of the investigated product.

Despite all the problems described above, it would be completely inappropriate to abandon the investment life insurance, bearing in mind its enormous economic and social significance. At this stage of the development of the insurance market, investment life insurance is in demand and contributes to the growth of the life insurance segment, having a positive effect on the development of the country's economy. Subject to a number of conditions, this financial product is able to provide insurance protection and generate income for the owner, which requires a search for a compromise of interests of all parties interested in its development.

For the further development of investment life insurance, a number of measures are needed.

It is necessary to legislatively define the concept of "investment life insurance", keep statistics and reform control over life insurance to identify prospects and development trends.

Measures are needed to clarify the specifics of investment life insurance. It is important to form and develop an effective infrastructure of the insurance market. Due to the complexity of this insurance product, it is necessary to develop training for managers of banks and insurance companies.

It is necessary to develop a plan of measures to improve the qualifications of personnel. Despite the existing problems, investment life insurance in the financial market has a high potential. Its development is a priority, since investment life insurance has a number of advantages - a guarantee of capital safety, investment income and insurance protection.

The growth of investment life insurance is due to the provision of tax benefits, stabilization of the securities market, and an increase in citizens' awareness. Investment insurance contracts guarantee a likely higher level of income than other financial insurance products.

CONCLUSION

Thus, examining the current stage of development of investment life insurance, we came to the conclusion that investment life insurance is a fairly new type of insurance that has not yet been fully studied and is not entirely clear for the population, which has certain advantages and disadvantages.

The growth in sales of investment life insurance products is due to the stabilization of the securities market, the development of tax incentives for income under investment life insurance contracts, and the impact on increasing citizens' awareness of the possibilities of obtaining investment income.

Investment life insurance contracts guarantee a probable and higher level of income than other financial products. The upcoming development of investment life insurance is closely related to the trend of expanding the range of banking and insurance products, which will lead to an increase in sales of investment life insurance products through banking organizations. These circumstances will serve as a growth stimulus for the socio-economic consequences of the introduction of investment and insurance products, the growth of the volume of investment life insurance contracts.

REFERENCES

1. Adamchuk N.G. International practice of life insurance. Textbook. - M.: Ankil, 2009. - 128 p.

2. Claudia Ceci, Katia Colaneri ba Alessandra Cretarola Unit-linked life insurance policies: Optimal hedging in partially observable market models // Insurance: Mathematics and Economics Volume 76, September 2017, Pages 149-163. <https://www.sciencedirect.com/science/article/pii/S0167668716305315>
3. Fedorova T.A. and other. Insurance. Textbook. 2nd ed. M.: "Economist", 2006. 271 p.
4. Gantenbein, M., Mata, M.A. 2008. *Swiss Annuities and Life Insurance: Secure Returns, Asset Protection, and Privacy*, Vol. 400. John Wiley & Sons.
5. Lelchuk A.L. Life insurance. Textbook. - M.: Ankil. 2010.
6. Nikola Dacev (2017) The Necessity of Legal Arrangement of Unit-linked Life Insurance Products. *UTMS Journal of Economics* 8 (3): 259–269.
7. O.T.Yuldashev. (October 2020). Development prospects of investment insurance product “Unit-Linked”. *International Finance and Accounting*, [Online] vol. 5. pp. 1-10. Available: <https://www.interfinance.uz/en/>
8. Sulimenko A.V. Prospects for the development of accumulative life insurance in Russia // Financial policy in the context of modernization of the Russian economy. RINH. Rostov-on-Don, 2011. - P. 64–72.
9. Toshmurzaevich, Y. O. (2020). Developing the Underwriting Process in Life Insurance. *European Journal of Business and Management Research*, 5(6). <https://doi.org/10.24018/ejbmr.2020.5.6.657>
10. Yuldashev O.T., Zakirkhodjaeva Sh.A. Life insurance. Study guide. - T.: “Economy and Finance”, 2019. - 380 p.



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THE SPECIFIC ACTIVITY OF THE TEACHER OF TECHNOLOGY EDUCATION

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ABSTRACT

The article gives information about the specifics of the work of a teacher of technology education and the organization of technology education and its role in the development of society. The teacher of technology education is distinguished from the teachers of other sciences by its very distinctive features: in terms of professional education and skills, level of preparation, working conditions and content. Such teachers are required to retrain their pedagogical, psychological, methodological, general-technical and ideological skills, to improve their professional skills to the level of higher education requirements.

KEYWORDS: *The Specific Activity Of Technology Education's Teacher. Education And Upbringing. Educational Events The Outside Of Classroom And School.*

INTRODUCTION

A technology education teacher is a leading professional who ensures the continuous practical application of technology education in a particular educational system. The teacher of technology education is the head unit, which ensures the education of students in this field and receives information, carries out class-lesson activities, various educational activities in this field. Currently, teachers of technology education prepared in secondary schools in the following directions operate:

1. Pedagogical institutes, universities, pedagogical colleges, such as "Physics and Technology", "Industrial Pedagogy", "Nature and Labor Education", "General Technical Sciences and Labor", "Vocational Education and Labor Education" of the named faculties in this specialty successfully completed the sections of "Teaching general technical sciences", "Teaching agricultural machinery and drawing", "Engineer-pedagogue" and "Technology education",

leading specialist teachers of the same subject with higher pedagogy, general technical training, education;

2. Graduated from institutes in various fields of national economy (mechanics, agriculture, construction, machinery, transport, etc.), has a degree in non-pedagogical specialties, engineers-technical specialists who teach in different directions, forms of technology education. This sphere requires retraining of people from pedagogical, psychological, methodological point of view.
3. Graduated from faculties, departments of pedagogical institutes, universities, pedagogical technical schools and colleges, educational institutions in other directions than technology education, pedagogical personnel who does not have a special education from technology education, but are now taking the lessons of technology education in addition to the basic lessons. Such teachers will need to be retrained in modern production, new techniques, modern technology and also general technical and technological skills in the field of folk crafts.
4. Personnel with secondary special education, who have graduated from various educational institutions, training courses, have a high level of practical production skills, but do not have higher education. Such teachers are required to retrain their pedagogical, psychological, methodological, general-technical and ideological skills, to improve their professional skills to the level of higher education requirements.

With a worthy assessment of the position of technology education in the development of society, the educational process in secondary schools is offered by masters of folk art, and if the basics are developed the educational, pedagogical, psychological, methodological, organizational, etc. of the teacher-student system, this important aspect of pedagogy would be further enriched, and these activities would also increase the effectiveness of the educational process.

The teacher of technology education is distinguished from the teachers of other sciences by its very distinctive features: in terms of professional education and skills, level of preparation, working conditions and content. Due to the peculiarities of the teaching method of Technology Education Science, from the admission of entrance examinations of higher educational institutions, which prepare specialists from technology education, to the graduation of a higher educational institution, it is necessary to radically reconsider the pedagogical technology, the process of training specialists before passing the state exam, to focus on the content and form to reflect the identity of the field and to update it in all its aspects. At the present time, it is a natural necessity to radically update the attention of public, private, personal enterprises, administrations, authorities, ministries and other management organizations to the work of training teachers in technology education, vocational education and to plan their solution to this problem, to implement leadership in their mutual cooperation.

In the preparation of the teacher in general secondary schools and practical pedagogical activity, the problems that they will solve, the tasks that they will perform, their knowledge, qualifications and skills and it is important to improve the tools they use, their knowledge and skills, and the ways and means, that is, the content and structure of the pedagogical activity of reading.

The system of current problems to be solved in the activity of a teacher of technology education is as follows:

1. Problems related to socio-economic changes.
2. Features of labor in society and the basics of its knowledge.
3. The purposefulness of the organization of educational events.
4. Problems related to the joint implementation of moral, national, technological, physical, environmental, economic, sophisticated, sexual, computer education of students in the educational process and others.

The types of activities of a technology education teacher in different contexts should include: Creating, organizing, interacting i.e. communicating with people, informing, developing, targeting, mobilization (in the implementation of a pedagogical activity), research, technical and technological, production activities and others.

A technology education teacher differs from other subject teachers in that he or she has a wide range of knowledge, qualification, and worldviews:

1. The scope of ideological and also political - ideological knowledge.
2. Psychological knowledge.
3. Pedagogical and methodological knowledge.
4. Natural-scientific knowledge.
5. Mathematical knowledge.
6. Technical and technological knowledge.
7. Economic knowledge.
8. Demographic and ethnographic knowledge.
9. Natural-biological knowledge.
10. Ecological knowledge.
11. Legal knowledge.
12. Perceptions of sophistication.
13. General cultural knowledge.
14. Information technology.
15. Organizational knowledge.
16. Knowledge of foreign languages, etc.

In order to conduct effective and complete technology education in general secondary schools, a teacher must have the following practical skills and competencies: mental, spiritual, intellectual, pedagogical, methodical, general, special, professional, computational, measurement, drawing and composing, various devices, tools, ability to control devices and also equipments, skills and competencies in dealing directly with the objects of labor, objects, weapons, and other areas.

The content of the pedagogical activity of a teacher of technology education in the organization of educational activities: In the main stage of the system of continuing education (grades 5-9

incomplete secondary school), the process of labor training of students involves the following objectives:

- to get acquainted with the spheres of production;
- to get acquainted with the technical means and technological processes used in production;
- productive forces and their types;
- carrying out of various technical calculations, performance of labor operations;
- participation in the productive process;
- to get acquainted with different professions and prepare for them;
- preparing students for work, profession and life;

Extracurricular and out-of-class educational activities, including labor education classes, play an important role in achieving the goals and objectives of labor training.

Extracurricular and out-of-school educational activities involving technology education aim to bring students closer together with the following key factors:

- ✓ tools of labor – objects of labor, weapons of labor, mechanisms, machinery, apparatus, equipment, tools and others;
- ✓ technological processes - physical and chemical effects on the means of labor and their transformation into a necessary product;
- ✓ labor effects - a set of human actions in the implementation of the technological process through the means of labor;
- ✓ product of labor - the product of a purposeful technological process of production;
- ✓ manual processes – it is a set of purposeful actions performed by people (workers and employees) without various mechanisms, without electrified means (For instance: manual processing of materials, manual painting, preparation of mixtures and others);
- ✓ mechanized processes - processing of labor objects using various mechanisms, machines and devices (For example: machining of materials using machines, transportation of goods and others);
- ✓ automated processes - processing of labor objects using machines and mechanisms under the supervision of workers (For example: smelting and placing metals in special furnaces, production of various chemicals in chemical plants and others);
- ✓ ancillary processes are the effects of labor that help to carry out a technological process (For example: preparation for operation, repair and maintenance of machinery and equipment, maintenance and inspection and others);
- ✓ the process of productive labor is the production of purposeful goods in which the product of labor has a commodity value as a result of exposure to the objects of labor by means of labor and tools.

In addition to technology education classes, extracurricular and out-of-school educational activities organized by technology education also play an important role in acquainting students with the above-mentioned processes and factors.

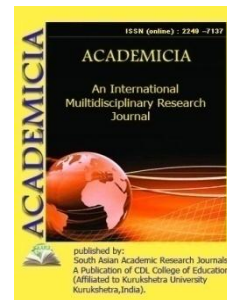
Extracurricular and out-of-school educational activities for technology education are in line with the general goals and objectives, form and content of school work training and have the following aspects. At school:

1. Practical training in workshops.
2. Practical tests on the training site.
3. Organize and look after a “live corner” at school.
4. Organize self-service work.
5. Participation of youth and students in labor events and Saturdays.
6. Participate in various technology education clubs.
7. Trips to manufacturing factories.
8. Out of school (on the basis of paternity or support enterprise).
9. As a successor to the dynasty of craftsmen in folk crafts.
10. Participate in the repair and maintenance of various items (classrooms, home, business and school) and etc.
11. Meetings with Labor Veterans and Advanced.
12. Participate in the repair and maintenance of various items (classrooms, home, business, school).

However, the role of the teacher of technology education is invaluable in the search for and implementation of educational activities rich in such educational opportunities, different views, national, local, ethnographic features.

LIST OF REFERENCES:

1. Doniev B.B. Methods of monitoring the pedagogical activity of teachers of labor education / Textbook. Samarkand, 2010. -72 p.
2. Muranov B.I. Organization of educational activities in the study of folk crafts. / Met. tav. - Samarkand, VPKQTMOI. 2011. -20 p.



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AN OVERVIEW ON SETS IN MATHEMATICS

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ABSTRACT

Mathematics is a comprehensive discipline that covers a wide range of ideas such as numbers, sets, relations, functions, algebra, and many more. It's a fascinating topic that's entirely dependent on logic, mathematics, fundamentals, and practice. In recent decades, students have regarded mathematics as one of the most difficult subjects in comparison to other subjects. As a result, the author chooses to create this review problem in order for students to understand the principles of sets more simply. Sets, Types of Sets, Operations of Sets, Venn diagram, Laws of Algebra of Sets, and Real-Life Examples of Sets are all covered in this article. The theory of sets is essential since the rest of mathematics is based on them. Sets are collections of items, objects, and components that have similar characteristics. People organize their books on the basis of various topics, thus sets may be utilized in real life. The authors also addressed set algebra rules such as identity laws, associative laws, and others in this article. This paper, according to the author, aids students in comprehending sets in mathematics. Mathematics also offers a wide range of career options, including lecturer, professor, finance manager, and mathematician. As a result, sets in mathematics have a bright future since they improve abilities and knowledge.

KEYWORDS: Elements, Laws, Mathematics, Sets, Venn diagram.

1. INTRODUCTION

Mathematics encompasses a wide range of subjects, including Sets, Relations, Geometry, Trigonometry, Graphs, and many more. The author has addressed Sets in mathematics in this article. A set is a classification of components, entities, or objects that have similar properties. People, alphabets, and numbers are examples of the kind of items that may make up a set. There are numerous instances of sets being utilized in real life, such as in the kitchen, where people

maintain their kitchen clean and well-organized, with plates kept separate from other utensils such as bowls, cups, and glasses. As a result, sets are defined as related objects that are maintained apart[1], [2].

1.1 Sets:

A set is a category of components, objects, and things that have similar properties. Upper letters are used to indicate a set, which are surrounded by curly brackets { }. The elements in the sets are non-repeatable.



Figure 1: The above diagram shows collection of clothes which is an example of sets

The example of sets is shown in Figure 1 as the Collection of clothes like hat, shirt, jeans, pants etc. have common property that people wear these clothes. A set is often described in two forms which are listed below:

- I. *Roster or Tabular form:* A roster form is a form in which all the elements are separated by commas and enlisted within braces { }[3]. For ex- Sets of five numbers can be written as {1, 2, 3, 4, 5}.
- II. *Set-builder form:* A set-builder form is a form which describes the things of a set instead of listing the elements. For ex- the set {1, 2, 3, 4, 5, 6, 7, 8, 9} list the elements but in set-builder form, it can be written as {x/x is a counting no. less than 10}.

1.2 Categories of sets:

- *Empty Set:* An Empty set is a set that doesn't involve any elements. Also known as null or void sets and it is denoted by ϕ . For ex- If the set is $\{x \in \mathbb{R}: X^2 = -2\}$ then the result is empty.
- *Singleton Set:* Singleton set can be defined as a set which involves only one element. The set of the first English letter can be written as {a} which is an example of Singleton set[4].
- *Finite Set:* A finite set is a set which is either null, zero or anyone can count its elements. For ex- A set of prime numbers from 2 to 50.
- *Infinite Set:* An Infinite set can be defined as a set in which elements cannot be counted. For ex- A set of whole numbers.
- *Equivalent Sets:* Two sets can be equivalent if their processing numbers are same in both sets i.e. $m(a) = m(b)$.

- **Equal Sets:** Two sets can be equal if every element of P is an element of Q and vice-versa. For ex- Two sets such that $P=\{10, 11, 15\}$ and $Q=\{15,11,10\}$ then $P=Q$ as Q contain every elements of P.
- **Subset:** A set is said to be subset of another set if each element of that particular set are present in another set. Each set is always is a subset for itself. An empty set is considered as a subset for each existing set. For example, if $A=\{1, 2\}$ and $B =\{4,1,5,2,3\}$ then here A is subset of B as every element of A is present in B. It is denoted as $P \subseteq Q$.
- **Universal Set:** Universal set can be defined as a set which involves all the possible values related to given context. For ex- $R= \{5, 7\}$, $S= \{9, 0\}$ and $T= \{3, 4, 6\}$ then A as a Universal set written as $\{0, 3, 4, 5, 6, 7, 9\}$.
- **Power Set:**Power set for any given set is a collection of all subsets of any given set and denoted by $P(X)$ where $X=$ any set. For example power set of $\{12,13,11\}$ will be $\{\{11\},\{12\},\{13\},\{11,12\},\{11,13\},\{12,13\},\{11,12,13\},\emptyset\}$.

1.3 Venn Diagrams:

A Venn diagram is a diagram in which all the possible values is represented within a rectangle and its subset is represented by circles within the given rectangle[5]. For ex- Suppose a set B is a subset of a set A then the circle representing A is drawn inside the circle representing B as shown in Figure 2[6].

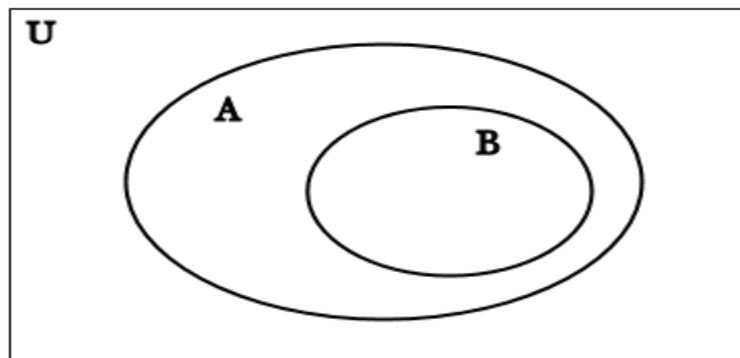


Figure 2: The above diagram shows the representation of Venn Diagram

1.4 Operations on Sets:

In this part, the author has discussed about some operations on sets which are stated below:

1. **Union of sets:** Union of sets can be defined as the set of all possible values which either belongs to two different sets or both sets. Sets union can be represented by 'U' symbols. Figure 3 shows the example of combination of two sets A and B.

$$A = \{1,2,3\}$$

$$B = \{3,4,5\}$$

$$A \cup B = \{1,2,3,4,5\}$$

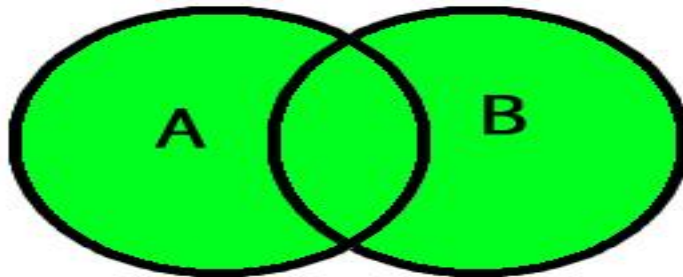


Figure 3: The above diagram shows the Fusion of two sets A and B

2. *Intersection of sets:* For any two sets, let's say P & Q. The intersection of P and Q is the set of those values that are common in P and Q. It can be represented as ' \cap ' symbol. For ex- If we have two sets such as A and B & $A = \{1,3,4,5\}$ and $B = \{2,1,4\}$ then $A \cap B = \{1,4\}$ as 1 and 4 is common to both A and B. If any pair of set does not have anything in common then, their intersection set contains \emptyset as it represents null value. Figure 4 represents the Venn diagram of intersection of two sets A and B[7].

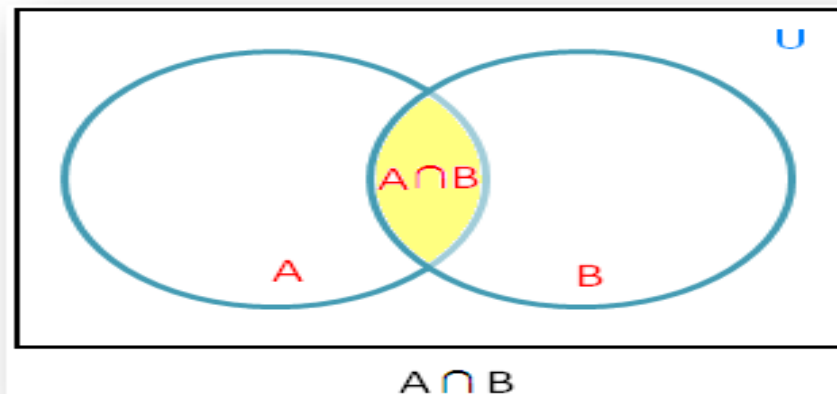


Figure 4: The above diagram shows the Venn diagram of intersection of two sets A and B

3. *Disjoint sets:* Disjoint sets for any two sets can be defined as sets which don't have any common elements. If disjoint sets have common values then they are said to be intersecting or overlapping sets. For ex- $X = \{1,2,3,4\}$, $Y = \{9,10,11\}$ and $C = \{1,2,3\}$ then X and Y is called disjoint sets as X and Y doesn't have any mutual values & A and C are said to be overlapping sets as they have common values[8]. Figure 5 represents the Venn diagram of disjoint sets X and Y.

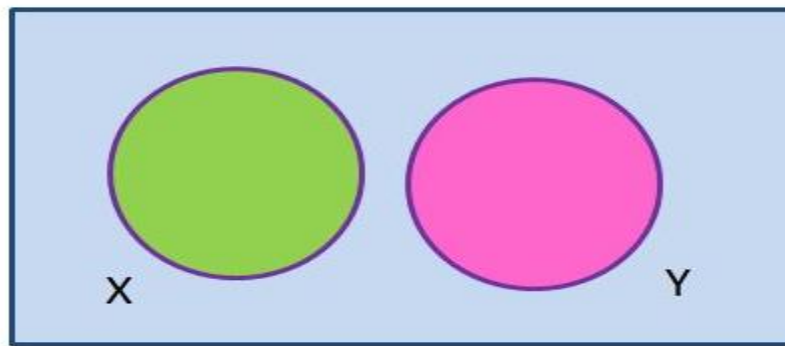


Figure 5: The above diagram shows the Venn diagram of two disjoint sets of X and Y

4. *Sets difference*: Suppose if take sets X and Y then sets difference is the removal of all the elements of X which is not involved in Y[9]. It can be written as $X - Y$. For ex- Suppose sets X and Y such as $X = \{5, 6, 7\}$ and $Y = \{6\}$ then $X - Y = \{5, 7\}$. The difference of sets is represented in Figure 6.

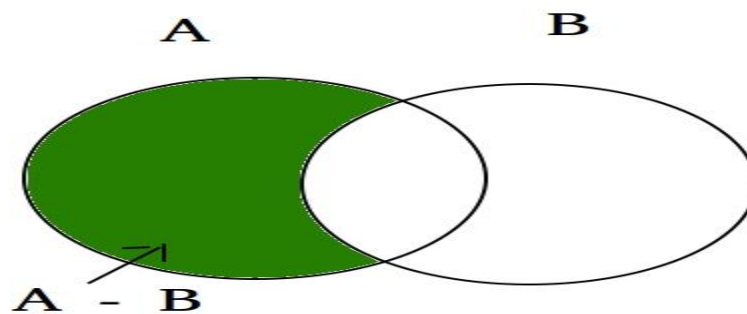


Figure 6: The above diagram shows the Venn diagram of difference in two sets

5. *Symmetric Differences*: Symmetric difference of two sets is the set of $(A - B) \cup (B - A)$ and It is denoted by $A \Delta B$.
6. *Complement of a set*: Sets Complement can be defined as all the values involved in A does not belongs to A' . It is denoted by X' where X is any set. Figure 7 represents the Complement of A. The coloured area is the complement of A.



Figure 7: The above diagram shows the diagram of Complement of a set A

1.5 Laws of sets of algebra:

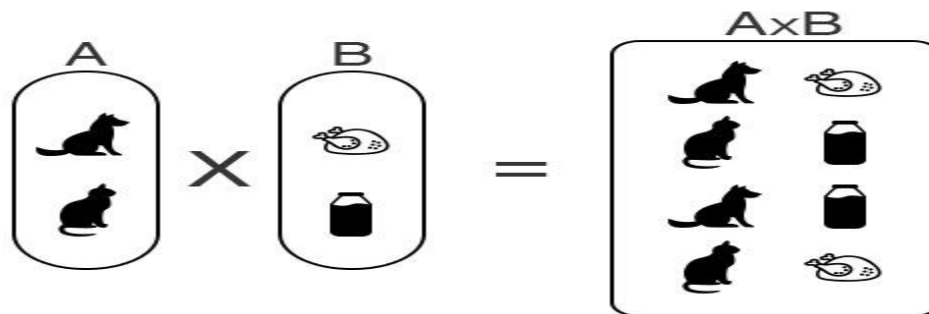
Table 1 represents the laws of sets of algebra.

TABLE 1: LAWS OF SETS OF ALGEBRA

Idempotent laws:	(1a) $A \cup A = A$	(1b) $A \cap A = A$
Associative laws:	(2a) $(A \cup B) \cup C = A \cup (B \cup C)$	(2b) $(A \cap B) \cap C = A \cap (B \cap C)$
Commutative laws:	(3a) $A \cup B = B \cup A$	(3b) $A \cap B = B \cap A$
Distributive laws:	(4a) $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$	(4b) $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$
Identity laws:	(5a) $A \cup \emptyset = A$	(5b) $A \cap U = A$
	(6a) $A \cup U = U$	(6b) $A \cap \emptyset = \emptyset$
Involution laws:	(7) $(A^C)^C = A$	
Complement laws:	(8a) $A \cup A^C = U$	(8b) $A \cap A^C = \emptyset$
	(9a) $U^C = \emptyset$	(9b) $\emptyset^C = U$
DeMorgan's laws:	(10a) $(A \cup B)^C = A^C \cap B^C$	(10b) $(A \cap B)^C = A^C \cup B^C$

1.6 Cartesian Product of sets:

Cartesian Products of two set P and Q is basically the sets of all involved pair (p, q). It is denoted as $P \times Q$. Example if we have , if $P=\{1,2,3\}$ and $Q=\{5,6\}$ then product Cartesian of P and Q will be $P \times Q = \{(1,5),(1,6),(2,5),(2,6),(3,5),(3,6)\}$. It can also be represented in set builder form as $P \times Q = \{(p, q): p \in P \text{ and } q \in Q\}$. Figure 8 represents the Cartesian product of sets.



Cartesian Product of Two Sets.

Figure 8: The above diagram shows the Cartesian products of two set

1.7 Examples of sets in real life[10]:

- Playlists as an example People have smart phones and laptops, and they can build playlists based on genres. As a result, a playlist is an example of a set.
- There are numerous galaxies in our universe, all of which are separated from one another by a significant distance. As a result, this is likewise a set example.
- The kitchen is maintained in order by the people, and dishes and bowls are kept separate. As a result, the kitchen is an example of a set.

2. DISCUSSION

Mathematics is a vast topic with many sub-disciplines. The majority of mathematical progress has been practical. Logic and numbers are the foundations of all mathematical ideas. There are a

number of initiatives that are entirely based on mathematical ideas. In the area of mathematics, there are many career possibilities such as teacher, professor, mathematician, and finance manager. Sets, Relations, Functions, Sequence & Series (which includes arithmetic and geometric progression), Trigonometry, Exponents, Logarithms, Algebraic Equations (such as Linear equations, Polynomial equations, and Cubic equations), and Algebraic Equations (such as Linear equations, Polynomial equations, and Cubic equations) are some of the topics covered in mathematics. Sets, types of sets, operations of sets, rules of algebra of sets, and real-life examples are covered in this review article. This review article was written by the author in order for students or others to get a better knowledge of sets in mathematics. As a result, the future of sets in mathematics looks bright, as people's understanding grows.

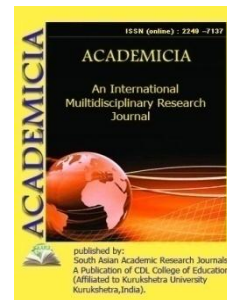
3. CONCLUSION

The theory of sets is significant because it underpins the rest of mathematics, and sets offer a variety of applications to the rest of mathematics. Sets are defined as a group of objects or components that have a similar characteristic. In recent decades, students have regarded mathematics as one of the most difficult subjects in comparison to other subjects. As a result, the author decided to create this review problem in order for students to understand the principles of sets more simply. Sets, Types of Sets, Operations of Sets, Venn Diagram, Laws of Algebra of Sets, and Real-Life Examples of Sets are all covered in this article. Because mathematics is a discipline based only on fundamentals and formulas, anybody who understands the fundamental ideas and formulae may be a competent mathematician. When it comes to employment possibilities, mathematics is a popular choice since there are many options such as finance manager, professor, teacher, and many more. As a result, the future of mathematical ideas is bright for individuals who want to improve their abilities and careers.

REFERENCES

1. J. D. Godino, "Mathematical Concepts , Their Meanings , and," *Proc. XX Conf. Int. Gr. Psychol. Math. Educ.*, vol. 2, pp. 1–7, 1953.
2. J. Ferreirós, *Labyrinth of thought: A history of set theory and its role in modern mathematics*. 2007.
3. R. A. Stoney, J. M. Schwartz, D. L. Robertson, and G. Nenadic, "Using set theory to reduce redundancy in pathway sets," *BMC Bioinformatics*, vol. 19, no. 1, 2018, doi: 10.1186/s12859-018-2355-3.
4. A. Kanamori, "The Empty Set, The Singleton, and the Ordered Pair," *Bull. Symb. Log.*, vol. 9, no. 3, 2003, doi: 10.2178/bsl/1058448674.
5. A. Dusa, "Venn: Draw Venn Diagrams," Available at: <http://CRAN.R-project.org/package=venn>, 2017.
6. P. Bardou, J. Mariette, F. Escudié, C. Djemiel, and C. Klopp, "Jvenn: An interactive Venn diagram viewer," *BMC Bioinformatics*, vol. 15, no. 1, 2014, doi: 10.1186/1471-2105-15-293.
7. A. Lex, N. Gehlenborg, H. Strobel, R. Vuilleminot, and H. Pfister, "UpSet: Visualization of intersecting sets," *IEEE Trans. Vis. Comput. Graph.*, vol. 20, no. 12, 2014, doi: 10.1109/TVCG.2014.2346248.

8. "Labyrinth of Thought: A History of Set Theory and its Role in Modern Mathematics," *Hist. Philos. Log.*, vol. 30, no. 3, 2009, doi: 10.1080/01445340902727586.
9. J. E. Baumgartner and K. Kunen, "Set Theory. An Introduction to Independence Proofs.," *J. Symb. Log.*, vol. 51, no. 2, 1986, doi: 10.2307/2274070.
10. L. A. Zadeh, "Fuzzy sets," *Inf. Control*, 1965, doi: 10.1016/S0019-9958(65)90241-X.



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A BRIEF DESCRIPTION ON THE FUNCTIONS OF TRIGONOMETRY

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ABSTRACT

There are a variety of mathematical ideas that are often utilized in real-world applications. Trigonometry is one such idea that is now widely utilized in a variety of tasks, including the construction of dams, bridges, and buildings. When it comes to solving real-world issues, trigonometric calculations have shown to be dependable and helpful. Working on it is both simple and enjoyable. In general, students find it difficult to grasp its ideas at first, but once they do, solving trigonometric problems becomes very interesting and enjoyable. Angles and sides are the focus of trigonometry. All trigonometric calculations and formulas are based entirely on triangle angles and sides. There are a number of trigonometric identities that may be used to assist solve trigonometric issues. This article has covered all of the ideas related to trigonometry, including identities, formulas, and graphical representations of trigonometric functions. This article describes how trigonometry is used in real-life situations. It discusses the future of trigonometry and the need of pupils fully understanding trigonometric principles.

KEYWORDS: Angle, Mathematics, Side, Sine, Trigonometry.

1. INTRODUCTION

Mathematics is the subject that students believe to be the most difficult. It's all about numbers in mathematics. The numbers 0 to 9 are the foundation of all mathematics. Math is entirely dependent on computations and logic[1]. Mathematicians employ a variety of theorems and rules to solve a variety of issues. In this article, a few of these theorems, rules, and ideas are briefly described.

1.1 Trigonometry:

Angles are the foundation of trigonometry. Cosecant, tangent, cosine, secant, sine, and cotangent are the six major functions in it. These may be expressed as cot, cos, cosec, tan, sec, and sin in abbreviated form, respectively[2], [3]. The inverse relationship between sin and cosec may be expressed as $\sin = 1/\text{cosec}$ or vice versa. In the same way, cos and sec have an inverse relationship that may be expressed as $\cos = 1/\text{sec}$ or vice versa. Tan and cot have the same inverse relationship, which is expressed as $\tan = 1/\text{cot}$ or vice versa. Trigonometry is entirely dependent on the use of right-angled triangles to accomplish different functions. All of these elements are needed to calculate the sides and angles of triangles. The sign “°” is used to indicate angles. There are a number of formulas that link these elements to triangle sides and angles.

1.2 Trigonometric Functions:

Sin, cos, sec, cosine, tan and cot are six important functions in trigonometry which form base of trigonometry.

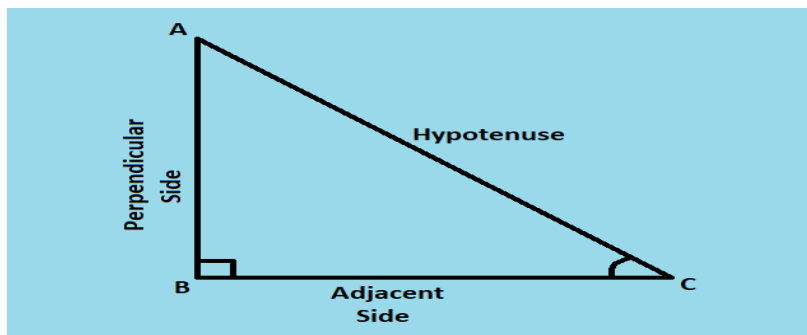


Figure 1: Triangle representing all three sides with respect to angle θ [4].

Figure 1 shows a triangle which represents all three sides with respect to angle θ .

$\sin \theta = \text{side opposite to angle} / \text{Hypotenuse of triangle}$

$\cos \theta = \text{side adjacent to angle} / \text{Hypotenuse of triangle}$

$\tan \theta = \text{side opposite to angle} / \text{side adjacent to angle}$

$\text{Cosec } \theta = \text{Hypotenuse of triangle} / \text{side opposite to angle}$

$\text{Sec } \theta = \text{Hypotenuse of triangle} / \text{side adjacent to angle}$

$\text{Cot } \theta = \text{Base} / \text{Perpendicular}$

There are various formulae which establish a relation between these components and can be used to find out solution of trigonometric problems[5]. These are called as Pythagorean identities. These are:

$$\cot^2\theta + 1 = \operatorname{cosec}^2\theta$$

$$\sin^2\theta + \cos^2\theta = 1$$

$$\tan 2\theta = 2 \tan \theta / (1 - \tan^2\theta)$$

$$\cos 2\theta = 2\cos^2\theta - 1$$

$$\cot 2\theta = (\cot^2\theta - 1) / 2 \cot\theta$$

$$\cos 2\theta = 1 - 2\sin^2\theta$$

$$\tan^2\theta = 1 + \cot^2\theta$$

$$\sin 2\theta = 2 \sin\theta \cos\theta$$

There are various formula for finding out sum and difference between two or more angles. These are called as difference and sum identities[6]. For two angles r and s these formula can be demonstrated as

$$\sin(r + s) = \sin(r)\cos(s) + \cos(r)\sin(s)$$

$$\tan(r+s) = \tan(r) + \tan(s)/(1 - \tan(r) \tan(s))$$

$$\sin(r - s) = \sin(r)\cos(s) - \cos(r)\sin(s)$$

$$\tan(r - s) = \tan(r) - \tan(s)/(1 + \tan(r) \tan(s))$$

$$\cos(r - s) = \cos(r)\cos(s) + \sin(r)\sin(s)$$

$$\cos(r + s) = \cos(r)\cos(s) - \sin(r)\sin(s)$$

For any three angles x, y, z and three sides X, Y, Z of a triangle there are Sine and Cosine laws which gives following relation:

1.2.1 Sine Laws:

$$x/\sin X = y/\sin Y = z/\sin Z$$

1.2.2 Cosine Laws:

$$z^2 = x^2 + y^2 - 2xy \cos Z$$

$$x^2 = y^2 + z^2 - 2yz \cos X$$

$$y^2 = x^2 + z^2 - 2zx \cos Y$$

There are Euler's formula in trigonometric which are used to find out exponential expressions. These are:

$$e^{ix} = \cos x + i \sin x$$

Where x = angle and i = imaginary number.

$$\tan x = (e^{ix} - e^{-ix})/i(e^{ix} + e^{-ix})$$

$$\sin x = (e^{ix} - e^{-ix})/2i$$

$$\cos x = (e^{ix} + e^{-ix})/2i$$

1.3 Trigonometry Table:

Trigonometric table contains the most commonly used values of different functions[7].

TABLE 1: TABLE OF MOSTLY USED VALUES OF TRIGONOMETRIC FUNCTIONS AT DIFFERENT ANGLES

Angle	0	30	45	60	90
Cosec θ	∞	2	$\sqrt{2}$	$2/\sqrt{3}$	1
Cot θ	∞	$\sqrt{3}$	1	$1/\sqrt{3}$	0
Sec θ	1	$2/\sqrt{3}$	$\sqrt{2}$	2	∞
Cos θ	1	$\sqrt{3}/2$	$1/\sqrt{2}$	$1/2$	0
Sin θ	0	$1/2$	$1/\sqrt{2}$	$\sqrt{3}/2$	1
Tan θ	0	$1/\sqrt{3}$	1	$\sqrt{3}$	∞

Table 1 represents the mostly used values of Trigonometric Functions at different angles such as 0, 30, 45, 60, 90 and rest other values can be find out using these values with the help of trigonometric identities and relation between the functions.

1.4 Circular Representation using Unit Circle:

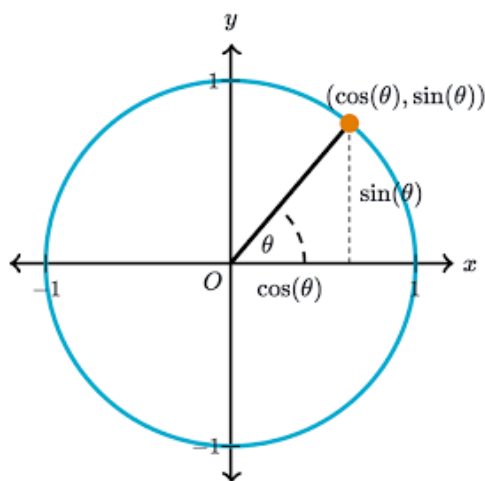


Figure 2: Circular representation of angle θ in triangle using Unit Circle[8].

In Unit Circle, Figure 2 displays a circular depiction of a triangle with sin and cos indicating its location coordinates. Because the circle's centre is at the origin, resulting in a radius of 1, it aids

individuals in directly measuring the angles of tan, sin, and cos. The base of the triangle is p , and the perpendicular is q . The Hypotenuse will have the same length as the circle's radius, which is 1. Trigonometric ratios in a unit circle are as follows:

1.5 Angle of Elevation:

It's the angle formed when someone looks up horizontally from the ground. It is the angle that exists between the horizontal plane and the observer's eye. For example, if a woman stares at a tower from the ground, an angle is created that is inclined towards the tower from the woman's eye. Using trigonometric functions, this angle of elevation may be used to measure distances and heights of bridges, buildings, and other structures.

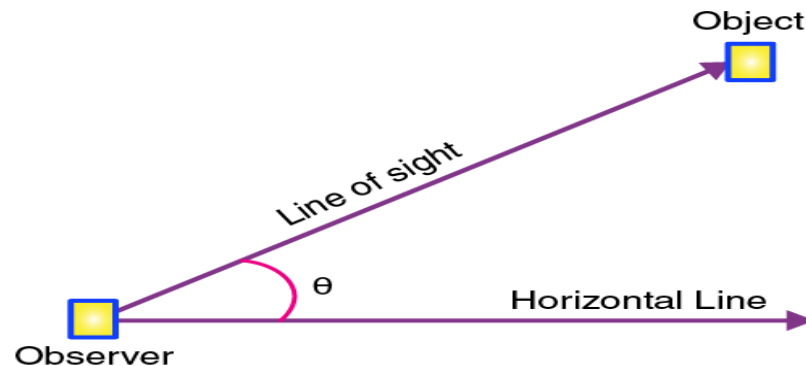


Figure 3: Angle of elevation from ground to an object higher than ground[9].

Figure 3 shows the Angle of elevation from ground to an object higher than ground with respect to the observer.

Formula to find out angle of elevation is:

$$\tan \theta = \text{Side Opposite to angle} / \text{Side Adjacent to angle}$$

1.6 Angle of Depression:

It's the angle formed when someone stares horizontally downwards from somewhere above ground level. It is the angle formed between the horizontal plane and the observer's eye when the observer is at a higher level than what he is looking at. For example, if a lady stares at a ball from terris, an angle is created that is slanted downward towards the ball from the woman's eye. Using trigonometric functions, this angle of depression is extremely helpful for calculating distances and heights of bridges, buildings, and other structures.

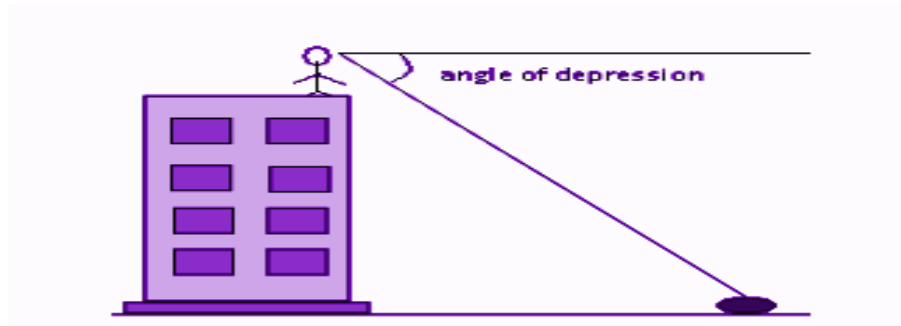


Figure 4: Woman staring from terrace of building on the ball kept at ground resulting in formation of angle of depression[9].

Figure 4 shows a woman staring from terrace of building on the ball kept at ground resulting in formation of angle of depression.

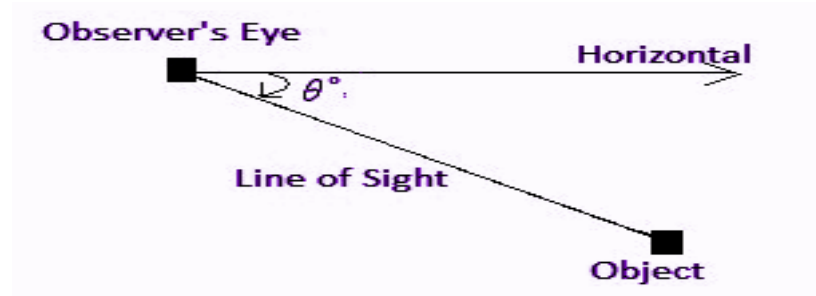


Figure 5: General representation of formation of angle of depression[9].

Figure 5 shows general representation of formation of angle of depression when someone looks at something kept at a lower level than the observer.

Formula to find out angle of depression can be written as:

$$\tan \theta = \text{Side Opposite to angle} / \text{Side Adjacent to angle}$$

1.7 Graphical representation of Trigonometric Functions:

Trigonometric functions can be represented in form of waves.

1.7.1 Sine wave:

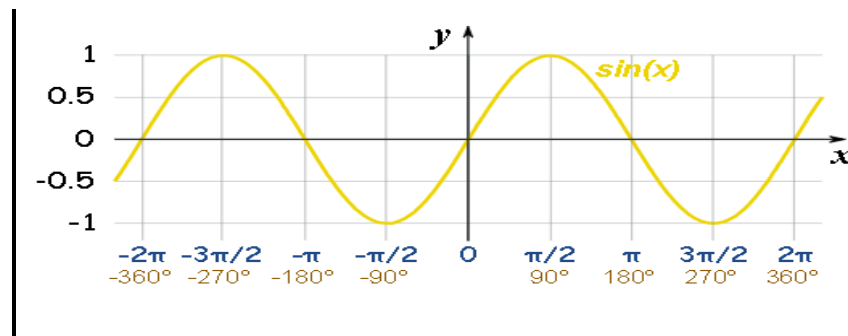


Figure 6: Graphical representation of Sine Function[10].

Figure 6 shows graphical representation of Sine function. In it X axis represent the values of function and Y axis represent angle. Sine function is continuous and passes through origin.

1.7.2 Cosine wave:

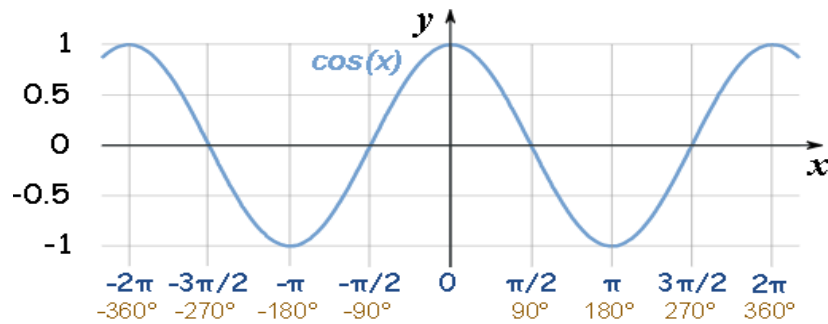


Figure 7: Graphical representation of Cosine Function[10].

The Cosine function is graphically shown in Figure 7. The X axis represents function values, whereas the Y axis represents angle. The sine function is a continuous function that does not go through the origin.

1.7.3 Tangent wave:

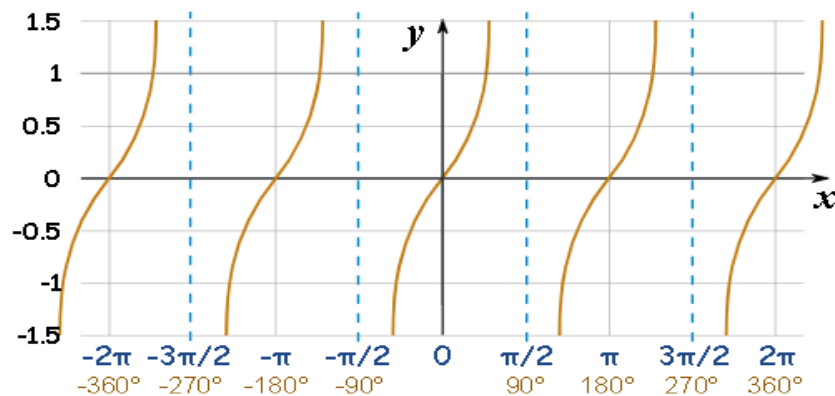


Figure 8: Graphical representation of Tangent Function[10]

The Tangent function is shown graphically in Figure 8. The X axis represents function values, whereas the Y axis represents angle. Tangent waves are not continuous waves that travel through the origin.

2. DISCUSSION

Mathematics is a discipline that studies numbers and the operations that may be done on them. It's a fascinating topic focused entirely on numbers, computations, and logic. It's a fascinating topic in which there's no need to memorize anything as in other courses; all that's required is attention and concentration when performing calculations. It offers a wide range of employment possibilities, which is why many students and parents choose Math as their primary subject in senior secondary school. Mathematics is built on a number of different ideas. Trigonometry is one of them, and it's a fascinating and entertaining subject with real-world applications. The many features and functions of trigonometry are explained in this article. It contains all of the trigonometric formulas that may be used to real-world situations and solved. It teaches how to depict different trigonometric functions graphically. This article shows how mathematics may

lead to a variety of employment possibilities, which can improve students' futures. In addition to all of this, the future scope of mathematics was addressed in this article.

3. CONCLUSION

Mathematics is a huge topic with a lot of different ideas to learn. The majority of mathematical progress has been practical. Mathematics is built on the foundation of numbers. Logic and numbers are the foundations of all mathematical theories. There are a number of initiatives that are entirely based on mathematical ideas. In the area of mathematics, there are many career possibilities such as speaker, professor, teacher, statistician, mathematician, operations research analyst, and many more. Sequences and Progressions, which include Arithmetic Progression, Harmonic Progression, and Geometric Progression, Trigonometry, Principle of Mathematical Induction, Binomial Equations, Differential Equation, Calculus, Differentiation and Integration, Probability, and more, are all concepts in mathematics. Geometry, which includes concepts such as the shapes, sizes, areas, and volumes of Triangles, Squares, Spheres, Cones, Cylinders, and many other geometrical figures, Complex Numbers, Sets, and many other concepts in mathematics, are used in real-life applications in areas such as building construction, bridge construction, and many other tasks.

Trigonometry is one such idea that is extensively utilized in real-world applications such as dam construction, bridge construction, building construction, road construction, and so on. In the construction of structures, the angle of elevation and depression are very significant. To determine the sides and angles of triangles with one 90-degree angle, trigonometry functions such as cosine, tangent, secant, sine, cosecant, and cotangent are employed. All of these formulas for finding sides and angles are covered in this article. In this article, many trigonometric identities and rules are explored. Mathematics is regarded as a topic that offers both students and instructors with many possibilities. As a result, mathematics has a bright future ahead of it, with numerous chances for students and instructors to demonstrate their abilities and acquire experience and knowledge.

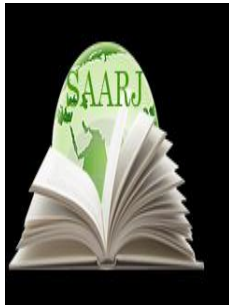
REFERENCES

1. J. D. Godino, "Mathematical Concepts , Their Meanings , and," *Proc. XX Conf. Int. Gr. Psychol. Math. Educ.*, vol. 2, pp. 1–7, 1953.
2. "Transliteration table. Trignometry and hyperbolic functions," *J. Appl. Math. Mech.*, 1968, doi: 10.1016/0021-8928(68)90087-7.
3. "Algebra and Trignometry," 2000.
4. "Traingle side representation." <https://byjus.com/maths/trigonometric-ratios/> (accessed Aug. 17, 2017).
5. A. Svirin, "1300 Math Formulas," *KR misc*, 2004.
6. S. Kabbaj, M. Tial, and D. Zeglami, "The Integral Cosine Addition and Sine Subtraction Laws," *Results Math.*, vol. 73, no. 3, 2018, doi: 10.1007/s00025-018-0858-x.
7. C. C. Grove, "Book Review: Plane Trigonometry and Tables," *Bull. Am. Math. Soc.*, vol. 22, no. 5, 1916, doi: 10.1090/s0002-9904-1916-02770-4.
8. "Circular Representation using Unit Circle."

<https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:trig/x2ec2f6f830c9fb89:unit-circle/a/trig-unit-circle-review> (accessed Aug. 17, 2017).

9. “angle-of-depression-and elevation.pdf.” BYJU’S.

10. “Trigonometric waves.pdf.” MathsIsFun.



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THE ROLE OF CLUSTER IN CONSTRUCTION MATERIALS INDUSTRY

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ABSTRACT

This article analyzes the construction materials industry of the Republic of Uzbekistan, its importance and provides recommendations for improvement on the basis of an innovation cluster. Strategic approaches are produced only in the separated regions. That's why it is important to form strategic approaches for development of innovational construction materials. The experience of developed countries shows that there is no single unified mechanism for creating, developing and stimulating clusters. As noted in the Address of the President of the Republic of Uzbekistan ShavkatMirziyoyev to the Oliy Majlis on December 29, 2020: "From now on, each village or mahalla will be developed based on its direction and growth points."

KEYWORDS: *Construction Materials Industry, Material, Cluster, Investment, Capital, Commercial Bank, Interest Rate, Draft.*

INTRODUCTION

The most prior issues of these days are reducing the participation of the country in economics, increasing the efficiency of ruling system in construction materials industry, promoting the organizations that are dealing with recycling local materials, diversification of locally produced materials and expanding the export and attracting investment to our network. By this, the purpose of extending the proportion of construction industry in the country's economy and building materials industry is stated. As noted in the Address of the President of the Republic of Uzbekistan ShavkatMirziyoyev to the Oliy Majlis on December 29, 2020: "From now on, each village or mahalla will be developed based on its direction and growth points. To this end, I propose to create a regional infrastructure development fund worth 3 trillion Uzbek sum on the next year. The fund will be used to co-finance infrastructure projects based on suggestions from local councils. Furthermore, 100 techno parks, small industrial zones, regional clusters and

logistics centers will be established in 84 districts and cities to further increase the industrial potential” [2].

Construction materials industry is one of the big fields of country's economy and it contains a number of fields and it is the main part of construction fund, the price of construction materials organizes the costs of construction manufacture. Additionally, delay in innovational development of construction materials industry leads to quiescency of the whole construction complex, the reason of the case is using old materials technologies and the cost of buying them.

Nowadays, there is no single policy in developing construction materials, more specifically innovational construction materials. Strategic approaches are produced only in the separated regions. That's why it is important to form strategic approaches for development of innovational construction materials. Organizing construction clusters in areas make way for linking this field with the policy of the country and the benefits of other participants of construction complex and scientific base.

By the information provided above, economic subjects, science, infrastructure and organized forms that are new to the field of construction – there evolves a chance to do with clusters.

Analysis of the theme-relating materials

The scientific works of local and foreign authors are being used as theoretical and methodical base of scientific approaches in usage of innovational clusters in production of construction materials.

M. Porter is the person who is the author of theory of developing and improving cluster and his works deal with the competitiveness of clusters. T. Anderson, K. Ketels, O. Solvell, M. Storper and some other scientists contributed to the development of clusters. Russian scientists, namely L.M. Dadayev, L.V. Ivanenko, C. Klysova, E.A. Monastirniy, E.I. Robinshtein, T.V. Pogodina are the ones who also dealt with this problem.

Additionally, the Russian scientists who studied the role of cluster are also A.A. Ugryumov, A.A. Voronin, L.S. Markova, L.V. Ivanenko, V.P. Tretyanka, V.V. Matitsina, L.N. Asaul and others. Despite this, the style of construction clusters is not fully developed yet. The problems of using clusters in territorial construction materials industry are yet to be solved.

Analysis and results

As we can see from the experiences of developed countries, innovational activities will develop if there are enough clusters. Scientific researches reveal that, at the place where attraction of innovational activities and innovational atmosphere is high, there you can see advanced clusters or vice versa.

The situation that covered the company can also be the reason for upgrading innovational activities as well as the results of construction companies. So, a company working in the field of construction materials industry can be the only one who attracted innovation or a partner with other companies like that and both can be efficient and beneficial for the company.

M. Porter is the person who used the term of cluster for the first time in science. He described cluster as general and common group of companies working in the same field of industry and collaborating with each other, and a group that is geographically situated side by side [2].

The effects of clusters' activities can be in the degree of elements, or in the economy of a region or a country. Some issues can be counted as factors of development with clusters in construction materials industry.

Internal factors:

1. Manipulating the size of manufacture and broadening activities range.
2. Separating costs and risks
3. Upgrading the ability of overcoming difficulties.
4. Flexibility and efficiency
5. Fast reaction to changes in demands of market.
6. Efficiency of attracting investments
7. Manipulating efficiency and flexibility of actions.
8. Improving stability and durability of market place.
9. Shortening the price of purchasing and spreading intellectual properties.

External effects are counted as results that are evolved inside the cluster. Some of them are;

1. Increase of money came from taxes.
2. Rising of employment rate.
3. Expansion of investment attraction.

As a result of the establishment and development of innovative clusters in the building materials industry, the optimal development of industry in the country will contribute to the growth of investment and economic recovery of the country [4]. This will create the conditions for the organization of constructive solutions through the transition to new housing systems and a more economical, prudent approach to resources, the formation of a different pricing policy to ensure the ability to manage buildings designed to meet the needs of the population.

The experience of developed countries shows that there is no single unified mechanism for creating, developing and stimulating clusters. Therefore, in order to carry out modernization on the basis of cluster principles, it is necessary to develop a state policy on the formation and support of clusters. Public cluster policy should include:

- supporting clusters in the budget, tax, finance and credit sectors
- Stimulation of their investment attractiveness;
- creating conditions for the development of innovative activities
- encouraging the development of infrastructure

Growth rates of production of some construction materials in the country in 2019-2020 *

№	Name of raw material results	Unit of measurement	Production volumes		Dynamics in 2020 compared to 2019 (In percent)
			2019	2020	
1	Limestone	Thousand tons	11 219,70	16 268,60	1,45

2	Soil components	Thousand tons	1 216,70	1 581,70	1,30
3	Quartz sand	Thousand tons	287,9	374,3	1,30
4	Sand and gravel materials	Thousand cubic meters	7 029,20	8 083,60	1,15
5	Brick raw material	Thousand cubic meters	2 092,40	2 406,30	1,15
6	basalt	Thousand tons	162,7	195,2	1,20
7	Gypsum stone	Thousand tons	1 292,00	1 679,60	1,3

***Source:** Based on data from the State Statistics Committee of the Republic of Uzbekistan

Table 1 shows that in 2019-2020, the volume of construction materials production increased in 2020 compared to 2019, while the share of total industrial output in the country and its regions increased. At the same time, many enterprises operating in the industry are operating at high efficiency. Its products meet the requirements of international quality standards.

Research shows that the peculiarities of the formation of regional branch clusters of the construction materials industry include:

- High investment and innovation potential of the industry, which creates conditions for the creation of a cluster of innovative types;
- Enterprises are connected to the location of resources, not to customers;
- The dependence of the construction industry as a supplier of the construction industry on all sectors of material production, which allows to expand the markets for the sale of these products;
- The need to take into account the areas of activity of enterprises of the construction industry in the formation of cluster links;
- Market orientation of the construction materials industry;
- High level of technical interchangeability of network products, the high level of competition, which allows to expand the range of clusters through the involvement of small business;
- The focus of cluster products on local markets due to the high cost of delivery to remote destinations.

CONCLUSION AND SUGGESTIONS

In short, the development of a cluster is largely determined by the development of the industry in which it operates. In this regard, before making a decision on the formation of a cluster, it is necessary to conduct an analysis of the economic environment in which it operates, its level of innovation. Based on this conclusion, we propose the following:

- Developing a cluster approach to innovation management
- On the basis of the construction materials industry of Tashkent region establishing a construction cluster; effective operation style;
- To form a style for effective usage of cluster in construction.

LIST OF USED MATERIALS

1. Address of the President of the Republic of Uzbekistan ShavkatMirziyoyev to the Oliy Majlis January 24, 2020.
2. MustafakulovSh.I. The attractiveness of the investment climate. Scientific practical guide.- Tashkent: Baktria press, 2017.-320 p.
3. Zaynutdinov Sh. N., Nurimbetov R. I. Upravlenieresursnoybazoyrazvitiyaproizvodstvostroitelnyxmaterialov v Nizov yaxAmudari / Jurnal. Architecture. Construction. Design. Tashkent, 2015 year.No4.
4. salohiddinovichibragimov support and development of innovative clusters in the production of building materials in uzbekistan International Scientific Journal Theoretical & Applied Science p-ISSN: 2308-4944 (print) e-ISSN: 2409-0085 (online) Year: 2021 Issue: 05 Volume: 97 Published: 26.05.2021 <http://T-Science.org>
5. Ibragimov S.O. Necessity and importance of innovative cluster in the building materials industry. "Social sciences and humanities in the education system" ISSN 2181-7286 Tashkent State Technical University named after Islam Karimov 2020



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VERSATILITY IN THE STORIES OF GAFUR GULAM

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ABSTRACT

The stories of well-known Uzbek writer Gafur Gulam are discussed in this article. The short stories "Kizalok" ("The girl"), "Shoshilinch telegramma" ("Urgent telegram"), and "Gazna" ("The treasury") are used to investigate the peculiarity of his writing talent. The writer's heroic spiritual experiences, as well as the richness of the vision of human nature's uniqueness are discussed. They are discouraged by the suitors coming to the young man. Mukarrama, who leaves her father's house with her boyfriend, thinks: "If only my father and mother weren't upset". In the story, the young man not only makes the ceiling and floor in the room where he and his wife live, but he also makes a brick stove on one side. He decorates the hotel separately. But when he comes to the old woman's room, he uses things like stool, mat, numdah, jug.

KEYWORDS: Hero, Prose, Story, Image, Artistic Expression, Originality, Artistic Craftsmanship.

INTRODUCTION

Gafur Gulam is well-known figure in Uzbek literature from the twentieth century. We have inherited a significant creative heritage from him as a poet, prose writer, translator and literary critic. Gulam's efforts are crucial in molding today's youngsters into people who are flawless in every manner.

We know that the artist was orphaned when he was a child and had to take care of numerous home tasks. He recalls his existence in the whirlwind of life, his adventures, in a variety of poems and stories.

In the 1920s, Gafur Gulam joined the Turkestan Commissariat of Education's drive to collect orphans. He works as a director-educator at "Urfon" school, boarding school (orphanage) for 150 students. Even if he perceived a certain resonance and likeness in his life, he could not be

obvious to the fate of orphans and their plight. The poet's first poem was likewise inspired by incidents that occurred in an orphanage. The poet, on the other hand, was dissatisfied and did not believe it important to publish.

G. Gulom pays special attention to the problems of children who have lost their breadwinner in his publicist articles. He encourages all comrades to gather orphans, encouraging good and honorable activities, in his piece "Let Us Not Forget Our Brothers".

Literary critic S. Mamajonov, who spoke about Gafur Gulam's short prose, quotes Oybek as follows: « *Gafur describes the image of people well in his stories. He can get into the psychology of his little characters. It clarifies their views, attitudes, goals and aspirations*» (2.50).

In writer's story "The Girl" (1928), the fate of Mukarrama and Ibai, who aspire to a free life, is decided by the girl's parents: uncle Shokir and aunt Zulaikho. They are discouraged by the suitors coming to the young man. Mukarrama, who leaves her father's house with her boyfriend, thinks: "If only my father and mother weren't upset". Although she lives peacefully in Andijan, she misses her parents. She embarrassed and apologizes for such a thing what she did. Especially impressive was the kindness of the parents who accepted Mukarrama's letter and knew that their child was healthy and happy. When Shokir uncle said: "May God give white road", aunt Zulaikho said, "...I see all three souls in good health".

Apparently, the girl's heart is full of remorse and her parents' feelings are full of compassion. Verses 23-24 of Surah al-Israh in the Qur'an state that honoring one's parents throughout life is one of the basic duties of every person(6). A child who wants to honor his parents must first love his mother. After all, "Paradise beneath the feet of mothers". Ms. Annemarie Schimmel, a German Islamic scholar, notes that many scholars, mothers of perfect people, were educated women who set an example for their children with their impeccable lives (1.84).

Indeed, a mother's role in Muslim life and responsibility for raising a child is extremely high. That is why our writers and poets pay special attention to the image of the mother in their works. In the stories and narratives of Gafur Gulam there are many interpretations of the image of the mother, which clearly demonstrates the skill of the writer. In the aforementioned story, "Kizalok" ("The girl"), the writer's artistry in this regard is even more evident. Writer makes a lyrical digression in the story and talks excitedly about his mother's love:

«No care can compare to the grace of a mother giving white milk. Mothers are respected for their hard work to grow and procure. All mothers are creators of the future, all mothers are "goddesses" of society...» (10. 16). If you pay attention, it is not only the main characters of the story, but also "all mothers," that is, the female race. It is also the cry of the writer's unkind heart toward his mother, who passed away at the age of only 36.

In the story "Urgent Telegram" ("Shoshilinch telegramma") (1931), based on a life story caused by a misunderstanding, postal workers confuse both the address of the telegram and the names of the senders. However, the tragic news throws the main character Mirmulomiddin into a whirlpool of endless sadness and suffering. In order to get rid of anxious, he cries until «...*the summer robe becomes wet* ». «*A hiccup caught in his throat and his body shuddered*»: «- *My mother, my dear mother, the cradle shook in the morning, the white milk, the wagon of my existence, died ... What a train wreck, what a tragedy. Fog filled the world, and tears flowed*

from my eyes» (10. 107). Although this story was written in 1931, there is no doubt that it also shows the traces of young Gafur Gulam's suffering in 1917 when he lost his mother.

The writer can lift this sad situation from the middle with a laugh in the story. That the date given in the name of Mirmulomiddin, who recalled his mother's death in Tashkent in 1918, corresponds to a prosaic biography, also confirms our opinion. The hero's humor by nature is also very close to the character of Gafur Gulam. The author also skillfully uses the appearance of letters to reveal the spiritual world of the main character. Contrasting situations exacerbate a funny situation. In the case of the telegram he said: *"The letters caught fire, and they began to burn me. "Every "alif " stabbed me in the stomach, every "sukun" squeezed my shoulder like fur, every" wow "dragged a poisonous dragon behind me" .(10. 107)*

When he saw the telegram as a joke, he said: "Every "alif "was a humorous finger under his arm, every "sukun" began to tickle his face like a mouth, every "wow"began to tickle his ears like a wet heap of girls. Or, if we look at examples like "I signed like a duck tail," it becomes clear that we are right.

A balanced set of expressive means in the work of Gafur Gulam - the palette of images is very diverse. The above examples are somewhat similar to Cholpon's novel. In his novel "Kecha va kunduz " ("Night and Day") Cholpon speaks with bitter sarcasm in her description of the trial transcript. Let's look at the tone of the quote: *"To be fair: the minutes are written in very beautiful writing. On a piece of paper, it goes straight, like a railroad track.. See the letters "d" and "b" above everything else! You will be amazed! Where "b" occurs, the tail is turned to the left; where "d" occurs, the tail is turned to the right. They both have high tails: both have their tails twisted like snakes! Not the protocol,show!Show!» (10. 255).*

While Cholpon exposed the tsarist regime in more depth, Gafur Gulam laughed at the chaos in the Soviet office. In this respect, the goal of the authors is to converge. However, it should not be overlooked that the story of Gafur Gulam was written in 1931, the novel Cholpon in 1935, and that these works differ in genre. Of course, one cannot say that Cholpon learned from the works of Gafur Gulam. However, the fact that the story was published at the time the novel was written suggests that Cholpon was familiar with it. It is worth noting that both authors were influenced by Russian literature, particularly the work of Gogol, in expanding the possibilities of artistic imagery.

The main character in Gafur Gulam's story "Gazna"("The treasury ")(1935) - "I" also connects the voice of the narrator. The exceptional confidence in the main character of the story is evident not only in his actions, but also in his words and actions, in his way of thinking.

Gafur Gulam cannot separate this character from the national soil, Uzbek traditions and culture, and Muslim psychology. The fact that the national basis of history is essentially compelling is also one of the factors that has ensured its survival. It tells the story of a young man who moves into a new home and arranges it in his own way: *« We carved a stool out of the upper part of the room of the second house, put a mat on the bottom, numdah on it, and entered the old woman with pleasure. (Whatever parents do, on the one hand they want joy and say, but on the other hand they want to please the ghost of the father).Anyway a jug ablution water with a sip of lenten soup is ready » (10. 131)*

In the story, the young man not only makes the ceiling and floor in the room where he and his wife live, but he also makes a brick stove on one side. He decorates the hotel separately. But when he comes to the old woman's room, he uses things like stool, mat, numdah, jug. This is not entirely accidental. He respects his mother's character, traditions, psychology, beliefs. This is the secret of "decorating" the room to the old woman's taste. In addition, as a Muslim child, he wants to conquer the hearts of his mother and fulfill his childhood responsibilities according to Islamic morality.

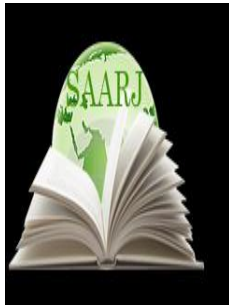
It is worth noting that in the story "Gazna" ("The treasury") in which the narrator uses the form of speech "I," one also hears Gafur Gulam's own voice, typical of his attitude toward his mother. In it the image of the conditional narrator is much closer to the author. It is not difficult to understand the tasks performed by the narrator by paying attention to the fact that the author's voice is absorbed by the voice of the main character.

While the "Gazna" ("The treasury")'s main character's misunderstanding of technical novelty is the story's novelty, tradition seems to be in the narrator's mind, in his heart the prevalence of Islamic enlightenment, in his practical activities, and in his faithful servant of God. Therefore, he cannot be called an uneducated man. After all, he is a man who deeply feels the duty of childhood, who seeks peace in the family, who has noble feelings. Writer emphasized the complexity of human nature, demonstrating the multifaceted nature inherent in the protagonist's character, as required by the situation.

In general, Gafur Gulam made a balanced use of colorful imagery, which ensured the popularity of his stories. Writer describes human nature and spiritual experience according to the lifestyles of the main characters. His stories have a special significance as an example of high art.

REFERENCE:

1. Annemarie Schimmel. Beautiful girl in my soul. Translation from German by Yuldash Pard.T. :Sharq, 1999.
2. Mamajonov S. Prose of Gafur Gulam. T. :Subject, 1966,
3. Matyokubova T. The Art of Gafur Gulam.. – T.: Science and Technology, 2006
4. Nazarov B. The World of Gafur Gulam. - T.:Subject, 2004.
5. Cholpon. Night and Day(Kecha va Kunduz). A novel // I took my word for it again. T. : Literature and Art, 1991
6. The Holy Qur'an. Uzbek - explanatory translation. The author of the translation and commentary is Alauddin Mansur. Surah Al-Isra. T.:Cholpon, 1992.
7. Gafur Gulam. A fine collection of works. 12 volumes. T.1. -T.:Subject, 1983
8. Gafur Gulam. A fine collection of works. 12 volumes.. T.2. -T.:Subject, 1984
9. Gulam. A fine collection of works. 12 volumes.. T.Z.. -T.:Subject, 1984
10. Gafur Gulam. A fine collection of works. 12 volumes.. 6 v. T. :Subject, 1986



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AN OVERVIEW OF 3D PRINTING IN EDUCATION

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ABSTRACT

In a variety of topics and educational contexts, the development of additive manufacturing and 3D printing technology is creating industrial skills shortages and possibilities for innovative teaching methods. As a result, research on these behaviors is developing across a broad variety of education fields, although frequently without reference to other disciplines' research. To address this issue, this article brings together disparate sources of research to offer a current literature overview of where and how 3D printing is being utilized in education. Six use categories are identified and described as a result of research into the application of 3D printing in schools, universities, libraries, and special education settings: (1) to teach students about 3D printing; (2) to teach educators about 3D printing; (3) as a support technology during teaching; (4) to produce artefacts that aid learning; (5) to create assistive technologies; and (6) to support students. Although evidence of 3D printing-based teaching methods can be discovered in each of these six areas, adoption is still in its early stages, and suggestions for future study and education policy are offered.

KEYWORDS: 3D Printing, Education, School, Student, University.

1. INTRODUCTION

As you may be aware, additive manufacturing is becoming more popular in a variety of sectors. To utilize 3D printing, you must first comprehend it. It is no longer necessary to demonstrate the significance of 3D printing in professional degrees. 3D printing has a wide range of applications, and it is currently utilized in a wide range of sectors for product development, manufacturing, tooling, and prototyping. Additive manufacturing will be present in increasingly more sectors in the near future, and education's job will be to educate students for future professions. Furthermore, 3D modeling and 3D printers can readily bring any educational topic to life, and 3D printing helps students develop strong practical skills such as coding and design thinking. There are a slew of benefits to using 3D printing in schools[1]. 3D printing and its close cousin, additive manufacturing, are digital fabrication technologies that are slowly but steadily challenging the industrial sector. While 3DP is still useful for fast prototyping and tooling, it is its use as a direct production technique that is causing widespread systemic upheaval. This disruption is taking place as 3DP gains momentum in areas where its present degree of technical complexity aligns with market requirements. Improvements in productivity and quality are being made, but a number of studies and reports looking into 3DP and digital fabrication have warned that a lack of 3DP education and skills is a major barrier to wider adoption.

As a result, it is essential to look at the present state of research on the implementation of 3DP in the educational system. The education system is defined as elementary and secondary schools, as well as institutions of further and higher education, for the sake of this analysis[2]. It examines the use of 3DP for instructional reasons rather than research. Furthermore, this study does not examine the use of 3DP for instructional objectives in an industrial setting. Prior research on 3DP has focused on how students learn about the technology, how educators learn about the technology, how design skills and methods for creativity are taught, and how learning may be facilitated via the creation of artefacts, according to a review of previous studies[3]. Across the K-12 spectrum and in colleges, as well as in libraries, makespaces, and special education settings, such activities are taking place. Before delving into these issues in depth, we'll give you a quick primer on 3DP and the use of digital fabrication technology in education[4]. In contrast to other general-purpose technologies, 3DP refers to a group of technologies that use additive layer-by-layer digital fabrication to create three-dimensional things. "Additive manufacturing" (AM) is described as "a technique of connecting materials to create things from 3D model data, typically layer by layer, as opposed to subtractive manufacturing methodologies" in its official nomenclature.

ASTM recognizes seven kinds of additive manufacturing, and a broad variety of goods based on these types are available on the market. Fused deposition modeling (FDM), stereolithography (SLA), selective laser sintering (SLS), selective laser melting (SLM), and digital light processing (DLP) are some of the most commonly used 3DP technologies, although new additive processes are still being researched and commercialized[5]. While polymers were first utilized in 3DP for prototyping, a considerably broader range of polymers, metal alloys, composites, and ceramics have since been created for use in digital manufacturing, with the kind of 3DP method used and the intended application dictating their usage. In comparison to other subtractive and transformational manufacturing methods, 3DP is an additive manufacturing process. In comparison to these methods, 3DP has a lot of benefits. However, being an emergent technology, it is still in its early stages of development; it has yet to reach its full potential, and there are extra

socioeconomic obstacles to overcome due to the technology's novelty. Table 1 provides an overview of these benefits and difficulties. The main firms in the 3DP sector are presently Stratasys and 3D Systems. They may be traced back to the initial 3DP patents filed in the mid-1980s, and they've evolved from being only focused on the use of 3DP in fast prototyping to a broader use in digital manufacturing. New entrants in both the professional and consumer sectors have been lured by the sector's development. The latter has attracted the bulk of newcomers. The RepRap project, an open source effort to build a self-replicating robot, was the catalyst for the consumer 3DP boom. Members of the Maker movement all around the world were very interested in this project. This initiative, along with the development of crowd funding sites like Kickstarter and Indiegogo, has allowed a slew of new businesses to enter the market. The 3D printer is just a small part of the broader 3DP business ecosystem. The 3DP ecosystem comprises businesses that create 3D scanning technology, CAD software, and materials, as well as service bureaus and online distribution platforms, in addition to equipment makers.

1.1 Ways of 3D printing being utilized in education

The purpose of this review is to describe how 3DP is utilized in the educational system. The parts that follow provide a summary of the information. There are four major educational settings where 3DP is used: Schools, colleges, libraries, and special education settings are the four types of educational environments. Each of these sections provides a brief explanation of how 3DP is implemented. utilized in these situations

- The use of 3D printing in schools: 3DP in schools and children's environments. From basic through secondary school, education encompasses the whole range, from elementary to middle school, for secondary/high school students, as well as combinations of the three. However, since there are few publications that explicitly address elementary and middle school, they are grouped together. For the sake of this debate, secondary and high school are used. Physical prototyping, such as 3DP, may help students get a better grasp of science and arithmetic. The bulk of the articles in this body of work support this viewpoint, providing instances of how 3DP is being utilized in schools to enhance STEM teaching. In the sciences, for example, 3DP was utilized to teach atomic structure to Grade 10 chemistry students, with a favorable connection discovered. between the incorporation of technology into the classroom and student learning. Japanese high school pupils, on the other hand, studied about By producing 3D printed police whistles, audio frequency may be increased. In Students were exposed to 3D printer building, computational thinking via a mix of Minecraft and 3DP, and design thinking through a 3D printer. Kaysville, a printed city planning game. Other research focuses on design explained how pupils learned to be creative. Product design and development, as well as technical drawing. In elementary schools and high schools, students are developing prosthetic hands. A project-based learning study of a trans media book project It was discovered that utilizing 3DP enhanced students' mathematical performance, as well as their knowledge of geometry. Via the creation of three-dimensional forms STEM The use of 3DP in K-12 education has been used to achieve integration. Students learnt about the enormous extinct shark in paleontology. 3D printed replicas of the teeth of Carcharocles megalodon. Furthermore, 3DP is being utilized in a number of STEM-related projects. School-based outreach initiatives. With the capacity to rotate 10 times, visualizations may help with spatial instruction. Year-old boys are especially well-served. Many of the benefits of 3D printing are shown in the examples above. They enable self-

directed creation and capability for autonomous and introverted labor, as opposed to virtual, screen-based artefacts. in addition to increasing physical tactility and observability. Created physical artefacts Incorporating 3DP into school curriculum is also beneficial from a pedagogical standpoint, since it may offer chances for collaboration. Various learning methods, including experiential learning, will be practiced. As well as failure. It was discovered in a study of two Greek high schools that. The usage of 3DP allowed for the exercise of various learning methods, including “We have found that this is especially helpful in engaging specific students: When given the appropriate motivation and resources, students who were otherwise uninterested in their project class (according to them and their instructors) may select what they want to study via inquiry Then students may proudly share their findings with others while gaining knowledge. rather than dry knowledge from textbooks.

- Universities that use 3D printing: Universities are the most likely to use 3DP in tertiary education. Moreover, there are just a few accounts of the technology's acceptance in the United States. additional institutes of higher education and continuing education Within Articles on the usage of 3DP at universities may be found in the literature. The usage of 3DP systems, scientific models, and test models; the development of 3DP systems, scientific models, and test models 3DP during project-based learning; incorporating 3DP skill development into the curriculum by incorporating it into current curricula courses, as well as new course introductions; and external involvement outside of the university This section contains short descriptions of each in the series. Turn. There are many stories of how open source was created. Engineering courses are including RepRap 3D printers. A mechatronics design's main point is their construction. Jordan is working on a senior capstone project at Philadelphia University, which is funded by the Princeton / Central Jersey Section .The Institute of Electrical and Electronics Engineers' (IEEE) Professional Committee on Joint Standards (PCJS) (IEEE)and is utilized at the University of Applied Sciences Offenburg to teach 3DP to industrial engineering and business masters students. In this instance, students constructed the 3D printer first, then downloaded and printed 3D models. The sciences, where 3D printing is used extensively at institutions, are one of the most important applications of 3DP. In the lab or in the classroom, models are developed to aid student learning. This use of 3DP to create visual models In a similar spirit, This also contains test specimens for determining the mechanical characteristics of various materials.
- Materials test models made of 3D printed polymer have been shown to be acceptable in engineering courses for this purpose, and Mechanical testing have been integrated into an undergraduate capstone research course at the University of Johannesburg's Mechanical Engineering Science Department. MSc graduate students at the University of Toronto's Faculty of Mechanical Engineering. During the fan and turbo compressor development, Belgrade utilized 3D printed components. Fourth-year aeronautical engineering students at Technion – Israel Institute of Technology created several experiments. 3D modeling was used to test various wing spoiler configurations and their effects. Wind tunnels using printed models. 3DP has also become a popular teaching tool in robotics. Being a low-cost method of promoting educational development haptic devices and robotics. For the chassis, a 3D printed chassis was used. Students may alter low-cost open source robotic systems. Robot, as well as to disseminate these changes to other students .3DP may be used to support project-based

learning and other types of learning. Numerous articles have been written on the usage of 3DP in projects [6]. The University of Michigan is one example. Second-year mechanical engineering students in Modena and Reggio Emilia. Undergraduates utilized 3DP to design and build an app as part of a project. The State University of New York's eye-tracking system, and The incorporation of 3DP into the classroom increased student involvement. a semester-long design program called "Introduction to MEMS". During It was a master's degree in mechanical engineering at Politecnico di Torino. The use of 3DP in a project-based learning setting was shown to enhance student attitudes toward mechanical engineering. Specifically, it was discovered that using 3DP resulted in favorable student response. Motivation, comprehension, interest, and education of students[7].

- 3D printing in libraries: Libraries at schools , universities , and community colleges , as well as public libraries, medical libraries , and libraries in general , are all mentioned in studies that view the library as a site where 3DP happens. The use of 3DP in libraries is part of a broader discussion regarding the role of libraries in the digital age. Those opposed to 3DP in libraries claim that it is a "exotic cutting-edge technology-based service" that is "a simple luxury or a needless expenditure for what may only be a limited number of customers". According to the sample of publications examined here, this is a minority viewpoint, with the majority of articles expressing support for 3DP integration within library services. "In most companies, the library is a natural option to store technology that has many potential users," says a more representative statement. Libraries can provide a significant service to their organizations by offering space and expertise for 3D printing while also increasing awareness of the other services they provide". Libraries, as a physical place, facilitate cooperation and knowledge sharing among library users, librarians, and educators, as well as lowering obstacles to participation. As a result of this accessibility, maker spaces inside libraries have emerged as creative spaces where library users may use 3D printers and other digital fabrication technologies, with such places promoting innovation and experimentation.
- While the majority of maker spaces are formed inside libraries, there are many examples of maker spaces that are developed outside of libraries[8].The neutral, non-departmental area at universities enables for contacts between students from other faculties as well as extracurricular usage. "The library is frequently viewed as a non-disciplinary or cross-disciplinary place on campus, where all users have access to the resources and services," Van Epps et al. write. By integrating 3D printing into our libraries, we are able to expand access to 3D printers from a select few to everyone". While access to non-traditional library services such as 3DP may be enhanced, their adoption in university libraries may be limited. Running basic 3DP workshops and pop-up maker technology workshops may help increase awareness, as can finding local champions like design professors, 3D visual researchers, and design-oriented student organization. Groenendyk and Gallant describe how the library wanted to "take the knowledge-sharing, innovation-driven principles of hacker spaces and integrate them into an academic library setting" in their 3D printing and scanning pilot projects at Dalhousie University Library[3]. The library wanted to make 3DP available to students who weren't previously familiar with it, such as those studying engineering and architecture. The 3D printing and scanning technologies were chosen for their low cost and ease of use. The librarians also anticipated that the 3D scanner would allow them to digitize and preserve different scientific and cultural items online. "By establishing this collection,

the Libraries will contribute to providing online visibility for both student and faculty work, as well as ensuring that the 3D material gathered is maintained and publicly available”. Librarians play an important role in the integration of 3DP into a school or institution. “School libraries may act as test beds,” said Mark Ray, Chief Digital Officer of Vancouver Public Schools[9]. As others follow our example, teacher librarians may play an important role in assisting educators who are dealing with change and uncertainty in this brave new world”. Library personnel, as a central resource, not only assist people who come into the library, but also educators who want to integrate 3DP into their teaching practice. A partnership between a librarian and an instructor at LaGuardia Community College resulted in the creation of a biological model for in-class instruction. While librarians' time and skill in delivering such services is a limiting issue, providing them with training in the use of 3DP technologies may help them overcome their lack of knowledge and discomfort when dealing with library customers. Such fundamental training is required to offer student instruction, as well as to guarantee that library personnel can maintain 3DP equipment and resolve problems. Librarianship abilities will need to develop in tandem with technological advancements.

- The use of 3D printing in special education: For individuals with visual, motor, and cognitive disabilities, 3DP is being utilized in special education settings. Within these contexts, students with visual motor and cognitive impairments, as well as combinations of the three, have utilized 3DP[9]. The use of 3DP in these contexts allows for the development of customized adaptive devices and instructional aids, as well as increased student engagement in STEM topics, the use of 3DP to build assistive devices is explored in more depth. As detailed in Buehler et al two-year 's study into its uses using 3DP in special education settings has significant difficulties. Students with cognitive impairments were given lessons on how to use Tinkercad software before being invited to build their own 3D creations in one of their studies. However, due to the complexity of the job and the short time available, most students chose to print or alter designs from open-source websites rather than develop their own[7]. Due to the difficulty of utilizing the program, students' enthusiasm in creating unique designs seemed to wane, with problems noted in changing perspectives and manipulating items. Furthermore, students with high assistance requirements found it especially difficult to create in three dimensions. Other adoption issues developed as a result of the students' occupational therapists[8]. While excited about 3DP's potential, they were worried about the time and effort needed to learn how to use the program “they presently view 3D design and printing as someone else's job, and see themselves as consumers of that work[10].”

2. DISCUSSION

3D printing, also known as additive manufacturing, has been called the next big thing, with the potential to be as widely used as the cellular phone industry. 3D printers convert a digital blueprint into a real three-dimensional item. Plastic, metal, nylon, and over a hundred more materials are used in the printing process, which is done layer by layer (additive manufacturing). Manufacturing, industrial design, jewelry, footwear, architecture, engineering and construction, automotive, aerospace, dentistry and medical industries, education, geographic information systems, civil engineering, and many more fields have found 3D printing to be beneficial. In every area of application, it has shown to be a quick and cost-effective solution. 3D printing's

uses are growing all the time, and it's proving to be a really interesting technology to keep an eye on. We will look at how it works as well as present and prospective uses of 3D printing in this article.

3. CONCLUSION

The current research on the use of 3DP in the school system has been summarized in this article. This state-of-the-art study offers a better picture of where and how 3DP is being utilized in the educational system by synthesising a varied and fragmented literature of 280 articles. Table 6 contains a high-level overview. Given its history as a fast prototyping technique, it's no surprise that 3DP is most often used in university engineering and design programs, with specific 3DP courses developing from these fields. However, it is clear from this study that 3DP has grown beyond its origins; it is now being actively integrated into a number of different topics and is being utilized to create learning artifacts. Other STEM fields are the most visible users of 3DP outside of engineering and design, and they are starting to show how 3DP may establish cross-linkages across different topics. There are presently just a few recorded instances of 3d printers being used during in-class instruction in non-STEM disciplines.

REFERENCES

1. Y. AbouHashem, M. Dayal, S. Savanah, and G. Štrkalj, "The application of 3D printing in anatomy education," *Medical Education Online*. 2015, doi: 10.3402/meo.v20.29847.
2. Y. Sun and Q. Li, "The application of 3D printing in mathematics education," 2017, doi: 10.1109/ICCSE.2017.8085461.
3. Y. M. Kwon, Y. A. Lee, and S. J. Kim, "Case study on 3D printing education in fashion design coursework," *Fash. Text.*, 2017, doi: 10.1186/s40691-017-0111-3.
4. A. Marro, T. Bandukwala, and W. Mak, "Three-Dimensional Printing and Medical Imaging: A Review of the Methods and Applications," *Current Problems in Diagnostic Radiology*. 2016, doi: 10.1067/j.cpradiol.2015.07.009.
5. L. M. Meier, M. Meineri, J. Qua Hiansen, and E. M. Horlick, "Structural and congenital heart disease interventions: The role of three-dimensional printing," *Netherlands Heart Journal*. 2017, doi: 10.1007/s12471-016-0942-3.
6. I. Valverde, "Impresión tridimensional de modelos cardiacos: aplicaciones en el campo de la educación médica, la cirugía cardíaca y el intervencionismo estructural," *Revista Espanola de Cardiologia*. 2017, doi: 10.1016/j.recesp.2016.09.043.
7. J. S. Kim, S. Hong, and C. Hwang, "Bio-ink Materials for 3D Bio-printing," *J. Int. Soc. Simul. Surg.*, 2016, doi: 10.18204/jissis.2016.3.2.049.
8. W. Huang and X. Zhang, "3D printing: Print the future of ophthalmology," *Investig. Ophthalmol. Vis. Sci.*, 2014, doi: 10.1167/iovs.14-15231.
9. C. Li, T. F. Cheung, V. C. Fan, K. M. Sin, C. W. Y. Wong, and G. K. K. Leung, "Applications of three-dimensional printing in surgery," *Surgical Innovation*. 2017, doi: 10.1177/1553350616681889.
10. T. P. Mpofu, C. Mawere, and M. Mukosera, "The Impact and Application of 3D Printing Technology," *Int. J. Sci. Res.*, 2014.



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APPLICATION OF NANOTECHNOLOGY IN AGRICULTURE

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ABSTRACT

From approximately 3.6 percent in 1985–1995 to less than 2 percent in 1995–2005, India's agricultural growth has slowed. This is far below the agriculture sector's goal of 4% annual growth by 2020. Food grain production is the main source of worry. Nanotechnology (NT) has been recognized as a promising technology for revitalizing the agricultural and food industries, as well as improving the life of the poor. Nanotechnology may help a variety of industries, including health care, materials, textiles, information and communication technology (ITC), and energy. Nanotechnology is used in crop production, food processing and packaging, food security and water purification, environmental remediation, crop enhancement, and plant protection in the agricultural industry. Agricultural production may be increased by using nanomaterials to create genetically better animals and plants, site-specific medication and gene delivery at the cellular/molecular level in animals and plants, and Nano array-based genetic alteration in animals and plants under stress. Nanotechnology has the potential to improve disease resistance, plant growth, and nutrient utilization by allowing precise administration of agrochemicals. Nano encapsulated solutions demonstrate the capacity to utilize pesticides, insecticides, and herbicides more effectively and site-specifically in an environmentally benign and greener manner. It has been effectively utilized in postharvest to preserve the freshness, quality, and shelf life of stored products while also avoiding disease outbreaks in a relatively

safe manner. Nanomaterials are a relatively new technology in agriculture, and further study is needed. Nanotechnology's application in agriculture has social and ethical implications that must be addressed. The toxicity of nanomaterials must be assessed before they can be commercialized and used in the field.

KEYWORDS: *Agriculture, Climate, Fertility, Nanotechnology Soil.*

1. INTRODUCTION

In the period 2004–2015, India's agricultural growth was 3.59 percent (Ministry of Finance, Government of India 2014), which is lower than the goal of 4% annual growth in the agricultural sector by 2020. Food grain production is the main source of worry. Annual per capita food grain output has decreased from 207 kg in 1991–1995 to just 179 kg in 2014 (Ministry of Agriculture, Government of India 2017–2018), posing a threat to food and nutritional security. With limited water and land resources, focused agricultural development may be achieved through careful application of modern technology to increase per unit natural resource productivity and farm revenue[1]. During the green revolution, potential yields and agricultural earnings were multiplied by utilizing short-duration modified high-yielding cultivars, extensive fertilizer usage, irrigation, and pesticides, while failing to utilize natural resources sustainably and efficiently. Farm production and earnings have been steadily declining in recent years. Stabilization of agricultural output is essential to sustain overall national growth, since agriculture is the source of livelihood for 60% of India's people.

Degradation of natural resources such as soil, climate, and water hastens the issues[2]. "Technology fatigue" is a term used to describe the tough condition in Indian agriculture. Focusing on innovations that may improve agricultural output, resource usage efficiency, and product quality is the need of the hour to overcome "technology weariness." Nanotechnology (NT) has been recognized as one of the promising technologies that may revitalize the agricultural and food industries and enhance the life of impoverished people. Nanotechnology is one of six "Key Enabling Technologies" recognized by the European Commission as having a significant role to play in the long-term development of many sectors (EC 2012). Norio Taniguchi coined the phrase "nanotechnology" in 1974. Nanotechnology is a field of science concerned with the study of materials at nanoscale scales (1–100 nm) (US EPA). Individual atoms, molecules, and molecular clusters are manipulated into new structures with new or completely different characteristics. At the nanoscale level, it includes a variety of applications such as the construction, control, and structuring of devices and materials of different natures such as chemical, physical, and biological. In 2001, the US Federal Government launched the National Nanotechnology Initiative (NNI) to promote nanotechnology[3].

Nanotechnology, according to the NNI, is the reorganization of matter with at least one dimension ranging from 1 to 100 nanometers. In general, the novel physical and/or chemical characteristics of nanoscale devices and materials offer significant roles in health, electronics, biotechnology, energy, and materials science. Nanotechnology, as a tool, can address the world's most pressing water, energy, health, agricultural, and biodiversity (WEHAB) issues. The United Nations Johannesburg Summit on Sustainable Development in 2002 highlighted these five key topics. According to a UN survey, increasing agricultural production via nanotechnology in poor countries is the second most significant factor in attaining Millennium Development Goals,

behind energy conversion and storage. Water treatment is the third most important use of nanotechnology. However, nanotechnology's use in the agricultural sector and food systems is still in its early stages both globally and in India, and its final success will be determined by stakeholder acceptability. The use of nanotechnology in agriculture necessitates the development of efficient regulatory and governance processes and systems involving all groups of stakeholders. As a result, nanotechnology has the potential to bring about a much-needed second green revolution in India's agricultural sector, with a focus on sustainable output. The following sections go through the many uses of nanotechnology in depth.

Agriculture benefits from many technical advances like as hybrid varieties, synthetic fertilizers, and pesticides throughout time. Now, agricultural experts are recognizing that smart innovation, such as nanotechnology, is critical for agricultural development in order to address global food security and climate change problems. Nanotechnology applications in agriculture have just recently gained prominence, although research on the subject began more than half a century ago. Nanomaterials are needed for increasing fertilization (or fertilizer) efficiency, yields, and reducing pesticide use; rapid and early pathogen and toxic chemical detection in food; smart pesticide and fertilizer delivery systems; smart food packaging and processing systems; and regulating agricultural food security. Agricultural productivity can be increased by using nanomaterial-induced genetically improved animals and plants, site-specific drug and gene delivery of molecules at the cellular/molecular level in animals and plants, and nano-array-based genetic modification in animals and plants under stress. Existing contaminants may be degraded and reduced using nanofilters or nanocatalysts, resulting in less pollution. Nanotechnology can be used in agriculture to make slow-release nanofertilizers for plant fertilizer; nanoparticles encapsulated pesticides for controlled and on-demand release; site-specific drug and nutrient delivery in fisheries and livestock; nanoparticles, Nano brushes, and Nano membranes for water and soil treatment; cleaning and maintenance of fishponds; and Nano sensors for a variety of applications.

1. Application of Nanotechnology in Agriculture

- *Soil Fertility Management:* Fertilizers are needed to preserve soil fertility and produce high-quality food and crops, especially with the introduction of high-yielding, hybrid, and fertilizer responsive cultivars. Leaching, drifting, runoff water, evaporation, soil moisture-driven hydrolysis, and microbial and photolytic degradation are all losses caused by traditional fertilizer delivery techniques (such as spraying and broadcasting). As a result, relatively little concentration reaches the intended location. Conventionally applied fertilizers lose 40–70 percent nitrogen, 80–90 percent phosphorus, and 50–90 percent potassium in the environment, necessitating recurrent fertilizer and pesticide treatments. However, excessive fertilizer and pesticide usage pollutes the environment, degrades natural resources, develops pesticide resistance in pests and diseases, reduces soil microflora and nitrogen fixation, and produces pesticide bioaccumulation. As a result, the best use of chemical/synthetic fertilizer based on the nutritional needs of the crop and the least amount of pollution are critical. This may be accomplished by using Nano fertilizers. Nano fertilizers, also known as smart fertilizers, are nanomaterials (NMs) that provide single or multiple nutrients to plants, thereby improving crop development and yield, or those that attach, polymeric shell encapsulation, polymeric nanoparticles entrapment, and nutrient-rich nanoparticle synthesis. When coupled with Nano

devices for synchronized release of N and P fertilizer, Nano fertilizers minimize undesired nutrient losses to the environment.

Nano fertilizers exhibit regulated chemical release, site-specific delivery, decreased toxicity, and improved nutrient absorption, Nano sized mineral micronutrient formulations can improve solubility as well as dispersion of micronutrients in soil, reduce absorption as well as fixation, improve bioavailability, which leads to increased NUE, and conserve fertilizer resources while complementing the better performance of conventional synthetic fertilizers (Liu and Lal 2015). A Nano fertilizer is a nanometre-sized product that delivers nutrients to particular target locations, improving nutrient usage efficiency (NUE) and reducing environmental degradation. Nutrients are encapsulated in nonporous materials, coated with thin film polymer, or supplied as nanoparticles or nanoemulsions in one of three ways: (a) encapsulated in nonporous materials, (b) coated with thin film polymer, or (c) delivered as nanoparticles or Nano emulsions (Rai et al. 2012). Because of the high surface tension, nanomaterial encapsulation on fertilizer bonds the material more firmly. High solubility, controlled and timed release, stability, efficacy, enhanced targeted action by providing appropriate concentration, and decreased toxicity with simple, safe distribution and disposal are all features of the fertilizer Nano formulation.

- *Environmental Remediation:* Pollutant degradation and sequestration are two types of environmental clean-up. The use of nanomaterials for remediation, i.e. Nano remediation, would be more efficient and cost-effective. Nano remediation (the use of nanoparticles for environmental remediation) may be used to clean ground and surface water, wastewater, soil, sediment, or other contaminants, as well as to reduce air pollution. Reactive nanomaterials are employed in Nano remediation to detoxify and convert contaminants. Reactive nanoparticles are injected into a polluted aquifer through an injection well in this procedure. The reactive nanoparticles are transported to the polluted location by groundwater. When nanoparticles come into touch with pollutants, they may bind to them, immobilize them, and breakdown them into less harmful and mobile molecules via adsorption or complexation. The cost of drilling and packing a well is high. Direct push wells are less expensive than drilled wells and are the most used technique for nano-iron clean-up. For site-specific areas, a nanoparticle slurry is also utilized [3]. Many reactive nanoparticles' performance has been assessed. For environmental remediation, nanoscale zeolites, noble metals, carbon nanotubes (CNT), metal oxides, and titanium dioxide are employed. Because of its large surface area and reaction rate, nanoscale zerovalent iron is the most appealing and often utilized material for environmental clean-up. with particle diameters ranging from 10 to 100 nm are injected into polluted sites to degrade them by forming a nanoparticle "wall" that cleans water as pollutants pass through it, or by employing mobile nanoparticles tiny enough to flow through soil pores. When nZVI is utilized to clean up a polluted location, it produces fewer harmful compounds throughout the cleanup process. In Nano remediation, bimetallic nanoparticles (BNP) are also utilized. BNP is made up of iron or other metal components that have been conjugated with metal catalysts such as platinum (Pt), nickel (Ni), gold (Au), and palladium. TCE (trichloroethane) elimination is usually done using palladium and iron BNPs [4]. Carbon nanotubes (CNTs) have recently become more popular due to their unique characteristics. Single walled carbon nanotubes (SWNT) and multiwall carbon nanotubes (MWNT) are two types of carbon nanotubes that are rolled into tubes (MWNTs). They are used to remove heavy metals such as Cr^{3+} , Pb^{2+} , and Zn^{2+} , metalloids such as arsenic compounds and persistent organic pollutants (POPs) such as dioxin. The use of nanomaterials

such as carbon nanotubes (CNTs) and titanium dioxide (TiO₂) has the potential to purify, sterilize, and desalinate surface water. Heavy metals, organic pollutants, and pathogens are all common contaminants found in surface waters. Nanoparticles may be employed as sorbents or reactive agents in surface water treatment. Nanoparticles are also utilized in Nano filtration membranes. Air pollution can be controlled using nanoparticle-based filtering methods[5]. Nano filters in automobile tailpipes and industrial smokestacks will be able to separate pollutants and prevent their entrance into the atmosphere. Even at very low concentrations, Nano sensors can detect hazardous gas leaks.

- *Crop Improvement:* Scientists have been enticed by nanotechnology to think in new ways. It has been able to change the genetic composition of the crops, which would not have been feasible otherwise. A nanotech research project in Thailand sought to alter the atomic properties of indigenous rice varieties, including the well-known jasmine rice. It is a goal to eliminate the debate over genetically modified organisms (GMOs), since nanobiotechnology aids agriculture in avoiding the GMO debate and progressing to the next level - atomically modified organisms (AMOs). According to BIOTHAIR, scientists from Chiang Mai University's nuclear physics lab have successfully used nanotechnology to change the colour of an indigenous rice cultivar. The cultivar is renowned for its purple stem, leaves, and grains, and the name "Kam" means "deep purple." The purple hue of the cultivar's stems and leaves has been transformed from purple to green thanks to nanotechnology. The research group's next goal, according to its scientists, is to deal with jasmine rice[6]. They want to develop a modified jasmine cultivar that is photo-insensitive, can be grown all year, and has smaller stems and superior grain colour. Mutation breeding is being used by Chiang Mai researchers. They're attempting to figure out the best way to get a nanoparticle through a plant's cell wall and membrane so that it can enter the cell and cause a specific change in the genetic makeup without interfering with other cell wall and membrane activities. Crop enhancement via mutation breeding and nuclear physics is a well-known technique, and the Vienna-based UN Food and Agriculture Organization/International Atomic Energy Agency program has made major contributions in this area since the technology's beginnings. Scientists have been using X-rays, beta rays, and gamma rays to alter the genetic composition of agricultural plants from the beginning[7].

- *Crop Protection:* Pesticides are used extensively throughout the globe to fight pests and diseases in order to satisfy the increasing population's food needs. Alternative methods of limiting pesticide usage are urgently needed. Only around 0.1 percent of pesticides reach target locations, and the rest is lost to the environment due to runoff, spray dispersion, off-target deposition, and photodegradation, resulting in higher environmental and application costs. Nanomaterials, one of the most recent advances in agricultural sciences, serve a critical role in plant protection due to their unique physical and chemical properties. The use of nanotechnology in plant pathology has provided fresh insights into crop protection[8]. Nanoparticles cling to the pathogen cell wall, causing deformity and eventually death because to increased energy transfer. Nanomaterials achieve two critical elements of disease management: first, efficiency with little environmental impact and decreased human health toxicity. Plant protection may be achieved via the controlled release of encapsulated pesticides against pests and pathogens, as well as the early detection of plant diseases and pollutants from pesticide residues using Nano sensors. Kuma and Virage (2006) found that nanomaterials may be utilized to safely administer insecticides, herbicides, and fertilizers at lower dosages to cover large plant surfaces and thousands of

plants[9]. Nano pesticide formulations assist in the slow release of less soluble active compounds by increasing their solubility. Pesticides are packed into nanoparticles and released in stages, depending on the requirement. Because nanoscale products are more reactive than bulk materials, crop protection is enhanced with a little quantity of nanopesticides. The chemical is properly absorbed by plants after being Nano encapsulated for measured and effective release to a particular host plant for pest control. When creating a Nano product, the method by which nanomaterials are absorbed by plants and their subsequent mobility through plant tissues and organs is critical. The formulation changes depending on whether the active component is absorbed via the leaves or roots of the plant. The root can readily absorb nanopesticides; however the nanomaterial will be absorbed more efficiently if it is ingested via the leaves[10].

1.2 Nanotechnology in Pesticides and Fertilizers

Agriculture that is both sustainable and profitable is required these days. It may be seen as presenting a long-term ecological strategy. Excessive tilling of the soil, which leads to erosion, and irrigation without proper drainage are two practices that may harm soil in the long run. Salinization will result as a result of this. This is to meet the requirements of humans for food, animal feed, and fibre. Long-term experiments are needed to demonstrate the impact of various methods on soil characteristics that are critical to long-term sustainability and to provide critical data for this goal. Nano-chemicals have emerged as potential agents for plant growth and pest control in the United States, according to a government body. Fertilizers are necessary for plant development. Nanomaterials that serve as fertilizers may have characteristics like crop enhancement and reduced environmental toxicity. Plants may provide an important pathway for bioaccumulation of contaminants into the food chain. The use of NPs for more effective and safe chemical usage in plants has been a recent breakthrough in agriculture. Several researchers have studied the effects of different NPs on plant growth and phytotoxicity, including magnetite (Fe_3O_4) nanoparticles and plant growth, alumina, zinc, and zinc oxide on seed germination and root growth of five higher plant species: radish, rape, lettuce, corn, and cucumber, silver nanoparticles and wheat seedling growth, sulfur nanoparticles on tomato, zinc oxide on tomato, and zinc oxide on Wheat growth and yield may be aided by silver nanoparticles. Wheat growth and production were significantly boosted by 25 ppm SNPs added to the soil. Zinc has long been regarded an important element for plant metabolic processes, despite the fact that it is only needed in minimal quantities. Zinc was discovered to have a key function in the control of reactive oxygen species and the protection of plant cells from oxidative stress. Zinc plays an essential role in the metabolic processes that lead to the production of chlorophyll and carbohydrates, as well as the synthesis of auxin or indole acetic acid (IAA) from tryptophan. Zn shortage may have an impact on agricultural production and product quality. Insecticide resistance in pest insects is becoming a bigger issue for agriculture and public health. Magnesium oxide is a common inorganic substance that has a wide range of applications, including adsorbents, fire retardants, improved ceramics, hazardous waste remediation, and photo electronic materials. As a result, different Mop synthesis methods and pathways have been described. Green techniques were used to make Mg OH , which included nontoxic neem leaf extract, Citrus lemon leaf extract, and acacia gum.

- *Pest control for plants:* Fusarium wilt is a devastating disease of tomato and lettuce in many regions owing to significant production losses, fungal survival in the soil for extended periods of time, and the development of resistant races. With the use of resistant cultivars and

pesticides, the disease may be controlled to some degree. However, the emergence and development of new pathogenic races is a persistent issue, and chemical treatment is both costly and ineffective. In recent years, nanoparticles have been proposed as a potential option for controlling plant diseases. produced magnesium oxide nanoparticles and investigated the impact of various concentrations on the green peach aphid (GPA) in a greenhouse setting.

- *Potential for Nano insecticidal action:* Copper oxide nanoparticles may be made in a variety of ways, including precipitation and chemical reduction . Citrus lemon juice and carob leaves [are two examples of plant aqueous extracts that have been documented. Many researchers have developed various methods for synthesizing ZnONPs, including chemical, precipitation, hydrolysis in polar organic solvents, and microwave synthesis.
- *Antimicrobial activity:* Several nanomaterials, including silver nanoparticles, are employed as antibacterial agents in food packaging. This is due to its extensive usage. Titanium dioxide (TiO₂), zinc oxide, silicon oxide (SiO₂), magnesium oxide, gold, and silver are some of the other nanoparticles presently in use. Each has its own set of features and activities; for example, zinc nanocrystal has antibacterial and antifungal properties. Silver was utilized by NASA and the Russian Space Station to cleanse and sterilize water, silver zeolite, and silver. Gold has excellent antifungal and antibacterial properties against 150 different microorganisms, as well as great temperature stability and minimal volatility.

2. DISCUSSION

As a consequence of dangerous nanoparticles, researchers have a wide range of risk perceptions. Nanoparticles may enter the human body via eating, cutaneous exposure, and inhalation, and they can penetrate the circulation, blood–brain barrier, and digestive system owing to their high bioavailability. It's important to remember that nanoparticles have different chemical characteristics than their bulk equivalents while developing regulations. When it comes to agriculture, nanoparticles may help poisons penetrate deeper into the soil. Nanoparticles may bind with other contaminants due to their greater surface area. To identify possible dangers, possibilities of exposure, and the risks that nanomaterials pose to people and other animals, risk assessment is needed. There is a requirement to assess the degree of potential hazards and environmental consequences. Nanomaterials should be thoroughly described and evaluated for mammalian and ecological safety. Although many studies have found no toxic effect of nanoparticles on soil microbial community, interpretations about potential risk should be based on scientific evidence rather than speculations. They carry them through the soil, resulting in Nano-pollutants to be adsorbed and absorbed deeper and faster than normal. Furthermore, nanoparticles are often reactive and may accelerate physical or chemical interactions with contaminants, potentially resulting in the formation of new hazardous substances. It's still unclear if the various alternative methods are effective at the nanoscale, or how many have been validated for nanomaterials thus far. Before any regulatory action is implemented, several fundamental questions about the issue problem should be asked: is the current regulatory framework adequate? If not, where should the focus of effort for nanotechnology regulation be? As a result, appropriate risk assessment and safety measures must be implemented. Science-based policy choices will aid in the formulation of a suitable risk assessment methodology throughout this process. Science assists in making informed policy choices by providing risk and benefit information about a technology or a product produced from it.

3. CONCLUSION

Agriculture, food processing and packaging, food security and water purification, environmental remediation, crop development, and plant protection all benefit from nanotechnology. Nanotechnology has the potential to improve disease resistance, plant growth, and nutrient utilization by allowing precise administration of agrochemicals. Nano encapsulated solutions demonstrate the capacity to apply pesticides, insecticides, and herbicides more effectively and site-specifically in an environmentally benign, greener manner. It has been effectively utilized in postharvest to preserve the freshness, quality, and shelf life of stored products, as well as to prevent disease outbreaks in a relatively safe manner. Nanomaterials are a relatively new technology in agriculture, and further study is needed. Nanotechnology's application in agriculture has social and ethical implications that must be addressed. The toxicity of nanomaterials must be assessed before they can be commercialized and used in the field. Nanomaterials have the potential to harm the ecosystem, the environment, and human health. According to experts, the potential dangers associated with nanoparticles discharged into the environment are very hazy. Consumer and commercial goods discharge a large quantity of engineered nanoparticles into the environment as technology advances. The current critical limitation in agricultural use is production scale and cost. Nanomaterials will be mass-produced in large quantities, and their effective application in agriculture will drastically decrease costs. Nanomaterials' potential use in many agricultural applications necessitates further study into their synthesis, toxicity, and successful application in the field. There are still many opportunities to explore with new Nano products and methods in the area of agriculture.

Despite the potential benefits of nanotechnology, agricultural applications are limited in comparison to other industries. The academic sector is mainly responsible for agricultural success. For it to succeed on the ground, public opinion and appropriate regulatory mechanisms are essential. In order to evaluate safety, several regulatory agencies should be engaged. The proper labelling of Nano products may give a new technology a bad connotation. When consumers read labelling on Nano products, they may reject them. Some consumer preference surveys revealed a generally unfavourable public perception of nanotechnology. Agriculture remains a borderline area for nanotechnology, as pioneering agro-nanotech products struggle to find a market. This is due to high manufacturing costs of nanotechnology-based goods, which are needed in large quantities in the agriculture sector, unclear technological profitability, regulatory concerns, and public opinion. However, the research and development prospects are extremely promising, and the possibilities provided by nanotechnology in a variety of agricultural applications are being thoroughly investigated. In addition, nanotechnology is rapidly evolving in other fields. Information gained in other emerging areas, such as energy and packaging, may be used to agricultural purposes, or may have spillover effects. Precision farming becomes highly advanced and accurate when we use a synergistic approach that includes smart Nano sensors, wireless sensor networks with smart dust sensors, ambient intelligence and other technologies that help farmers make better decisions by providing precise information. The issue of enabling Nano sensor communication is yet unsolved. To overcome the difficulties and actualize this new paradigm, additional research on network size, energy harvesting, channel modelling, routing algorithm, and improved MAC protocol is required.

REFERENCES

1. N. Dasgupta, S. Ranjan, D. Mundekkad, C. Ramalingam, R. Shanker, and A. Kumar, "Nanotechnology in agro-food: From field to plate," *Food Research International*. 2015, doi: 10.1016/j.foodres.2015.01.005.
2. S. Neethirajan, I. Kobayashi, M. Nakajima, D. Wu, S. Nandagopal, and F. Lin, "Microfluidics for food, agriculture and biosystems industries," *Lab on a Chip*. 2011, doi: 10.1039/c0lc00230e.
3. C. Witharana and J. Wanigasekara, "Drug Delivery Systems: A New Frontier in Nano-technology," *Int. J. Med. Res. Heal. Sci.*, 2017.
4. S. Mousavi and M. Rezaei, "Nanotechnology in agriculture and food production," *J Appl Env. Biol Sci*, 2011.
5. J. K. Patra, G. Das, and K. H. Baek, "Towards a greener environment: Synthesis and applications of green nanoparticles," *Pakistan Journal of Agricultural Sciences*. 2016, doi: 10.21162/PAKJAS/16.3027.
6. H. K. et al. . Hajira Khanm et al., "Nano Zinc Oxide Boosting Growth and Yield in Tomato: The Rise of 'Nano Fertilizer Era,'" *Int. J. Agric. Sci. Res.*, 2017, doi: 10.24247/ijasrjun201724.
7. R. L. Maynard, "Nano-technology and nano-toxicology," *Emerg. Health Threats J.*, 2012, doi: 10.3402/ehth.v5i0.17508.
8. E. SAKA and G. TERZİ GÜLEL, "Gıda Endüstrisinde Nanoteknoloji Uygulamaları," *Etlik Vet. Mikrobiyoloji Derg.*, 2015, doi: 10.35864/evmd.513387.
9. M. Magno, S. Marinkovic, B. Srbinovski, and E. M. Popovici, "Wake-up radio receiver based power minimization techniques for wireless sensor networks: A review," *Microelectronics J.*, 2014, doi: 10.1016/j.mejo.2014.08.010.
10. S. Abdalla, R. AL-Wafi, and A. Pizzi, "Stability and combustion of metal nano-particles and their additive impact with diesel and biodiesel on engine efficiency: A comprehensive study," *Journal of Renewable and Sustainable Energy*. 2017, doi: 10.1063/1.4979962.



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ACTIVE TEACHING STRATEGIES IN HIGHER EDUCATION

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ABSTRACT

Requests for changes in teaching at all educational levels are normal consequences because of the rapid technological development and today's dynamic and complex reality. To improve educational achievements and students vocational training at the university, it is required to use alternative methods and procedures of teaching, blended in a combination of original strategies that promote active learning. This article indicates that the method of lecturing is the dominant one on the respondents' studies, but with a frequent use of guided conversations and discussions, which indicates a gradual reorganization of higher education. Results obtained in this paper do not demonstrate a continuing willingness of students towards intellectual and emotional involvement in the learning process and taking responsibility for learning on their own.

KEYWORDS: *Higher Education, Teacher, Student, Teaching Strategies, Methods and Procedures, Active Learning and Teaching.*

INTRODUCTION

The consequence of the ever more important role of knowledge for the economic and social prosperity and of the focus on the active role of individuals in the building of his knowledge is the tendency to implement the new guidelines in the organization of the teaching process where the teaching – learning relationship is more flexible, students are encouraged to take an active role in instruction processes and the teaching outcomes must include the acquisition of knowledge but also the gaining of competences. The goals of education defined through the learning outcomes or development of competences cannot be realized by sheer usage of traditional didactic strategies, approaches and methods, and more efficient form of teaching and learning are required. The goal of this paper is to direct the attention to strategies of teaching at the higher educational level, in particular the strategies which foster active learning and

acquisition not only of new knowledge but also skills and attitudes in answer to the requirements of the rapid technological development and contemporary labor market.

Teaching has been changing under the influence of social changes which require the university education to answer the requirements of the dynamic and complex reality by organizing a learning process able to train students to operate in professional practice (Apel, 2003, 32). The first step in the changes is to shift the emphasis from the teacher as knowledge provider to the student as the knowledge and skill acquirer. The student is no longer a passive recipient but becomes an active searcher in the process of knowledge building and application of knowledge and skills. This results in a more efficient education of young people, able to take their position in society. An American author, Prince (2004), considers that active learning can be achieved by any method of teaching which actively involves students into the process of authentic learning. Naturally, this mode of learning supersedes sheer memorizing and repetition of what the professor had said or done. The essence of such learning is in constant intellectual participation in the learning process. An Italian author, Zanchin (2002), also thinks that active teaching implies involvement of students in the teaching of curriculum contents, which fosters development of their procedural knowledge and its integration with declarative and metacognitive knowledge. Strategies of active teaching must possess the following characteristics: • integrate thought and practical activities; • enable varied learning styles; • enable a methodologically correct teaching of curriculum contents regarding single disciplines; • promote cognitive interaction with the others, whether adults or peers; • develop higher-level cognitive processes; • foster reflection and metacognitive activity; • support readiness to carry out tasks and motivation to learn; • enable observation and monitoring of students (e.g. their pre knowledge and learning styles). Lecture has so far remained the dominant form of academic teaching in spite of continued attacks, critiques and intentions to suppress it and replace it with more efficient methods and procedures (Apel, 2003, 27-37). In the effort to introduce changes in the approach to teaching at university, numerous researches have been carried out. These researches show that direct teaching is efficient in the transfer of knowledge, but is not sufficient for deeper understanding, problem solving, creative work and similar. (Terhart, 2001, Vizek Vidović, Vlahović-Štetić, Rijavec, Miljković, 2003, Apel, 2003). Academic education is broadened by learning with the help of the new media, but personal interaction in social situations remains important in the learning process. New methods which will encourage students to participate in the teaching process, in a written or spoken form or actively, are therefore being researched

Authors Vizek Vidović, Vlahović-Štetić, Rijavec and Miljković (2003, 335- 375) do not use the term strategy, but a much narrower term: teaching methods or methods of teaching, defined as the learnt generalised form of behaviour which can be systematically applied in various teaching fields in order to facilitate and improve the learning outcome. Teaching techniques i.e. specific actions which are developed for the purpose of teaching a particular type of content, are an even narrower form of behaviour. The authors classify the teaching methods in accordance with the level of activation of students and teachers during teaching, and in accordance with the number of people taught. The extremes considering these two criteria are the maximum activity of teachers teaching in a numerous class vs. one student learning independently with occasional consultations with the teacher. Between these two extremes the authors included the following basic teaching forms: direct teaching, teaching based on guided discovery and discussion and

independent learning regulated by feedback from the teacher on learning success. Direct teaching thus comprises the lecturing technique and the technique of display and modelling for the purpose of acquiring skills and procedural knowledge. The teaching based on guided discovery method comprises techniques of total and guided discovery, dialogue and discussion. The authors consider that independent learning requires development of skills for following the teaching process and skills of independent learning such as: organisation and elaboration of course-book texts, problem solving, revision, exercising, critical thinking and metacognitive skills. The above described overview of methods was amended by the authors (2003, 473-498) in the chapter of humanistic approach to education based on the following principles: student oriented instruction, teacher as the facilitator, assistant and partner in the process of learning, contents is not the goal but the means to realize educational goals, learning is best encouraged in a cooperative environment. The best known forms of humanist education in practice are the open education, learning through research, learning through discovery and group discussion

Turbulent social processes require a flexible and dynamic university ready to change and accept the fact that it is no longer the exclusive place where information is gathered and knowledge acquired. Any demand for a change involves innovative approaches to teaching and learning as a response to the challenges set by new media and learning theories, such as cognitivism and social constructivism. An especially important role is played by active teaching methods and procedures which recognize different needs of individual students, asking them to assume liability for personal learning and promoting critical thinking and independent learning. The leader of these changes is the teacher who must be able to implement various different teaching methods and procedures and to alternate them strategically encouraging creativity, problem solving, experience-based learning and metacognition. The fact that working methods and procedures, such as guided conversation, participation of student in discussions and debates, are being used on a more frequent basis, indicates a positive movement in the reorganization of university teaching process. Nevertheless, our research indicates the still predominant position of the oral lecture method and the need for a more varied usage of teaching methods and procedures enabling students to be more active and to assume greater liability in their own educational process.

BIBLIOGRAPHY

1. Apel, H. J., (2003), Lecture, introduction to the academic form of teaching, Zagreb: Erudit A
2. Baldacci, (edited by), (2004), I modellidelladidattica, Roma: Caroccieditore
3. Bežen, A., (2008), Metodika, znanost o poučavanjunastavnogpredmeta, Zagreb: Učiteljskifakultet i Profil
4. Bežen, A., i dr., (1993), Osnovedidaktike, Zagreb: Školskenovine
5. Bognar, L., Matijević, M., (2002), Didaktika, Zagreb: Školskaknjiga
6. Chiari, F., (2010), I MetodiAttivi ed igiochi di simulazione, namrežnojstranici<http://provvbo.scuole.bo.it/cliccando/cap13.pdf>
7. Desforges, Ch., (2001), Uspješnoučenjeipoučavanje. Psihologijskipristupi, Zagreb: Educ



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TYPES OF EDUCATION AND TRADITIONS OF ITS ORGANIZATION IN THE 15TH CENTURY (ON THE EXAMPLE OF WESTERN EUROPE AND CENTRAL ASIA)

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ABSTRACT

This article covers the social life of European and Central Asian peoples in the Middle Ages. There are theoretical ideas about the level of development of education, culture and art. The article also compares the methods of education and training on the two continents.

KEYWORDS: *Medieval Social Life, Education, Literary Life, 15th Century Schools, Church Schools, High Schools, Madrassas, Secular And Religious Education.*

INTRODUCTION

For a long time in Western Europe, only church ministers were literate. They had to read church books and know the prayers.

Large churches and monasteries had schools to train priests. Students memorized many prayers, learned to read, write, count, and sing church songs. In arithmetic classes, they calculated how many days a particular religious holiday would come. The knowledge needed to build church buildings was taught through geometry.

School science was hard and arduous. Both the French and the Germans and the English were taught in Latin, which was a foreign language for them. Books and prayers were written in that language at that time. Often there was only one book for the whole school, and the teacher would show it to the students in turn. Children did not try to arouse interest in knowledge, and depression prevailed in the teaching. Knowledge was taught to students with sticks. It was said of an educated person that he "grew up under the staff of his Master."

He graduated semi-literate people from church schools. Many could only read the Latin text without understanding the meaning of what they were reading. In the Middle Ages, the school was completely in the hands of the clergy.

With the growth of cities, more literate people were required. It was necessary to calculate the proceeds from the sale, to operate in the city councils and in the courts. In the Middle Ages, city schools began to appear in Europe, not church schools. They taught writing and arithmetic better than the clergy, and gave some knowledge of the natural sciences.

In the Middle Ages, man had very little knowledge, and science could explain almost nothing. The priests were convinced that the evidence of the scholars did not contradict the teachings of the church. The Church emphasizes that man cannot enter the mysteries of nature because everything in the world happens by the will of God. Therefore, medieval scientists learned little about nature. Often, their eyes were fixed on the yellowed pages of church books, looking for ready answers to all the questions in them.

During the Middle Ages, such disciplines as astrology and alchemy flourished in Western Europe. Astrologers have suggested that the future can be determined by the stars. Kings, generals, and travelers consulted astrologers before doing any work. Alchemists have wasted their efforts in the search for a mysterious substance that can turn all metals into gold.

But the development of economics has led to the birth of true scientific knowledge. Farmers improved tillage, observing animals and plants. Craftsmen tested the properties of metals and stones in their small workshops, making paint and glass.

With the growth of trade, the geographical knowledge of Europeans also expanded.

In the early 16th century, nomadic Uzbeks came to power in Movarounnahr, and the Timurid dynasty became part of the Mongol Empire in India. Initially, these phenomena led to a certain degree of isolation of these regions from each other and an increase in local features in the Persian literature. Nevertheless, cultural ties are almost unbroken and their intensity gradually increases.

By the 16th century, Central Asia was experiencing a renaissance in science, education, and social life in general. The political process has, of course, paved the way for changes in public life. In the second half of the 16th century, Movarounnahr became a strong centralized state, and the period of Sahibquran Timur and the first Timurid rulers left its mark in history as a period when science, culture and education began to flourish again. That is why the second Renaissance in the East took place in these centuries. Academician M. According to Khairullaev, the second half of the 14th century marked the beginning of the second phase of the Eastern Renaissance in the 15th century. With the establishment of the great centralized state of Timur, science, culture and education began to flourish again in Movarounnahr. The culture of this period is considered to be the culture of the IX-XII centuries in terms of its principles, direction, economic basis. The role of Sahibkiron Amir Timur in the development of science, culture, art, literature, architecture, economic and cultural relations and the creation of a social environment is unique.

In the 15th century, economics, architecture, literature, and culture flourished in Central Asia, and by the time of the Great Patriotic War, mathematics, astronomy, and medicine flourished. The cities of Samarkand and Herat had become cultural centers. During this period, education was closely linked to religion, and madrassas gained the status of higher education. Three

madrassas were built in Bukhara, Samarkand and Ginduvan, which served as a scientific center for the development of science. The following inscriptions could be seen on the roof of the madrasah in Bukhara: "It is obligatory for every Muslim to strive for knowledge" [2, 157]. Madrassas specialized in, for example, the training of management staff in the Muhammad Sultan Madrasa, the training of personnel for religious institutions in the madrasah of MawlanaQutbiddin Sadr, the training of general specialists, ie intellectuals, imams, scholars, schoolteachers, Idigu Temur, Saroyulkhanim madrassahs [3, 134]. But in their bar, the Qur'an, Hadith, and jurisprudence were studied.

One of the peculiarities of the madrasas of this period was the strong emphasis on the teaching of Arabic grammar in all madrasas. In addition, classes in madrassas were conducted in Arabic, Persian and Turkish.

During this period, the Uzbek literary environment also changed. In the XIV-XV centuries there was a significant shift in Uzbek literature, and valuable works were created by Atoi, Sakoki, HaydarKharozimi, Durbek, Lutfi. Many works in Arabic and Persian had been translated into Uzbek.

One of the most important changes in the society was to increase the literacy of the population, to create opportunities for the education of children. Private schools were established, and some officials hired teachers to provide home-based education. During this period, schooling began at the age of six. At school, they began with reading and writing, and later, after graduating, they were educated in madrassas and acquired both religious and secular knowledge.

In the Middle Ages, literature was a dominant form of "cultural work" in Iran and Central Asia, and included other forms of cultural activity. All the different professions could belong to the same literary circle, so there was a great need for literary education during this period. The love of literature united educated people by the middle of the 15th century, and in the education system of those years, knowledge of poetry was mandatory. At the time, literature was both a means of propaganda and an expression of ideas and feelings. In this regard, the study of the activities of literary circles was an important step in the reconstruction of the historical and psychological portrait of the society of the chosen period Movaraunnahr.

In the first half of the 16th-17th centuries, Movaraunnahr served as a center for the reorganization of literary circles. There are three sources that reveal this period - Hasan Nisari's "Muzakkir-iahbob" (for the first half of the century), "Tazkirat ash-shuaro" (for the second half of the XVI century) and MutribiSamarkandi's "Tarih-iJahangiri" (XVI century - The first third of the seventeenth century). These sources cite more than six hundred writers who took part in the literary life of Movaraunnahr in one way or another. A study of Katy Harawi's anthology Majma ash-shuara-yiJahangirshahi has shown that this work provides information about the poets of Movarounnahr who left for India. The latest anthology is of great importance in the study of Iranian-Indian literary relations.

The role of poetry has not changed over the centuries. And although the brightest and most detailed pictures depicting them are taken from pre-Mongol sources, all of them are reflected in the literary work almost unchanged.

The main features of the literary life of the period under consideration were the desire to write "artificial" poetry and the spread of poetry among the lower strata of society. It also became

famous for his Sufi poems, which were quickly recognizable for their unique composition and limited imagery, ranging from ghazal to ghazal. It was impossible not to mention the bilingualism that existed at that time: many poets wrote poetry fluently in Persian and Turkish.

In conclusion, the level of Western education was inseparable from that of Central Asia. Areas of science that were abstract, especially for Europeans, were studied in detail by Asians in the 15th century: examples of such sciences were architecture, astronomy, geography, and medicine. Literary views also differed greatly between the West and the East. The feudal system also dominated Western literature in the 15th century.

REFERENCES

1. B. Ahmedov. Sources of history of the peoples of Uzbekistan. - T.: O'qituvchi, 1991.
2. K. Hoshimov, S. Nishonova, M. Inomova and others. History of pedagogy. T.: O'qituvchi, 1996. - 488 p.
3. K. Xoshimov, S. Nishonova. History of pedagogy: Textbook. T.: National Library of Uzbekistan Publishing House named by Alisher Navoi, 2005. - 304 p.
4. K. Xoshimov. SafoOchil. Anthology of Uzbek pedagogy. T. 1995.
5. M. Khayrullayev. From the history of socio-philosophical thought in Uzbekistan. T., 1995.
6. N.M. Mallayev. History of Uzbek literature. —T.: O'qituvchi, 1965
7. O. Musurmonova. Forming a spiritual culture of students. T.: Science, 1993
8. O. Hasanbayeva, Chrestomathy from the history of pedagogy. T.: Teacher, 1992. - 208 p.



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A REVIEW ON TYPES OF ANTENNA

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ABSTRACT

In a wireless communication system, the antenna is the most essential component. Electrical signals are converted into radio waves via antennas, and vice versa. Antennas come in a variety of shapes and sizes, each with its own set of characteristics based on the signal transmission and reception requirements. In this article, we compare and contrast different kinds of antennas based on their forms, materials utilized, signal bandwidth, transmission range, and other factors. Our primary goal is to sort these antennas into categories based on their intended use. Antennas are the fundamental requirements for wireless communications in the contemporary age, since they are needed for quick and efficient transmission. This document will assist the design architect in selecting the best antenna for the job.

KEYWORDS: Applications, Antenna, Dipole, Communications, Signal Transmission.

1. INTRODUCTION

Antennas are one of the most basic components of any electric system. It connects the open space with the transmitter or the free space with the receiver. Antennas are devices that convert RF or electrical signals. It is also used to convert a signal into an electromagnetic or wave signal. Receiving an electromagnetic pulse and converting it to an electrical signal. Antennas are the devices that are used to transmit data. Information in the form of a signal emitted by an electromagnetic wave converse in an unguided or wireless manner. In a radiating antenna. If it had a high radiating resistance, it would impair its efficiency. The antenna's efficiency will be

high due to its resistance. Antennas are a helpful method of communication in a variety of situations. Antennas are utilized to transmit in the form of sound, graphical video as a result of their significance in communication. Antennas are developed on a regular basis to meet the needs of the market. Antennas are designed for a variety of applications. For improved communication, materials and structures are required. They really are. Radio, television, satellite, broadcasting, and design communications, cellular system, etc. It also took into account necessary for determining the characteristics of a system[1]. There are antennas in operation.

Different systems have several types of. They have antennas attached to them. Directionality is used in certain systems. The operating characteristics of the antennas are developed around them. The antennas, on the other hand, are just the system's features. Used to transfer omnidirectional electromagnetic energy. It may be utilized in certain other systems or in other systems for point-to-point communication where the gain and range are increased. Wave impedance must be reduced. As far as antennas and their applications are concerned, is very low, thus this analysis is critical for identifying. Antennas of various types and their uses in diverse systems[2]. This article provides a comprehensive overview of different antenna types. It evolved to fulfill an important communication job in A variety of communication network fields are discussed. An antenna or aerial, used with a transmitter or receiver, is the contact between radio waves traveling across space and electric currents flowing through metal conductors. When transmitting, a radio transmitter sends an electric current to the antenna's terminals, which the antenna then emits as electromagnetic waves. An antenna receives part of the strength of a radio wave and converts it to an electric current at its terminals, which is then transferred to a receiver to be amplified[3]. Antennas are an important part of any radio system[4]. An antenna is a collection of conductors (elements) that are electrically linked to the receiver or transmitter. Antennas may be constructed to transmit and receive radio waves in all horizontal directions equally (omnidirectional antennas) or to broadcast and receive radio waves preferentially in one direction (directional, high-gain, or "beam" antennas). An antenna may include non-transmitter components such as parabolic reflectors, horns, or parasitic devices that guide radio waves into a beam or other desired radiation pattern. Heinrich Hertz, a German scientist, constructed the first antennas in 1888 as part of his pioneering experiments to establish the reality of waves anticipated by James Clerk Maxwell's electromagnetic theory. For both transmitting and receiving, Hertz used dipole antennas at the focal point of parabolic reflectors[5]. Guglielmo Marconi, who won the Nobel Prize for his work on antennas for long-distance wireless telegraphy, started developing them in 1895[6].

1.1 Types of Antenna:

- *Biconical Dipole Antenna:* An infinite constant-impedance transmission line has no limit on data transfer capacity, but any realistic implementation of the biconical dipole has limited extension appendages that create an open-circuit stub in the same way that a resonant dipole does. In the case of transmission, the loss caused by radiation from the biconical transmission line reduces the wave reflected by the open circuit end, and if the conical surface was long enough, the far end would be rendered electrically "invisible" at the terminals. At higher frequencies, its behavior resembles that of a true biconical transmission line, with the maximum limit determined mostly by the precision with which the 'near-coincident apices' can be implemented. Between these two extremes, a worthwhile return loss may be achieved

across an octave or more, depending on what defines "sufficient" for the anticipated use, such as 10dB. Despite these limitations, this is nevertheless one of the most basic genuinely[7].

- *Antenna with a Left-Handed Dipole:* Left handed dipole antennas are a novel kind of antenna that gets its name from the fact that its transmission is left-handed. Shunt inductors and capacitors are used in the antenna design. The capacitor is placed on one side of the line, causing currents of varying amplitude on both sides. Because the eliminate currents are of varying adequacy, they do not completely cross out in the far field, and so it transmits. With a shorter wavelength, the frequency of the left-handed transmission line decreased. In free space, the 0.18 wavelength receiving antenna has a gain of 3.9 dB and a transmission capacity of 1.7 percent .
- *Antenna with a Folded Dipole:* Folded dipole antennas are simple, low-cost, have a smaller footprint, are cheap to manufacture, and are simple to install. The folded dipole antenna is made up of two folded wires with the folded ends of the dipole antenna left open. The folded dipole antennas have a broad loop configuration. In Xin, there is more flexibility in adjusting the impedance design, which is critical. The impedance is determined by the geometric parameters rather than the strip thickness. The radiation patterns are identical to those of a dipole antenna.
- *Dipole Antenna:* When a dipole antenna has half wave length at output, it is called a half-wave dipole antenna. The resonant frequency of a half-wave dipole antenna causes size fluctuation. The suggested antenna operates at a full frequency of 1.995 GHz, making it suitable for GSM technology. The frequency range of a half-wave dipole antenna is 1.877 GHz to 2.1199 GHz. The proposed dipole antenna is a radio antenna that is constructed using wire and a center-fed portion. Two wires are placed in line in a half-wave dipole antenna, with a tiny gap between them. The center of both wires is connected to the voltage[8]. If a half wave dipole occurs, the length of the dipole should be half the wavelength, however in practice it is computed as 0.45 wavelength time. Current flows between the two poles of a half-wave dipole antenna. The radio signal is emitted by the passage of current and voltages in the suggested antenna.
- *L-loop Antenna:* L-loop antennas take the least amount of effort, are geometrically smaller, and have a radio effective structure, which is needed in ultra-wideband applications (UWB). It's a unique printed loop antenna since the arms include an L-shaped section. Antennas in UWB systems offer excellent performance for lower band frequencies ranging from 3.1 GHz to 5.1 GHz. The antenna has a 10dB return misfortune transmission speed throughout the whole frequency range. The L part of the loop antenna selects the lower frequency band, while the decrease transmission line determines the upper frequency limit [5]. The shape of the antenna is dependent on FR4 substrate and FED with 50 ohms linked reduced transmission line. The construction of an L-loop antenna[5]. The entire length of the square loop's outer boundary The construction of the L-Loop antenna. The whole length of the square circle antenna's exterior breaking point should be one wavelength, with the aim of having direct focused radiation. A helical antenna is a kind of antenna that has a helical shape. The helical antenna was invented by John Kraus in 1964. These antennas have been around for a long time. All things considered, unifilarhelix antennas are made up of a single wire or restricted tape wrapped like a right or left hand screw, self-supporting or spun on a

dielectric cylinder . Such antennas have been widely used for many years because to their practical emission and ease of usage. Furthermore, owing to their remarkable and exceptional characteristics, these antennas are frequently employed to get microwaves from VHF[9]. Because high gain is needed in satellite communication, helical antennas are employed. Because a greater gain is required in a parabolic dish, a helical antenna was built for this purpose. The proposed antenna has a very broad bandwidth. The helical antenna. The geometry of this kind of antenna model design was fed via a 50 Ohm coaxial connection. It is made up of a single empty dielectric chamber with a relative permittivity of 2.1 and a cross-sectional area of 61.33mm. The antenna was aided by the generator located at the base, between the antenna and the ground plane. The feed is at the bottom of this section[10].

- *Yagi-uda Antennas*: The suggested antenna is referred to as a yagi antenna or simply a yagi. The yagi antenna is a guided path with a dipole and additional strongly linked parasitic components, such as reflectors and directors. Reflectors, a dipole, and directors make up the yagi antenna's construction. UHF/VHF radars, phased Doppler radars, and wind profiler systems all utilize these antennas. The performance of the reflector dipole or feeder, as well as the director, is determined by these components. The construction of the yagi-uda antenna.
- *Spiral Antenna*: High bandwidth is required in wireless communication systems, necessitating the use of wideband antennas. In comparison to other antenna, the proposed antenna has a better spectral competency. Spiral antennas have the advantages of being easy to manufacture, low cost, extended life, and better emission performance. Ultra-wideband radio (UWB) operates in the frequency range of 3.1 to 10.6 GHz. In comparison to other planer antennas, the spiral has a high spectrum efficiency, which means a fast transmission rate. It is based on Archimedes' spiral guideline and comes in a variety of forms based on outlining goals. Theoretically, a spiral antenna apparatus with an infinite number of turns and perfect arm splitting possesses indefinite spectral proficiency and transfer speed. For all intents and purposes, we must cope with the fact that the unfathomable vastness is impractical, and the addition turns cannot be too close to one another without dread.
- *Antenna for Beverage*: Antennas for beverages are widely utilized in a variety of applications. It can receive signals in the frequency range of 2 MHz to 30 MHz and utilize them for direction finding. On a low height, these antennas have a high directivity. Beverage antennas are low-cost and have a straightforward design. A high frequency signal is received by the current detecting terminal, which modulates a laser diode. The high-frequency signal is then demodulated after passing via optical fiber to the receiver. The demodulated signal was measured using a Hewlett-Packard 8753B network. In a high-frequency antenna system, the laser output remained constant to prevent heat-dependent fluctuation, and optical-fiber offered significant benefits over co-axial cable. The construction of the beverage antenna.
- *Reflector with a Parabolic Shape*: There are two types of antennas in this category. One is a right cylinder, whereas the other is a paraboloid. To feed a cylinder type linear dipole, a linear array, a slotted waveguide, and so on are utilized. On the other hand, with a paraboloid, feeding is done in a conical or pyramidal shape. The suggested antenna's radiation field pattern is based on the feed component's radiation pattern, as well as the reflector material and measurements. It's found on parabolic reflectors, which collect and

focus parallel incoming radio wave beams, focusing them into the real antenna at its focal point on focus. The construction of the parabolic reflector.

- *Antenna with a Corner Reflector:* These antennas are easy to use, efficient, and effective. The suggested antenna consists of a dipole element, and it should be a low-cost, small-size, and reliable wireless system. The planer inverted-f antenna has a low profile, is small in size, has a wide bandwidth, and has a high gain. It covers the DCS-1800 and PCS1900 frequency bands. A square planer element suspends the dielectric FR4. The substrate's plane is at the ground's base. The dimensions of the proposed antenna. Planer inverted-f antennas are used in smartphones because of their features. The planer inverted-f antenna is a low-profile, high-efficiency antenna used in portable devices. Because of their properties, they are utilized in a variety of technologies. The device's operating qualities are better if it's simple to make, the signal emission is high, the covered area is small, and the impedance matching is low. The planer inverted-f-antenna (PIFA) is formed as a parallel portion from a wire to a plate with the inverted-f adjusted to it. These antennas reverberate construction with completely resistive burden impedance at the frequency of operation. The antenna's electrical execution is affected by the radiator's height, feed separation and area, and length variation, among other factors.

The construction of the planer inverted-f-antenna.

- *Antennas with a Bow Tie:* Dense, effective, and low-cost devices have become more important in communication network systems. The similar feature is needed in multi-band applications. The current communication network necessitated antennas that were light in weight, cheap in cost, dense, mobile, and simple to operate. Two mirrors are needed in the manufacture of the proposed antenna and are positioned on a rectangular patch. Lumped port is utilized for Coplanar Wave Guide (CPW). The proposed antenna's output is limited by its location, distance, and alignment. Mobile communication networks and wireless systems are effective uses of these antennas.
- *Periodic Log Antenna:* In telecommunication, a log periodic antenna is a broadband, multi-component, tight pillar, directional antenna with radiations and impedance characteristics that repeat periodically as a logarithmic function of the frequency excitation. A logarithmic rise in element length and space occurs from one terminal to the other in a log periodic antenna. This kind of antenna, with its directionality and modest gain, is ideal for an area that needs a wider frequency range. These antennas were created with a broad bandwidth in mind for a particular application. The antenna is made up of a series of dipoles that are alternately connected by a balanced transmission line known as a feeder. To induce end-case radiation to go in a shorter direction, these closely spaced elements are linked oppositely form element and cancel the broadside radiation. A short coaxial cable was utilized. The antenna's own balun is created by connecting the feeder to the conductor of the coaxial wire.
- *Log Periodic Dipole Antenna:* If there are any wideband applications, the suggested antenna will come in useful. The VHF frequency range for the log periodic array antenna is 30 MHz to 300 MHz. Independent antennas with a bandwidth larger than 10:1 are classified as log periodic antennas. Raymond Duhamel was the first to come up with the idea of a log periodic array structure. Is bell invented the log periodic dipole array in the 1960s. The input impedance, gain, radiation, and other characteristics of the proposed antenna change

periodically in the logarithm of the frequency space. A log periodic array is what this is called. The construction of the log periodic dipole array antenna.

- *Log Periodic Fractal Koch Antenna:* The suggested antenna, the log periodic fractal koch antenna (LPFKA), is used in devices that operate in the ultra-high frequency (UHF) band. The fractal Koch method may reduce the antenna size by up to 27% without affecting the antenna radiation or reception performance. Antennas are now created in tiny sizes with less covered area and greater bandwidth, thus they are manufactured in a variety of directions and shapes. Koch bend is a good example of a self-comparable space-filling fractal that may be used to make a wideband, multiband, or scaled-down antenna. The antenna aids in breaking free from imprisonment. The log periodic fractal koch antenna.
- *Horn Antenna:* Jagadis Chandra Bose invented the proposed antenna in 1897, which was a pyramidal horn antenna. The characteristics of a horn antenna are straightforward: it can be stimulated by wavelength. The suggested antenna is known as a principle feed reflector antenna. Because these losses are so small, we estimate the suggested antenna's gain to be the same as its directivity. The horn antenna served as both an antenna and a reflector. They aren't waveguide-matched properly. When compared to waveguide and high directivity, the horn antenna radiates a constant phase front and sends a larger aperture. Horn radiation gain is related to the square of the wavelength and the area A of the flared open flange. Horn radiation is the impedance transition between free space and waveguide impedance provided by a tapered termination with a length equal to a waveguide. Horn radiators serve as both reflector antennas illuminators and antennas in and of themselves. These antennas aren't the greatest fit for the waveguide, but they can still achieve standing wave proportions of 1.5:1 or less. The flared open rib area corresponds to the rise of a horn radiator, and the square of the wavelength corresponds to the decrease. The construction of the horn antenna.
- *Wearable Antenna:* Wearable is the term given to the planned wearable antenna since it may be worn on the human body. These antennas are embedded in clothing and provide functions such as tracking and navigation, remote computing, and human safety. In wireless communication, body-centric communication has become more important. Smaller, lighter, less costly, long-lasting, and easy-to-install antennas are in more demand these days. The antennas suggested are utilized in medical emergencies, firefighting, and military applications. They may be used to keep track of athletes. The antenna radiator of a wearable antenna is rectangular, with a width of W and a length of L . The patch radiator has a minor impact on the radiation pattern but a large effect on the input impedance and operating band. The radiation powers, as well as the bandwidth and antenna performance, rise as the radiator width grows.

2. DISCUSSION

Antennas are found in a wide range of wireless systems, from IoT devices to microwave and millimeter-wave imaging systems like radio telescopes. Antennas are the essential component of a wireless system because they transform electron flow into electromagnetic radiation in a symmetric and well-designed way. An antenna's precise behavior is determined by the geometry of the conductors and dielectrics in its construction, and there are many different antennas to meet different application needs. Radiation parameters and network parameters are the two major types of antenna behavior. Typically, these characteristics are only provided for the

frequencies that fall inside an antenna's bandwidth. An antenna's bandwidth is simply the frequency range that the manufacturer has specified. Broadband behavior is common in antennas, and it may extend beyond the antenna's bandwidth. Radiation parameters explain how the antenna works when it transfers electromagnetic energy to electronics and back. The behavior of an antennae interconnects and ports, which link it to transmitters, receivers, interconnect, and measurement equipment, is described by network parameters.

3. CONCLUSION

The study's conclusion provides a wealth of information on various antenna types. With the assistance of this study paper, we can choose the optimal antenna to meet the requirements for the needed wireless communication system. The applications and functions of antennas are examined in this article based on their groupings. One of the most important and least understood aspects of any radio communication platform is the antenna system. The antenna system serves as a link between the radio system and the outside world. Antennas at the transmitter and receiver are required for wireless communication systems to function correctly. Antenna design and placement may make or break a wireless system, and many poor-performing systems can be traced back to antennas that were incorrectly installed or positioned. A single antenna at the base station and one at the mobile station may make up the antenna system. The antenna is primarily used by the base station and the mobile phone to establish and maintain communication links. Antennas come in a variety of shapes and sizes, each of which serves a particular purpose depending on the application. The antenna that a system operator uses.

REFERENCES

1. D. H. Werner and S. Ganguly, "An overview of fractal antenna engineering research," *IEEE Antennas Propag. Mag.*, 2003, doi: 10.1109/MAP.2003.1189650.
2. K. V. S. Rao, P. V. Nikitin, and S. F. Lam, "Antenna design for UHF RFID tags: A review and a practical application," *IEEE Transactions on Antennas and Propagation*. 2005, doi: 10.1109/TAP.2005.859919.
3. S. Gao *et al.*, "Antennas for modern small satellites," *IEEE Antennas Propag. Mag.*, 2009, doi: 10.1109/MAP.2009.5338683.
4. M. S. Vijay and P. B. U. L., "An Overview Of Smart Antenna And A Survey On Direction Of Arrival Estimation Algorithms For Smart Antenna," *J. Electron. Commun. Eng. (IOSR-JECE)*., 2012.
5. A. A. Mulla and P. N. Vasambekar, "Overview on the development and applications of antenna control systems," *Annual Reviews in Control*. 2016, doi: 10.1016/j.arcontrol.2016.04.012.
6. J. Costantine, Y. Tawk, S. E. Barbin, and C. G. Christodoulou, "Reconfigurable antennas: Design and applications," *Proc. IEEE*, 2015, doi: 10.1109/JPROC.2015.2396000.
7. A. Petosa, "An overview of tuning techniques for frequency-agile antennas," *IEEE Antennas Propag. Mag.*, 2012, doi: 10.1109/MAP.2012.6348178.
8. A. H. Lokman *et al.*, "A Review of Antennas for Picosatellite Applications," *International Journal of Antennas and Propagation*. 2017, doi: 10.1155/2017/4940656.

9. R. Rani, P. Kaur, and N. Verma, "Metamaterials and their applications in patch antenna: A review," *International Journal of Hybrid Information Technology*. 2015, doi: 10.14257/ijhit.2015.8.11.17.
10. Y. Zhao *et al.*, "Broadband Low-RCS Metasurface and Its Application on Antenna," *IEEE Trans. Antennas Propag.*, 2016, doi: 10.1109/TAP.2016.2562665.



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AN OVERVIEW OF LITHIUM ION BATTERY AND ITS COMPOSITION

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ABSTRACT

For a wide variety of Li-ion battery electrodes, this overview covers important technical advances and scientific difficulties. Many families of appropriate materials are compared using a periodic table and potential/capacity graphs. Commercial intercalation materials such as lithium cobalt oxide (LCO), lithium nickel cobalt manganese oxide (NCM), lithium nickel cobalt aluminum oxide (NCA), lithium iron phosphate (LFP), lithium titanium oxide (LTO), and others are compared to conversion materials such as alloying anodes in terms of performance, current limitations, and recent breakthroughs (F, Cl, Br, I). There's also talk of new polyanion cathode materials. Each kind of electrode material is discussed in terms of cost, abundance, safety, Li and electron transfer, volumetric expansion, material dissolution, and surface reactions. The study covers and categorizes both basic and particular methods for overcoming current problems.

KEYWORD: Anodes, Cathodes, Electrodes, Li-Ion Battery.

1. INTRODUCTION

Li-ion batteries offer an unrivaled mix of energy and power density, making them the preferred technology for portable gadgets, power tools, and hybrid/full electric cars. Li-ion batteries will substantially decrease greenhouse gas emissions if electric vehicles (EVs) replace the bulk of gasoline-powered transportation. Li-ion batteries' high energy efficiency may allow them to be used in a variety of electric grid applications, such as improving the quality of energy harvested from wind, solar, geo-thermal, and other renewable sources, allowing for more widespread use and the development of an energy-sustainable economy. As a result, both business and

government funding organizations are interested in Li-ion batteries, and research in this area has exploded in recent years[1].

However, many people believe that Li-ion batteries will not be able to meet the world's requirements for portable energy storage in the long term. Li-ion batteries are presently expensive for certain uses (such as transportation and grid), and a shortage of Li and some of the transition metals now used in Li-ion batteries may become a problem in the future. Li-ion batteries, on the other hand, offer certain basic benefits over other chemistries. To begin with, Li has the lowest reduction potential of any element, enabling Li-based batteries to achieve the greatest cell potential conceivable. Li is also the lightest element, with one of the lowest ionic radii of any single charged ion. Li-ion batteries have a high gravimetric and volumetric capacity, as well as a high power density, due to these reasons. Finally, although multivalent cations have a larger charge capacity per ion, the extra charge decreases their mobility considerably. Given that ionic diffusion in solid electrodes is often the rate-limiting element for battery power output, developing alternative chemistries poses a significant challenge[2]–[4].

In the foreseeable future, there is unlikely to be a major shortage of Li. Similar predictions about peak oil have been made, but they have failed to materialize as global oil stocks and resources continue to increase as prices rise and exploration and mining technology advance. The quantity of Li present in the Earth's crust is sufficient to power a worldwide fleet of cars in absolute terms. Rising costs, on the other hand, may be an issue for Li-ion batteries, since cost is a significant barrier to their adoption in renewable energy applications. Despite this, Li does not yet play a significant role in the cost of Li-ion batteries. The cathode and electrolyte include lithium, which accounts for just a tiny percentage of the total cost. The cost of processing and the cost of cobalt in cathodes are the main contributing variables within these components. Li-ion batteries will very certainly continue to dominate portable electrochemical energy storage for many years to come, owing to its basic advantages.

Because Li-ion batteries are the most common type of portable electrochemical energy storage, lowering their cost and increasing their performance may significantly extend their applications and allow new energy-related technologies. Electrode materials have gotten a lot of attention in Li-ion battery research so far. Electrodes with greater rate capability, charge capacity, and (for cathodes) adequate high voltage may increase the energy and power densities of Li batteries, allowing them to be smaller and less expensive. However, this is only true if the material isn't prohibitively costly or uncommon[5], [6].

1.1. Cathodes:

1.1.1. Materials for intercalation cathodes:

A solid host network that may store guest ions is known as an intercalation cathode. The guest ions may be reversibly added and deleted from the host network. Li^+ is the guest ion in a Li-ion battery, whereas metal chalcogenides, transition metal oxides, and polyanion compounds make up the host network. There are various crystal forms for intercalation compounds, including layered, spinel, olivine, and tavorite. For the cathode materials in Li-ion batteries, the layered structure is the oldest type of intercalation compounds. Metal chalcogenides, such as TiS_3 and NbSe_3 , have long been investigated as potential intercalating cathode materials. While TiS_3 only had limited reversibility owing to the irreversible structural shift from trigonal prismatic to octahedral coordination after lithiation, NbSe_3 had reversible electrochemical activity. LiTiS_2

(LTS) was extensively researched among many other kinds of chalcogenides owing to its high gravimetric energy density coupled with extended cycle life (1000+ cycles) and was ultimately commercialized by Exxon. However, owing to their greater operating voltage and consequent better energy storage capacity, most current intercalation cathode research is focused on transition metal oxide and polyanion compounds[7].

1.1.2. Transition metal oxide:

Goodenough's LiCoO_2 (LCO) was the first and most commercially viable kind of layered transition metal oxide cathode. SONY was the first to market it, and it is still utilized in the majority of commercial Li-ion batteries today. Co and Li occupy alternate layers in octahedral sites, forming a hexagonal symmetry. Because of its comparatively high theoretical specific capacity of 274 mAh g^{-1} , high theoretical volumetric capacity of 1363 mAh cm^{-3} , low self-discharge, high discharge voltage, and excellent cycle behavior, LCO is a highly appealing cathode material.

1.1.3. Polyanion compounds:

Researchers have discovered a new class of chemicals known as polyanions while researching novel cathode materials. Large $(\text{XO}_4)^{3-}$ polyanions ($\text{X} = \text{S}, \text{P}, \text{Si}, \text{As}, \text{Mo}, \text{W}$) occupy lattice sites and enhance cathode redox potential while maintaining its structure. The typical material for the olivine structure is LiFePO_4 (LFP), which is renowned for its thermal stability and high power capacity. In a slightly deformed hexagonal close-packed (HCP) oxygen array, Li^+ and Fe_2^+ occupy octahedral sites, whereas P is found in tetrahedral sites in LFP. The LiFePO_4 cathode has many flaws, including a low average potential and poor electrical and ionic conductivity. Over the past decade, intensive research has resulted in substantial advances in both LFP performance and mechanistic knowledge. The use of carbon coating and cationic doping in conjunction with particle size reduction was shown to be beneficial in improving rate performance. It's worth noting that if particles are uniformly nano-sized and conductive nano-carbons are utilized in the cathodes, excellent electrochemical performance may be obtained without carbon coating. For example, a virus-templated amorphous anhydrous FP/ CNT composite showed encouraging results. A curved one-dimensional lithium diffusion route via the $[0\ 1\ 0]$ direction has been suggested as a possible explanation for the easy redox reaction in non-conducting LFP. However, the energy density of LFP cells is limited by the low density of nanostructured LFP electrodes and their low average potential. A new non-olivine alluaudite LFP with fundamentally different electrochemical properties than olivine LFP was recently discovered.

1.1.4. Compounds of fluorine and chlorine:

Due to their intermediate operating voltages and high theoretical specific and volumetric capacities, metal fluorides (MF) and chlorides (MCl) have lately been extensively studied. However, MF and MCl have weak conductivity, high voltage hysteresis, volume expansion, undesirable side reactions, and active material dissolution. Because of the wide band gap produced by the highly ionic nature of the metal-halogen interaction, most MF, notably FeF_3 and FeF_2 , are renowned for their low electrical conductivity. Their open architecture, on the other hand, may enable excellent ionic conduction. Because of the same reason, chlorides have low electrical conductivity. For factors such as low electronic conductivity and ion mobility, all of the reported MF and MCl materials have very significant voltage hysteresis.

1.1.5. Sulfur and lithium sulfide:

Sulfur has a very high theoretical capacity of 1675 mAh g^{-1} , is inexpensive, and is plentiful in the Earth's crust. S-based cathodes, on the other hand, have a low potential compared to Li/Li^+ , poor electrical conductivity, solubility of intermediate reaction intermediates (polysulfides) in the electrolyte, and (in the case of pure S) a very low vaporization temperature, which causes S loss during vacuum drying. Sulfur also has an 80% volume change, which may cause the electrical contact in typical carbon composite electrodes to be destroyed. S may be enclosed in a hollow structure with extra internal empty space to minimize the effects of both dissolution and volume expansion. Sulfur was impregnated into polyvinyl pyrrolidone polymer, carbon, and TiO_2 capsules via infiltration and chemical precipitation. These materials have a cycle life of up to 1000 cycles when tested in half cells with thin electrode designs.

1.1.6. Selenium with tellurium:

Se and Te have recently gotten a lot of interest since they have greater electrical conductivities than S and potential volumetric capacities of 1630 mAh cm^{-3} and 1280 mAh cm^{-3} in the completely lithiated form, respectively. Se and Te have better active material usage and rate capacity than S due to their higher electronic conductivity. Similar to S, high order polyselenides dissolve in Se-based cathodes, leading in rapid capacity loss, poor cycle performance, and low coulombic efficiency. Polytelluride dissolution has not been documented thus far.

1.1.7. Iodine:

The lithium-iodine primary battery, which utilizes LiI as a solid electrolyte ($10^{-9} \text{ S cm}^{-1}$), has a low self-discharge rate and a high energy density, and is a popular power source for implanted cardiac pacemakers. During discharge, the cathodic I is reduced first to the tri-iodide ion (I_3^-), then to the iodide ion (I^-). However, because of its limited power capacity, this chemical is troublesome for use in most other applications. Furthermore, iodine, triiodide, and lithium iodide are all soluble in typical organic electrolytes. Due to LiI 's great solubility in organic solvents, iodine ions have been proposed as a replacement for LiI in lithium-flow batteries. Due to the low melting point of I (113°C), active iodine was recently absorbed into the pores of porous carbon. The increased electronic conductivity and reduced active material dissolution resulted in a high discharge voltage plateau, excellent cycle performance, and high rate capability for the as-produced iodine-conductive carbon black composite.

1.2. Anode

Because Li metal develops dendrites, which may cause short circuiting, a thermal run-away reaction on the cathode, and a fire, anode materials are required in Li-ion batteries. Li metal, on the other hand, has a short cycle life. Others have examined the main attempts to enable Li metal anodes, therefore this subject will not be discussed here. Rather, this section gives a quick rundown of secondary anode materials. We suggest reading more in-depth evaluations on carbon lithium titanium oxide (LTO) and Type A and Type B conversion anode materials for additional research[8], [9].

1.2.1. Graphitic and hard carbons:

Carbon anodes were the first to make the Li-ion battery economically feasible over 20 years ago, and they are still the preferred anode material today. The intercalation of Li between the

graphene planes, which provides excellent 2D mechanical stability, electrical conductivity, and Li transport, causes electrochemical activity in carbon. This method can store up to 1 Li atom every 6 C. Low cost, plentiful availability, little delithiation potential versus Li, high Li diffusivity, strong electrical conductivity, and very low volume change during lithiation/delithiation are all characteristics of carbon. When compared to alternative intercalation-type anode materials, carbon offers an appealing balance of cheap cost, abundance, moderate energy density, power density, and cycle life. Although carbon has a greater gravimetric capacity than most cathode materials, commercial graphite electrodes have a low volumetric capacity (330–430 mAh cm⁻³).

Carbon anodes for commercial use may be classified into two categories. Graphitic carbons contain big graphite grains and have a charge capacity that is near to theoretical. Graphitic carbons, on the other hand, do not mix well with a PC-based electrolyte, which is favored owing to its low melting point and rapid Li transfer. Between the graphitic planes, PC intercalates with Li⁺, causing the graphite to exfoliate and lose capacity. Li intercalation happens at the basal planes even without solvent intercalation, thus the SEI preferentially develops on these planes as well. Single crystalline graphitic particles experience uniaxial 10% strain along the edge planes during Li intercalation. Such a high level of stress may harm the SEI and shorten the cell's cycle life. To shield the susceptible edge planes from electrolyte and achieve high coulombic efficiency, graphitic carbons have recently been covered with a thin coating of amorphous carbon[10].

1.2.2. *Lithium titanium oxide (LiTiO₂):*

Despite the greater cost of Ti, the decreased cell voltage, and lesser capacity, LTO has been successfully marketed because it enables the combination of better thermal stability, high rate, relatively high volumetric capacity, and long cycle life (175 mAh g⁻¹ & 600 mAh cm⁻³ theoretical). A “zero strain” intercalation process in conjunction with a high lithiation potential results in a high rate and stability. Because the phase shift produced by lithiation/delithiation only results in a little (0.2 percent) change in volume, LTO is termed “zero strain.” This shows up electrochemically as a tiny volt-age hysteresis in the charge discharge curve. Furthermore, because of the high equilibrium potential (1.555 V vs. Li/Li⁺), LTO may be operated in a potential window above 1 V, substantially avoiding the development and expansion of the anode SEI, which can delay Li insertion and generate Li losses in graphite anodes. The absence of volume fluctuation improves the SEI's stability even after it has been created. LTO nanoparticles, comparable to intercalation cathode material, may be utilized since SEI impedance is not a problem, resulting in better rate performance at the cost of reduced volumetric capacity. LTO is also very safe since its high potential inhibits the production of Li dendrites, even at high rates. As a result, despite its poor Li diffusivity and electrical conductivity, LTO is an excellent material for low-energy, high-power, long-cycle-life Li-ion batteries.

1.2.3. *Alloying materials – conversion materials (Type B):*

At low potentials, ‘alloying materials’ refer to elements that electrochemically alloy and produce compound phases with Li (preferably below 1 V). Alloying materials may have very high volumetric and gravimetric capacity, yet they're known for their massive volume shift when lithiated, swelling too many times their original volume. Particles may shatter and lose electrical contact as a result of this. Anodes' SEI protective layer may be destroyed by volume changes,

leading in continual electrolyte breakdown, Li inventory loss, and increased cell impedance. Due to the loss of active material and increased cell impedance, alloying anodes have a limited cycle life, particularly at large mass loadings. The most effective approach has been to make a carbon composite with alloying material particles that are tiny enough for mechanical stability, electron transport, and Li transport while preserving Li diffusion pathways inside the electrode. The active material may be encased in a carbon shell with enough empty space to allow for volume expansion to stabilize the SEI. In theory, this should stabilize the SEI and prevent particles from sintering into bigger particles, allowing for long cycle times even at high mass loadings. If a carbon shell is not employed, electrolyte additives may help to further stabilize the SEI and extend the cycle life, while binders that attach to the active material, have a high stiffness, and expand little in electrolytes can help to give further mechanical stability. Even yet, in complete Li-ion battery cells, high mass loading electrodes with high volumetric capacity ($>800 \text{ mAh cm}^{-3}$) and extended cycle life (10^3+ cycles) have yet to be proven. Furthermore, nanoparticles have a large surface area by definition, resulting in significant amounts of SEI generation and irreversible capacity loss during the first cycles.

1.2.4. Other conversion materials (Type A):

Using oxides in which Li_2O is generated during the first charging of the battery was formerly a common method of creating conversion materials. The Li_2O serves as a "glue" to hold alloying material (such as Si or Sn) particles together while also decreasing overall volume change inside the particles. However, since Li_2O has a poor electrical conductivity, this method always results in a high irreversible capacity and a significant voltage hysteresis, which persists even at very slow speeds. If the voltage range is substantially extended, Li_2O itself may be utilized as an active material, allowing non-alloying transition metals to be employed. This lowers first-cycle capacity loss and improves charge capacity, but it also reduces the potential difference between the cathode and the anode. If the Li_2O phase is depleted, active alloying materials' nanoparticles may sinter into bigger particles, increasing resistance. Furthermore, the procedure usually results in a significant volume change, which may cause problems comparable to alloying anodes.

MgH_2 and MgC_{12} are two of the most common Type A conversion anode materials. Both $\text{Li}_{1.07}\text{V}_{0.93}\text{O}_2$ and $\text{Li}_{1.07}\text{V}_{0.93}\text{O}_2$ are intriguing in that they exhibit modest voltage hysteresis and delithiation potentials, although at low rates. However, no research has proven that these electrodes are feasible at greater rates, and the cycle life shown is very limited. Similarly, certain phosphide and nitride electrodes have been found to exhibit minimal voltage hysteresis over many cycles, but only at modest charge/discharge rates.

2. DISCUSSION

Lithium-ion technology is all the rage in the battery world. They are now a popular source of power in a variety of daily goods, including computers, cell phones, power tools, and even automobiles. The significance of dependable portable power is enormous and constantly increasing as technology develops, concentrating on speed, large data, and mobility. Rechargeable lithium-ion (Li-ion) batteries are becoming more common as a power source for both small and big cleaning equipment at Tennant. Maintenance, lifespan, charging speed, safety, and simplicity of charging are the five areas in which they excel.

2.1. What is the difference between lithium and lithium-ion batteries?

Most lithium batteries are not rechargeable, while lithium-ion batteries are. Li-ion batteries are more stable and can be recharged hundreds of times. Compared to conventional rechargeable batteries, they feature a greater energy density, voltage capacity, and lower self-discharge rate. Because a single cell has a longer charge retention than other battery types, this results in higher power efficiency.

3. CONCLUSION

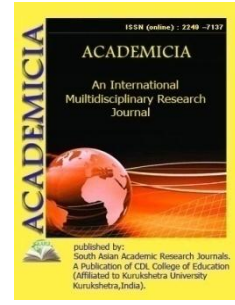
The Li-ion battery has obvious basic benefits and has been evolved into the high energy density, long cycle life, and high efficiency battery that it is today thanks to decades of study. New electrode materials are still being developed to push the limits of cost, energy density, power density, cycle life, and safety. There are a number of promising anode and cathode materials on the market, but many of them have poor electrical conductivity, sluggish Li transport, dissolution or other undesirable interactions with the electrolyte, low thermal stability, excessive volume expansion, and mechanical brittleness. Various approaches have been tried to overcome these obstacles; various intercalation cathodes have been commercialized, and conversion material technology is steadily approaching broad use. In the area of Li-ion battery electrode materials, the past two decades have been an exciting period for research. Li-ion batteries will undoubtedly have a larger effect on our lives in the years to come as new materials and methods are discovered.

REFERENCES

1. S. Ma *et al.*, "Temperature effect and thermal impact in lithium-ion batteries: A review," *Progress in Natural Science: Materials International*. 2018, doi: 10.1016/j.pnsc.2018.11.002.
2. G. Zubi, R. Dufo-López, M. Carvalho, and G. Pasaoglu, "The lithium-ion battery: State of the art and future perspectives," *Renewable and Sustainable Energy Reviews*. 2018, doi: 10.1016/j.rser.2018.03.002.
3. B. Huang, Z. Pan, X. Su, and L. An, "Recycling of lithium-ion batteries: Recent advances and perspectives," *Journal of Power Sources*. 2018, doi: 10.1016/j.jpowsour.2018.07.116.
4. P. K. Nayak, L. Yang, W. Brehm, and P. Adelhelm, "From Lithium-Ion to Sodium-Ion Batteries: Advantages, Challenges, and Surprises," *Angewandte Chemie - International Edition*. 2018, doi: 10.1002/anie.201703772.
5. C. R. Birkel, M. R. Roberts, E. McTurk, P. G. Bruce, and D. A. Howey, "Degradation diagnostics for lithium ion cells," *J. Power Sources*, 2017, doi: 10.1016/j.jpowsour.2016.12.011.
6. Y. Jin, B. Zhu, Z. Lu, N. Liu, and J. Zhu, "Challenges and recent progress in the development of Si anodes for lithium-ion battery," *Adv. Energy Mater.*, 2017, doi: 10.1002/aenm.201700715.
7. B. Rousseau, V. Timoshevskii, N. Mousseau, M. Côté, and K. Zaghib, "A novel intercalation cathode material for sodium-based batteries," *Electrochem. commun.*, 2015, doi: 10.1016/j.elecom.2014.12.022.
8. Z. Xiong, Y. S. Yun, and H. J. Jin, "Applications of carbon nanotubes for lithium ion battery

anodes,” *Materials (Basel)*., 2013, doi: 10.3390/ma6031138.

9. X. Zuo, J. Zhu, P. Müller-Buschbaum, and Y. J. Cheng, “Silicon based lithium-ion battery anodes: A chronicle perspective review,” *Nano Energy*. 2017, doi: 10.1016/j.nanoen.2016.11.013.
10. Y. Chen, J. Li, Y. Lai, J. Li, and Z. Zhang, “Tailoring graphitic nanostructures in hard carbons as anode materials achieving efficient and ultrafast sodium storage,” *J. Mater. Sci.*, 2018, doi: 10.1007/s10853-018-2295-3.



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WRITING SKILLS AT THE LEARNING LANGUAGE

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ABSTRACT

In the next article we will talk about the advantages of writing skills, as well as the fact that in the activities mentioned in it, the language learner not only gains various language skills for communication, but also expresses opinions about increasing interest in the language, a positive attitude to the language, the emergence of a sense of learning, because of its naturalness and usefulness.

KEYWORDS: Skill, Writing, Reading, Foreign Language, Exercise, Dictation, Lesson, Text.

INTRODUCTION

In the framework of reforms aimed at building a new society based on the priority of democratic principles, we pay great attention to educational work in the country. In particular, the Law of the Republic of Uzbekistan "On Education" and the National Training Program are the primary factors ensuring the socio-economic and cultural development of the country. Besides implementing their needs, the basics of training competitively, they have identified highly qualified specialists.

Language learning expands the world to man because the resources written in every language are the source of a universe of truths. A person who learns a language discovers a world of new truths. Perhaps one of the reasons why Ahmad Yugnaki, Mahmud Kashgari, Zamakhshari, Imam Bukhari and hundreds of other scholars of ours conquered such high peaks of science is that they mastered Persian and Arabic, which were the international languages of the time. Good knowledge of the language led to the sources written in these languages, on the one hand, and on the other hand, their works written in Arabic and Persian were immediately known and popular all over the world.

METHODS

Persian has been studied in Uzbekistan since ancient times. A large part of our cultural heritage of the past was written in Persian. Modern Persian is the state and literary language of Iran. The basic dialect of the Persian literary language is the Tehran dialect. Each period had its own grammatical features, lexical changes, and a certain writing system. Persian attracts poets and scholars from many countries due to its melody, the richness of synonyms and eloquence of words. . It is known that many Uzbek poets wrote their poems and works in Persian as well as in Uzbek until the end of the 19th century.

RESULTS AND CONSIDERATIONS

Thousands of medical, mathematical, astronomical, historical, philosophical, legal, linguistic and literary manuscripts written in Persian by thousands of Iranians, Tajiks, Uzbeks, Indians, Azerbaijanis and other peoples of the East are preserved in the Manuscripts Fund of the Institute of Oriental Studies of the Academy of Sciences of Uzbekistan. the devons and tazkirs of the poets can be proof of our opinion. The vocabulary of modern Persian is rich in Arabic words and Arabic elements. In addition, some Arabic grammatical and graphic elements have entered the Persian language. All this is used in accordance with the grammatical rules of the Persian language.

Currently, Persian is studied in Uzbekistan for scientific and practical purposes. At a time when the social, political, cultural and economic ties of our country with foreign countries of the East are strengthening, one of the urgent issues of the day is to cultivate talented philologists, translators, simultaneous translators who are fluent in foreign languages, including Oriental languages. At the same time, it is important to introduce international educational standards for foreign language teaching in the system of continuing education in Uzbekistan and to base it on the level of "pan-European competencies in foreign language acquisition: learning, teaching, assessment."

The use of modern teaching methods in the educational process leads to high results in the teaching process. The choice of teaching methods based on the didactic task of each lesson is considered expedient. While maintaining the traditional form of the lesson, enriching it with a variety of modern methods will ensure that the level of mastery of the learners will increase. This requires a rational organization of the teaching process, constant stimulation of students' interest in the learning process by the teacher, the use of interactive methods to break down the content of the material into small pieces and encourage students to perform mass exercises independently. When these methods are used, the educator encourages the learner to actively participate.

The position of our independent republic in the world community is growing, international relations, trade, tourism and cultural and economic ties between the countries are developing. One of the important tasks of today is to teach Oriental languages to young people who will create the future of our country, to develop their oral and written language in this language. Now let's explain a little about writing skills. I did teaching writing in a foreign language for two purposes, just like teaching reading: the first is to express in writing the words and grammatical rules that language learners have learned through listening or reading, and the second is to communicate. Only in the latter case is it necessary to cultivate the skill of writing, which includes specific rules and subtleties.

From the moment a language learner becomes acquainted with the ability to read and understand the interrelationships of letters and the difference in sound, we can begin to practice writing the letters of the language alphabet if we take the example of Persian. Language learners who use Latin letters in their native language should practice hand-to-hand writing from right to left. They have to learn to write each letter separately and how to put them together, just as an artist teaches a student to hold a hand. After exercises dedicated to learning letters, the language learner becomes familiar with writing individual words and phrases. It should be noted that it is not necessary to know all the letters from "alif" to "yo" from the beginning of reading. For example, a teacher can practice words such as دوز with language learners after teaching only the four letters of "د، ز، ر، و" and even record dictation. Then, by teaching one or two letters in each lesson, language learners can practice the words they have learned by "hearing or reading" in the texts and construct a sentence with those words and conduct the dictation at the speech level.

After learning to write letters and words, language learners can copy the texts they have learned in listening, reading, and conversation lessons, and also complete the exercises in writing. After this step, writing exercises can be done at the paragraph level. Thus, using the word and grammar rules memorized in listening and reading lessons, a one-paragraph material can be prepared and language learners can be asked to change a view of the grammatical rule and copy the sentences in the paragraph. For example, the pronoun "من" in the first sentence is written by changing "ما" and "انها" to "او". Thus, language learners not only copy the sentence, but also rewrite the text.

We call it the ability to write for communication. In extracurricular social life, we practice writing a speech for a variety of purposes, some of which include:

Record a message given over the phone, correspond with friends and offices, write a shopping list or invitation, greeting card, daily memoirs, article, story and other literary works, etc. Of course, in today's developed society, they use hearing, reading, and speaking more than writing to communicate. But often our language learners who are determined to continue their studies or learn Persian for research need to write in order to carry out their educational work. They need to write a report on their research work, take an exam, take notes of what they have read or heard, write down what the teacher has said, and write down a lot of their work in the learning process.

For a language learner to acquire writing skills, he or she needs to know what kind of person or persons the interviewee is; must be familiar with the content of the text, possess the words and phrases used to express his intention, so that, depending on the situation of the speaker, he can express his intentions through written speech using appropriate words and phrases. In order to obtain such information, the following exercises are performed in the lesson.

The language learner is given one sentence, on the basis of which he composes similar sentences, using words he knows; the language learner is given a text (a paragraph) in which he writes some words (verb, noun, adjective, adverb) in the desired form; based on a given table, map, project, picture, and so on, the language learner makes sentences that are worthy of each other; compound and complex sentences are formed on the basis of a given simple sentence; the sentences of a text are given in a chaotic manner, the language learner must arrange the sentences correctly, relying on the knowledge in his mind; the text is given and answers the

questions asked about it and writes the answers in the form of a coherent text; an incomplete story is given for reading, the language learner must fill in the blanks in it.

The following exercises are recommended to prepare the content of the text:

1. Divide the language learners into groups of two, and both are given the same texts written in Persian. Each of the two people in the group is asked to focus on the written text and to identify the similarities and differences between the two texts in terms of art and style. Each group is then asked to share the results of their observations with their classmates and to record the statements made by all group members.
2. We give each language learner a letter (or some text) from the salespeople. Please read the letter and write a synopsis. You will then be asked to write a sales letter based on the abstract you have written and compare what you have written with the original letter to determine how much information you have received to reflect in the letter.
3. Write a topic on the board. For example, "Is wealth good or science?" language learners are then asked to write their thoughts one by one. The views of language learners are written on the board. We ask each of them the reason why they expressed such an opinion. In this way, we encourage all group members to debate for a while. We then ask language learners to write an article on the board based on the discussion in the lesson.

Research shows that a teacher should help a language learner to prepare spiritually for the topic to be written in a spiritual way as outlined in paragraph "B". The teacher should not ask language learners to write down what they know about the topic and then submit it to the teacher for evaluation but should help language learners in their thinking strategy and writing down what they have in their hearts and organize what they want to write, and finally in the writing process.

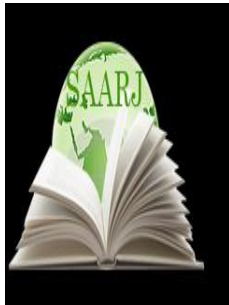
CONCLUSION

Finally, with the help of the language teacher, the learner should be aware that each text is written for a specific purpose and that there is a specific purpose in writing it, and that appropriate grammatical structures and logical sentences are used to make such a connection. In the activities mentioned above, the language learner not only uses different language skills to communicate but also because they are natural and all language learners in the class feel a sense of reliance on each other, there is an increased interest in language, a positive attitude to language, a sense of learning.

REFERENCES

1. Avliyakov NH Modern teaching technologies. Study guide. -T: 2001. - 68 p.
2. Azizkhuzhaeva NN Pedagogical technologies and pedagogical skills. -T., 2006.
3. Galskova N.D. Modern methods of teaching foreign languages. -Moscow, 2003.
4. Arifdjanov, Z. T. (2021). VARIANTS OF SIMPLE VERB خواستن. Theoretical & Applied Science, (6), 418-420.
5. Arifdjanov, Z. T. (2021). Functional Equivalents And Groups Of Meanings Of Simple Verbs In Persian Language. Theoretical & Applied Science, (6), 19-23.

6. Djafarov, B., & Arifdjanov, Z. (2021). Issues In Semantic Study Of Turkic Loanwords In Persian. Theoretical & Applied Science, (6), 350-352.
7. Lutfullayeva D. (2017). Assosiativ tilshunoslik nazariyasi. Monografiya. - Toshkent: Merius. 140 b.
8. Nasirova, Malika (2019) "Incomplete Conjunction Of Words In The Arabic Grammar," The Light of Islam: Vol. 2019:Iss.4, Article15. Availableat: <https://uzjournals.edu.uz/iiu/vol2019/iss4/15>
9. Feruza, Nizamova (2019). Amir Khusrav's literary heritage in applied art rituals // Theoretical & Applied Science. International Scientific Journal. Philadelphia, USA. 24.09.2019 –Pp. 189-195. <http://www.t-science.org/arxivDOI/2019/10-78/PDF/10-78-35.pdf>
10. Feruza, Nizamova (2019). Technological Issues and Innovative Solutions of Learning Ruba'is of Amir Khusrow Dehlavi // International Journal of Innovative Technology and Exploring Engineering (IJITEE), ISSN: 2278–3075 (Online), Volume-9 Issue-2, December 2019, Page No. 4792-4798. <https://www.ijitee.org/download/volume-9-issue-2/>



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ATYPICAL LOCATION OF TERATOMA IN CHILDREN FEATURES OF DIAGNOSIS AND TREATMENT

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ABSTRACT

The article presents teratomas of rare localization in children according to the authors' observations from 2003 to 2015. During this period, 69 children were examined and treated at the Department of Hospital Pediatric Surgery of Tashkent Pediatric medical institute. Sacro-coccygeal teratomas were detected in 52 (75.4%), teratomas of rare localization in 17 (24.6%) children aged from 1 month to 14 years old. Among the observed children the girls were 42 (60.9%), the boys - 27 (39.1%). For diagnostic purposes, in addition to generally accepted clinical and laboratory studies, the children underwent ultrasound, MSCT, rectoromanoscopy, irrigology, excretory urography examinations. Considering that the teratomas are mixed tumors of a complex structure, capable of malignancy, the details of the clinical course, diagnosis and results of treatment of children with the presented pathology were studied in this research. Based on the analysis of the described observations, the authors came to the conclusion that there is a need for an early surgical intervention, which has no alternative in treating children with teratomas, regardless of their type, localization and extent of the process, in order to avoid the risk of developing severe complications.

KEYWORDS: *Teratomas, Malignancy, Localization, Children*

INTRODUCTION

Teratomas are mixed tumors of a complex structure. Tissues arising from 2-3 germinal leaves can be found in them. Their presence is unusual in the organs and anatomical areas in which the tumor develops. It is known that the occurrence of teratoma is a consequence of a violation of the embryo morphogenesis. Teratoid tumors constitute 5.9% of tumors in children, and 22.4% of

cases in newborns and infants. The frequency is 1 in 35,000 live births [1, 2, 20]. According to the localization, mature or benign teratomas and immature (malignant) or teratoblastomas of gonadal and extragonadal area, are distinguished [1, 3,4,5,6,8,19]. The frequency of malignancy of the tumor is directly proportional to the age. The risk of malignancy in newborns does not exceed 5%, in children under 1 year old it constitutes more than 60%, in children over 1 year old — 75%. Malignant teratomas (teratoblastomas) are multicomponent formations, the tissues of which reach different degrees of differentiation with the presence of malignant elements. The morphology of teratomas is extremely diverse and fully justifies its name "miraculous tumors." The presence of immature embryonic tissues in them serves as a basis for treating them as tumors [2,3,6,7,9]. According to their course, they can be regarded as a malformation. Associated anomalies are observed in 20% of cases. Teratoid tumors are found in various body cavities, in almost any organ and body tissues [3, 4, 5,8,14]. The diagnosis of extracavitary teratomas is not difficult. Such formations can be established before the birth of the child. In some cases, their removal is recommended in the antenatal period [4,10,11]. Diagnostics and tactics of treatment of germ cell tumors with rare localization teratomas are not well understood yet.

The aim of the work is to analyze the clinical course, diagnosis and the results of surgical treatment of children with teratomas of rare localization based on clinic materials.

Materials and Methods

From 2003 to 2015, 69 children with teratomas of various localization were treated at the Department of Hospital Pediatric Surgery of Tashkent Pediatric medical institute: sacro-coccygeal teratomas (SCT) - 52 (75.4%); teratomas of rare localization - 17 (24.6%). The age of the patients was from 1 month to 14 years old. There were 42 girls (60.9%) and 27 boys (39.1%). In the diagnosis, in addition to the generally accepted clinical and laboratory methods, ultrasound (US), multispiral computed tomography (MSCT), rectoscopy, irrigology and excretory urography were used.

RESULTS AND DISCUSSION

The size, shape and localization of teratomas were noted in children of different age groups (Table 1).

TABLE 1 THE DISTRIBUTION OF PATIENTS BY AGE AND LOCALIZATION OF TERATOMAS (N = 69)

Patients' age		1-3 months	4-6 months	7-12 months	1-4 years	> 4 years	Total :
Distribution of teratomas according to the localization		hs	hs	hs		s	
Sacro-coccygeal	External type	5	6	4	—	—	15 (21,8 %)
	Internal type	—	5	6	—	—	11 (15,9 %)
	Mixed type	7	11	8	—	—	26 (37,7 %)

							(%)
Teratomas of abdominal cavity	Abdomen	–	–	–	2	–	2 (2,9%)
	Mesentery of the intestine	–	1	2		–	3 (4,3%)
Genital teratomas	Ovary	–	1	–	1	2	4 (5,8%)
	Testicle	–	–	–	2	1	3 (4,3%)
Chest teratomas		–	–	2	2	–	4 (5,8%)
Retroperitoneal teratomas		–	–	–	–	1	1 (1,5%)
Total:		12 (17,4%)	24 (34,8%)	22 (31,9%)	7 (10,1%)	4 (5,8%)	69 (100%)

As can be seen from the table, sacro-coccygeal teratomas (SCT) of various localization and depth, are most often observed. In other areas and organs of the body, teratomas are rarely observed, which correlates with the literature data. The internal type of SCT localization - presacral teratoma - is also considered as a rare pathology variant by some authors.

As a rule, teratomas of external localizations are found from birth. Sometimes formations reach a very large size and make the childbirth difficult. Methods of diagnosis of teratoid tumors depend on their localization. Screening and informative diagnostic method is ultrasound. During the ultrasound, the location, size, structure of the formation and belonging of the organ are determined [12,16,17,18]. As an additional method in the diagnosis X-ray and CT studies, allowing to find out the connection of the tumor with the surrounding tissues and associated malformations, can be used. Currently, CT has practically become the leading diagnostic method for teratomas of any localization. Based on CT examination data, in 22 (31.9%) of 69 patients were found to have associated developmental defects: coccyx hypoplasia - 10 (14.5%); connection of teratoma with spinal hernia - 7 (10.1%); ureterohydronephrosis - 2 (2.9%); anomalies of the development of the ribs - 2 (2.9%); incomplete doubling of the kidneys - 1 (1.5%).

The clinical manifestations of teratomas are diverse and are largely determined by their localization. Abdominal teratoma localization was noted in 5 (7.2%) cases of our observations. According to the literature, gastric teratoma is rare and accounts for about 1% of tumors of this localization. Gastric teratomas in newborns and infants are often observed among boys and have a low propensity for malignancy [1,4,5,12,18,20]. Teratoma can be detected in a child in any

organ or in the abdominal cavity in the form of formation of various sizes. The small size of the tumor remains unnoticed for a long time due to the absence of pain and symptoms of obstruction. With the increasing of the teratoma, vomiting, bouts of pain, constipation periodically appear. A careful examination of the abdomen, in such cases, reveals its asymmetry to some extent due to bulging on the side of education. Palpation is determined sedentary painless education with smooth or uneven contours. In our observations, stomach teratomas were detected in 2 children aged 3 years, which constituted up to 2.9% of the patients with teratoid tumors. The disease was manifested by the palpable formation in the epigastric region, the symptoms of partial high intestinal obstruction and a body mass deficit of up to 20-30%.

Contrast studies of the gastrointestinal tract showed partial obstruction on the stomach level; with ultrasound and MSCT, an increase in the organ was established due to the intimately adjacent formation of a heterogeneous structure (Fig.1).

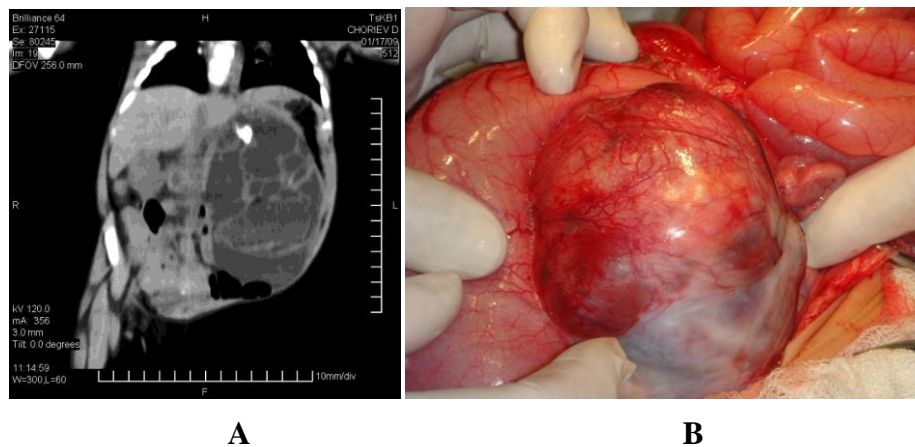


Fig.1 Stomach teratoma: A) CT scan - heterogeneous formation in the projection of the stomach; B) the view of tumor during surgery.

Patients are operated with the suspect of doubling of the stomach. During the operation, it was possible to completely separate the formation from the body of the stomach that was situated along the greater curvature. The macroscopic structure was heterogeneous, had solid cystic character with mucus-like contents and heterogeneous inclusions (hair and cartilage plates) that made it possible to regard the pathology as teratoma of the stomach. The diagnosis was confirmed by histomorphological examination of the removed tumor. The postoperative period was uneventful. Patients were discharged in satisfactory condition.

Teratoid tumors of the mesentery of the large intestine were diagnosed in 3 children. The patients were operated on with the diagnosis of “abdominal tumor”, since “palpable tumor syndrome” in the abdominal cavity was revealed via the main clinical manifestation and auxiliary examinations. The formation was located along the mesenteric edge of the colon within the ascending and descending colon (Fig.2-A). In 2 patients, the formation was spread in the mesentery and consisted of numerous nodes of different size with solid structure and heterogeneous content, and enveloped in a capsule (Fig.2-B). It was separated from the adjacent section of the colon. In one child, the formation of the structure mentioned above, engulfed over 10 cm of the descending colon in the form of a coupling with intimate soldering to the wall. In this case, along with the removal of the tumor-like formation, the resection of the corresponding

section of the large intestine with the imposition of an end-to-end anastomosis was required. The histological findings in these observations became the basis for the diagnosis of teratoma of the specified localization.

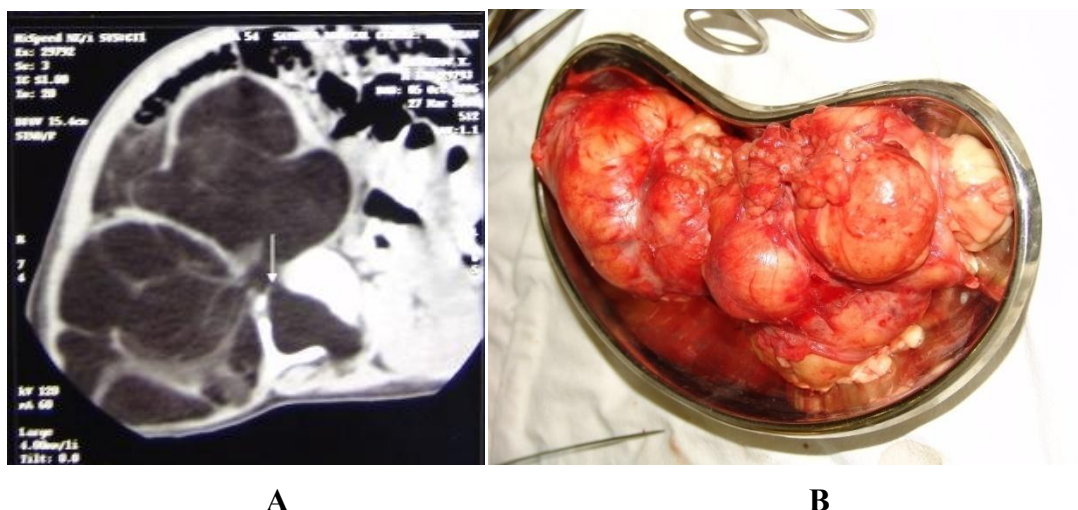


Fig.2 Teratoid tumor of the mesentery of the large intestine: A) CT scan of the abdominal cavity - a giant formation of heterogeneous structure; B) macropreparate of the removed tumor.

Of the 52 patients with SCT, 11 (21.1%) were diagnosed with an internal type of tumor localization. 11 children with presacral localization of the SCT were hospitalized with complications of the disease in the form of a difficult act of defecation and/or urination, abdominal pain. Two had the symptoms of general intoxication: pale skin, weight loss, physical development lag, vomiting, fever. A finger study of the rectum revealed a presacally located tumor-like mass. These ultrasound and MSCT allowed to establish the correct diagnosis. Impaired pelvic function and dysuria in these patients were due to compression of the rectum and ureter by a tumor-like formation; intoxication phenomena in two patients - due to the malignancy. Complications are usually manifested by bright symptoms and deterioration of the child's general condition. By the time of birth, a tumor can squeeze or displace the rectum so much that from the first days of life a child has intestinal obstruction. When a bladder is pressed, the complication is manifested by urinary retention; the urine is separated by drops, the bladder is stretched, the child is worried when urinating, and retches. Catheterization is difficult. The compression of a rectum or urethra by a tumor in some patients was observed at the age of 2-3 months; in one child - at an older age. The compression of the ureter in two patients led to the development of secondary ureterohydronephrosis.

Gonadal teratomas in 7 children were presented in the form of ovarian teratomas in girls and testicular teratomas in boys. Four girls were observed with ovarian teratoma. The main clinical signs were the presence of volumetric formation and abdominal pain. Two girls were hospitalized in an emergency due to increased pain syndrome with irradiation to the perineum, the appearance of a delayed stool and painful urination. An objective examination drew attention to the paleness of the skin, increased heart rate, massively spread pain and active muscle tension during palpation of the abdomen. In 2 cases, the main symptom was palpation of the tumor-like formation without pain and disorders of defecation and diuresis. The data of clinical examination

and auxiliary examination methods before the operation found twisted ovarian cyst in 2, and mesentery cyst in 1 patient. In 1 child, a possible pathological process associated with ovarian tumor, was suggested. After careful examination, all patients were operated on. The final volume of surgery, as a rule, was determined during the operation. In two girls, teratoma was represented by a unilateral tumor formation sized 7x8x6cm having cystic and solid structures and heterogeneous inclusions, covered with a single thick sheath that had grown into the ovarian tissue, containing more than 12 different sizes. In this case, the operation was completed by removing the tumor and ovarian tissue (Fig.3-A). In the second girl, the tumor capsule adhered to the ovarian tissue without macroscopic changes. The tumor was accepted as benign. The volume of operation was sparing, and limited to the removal of the tumor with preservation of the ovarian tissue. In two girls, the formation consisted of multi-chamber nodes represented by solid tissue structures and many components of heterogeneous inclusions with diffuse growth of the capsule in the infiltrated ovarian tissue. The surface of the tumor had a hilly character, the size exceeding 12 cm in diameter. The changes are regarded as ovarian teratoblastoma without spreading to the second ovary and lymph nodes. The operation is completed by removing the tumor and the ovary as a single unit (Fig.3-B).

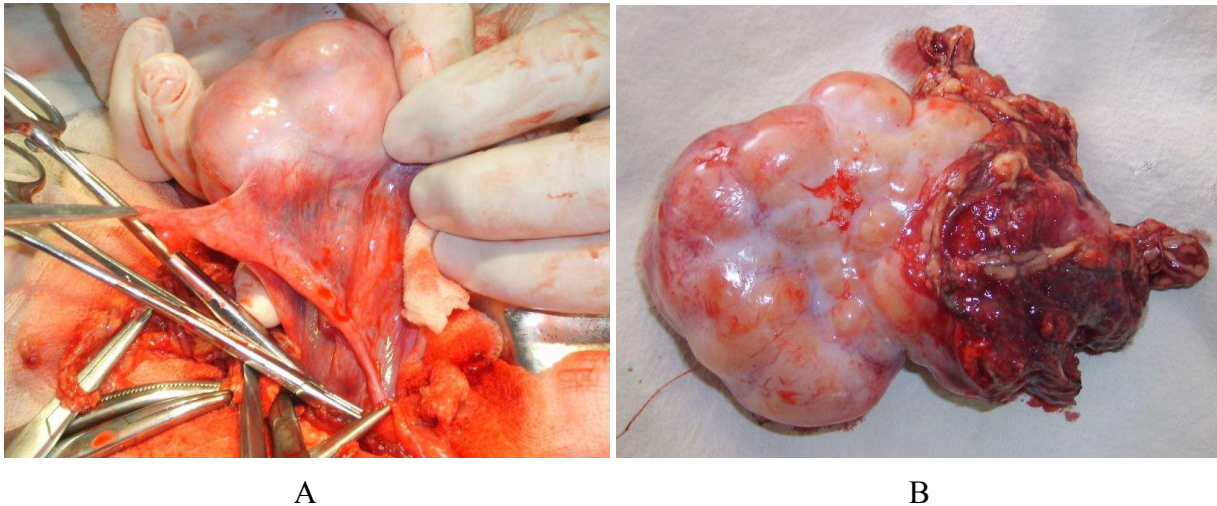


Fig.3 Teratoma of the ovary: a) the view during operation, b) macropreparate of the removed tumor.

Testicular teratomas are more common in children under the age of 2 years, and are often detected from birth. Teratomas are benign as opposed to adults whose ovarian teratomas are malignant. The cases of malignant teratoma in boys 15-16 years of flat keratinizing epithelium, mucous glands, undifferentiated epithelial tissue have been described [1,2,4].

In our observations, teratoid tumors of the testes were detected in 3 children. In patients who were under observation due to the "tense dropsy," there was an increase and a sharp induration of one of the testicles. An ultrasound showed an increase in the affected testicles due to an inhomogeneous solid structure. Orchofuniculectomy was performed. On the section of the macropreparation, heterogeneous tissue and hair were revealed (Fig.4).

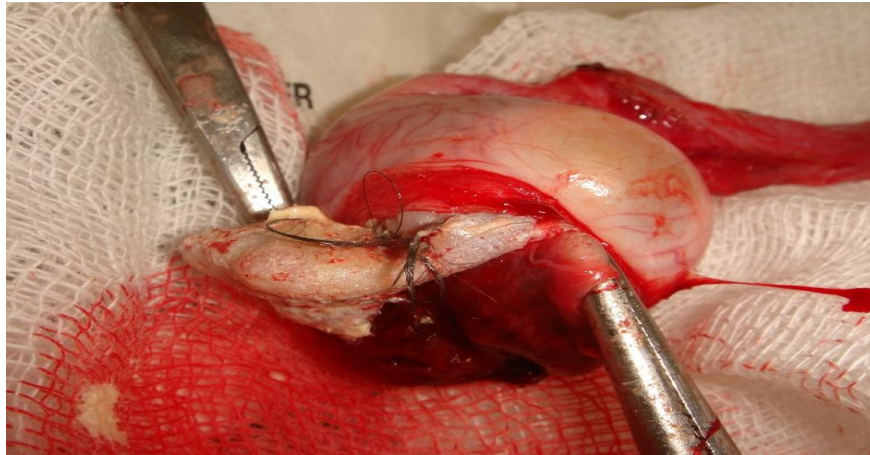


Fig.4 Testicular teratoma: adipose tissue and hair are determined in the incision

Teratoid tumors of the chest were found in 4 patients: with the localization of the process in the anterior mediastinum - 3, and in the lung parenchyma - 1. All children were monitored and treated by pediatricians with suspected pneumonia, bronchitis, pleurisy. Like other benign tumors of the chest, teratoma is manifested by respiratory symptoms associated with compression of the respiratory tract. Most often it is noisy, sometimes stridor breath. Rapid breathing may be due to the compression of the pulmonary parenchyma by the formation of large sizes. In the early stages, the tumor may be asymptomatic in the form of tachypnea during exercise. In 2 patients, due to the significant size of the tumor, the asymmetry of the chest was clearly defined. In one child, chest teratoma was detected on a roentgen as a random finding. On X-ray the teratoma is characterized as a formation with fuzzy contours, containing calcifications or bone inclusions. CT scan is more informative for diagnosis (Fig.5).

Patients with chest teratomas underwent surgery. Three patients underwent the resection of the tumor from the anterior mediastinum; one patient from the lobe of the lung bearing teratoid formation. Patients were discharged from the hospital in a satisfactory condition. In a child who underwent a resection of the lung, metastases are found in other organs in six months after the operation. Three patients after the removal of teratomas from the mediastinum are under observation, and developing according to their age.

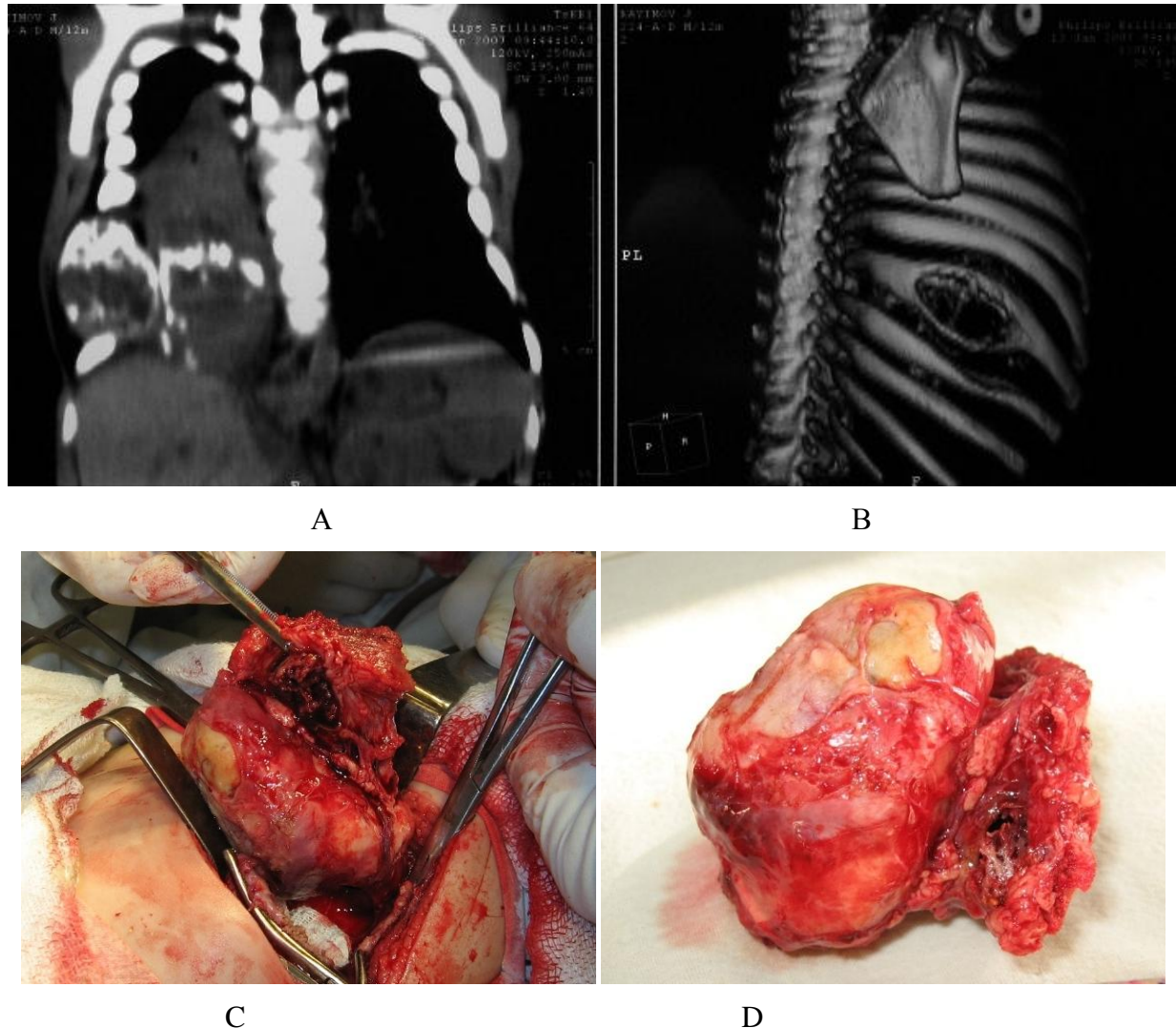


Fig.5 Teratoma of the right lung: inhomogeneous nodules with inclusions (A) are determined at CT; germination of the process to the 7th-8th ribs (B); view of the tumor during surgery (C); macropreparate (D)

In one patient, a teratoid tumor emanating from the retroperitoneal space was noted. Palpation revealed the formation of a dense consistency with a bumpy surface, limited mobility. CT scan showed a multi-chamber formation of a cystic and solid structure (Fig.6). The child was operated on. The bulk of the huge formation sized 15x17-20 cm consisted of adipose tissue in the form of nodes of various sizes, having a separate capsule, containing atheromatous nodes with hair and cartilage inclusions in some areas. The postoperative course is without complications. The patient is under observation.

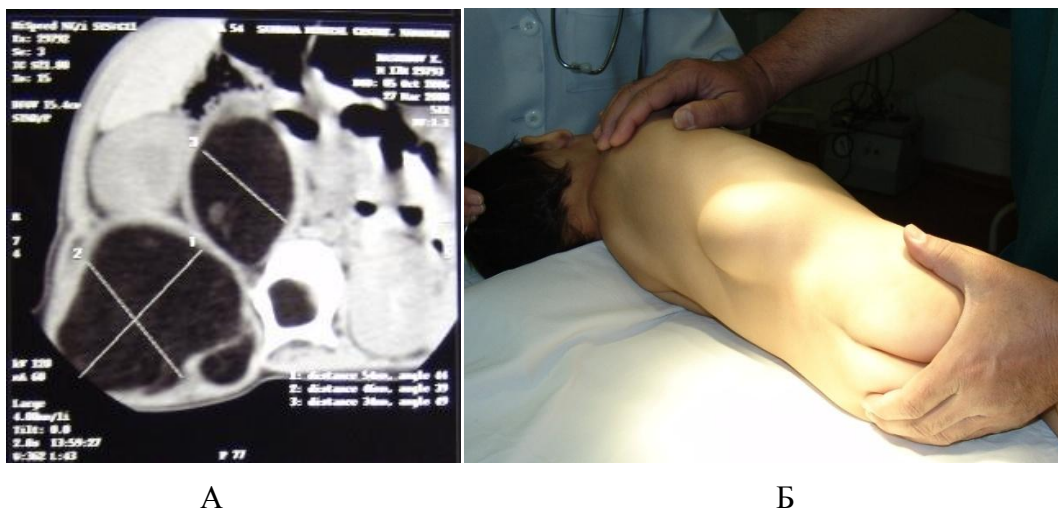


Fig. 6. Retroperitoneal teratoma: A) multi-chamber cystic formations are determined at CT; B) the view of the patient

The need for the early surgical intervention in teratomas is undoubted and is supported by many authors. Like most other authors, we believe that teratomas, regardless of their localization, are subject to surgical removal as soon as possible after their detection. This prevents their excessive growth and the development of various complications. Indications for urgent surgical intervention are: compression of a rectum or urethra by a tumor, observed during internal localization of the SCT; suspected malignant degeneration. The rapid growth of the tumor, if it does not lead to squeezing of the organs of the perineum, should still be regarded as an indication for emergency surgery because of the risk of malignant degeneration.

In other locations, a rupture or dramatic thinning of the membranes during ulceration or necrosis of the skin, suppuration of individual cystic cavities, also serve as indications for the urgent operation. The nature and duration of preoperative preparation depend on the type of complications.

The postoperative period was uneventful in all patients. Our clinical observations show that if a tumor consists of benign mature tissue, then the removal of teratoma is the method of choice and provides good long-term results. With teratoblastomas, the long-term results of treatment were worse. In 2 (2.9%) patients the metastasis of the tumor and death were observed. Patients died within the first 4-6 months because of the tumor recurrence with generalization of the process and progressive tumor intoxication, anemia, cachexia. All patients recovered after surgery, complications were not observed. In all cases, the diagnosis of teratoma is confirmed by histomorphological examinations.

CONCLUSIONS

Our clinical data correlate with the literature data that the peculiarity of teratomas in children is their benign course and rare metastasis into the nearby anatomical structures and organs. In most cases, teratomas have the character of multi-chamber cysts of various sizes or solid growths consisting of mature tissues, between which sometimes there are fields of solid growths of undifferentiated embryonic character. Most teratomas are organoid, composed of structures resembling organs and various tissues, rudiments of limbs.

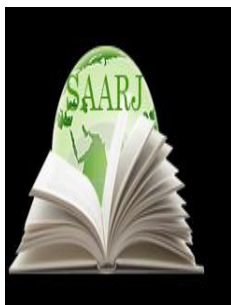
Benign teratomas tend to grow aggressively, but they do not grow into nearby anatomical structures, and malignant teratomas are characterized by aggressive growth and metastases into the nearby organs and other parts of the body. Cases of immature teratomas increase with age. This confirms the necessity of and early diagnosis and timely surgical intervention.

With teratomas of any localization, oncological alertness is a decisive factor in preventing their malignancy and other complications.

BIBLIOGRAPHY

1. Ashcraft K.W., Holder T.M. Pediatric surgery. SPb: Raritet-M, 1999,400.
2. Durnov L.A., Polyakov V.E., Akhmedov B.P., Khakimov G.A. Guide to pediatric oncology. Tashkent. Abu Ali ibn Sino. 2001,500.
3. Klimenko VN Vneraradnye hemorrhagic tumors // Practical oncology. P. 63-68
4. Ergashev N.Sh., Diyarov N.A., Allaberganov I.K., Khurramov F.M. Teratomas of sacrococcygeal area in children. New day in Medicine. Tashkent. 2014;2:57-61.
5. Akinkuotu A.C., Coleman A., Shue E., Sheikh F., Sinjiro Hirose, Fooong-Yen Lim, Olutoye O.O Predictors of poor prognosis in prenataly diagnosed sacrococcygealteratoma: A multiinstitutional review. J. Pediatr. Surg. 2015; 50 (5): 771-4
6. Allen H.D., Moss and Adams' Heart Disease in Infants, Children, and Adolescent: Including the fetus and young Adult. Lippincot Williams and Wilkins; 2007.
7. Batt G.C., Nondan D., Sen A., Kanaujia P. Fever of Unknown Origin: A Case of Post Obstructive Pneumonia Complicating Mature Teratoma // Ann. Med. Health. Sci Res. 2013. Vol. 3. N 3. P. 461-463
8. Choi DJ, Wallace EC, Fraire AE, Baiyee D. Best cases from the AFIP: intrarenal teratoma. Radiographics. 2005;25(2):481-285.doi: 10.1016/j.jpedsurg.2006.03.019.
9. Goel A., Danaher L., A. et al. Mediastinal teratoma // Radiopaedia.org.
10. Hedrick HL, Flake AW, Crombleholme TM et al. Sacrococcygeal teratoma: prenatal assessment, fetal intervention, and outcome. J Pediatr Surg. 2004;39:430-8.
11. Kim E, Bae T.S., Kwon Y., Kim T.H., Chung K.W., Kim S.W. et al. Primary malignant teratoma with a primitive neuroectodermal tumor component in thyroid gland: a case report. J. Korean Med. Sci. 2007; 22 (3): 568-71 2007
12. Malogolowkin MN, Orteg J. Immature teratomas: identification of patients at risk for malignant recurrence. J. Nat. Cancer. Inst. 1989;81:870-874.
13. Mamedov Ad.A., Kirgizov I.V., Nelyubina O.V., Selitskaya A.B., Blinder Zh.A. A clinical case of teratomas of the oral cavity and oropharynx, combined with congenital cleft lip and palate. Detskayastomatologiya. 2012; (6): 8-10. (in Russian)
14. Morozov D.A., Pimenova E.S., Dvoryakovskiy I.V., Talalayev A.G. Thyroid teratoma and newborns. Detskayakhir. 2014; 18 (5): 33-6. (in Russian)
15. Neonatal Surgery. (Neonatal'nayakhirurgiya). / Yu. Isakov, N.N. Volodin, A.V Geras'kin. Moskov: Dinastiya; 2011; 579-88. (in Russian)

- 16.** Nzegwu MA, Aligbe JU, Akintomide GS, Akhigbe AO. Mature cystic renal teratoma in 25-year-old woman with ipsilateral hydronephrosis, urinary tract infection and spontaneous abortion. *Eur J Cancer Care (Engl)*. 2007;16(3):300. doi: 10.1111/j.1365-2354.2006.00755.x.
- 17.** Tapper D., Sawin R. Teratomas and Other Germ Cell Tumors. *Pediatric Surgery*. St.Louis. Baltimore-Boston: Mosby. 1998,447-459.
- 18.** Tran K.M., Flake A.W., Kalawadia N.V. et al. Emergent excision of a prenatally diagnosed sacrococcygeal teratoma. *Paediatr. Anaesth*. 2008;12:28-35.
- 19.** Yaqoab N. Ahmed Z. Jafri N, et al. Renal teratoma; a rare entity. *J Pak Med Assoc*. 2003;53(10):492-493
- 20.** Yavuz A. Caken K. Alimoglu E, Akkaya B. Mature Cystic renal teratoma. *Iran J Radiol*. 2014;11(1):e11260. doi: 10.5812/iranjradiol.11260



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AN OVERVIEW OF MICROSTRIP ANTENNA

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ABSTRACT

A remarkable increase in the field of broadband communication has paved the way for a wide range of micro strip antenna research and applications. Micro strip antennas' flexibility brought a new dimension to it. The introduction and overview of the Micro strip antenna are presented in this research paper. The benefits, disadvantages, and limits of various feeding methods are also addressed. The techniques for modeling a micro strip antenna are also discussed. It also gives a notion of how antennas are classified. patch antenna with microstrips. A patch antenna's design and analytical techniques have been explored. Various patch shapes have been used and explored in relation to the applications. Despite the fact that much work has been done on micro strip antennas, there is still much more to be done. Microwave and millimeter wave technology have advanced to the point that systems can now be miniaturized.

KEYWORDS: *Antenna, Electromagnetic, Microstrip, Probe, Feeding.*

1. INTRODUCTION

A patch antenna (also known as a microstrip antenna) is one of the most recent antenna and electromagnetic applications technologies. Because of its ease of usage and compatibility with printed circuit technology, it is currently extensively utilized in wireless communication systems. In the 1950s, electromagnetic wave-radiating microstrip geometries were first proposed. In 1953, Deschamps [3] presented the idea of a microstrip antenna for the first time. The microstrip was patented by Gutton and Baissinot in 1955. Microstrip lines and radiators were first created in labs

as specialized equipment. During this time period, there were no commercially accessible printed circuit boards with controlled dielectric constants. As a result, it wasn't until the 1970s, when Robert E. Munson improved it that this antenna became viable. The availability of low-loss tangent substrate materials sped up development throughout this decade, thanks to the efforts of other researchers. Enhanced photolithographic methods, improved theoretical modeling, and appealing thermal and mechanical characteristics of the substrate are among the other reasons driving the advancement. Munson [6] and Howell [7] were the first to create a workable antenna.

Microstrip antennas and their arrays have seen a wide range of applications since then, thanks to considerable research and development. With the advances in printed circuit technology, microstrip or printed patch antennas are now utilized in virtually all wireless systems. Microstrip or patch antennas are used in wireless communication applications to emit and receive electromagnetic radiation in the microwave range. The geometry of the printed patch [8] as well as the material properties of the substrate onto which the antenna is printed determine the performance and functioning of a microstrip antenna. Microstrip antennas are a recent innovation. It was created to make it easier to combine an antenna and other communication system driving circuits on a single printed circuit board or semiconductor chip (Carver and Mink, 1981; Pozar, 1992). Aside from the aforementioned benefits, the antenna manufacturing using integrated-circuit technology allows for great dimensional precision, which was previously impossible to accomplish using conventional fabrication techniques. A microstrip antenna's geometry is made up of a dielectric substrate with a thickness of d , full metalization on one side, and a metal "patch" on the other. In most cases, the substrate is thin. The metal patch on the front surface may take many different forms, but the rectangular shape is the most typical. Various ways of energizing the antenna are available. One popular method is to feed from a microstrip line by attaching the microstrip antenna to one of its edges near the center. The microstrip line may be directly fed by connecting a signal source between the microstrip line and the ground plane, or it can be supplied via a feeding circuit. The broadside (perpendicular to the substrate) of the microstrip antenna generates the most radiation, while the end-fire (along the substrate's surface) produces the least. The antenna's size is typically chosen such that it resonates at the working frequency, resulting in a real input impedance. This necessitates a rectangular microstrip antenna with a length of approximately half a wavelength in the dielectric medium.

On the other side, the width of the antenna, W , affects the input impedance level. A rectangular chamber with open sides is what a microstrip antenna looks like [1]. The radiation is caused by the fringing fields that pass through the open sidewalls. The structure, however, is mostly a resonant cavity with relatively little fringing radiation. As a result, the radiation's bandwidth is low when compared to the bandwidth of the antennas mentioned previously. The limited bandwidth, on the other hand, is sufficient for a wide range of communication applications. For some analytical modeling of a microstrip antenna, see Balanis (1997) and Carver and Mink (1981). Rectangular and circular patches are the most frequently utilized microstrip antennas. These patches are suitable for both basic and complex applications. Dual-frequency operations, circular and dual polarizations, wide bandwidth, beam scanning, and other features may be readily achieved with these patches. By initially applying any new numerical or analytical method to these geometries, any new numerical or analytical approach is standardized. The rectangular microstrip patch antenna is without a doubt the most basic microstrip antenna design [2]. As a result, this article is on rectangular microstrip antennas. A Microstrip patch

antenna in its most basic form comprises a radiating patch on one side of a dielectric substrate and a ground plane on the other, as.

A microstrip antenna is a dielectric substrate panel wedged between two conductors in its most basic form. Ground plane refers to the bottom conductor, whereas patch refers to the top conductor. Microstrip antennas are often employed at frequencies ranging from 1 GHz to 100 GHz[3]. The patch has been chosen to be very thin. Patches are often made of gold or copper and come in a variety of forms. Because of their low resistivity, resilience to oxidation, simplicity of soldering, and ability to attach effectively to substrates, these conducting metals are the most popular. On the dielectric substrate, the feed line and radiating patch are etched. The radiating patch may be designed in a variety of forms depending on the required features, but owing to their simplicity of manufacturing and analysis, circular, square, and rectangular designs are the most popular. Despite the differences in geometrical form, their radiation properties are identical because they function like a dipole. Surface waves and spurious feed radiation rise as the thickness of the dielectric substrate increases, reducing the antenna's bandwidth. Unwanted cross-polarized radiation is also produced by the feed radiation. The fringing fields between the patch's borders and the ground plane are what cause microstrip patch antennas to emit. For improved performance, a thick dielectric substrate with a low dielectric constant is preferred. This will increase efficiency and reduce radiation[4]. However, this feature has a tendency to increase the antenna's size. The substrate dielectric constants should be high in order to create a compact form. Such a design, on the other hand, will be less efficient and have a smaller bandwidth. Impedance matching between the antenna and the feed line is needed to guarantee maximum energy transmission from the source to the radiating components[5]. The antenna and feed line will be matched at a port position that is roughly chosen. After decades of study, it was discovered that the geometry of the printed patch and the material properties on which the antenna is printed control the performance and operating of a microstrip antenna[4]. Although rectangular patches are the most common, square, circular, and triangular patches are all conceivable. The radiating element may be square, rectangular, triangular, elliptical, or circular in form, depending on the properties of the transmitted electromagnetic radiation, and must be distanced from the ground plane by a defined distance. Between these two conducting layers is a strip of dielectric substrate.

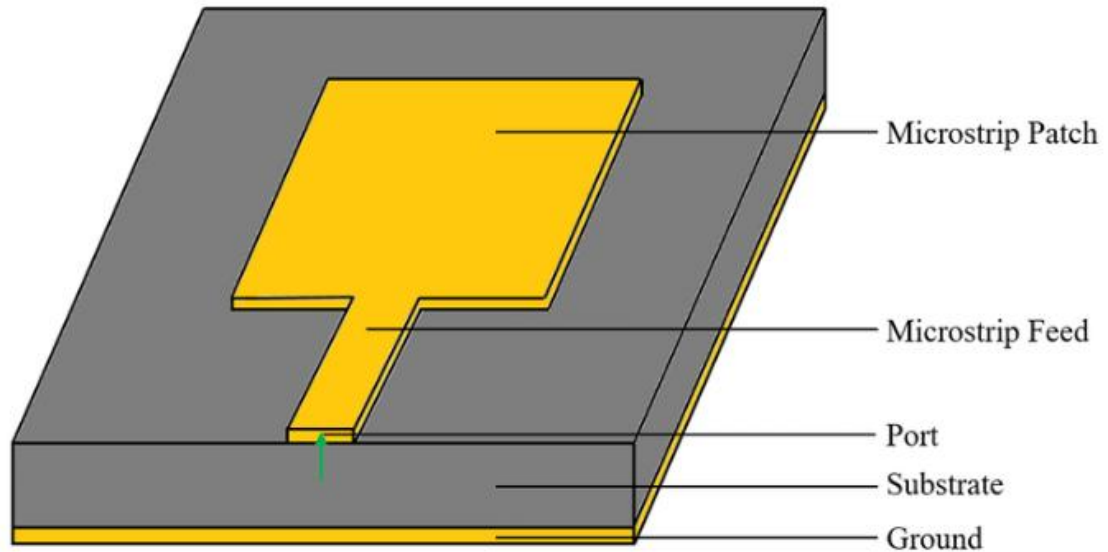


Figure 1: Diagrammatic Representation of [PROFILE]

1.1 Application of Microstrip Antenna

The usage of micro strip or printed patch antennas may meet a variety of commercial needs. Rectangular shaped patch antennas are the most often used antennas out of a variety of forms. Micro strip patch antennas meet the majority of criteria for mobile and satellite communication systems, and several different types of micro strip antennas are available. Other common uses include aircraft, spacecraft, satellites, and missiles, all of which benefit from the micro strip antenna's size, weight, cost, performance, simplicity of installation, and low-profile design. In the field of mobile radio and wireless communications, there are many additional government and commercial uses where this antenna is appropriate. These antennas are used to meet a wide range of business requirements [6]. The omnipresent Global Positioning System (GPS), ZigBee, Bluetooth, WiMAX, Wireless Fidelity (Wi-Fi), and wireless communication technologies are among the many applications. Antennas are in high demand for navigational applications such as automotive asset tracking and maritime applications. In the fields of industry, transportation, and medicine, it is widely used in radio frequency identification (RFID) and radar systems. In summary, micro strip antennas meet the needs of a lightweight, flexible antenna system.

In recent years, satellite digital audio radio services have used printed monopole micro strip antennas as an alternative to audio commercial broadcasts in cars. The benefits of utilizing antennas in communication systems will continue to drive the development of new applications that rely on them[7]. They are the gadget that allows all of the wireless technologies that have grown so common in our culture to function. In many contemporary communication systems, the material costs of cable infrastructure also promote the usage of antennas. The number of applications will continue to expand as people become more aware of the capabilities of Microstrip antennas, especially owing to their radiation mechanism and functional performance[8]. Certain applications in communications, electronic support and countermeasures, radar, and radiometry require a large bandwidth.

Some common application of Microstrip antenna:

- Satellite Communication Direct Broadcast Service.
- Mobile Communication Systems
- Radars such as Doppler and others
- Missiles and telemetry are the fourth and last items on the list.
- Environmental Instrumentation and Remote Sensing
- Receivers for satellite navigation.
- A radio altimeter is a device that measures the altitude of an object.
- Intruder Alarms and Biomedical Radiators
- Wireless Communication Systems and Services for Individuals.

1.2 Feeding Techniques for Microstrip Antenna:

The feed transports electromagnetic energy from the source to the patched area. Some of this energy escapes the patch's confines and is radiated into space. A number of techniques are used to feed the signal in micro strip patch antennas. Feeding techniques are divided into two categories: contacting and non-contacting. The input radio frequency power is supplied directly to the patch via a connecting device such as a micro strip line in the contacting technique. Electromagnetic field coupling is used in the non-contacting method, which is also known as the indirect scheme, to transmit power between the micro strip line and the radiating patch. Micro strip line feed, coaxial feed, aperture coupling feed, proximity coupled micro strip feed, and coplanar waveguide feed are the four most common feeding methods[9]. The bandwidth, radiation pattern, polarization, gain, and impedance of an antenna are all influenced by the feeding technique. The coaxial and micro strip feeds are the most frequently utilized feeding methods in practice. Because the antenna and feed lines' input impedances vary from the standard 50-ohm line impedance, matching is typically needed. The antenna and its feed line will be matched if the port position is chosen correctly. The section below gives a short explanation of each of these feeding techniques[10].

- *Micro strip Line Feed:* Micro strip Line Feed is a kind of micro strip line that is used to A conducting strip is linked directly to the edge of the Microstrip patch in this kind of feed method. In comparison to the patch's size, the conducting strip is narrower. Because the feeding system and radiating patch may be printed on the same dielectric substrate, this technique is the simplest to implement. This configuration creates a flat structure. Edge-fed patches may be used to build huge arrays because of this benefit. The disadvantage is that the feed line radiation causes a rise in the crosspolar level. Furthermore, in the millimeter wave area of the spectrum, the feed line dimension is equal to the patch size dimension, resulting in increased unwanted radiation. An inset incision in the patch may be part of the feed arrangement to the patch. The inset cut in the patch's function is to match the feed line's impedance to the patch without the need of any extra matching elements. This is accomplished by carefully managing the inset position. This is a simple feeding system

because it allows for straightforward manufacturing, modeling simplicity, and impedance matching.

- *Feeding of the Coaxial Probe:* The most popular method for feeding printed patch antennas is the coaxial feed or probe feed. To accomplish impedance matching, this feed may be supplied at any desired position inside the patch. The inner conductor of the coaxial connection is soldered to the radiating patch via the dielectric, while the outer conductor is attached to the ground plane. Low radiation loss is achieved using the coaxial or probe feed technique. The primary benefit of this feed is that it may be positioned anywhere inside the patch to match its input impedance. This feed technique is simple to make and emits little spurious radiation. However, since a hole must be drilled into the dielectric substrate, it has a significant disadvantage in terms of bandwidth and is difficult to utilize. The hole in the substrate must also be bored, and the connection must extend beyond the bottom ground plane. It is not entirely flat, and the asymmetry of the structure is due to the feeding system. Increased coaxial feed or probe feed length for thicker dielectric substrates makes the input impedance more inductive, causing impedance matching issues. Both of the aforementioned techniques of direct feeding the microstrip antenna have issues with thick substrates, which are often used to produce wide band. Increased probe length makes the input impedance more inductive in a coaxial feed, causing the matching issue. An increase in substrate thickness increases the width of the microstrip feed, which increases the unwanted feed radiation. Microstrip line and coaxial feeds suffer from probe reactance and surface wave excitation issues on high thickness dielectric substrates. These issues are solved by the indirect feed, which is described further below.
- *Microstrip Feed with Aperture;* The field is linked from the feed line to the resonating patch via a slit in the ground structure that is positioned between the two substrates in an aperture coupling. There is a feed line on the bottom substrate and a radiating patch on the top substrate. The field is coupled from the microstrip line feed to the radiating patch via an electrically tiny aperture or slot created in the ground plane in the aperture coupled microstrip antenna design. Under the patch, the coupling aperture is usually centered. Because of the configuration symmetry, this helps to reduce cross-polarization. The form, size, and placement of the aperture determine the degree of coupling from the feed line to the patch. There are two types of slot apertures: resonant and non-resonant. The resonant slot adds additional resonance to the patch resonance, thus boosting bandwidth, albeit at the expense of increased back radiation. As a consequence, non-resonant apertures are often used.
- *Proximity-Related Micro Strip Feeding Method:* a non-contacting microstrip feed arrangement utilized a two-layer substrate with the microstrip line on the bottom layer and the patch antenna on the top layer. This feeding technique has two dielectric layers, one of which is a radiating patch layer and the other of which is a feed line with a ground plane on the reverse side. A common ground plane separates the two substrates. Through a slot aperture on the common ground plane, the patch is electromagnetically linked to the microstrip feed line on the bottom substrate. These settings may be utilized to increase bandwidth regardless of the shape or size of the slot. Because of the shielding effect of the ground plane, radiation from the open end of the feed line does not interfere with the patch's radiation pattern. This feature also enhances the purity of the polarization. Due to the symmetry of the arrangement, the coupling aperture is typically centered beneath the patch, resulting in

reduced cross polarization. To maximize patch radiation, a thick, low dielectric constant material is utilized for the bottom substrate and a thin, high dielectric constant material is used for the top substrate. Wider bandwidth is a noteworthy characteristic of this feed arrangement, which is mainly due to an increase in the thickness of the micro strip patch antenna. This method allows you to use a different substrate for the patch and the feed line in order to get the best results. The main disadvantage of this technique is the difficulty in manufacturing owing to the numerous layers that must be aligned properly. The antenna thickness rises in this technique as well.

- *Feeding using a Coplanar Wave Guide (CPW)*; The Micro strip antenna has also been excited using the coplanar waveguide feed. The coplanar waveguide is printed on the ground surface of the patch in this manner, as illustrated in Figure 6. A coaxial feed excites the line, which is terminated by a slot that is almost a fourth of the slot wavelength long. Because of its numerous advantages, such as broad band width, simple construction, a single metallic layer, fewer soldering points, and compatibility with other circuits, this feeding technique is extensively employed for wireless communications. The major drawback of this technique is that it produces a lot more radiation due to the larger slot. This may be improved by shrinking the slot dimension and reshaping it into a loop.

2. DISCUSSION

A microstrip antenna (also known as a printed antenna) is an antenna that is manufactured on a printed circuit board using photolithographic methods (PCB). It functions as an internal antenna. Microwave frequencies are where they're most often utilized. An individual microstrip antenna is made up of a patch of metal foil in different forms on the surface of a PCB (printed circuit board) and a metal foil ground plane on the opposite side. The majority of microstrip antennas are made up of numerous patches arranged in a two-dimensional array. Foil microstrip transmission lines are used to link the antenna to the transmitter or receiver. Between the antenna and the ground plane, a radio frequency current is delivered (or, in receiving antennas, a received signal is generated). Due to their thin planar profile, which can be incorporated into the surfaces of consumer products, aircraft, and missiles; their ease of fabrication using printed circuit techniques; the ease of integrating the antenna on the same board as the rest of the circuit; and the possibility of adding active devices such as microwave integrators, microstrip antennas have become very popular in recent decades. Patch antennas are by far the most popular kind of microstrip antenna. Patch antennas may also be used as constituent components in an array. A patch antenna is a narrowband, wide-beam antenna made by etching the antenna element pattern in metal trace attached to an insulating dielectric substrate, such as a printed circuit board, with a continuous metal layer connected to the other side of the substrate that serves as a ground plane. Square, rectangular, circular, and elliptical microstrip antennas are common, although any continuous form is conceivable.

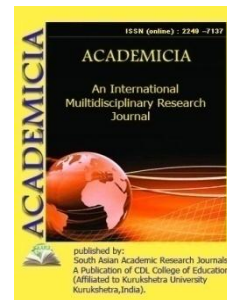
3. CONCLUSION

The article provides a succinct overview of antennas in general and microstrip antennas in particular. It concisely explains the benefits and drawbacks of microstrip antennas, as well as the different methods utilized in source feeding. A short comment about the analytical procedure is included with the explanation of the feeding methodology. Patch antenna with microstrips. A patch antenna's design and analytical techniques have been explored. Various patch shapes have

been used and explored in relation to the applications. Despite the fact that much work has been done on microstrip antennas, there is still much more to be done. Microwave and millimeter wave technology have advanced to the point that systems can now be miniaturized.

REFERENCES

1. R. Mishra, "An Overview of Microstrip," *Int. J. Technol. Innov. Res.*, 2016.
2. K. F. Lee, "A personal overview of the development of microstrip patch antennas," 2016, doi: 10.1109/APS.2016.7696053.
3. D. M. Pozar, "Microstrip Antennas," *Proc. IEEE*, 1992, doi: 10.1109/5.119568.
4. M. R. Ghuge, A. P. Khedkar, and P. U. Indulkar, "A Comparative Study of Gain Enhancement Techniques for Microstrip Patch Antenna," *Int. J. Eng. Sci. Innov. Technol.*, 2014.
5. M. I. Nawaz, Z. Huiling, M. S. S. Nawaz, K. Zakim, S. Zamin, and A. Khan, "A review on wideband microstrip patch antenna design techniques," 2013, doi: 10.1109/ICASE.2013.6785554.
6. D. Alvarez Outerelo, A. V. Alejos, M. Garcia Sanchez, and M. Vera Isasa, "Microstrip antenna for 5G broadband communications: Overview of design issues," 2015, doi: 10.1109/APS.2015.7305610.
7. M. Polívka, A. Holub, and M. Mazánek, "Collinear microstrip patch antenna," *Radioengineering*, 2005, doi: 10.5772/9396.
8. Z. H. Hu, M. Gallo, Q. Bai, Y. I. Nechayev, P. S. Hall, and M. Bozzettit, "Measurements and simulations for on-body antenna design and propagation studies," 2007, doi: 10.1049/ic.2007.1067.
9. J. L. Gómez-Tornero, A. Alvarez-Melcón, F. Mesa, F. Medina, G. Goussetis, and Y. Jay Guo, "Analysis and design of controllable leaky-wave antennas inspired by Prof. Arthur Oliner a tribute to Prof. Oliner," 2014, doi: 10.1109/EuMC.2014.6986465.
10. K. Bt Lias, M. Z. A. Narihan, and N. Buniyamin, "An antenna with an embedded ebg structure for non invasive hyperthermia cancer treatment," 2014, doi: 10.1109/IECBES.2014.7047577.



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A REVIEW OF THE INDIAN LITERATURE ON WOMEN IN AGRICULTURE

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ABSTRACT

In recent years, India has seen an increase in study on different elements of women's lives, with early emphasis on social aspects of their status giving way to studies of women's place in the economic realm, a change spurred by the worrying decrease in female involvement. While farm pressure groups and protests have long been a part of Indian history as a result of deep-rooted structural problems such as colonial extraction, manipulative cropping patterns, corporatization of agriculture, and low investments, recent farmer protests have seen a historical trend emerge: the participation of female laborers, women farmers, farm widows, and the consequent viability of agriculture. This article examines the academic literature on women in agriculture, identifying gaps and suggesting topics for further research.

KEYWORDS: Agriculture, Farming, Indian Women, Women in Farming.

INTRODUCTION

In recent years, women's role in social production has been the subject of extensive research. The proclamation of the women's decade, and thus governmental acknowledgment of the significance of researching different aspects of women's involvement in production/reproduction, sparked a worldwide boom in theoretical/empirical literature of India, between 1975 and 1985, there was a boom in study on different elements of women's lives[1]. Though the study initially focused on the social elements of women's status, the worrisome decrease in women's involvement highlighted in the Committee on the Status of Women's report turned emphasis to women's role in economic output. Studies on the participation rate have primarily focused on attempting to (a)

explain the long-term decline in female employment, (b) measure the extent of the decline, (c) comprehend the factors underlying the striking regional variations in female work participation rate, (d) assess the adequacy of existing modes of data collection on women's work, and (e) develop alternate methods of capturing women's work. Despite the agricultural sector's overwhelming significance for female employment, research on women in agriculture is a relatively recent topic of interest[2]. The existing research on female involvement in agriculture has mostly focused on the paradox of a growing proportion of female farm laborers in the female workforce despite a decreasing overall participation rate. Inter-regional differences in the prevalence of female agricultural laborers, as well as the potential consequences, have been studied. In the context of the Green Revolution plan, technological development and its effect on female employment in agriculture has become an important topic of research.

Micro-level empirical studies aiming to evaluate the employment impact on labor-use per acre have dominated research in this field. Only a few have attempted to combine the different aspects of technical change's effect on salaries and earnings, access to productive resources, and general changes in women's status as assessed by nutritional levels, mortality rates, and other factors[3]. The description, to some degree, of the gendered division of labor in agriculture has been an important part of this literature on technological development. There has been no effort to develop techniques to quantify the intensity and productivity of women's labor, to evaluate the complementarity of women's work to men's work, or to evaluate the relationship between women's work and the production structure. So yet, the findings of different research have not been knitted together into a cohesive whole. The difference between sex-sequential and sex-segregated tasks is an important typology that has emerged from the literature on African women's position in the industrial system and may be effectively integrated into the studies in India. Rural development programs have been a key approach for reducing the escalating conflicts that have resulted from the introduction of new technologies[4]. Women have had a minor role in the majority of these programs. On the other hand, programs aimed specifically at women were created due to a lack of awareness of the specific aspects of women's involvement in agriculture.

Furthermore, such programs are founded on an uncritical acceptance of patriarchal ideology's societal standards towards women. In such a scenario, collective action is the only feasible option for protecting the interests of landless women. The role of women has been largely overlooked in studies on the process of organizing the landless. There has been a rise of battles in the agricultural sector since the 1970s, with women playing a major part[5]. What effect does this involvement have on women's lives? Has women's involvement in the fight resulted in changes in the movement's slogans and style? What function do women's organizations play? What ties do they have to other social groups? All of these are crucial issues that have yet to be addressed. (a) Women's lower participation rate in the Indian economy is one of the most noticeable characteristics of their involvement. In India, a combination of class/caste hierarchy and patriarchal ideology determines the amount of female involvement in production. The amount and types of women's productive labor would be determined by a family's position in the caste/class hierarchy in a hierarchical society based on households. It's worth noting that, although the Sanskritisation process women's retreat from physical labor is significant, the difference between the taboos against 'out-door' and 'inside' labor is much more important. Aside from the extremely wealthy landowners' families, physical labor linked to agriculture and

processing is an important component of the job done by women in rural households. The majority of pre- and post-harvest labor is done in the house complex rather than in the field, and most peasant women perform a significant part of it.

While women from impoverished peasant families may also help out in the field, ladies from upper-class households would never do so. The significance of this distinction between 'outside' and 'inside' labor is clearly shown by enumeration of agricultural activities. She outlines the distances involved in these jobs, the distances permitted for women, and the boundaries beyond which the labor becomes 'outside' employment and therefore not suitable for women. The significance of this difference for the Narsapur lace-makers, for whom it translates into never-ending individual battles to preserve social status[6]. Most macro-level research on the determinants of female labor participation have failed to find any obvious relationships that women enter the labor because they need a certain level of money. The supply curve for female labor is thought to be goes on to say that a substantial decrease in family income is required before women may be attracted into the labor due to hefty household duties. This raises the issue of domestic labor: what are the activities, how are they categorized, and how much work is there? (i.e., number of hours). Despite the fact that it is well accepted that a poor woman's working day in India may last anywhere from 12 to 16 hours, there are few comprehensive studies on how women divide their time between different tasks. One thorough research was, who surveyed 127 families in three villages in Rajasthan and West Bengal over the course of a year[7].

Women in the age ranges 19-34, 34-44, and 44-70 spend more time than males in a variety of activities, according to this data. In Rajasthan, women are more likely to engage in 'visible' labor such as grass cutting, cow grazing, and milking, while in Bengal, women's employment is more homebound, with rural Bengali women spending more than half of their time on non-agricultural activities such as patchwork, weaving, and begging. In Bengal, cooking is a more time-consuming procedure than it is in Rajasthan approximately 3.5 hours' compared to 2.23 hours. In Himachal Pradesh the critical role of women in animal care women spend 3.07 hours per day on this activity, compared to 2.87 by males[8]. Women are important to subsistence production, according to the same research, since they dominate the activities of transplantation, weeding, and harvesting in their own farm labor. In a research conducted in Karnataka the significance of women's collecting activities, such as gathering fuel, which takes almost two hours per day—in fact, women spend 56% of their time on survival chores, compared to 31% for males. Women in Andhra's arid villages participate in a variety of tasks for the family's survival. Certain activities, such as collecting fuel and vegetables, are so intertwined with other chores that males are unaware of them, despite the fact that they are essential to the family's survival. This 'invisibility' of women's labor, household duties, and other responsibilities stems from a cultural ideological framework that prioritizes males as the main breadwinner[9]. It may also be a holdover from a previous societal structure in which women were mainly responsible for sustenance, thus their contribution to the family's material reproduction is not regarded as economically significant. Controlling women's mobility (i.e., sexuality) is an important part of the Indian economy's property system, and it disproportionately impacts women from rural communities. As a result, the social norms of purdah limit the possibilities of outside wage-work for these women, as well as peasant families' willingness to recognize women as wage workers when they are pushed into such wage-work[10].

DISCUSSION ON THE PARTICIPATION OF INDIAN WOMEN IN FARMING

In other words, a woman was only recorded as a worker if the product of her duties made it into the trade network. As "in an economy that is only partially monetized, there is analytically no meaningful difference between domestic labor and agricultural activity whose output is consumed inside the house" this is just a reflection of cultural prejudice. In this context, propose that NSS's domestic labor activity code be replaced with three more specific activities: child care, cooking and washing, and fuel and water collection. This may not be enough to address the issue of undercounting or non-inclusion, since many activities' output is consumed and sold in different ways. Furthermore, how should one factor in the preparation of a mid-day lunch for agricultural workers or the cleaning of cow sheds? Surprisingly, no thorough analytical tying up" of the home economy to non-domestic social production has been done, which is necessary for any meaningful evaluation of the effect of development on women's life. As the preceding discussion demonstrates, the literature has focused on the issue of distinguishing between housework and the spectrum of activities that make up 'productive' labor. One tangible consequence of the discussion has been a heightened awareness among data collecting organizations in the nation namely, the NSS and census to give more attention to evolving ideas and methods of collection that would net in as many women workers as feasible. This is reflected in the instructions to census enumerators, as well as the more comprehensive enumeration of jobs performed by women who identify themselves as housewives in the.

NSS 32 round. When women involved in household duties i.e. activities such as fuel, feed, and water gathering are added to women who identify themselves as workers, the participation percentage of women increases. This involvement percentage is considerably higher than the men's average of 63.66 percent. More interestingly, the coefficient of variation in the female labor force participation rate across states falls from 0.452 to 0.124, leading to the conclusion that "the observed variation in female labor force participation rates across states is an artifact created by the unjustified exclusion of a considerable range of women's tasks from so-called "economic activity". Another significant result is that the percentage of women involved in poultry, dairy, and kitchen-gardening all activities indicating access to resources has a substantial negative association with the traditionally defined labor force participation rate. Unfortunately, the NSS data does not include time disposition information, which is critical for assessing these women's availability for paid employment.

Due to time and cost constraints, large-scale time disposition studies by national statistical organizations are impossible, and there is a pressing need for more region-by-region micro-studies on the model of the Jain and Chand study to better understand (a) the nature of India's domestic economy, (b) regional variations, and (c) the stresses and strains on the economy. Another feature of the participation rate is the downward tendency seen throughout censuses. One point of contention in the discussion over the reported decreasing trend is the degree to which the decrease is fictitious and just a reflection of definitional changes. Variations in women's participation rates are mainly due to definitional changes, and that there is no decrease between the 1931 and 1961 censuses, which are similar in terms of concepts and therefore coverage. Even with the post-1971 Census survey estimates, claims that the 1961 and 1971 censuses, particularly with regard to women, are not comparable. A comparison of the 1961 census estimate with NSS estimates for 1972-73 and 1977-78 shows that the participation rate of rural females did not decrease. Women had to battle hard inside the organization for their rights

to own property when land was seized for redistribution. Despite the fact that their right to land had been recognized, the state refused to give it to women. Women from various villages got 150 acres of the 800 acres re-distributed after a long battle with district authorities. A subsequent battle revealed that these women's access to a fundamental productive resource provided them with the strength to fight for their identity. "Didi, previously we had tongues but couldn't talk, we had feet but couldn't walk," one lady said eloquently. We have the power to talk and move now that we have the land.

So far, the debate has focused on certain kinds of technical developments in the agricultural industry. It should be noted that the majority of the current research has focused on the effect on agricultural production employment. There has been few research on the other impacts of technological development that we discussed at the beginning of this article. Furthermore, most of the data presented so far has been in terms of labor time, with no discussion of the implications for the quantity of agricultural laborers or the stock of agricultural laborers. The total effect of new technology on female employment would be mainly determined by the degree to which it is adopted, the pace of production growth, and the new technology's employment elasticity. We discussed the class and caste aspects of female involvement in the previous section, but most of the research on technical development has been done in isolation from these factors. We'll try to tie these threads together in this section. Since the mid-nineteenth century, when the commercialization process began, there have been major changes in the social organization of production.

Many of these developments, as well as their consequences, have been the subject of the now-famous 'modes of production' discussion for an overview of the problems involved. Changes in agricultural relationships have intensified with the introduction of HYV technology. In India, for example, evictions of tenants and landlords' resumption of personal agriculture have been extensively documented. In the regions of HYV technology, there has also been an increase in the concentration of land, assets, and incomes. Overall, these changes in the agrarian system have resulted in a massive rise of agricultural laborers, which has been extensively reported. As previously stated, between 1961 and 1981, the proportion of female agricultural laborers quadrupled, while the absolute number of female agricultural laborers rose from 13.8 million to approximately 30 million. When considering the HYV technology's effect on employment, it's important to note that its use has mainly been restricted to the wheat bowls of Punjab, Haryana, and Uttar Pradesh, as well as portions of Andhra Pradesh, Tamil Nadu, and perhaps Gujarat. The highly unequal pattern of agricultural development reflects the geographical narrowness of this technology for the most recent data. Furthermore, technological development has been extensive and has only been applied in the case of a few crops, notably rice and wheat, and to a lesser degree cotton. The semi-arid regions' essential food crops have been largely unaffected.

As a result, these cautions must be considered in the discussion of the effect of HYV technology on per capita employment that follows. In contrast to the supply-side flooding of the rural labor market, available data suggests that there has been no concurrent rise in labor demand. Between 1964-65 and 1974-75, the average number of full days worked in agricultural activities decreased for all age groups: men, women, and children the respective figures being 208 to 186 for men, 138 to 129 for women and 167 to 145 for children. Only the 1983 figures suggest a slight increase or at the very least no deterioration in overall agricultural employment for women. Until more comprehensive research is available, the focus must be on patterns from the 1970s. In

addition to decreasing employment, RLE data show that the average number of days not worked owing to a lack of job involuntary unemployment has increased for men, women, and children, with women seeing the greatest rise 91 to 119 days in the case of females whereas the comparative figures for men and children were 47 to 74 and 51 to 72 respectively. One disadvantage of using RLE data is that it only includes employees whose primary source of income is agricultural wage-work, so we aren't obtaining the true overall demand for casual labor. The displacement of traditional wage-laborers by intermittent wage-workers from farming families may be contributing to the increase in involuntary unemployment. Given spotty evidence of landlords intentionally favoring own caste laborers who may also own land in some circumstances, this is a topic that needs to be investigated further. As previously stated, the HYV technology increases labor demand in some agricultural activities. This is supported by records from the Royal Labor Enquiry, which show that both women and men worked more days in transplanting, weeding, and harvesting, with women working more days. The increase of male and female labor days was not in 'gender-specific' activities. Even though weeding is a female-specific activity with the greatest increase in female labor days, male labor days grew even faster 136 per cent for female labor days compared to 143 per cent for male labor days. Similarly, in male-specific tasks such as planting and harvesting, female labor days increased faster than male labor days.

CONCLUSION AND IMPLICATION

Though not exhaustive, the preceding survey of literature on women in agriculture has shown several gaps in the current literature and indicates to potential future research areas: (1) The current literature's most noticeable characteristic is its narrow emphasis on certain areas and crops. The literature has mostly focused on the Green Revolution regions of Punjab, Haryana, and the delta areas of Tamil Nadu and Andhra Pradesh. However, rain-fed agriculture continues to dominate nearly two-thirds of Indian agriculture, largely unaffected by the Green Revolution. As a result, we know very little about the role of women in dry-land agriculture, or even tribal agriculture with the exception of the Telangana area. This is especially significant since these areas are among the poorest in the nation, and we know that poverty is a key factor in women being forced to work in agriculture. If we want to get an understanding for the nation as a whole, we will need to conduct studies on the women in these areas. Insofar as rain-fed agriculture is geared more towards subsistence production, such research would also offer a baseline for evaluating the effect of commercial agriculture. Men tended to take over the agricultural production cycle that had traditionally been the domain of women after a crop entered the market nexus, according to a Latin American research. Despite the extensive literature on the effect of the Green Revolution on women, there are still areas that need to be researched more and more thoroughly. One such area is the issue of mechanization's effect. Studies have shown the disparities between mechanized and non-mechanized farms. It is undeniable that agricultural mechanization in India has grown significantly during the last two decades. However, not only are some key types of mechanization such as combine harvesters mainly confined in Green Revolution regions, but they are also limited to pockets within those areas. As a result, if we want a complete understanding of mechanization, we must examine the degree to which different kinds of mechanization are used. Only then will we be able to determine the degree to which conventional work patterns have been disrupted.

REFERENCES

1. S. S. Rathi and C. Vermaak, "Rural electrification, gender and the labor market: A cross-country study of India and South Africa," *World Dev.*, 2018, doi: 10.1016/j.worlddev.2018.05.016.
2. M. Sanchez *et al.*, "Predictors of daily mobility of adults in peri-urban south India," *Int. J. Environ. Res. Public Health*, 2017, doi: 10.3390/ijerph14070783.
3. B. Sabri *et al.*, "Gender differences in factors related to HIV risk behaviors among people who inject drugs in North-East India," *PLoS One*, 2017, doi: 10.1371/journal.pone.0169482.
4. S. Jaggi, S. K. Bahl, and S. S. Suri, "Women Vs Men in Manufacturing Sector," *IRA-International J. Manag. Soc. Sci. (ISSN 2455-2267)*, 2016, doi: 10.21013/jmss.v3.n2.p4.
5. V. Lauria *et al.*, "Importance of fisheries for food security across three climate change vulnerable deltas," *Sci. Total Environ.*, 2018, doi: 10.1016/j.scitotenv.2018.06.011.
6. R. L., M. N., and B. F., "Nutritional status and poverty assessment of vulnerable population groups in Armenia," *Sozial- und Praventivmedizin*. 2005.
7. J. Kong *et al.*, "Research reveals the benefits of Meditation.," *J. Pain*, 2009.
8. L. M. Bartoshuk *et al.*, "Food cravings in pregnancy: Preliminary evidence for a role in excess gestational weight gain," *Appetite*, 2016.
9. M. Audi Ghaffari and Segret, "Perdebatan Nahwu Aliran Basrah dan Kufah dalam Konteks Sosial-Budaya dan dan Implikasinya dalam Pembelajaran Bahasa Arab," *Glob. dan Kebudayaan Lokal Suatu Dialekt. Menuju Indones. Baru*, 2005.
10. S. B. VÉLEZ and A, "Oxidation Kinetics and Mechanisms in HT-9 Ferritic/Martensitic Stainless Steel," 2005.



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RESEARCH IMPACT OF DRIVING SYSTEMS OF TRACTORS AND WORKING BODIES OF TILLAGE MACHINES ON SOIL

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ABSTRACT

The article presents the results of a study of the impact of the running systems of tractors and working bodies of tillage machines on the development of the root system of farmland and on productivity. It has been established that the presence of a compacted layer in the subsoil leads to the suppression of microbiological processes and depletes the soil in nutrients. Additional loosening of the subsoil horizon contributes to increased crop yields.

KEYWORDS: MTA Running Systems, Impacts, Compaction, Loosening, Crop Yield.

INTRODUCTION

With the intensification of agricultural production processes, the problem of the compacting effect of machine-tractor units (MTA) on the soil arose. Multiple passes through the field of tractors, combines and other mobile equipment led to the spraying of the upper and compaction of the lower layers of the soil, which negatively affected its fertility and crop productivity.

Studies [1] found that during agricultural work, the MTA running systems cover with tracks from 40 to 80% of the field surface, and the headlands are exposed to 8-10 times impact. Due to the increase in the mass of tractors and agricultural machines, not only the arable, but also the subsurface horizons are compacted. As a result of compaction, erosion processes intensify, soil density and its resistance to processing increase by 1.5-2 and 1.3-1.9 times, respectively, and the total and capillary porosity of the fertile layer decreases.

Studies [2] also found that an increase in soil density and hardness leads to a decrease in the vital activity of soil microflora and, as a result, to a shortage of 20-40% of the crop. In connection

with the excessive use of moldboard plows and other working bodies, the so-called "plow bottom" is formed, which prevents the penetration of irrigation water, precipitation into the underlying layers and the evaporation of excess moisture from the lower horizons. This contributes to the development of water erosion on sloping lands, and on the plains and lowlands - the formation of wet "saucers" in which melt and rainwater stagnate. All of the above negative factors led to the degradation of the fertile soil layer and the expansion of the area of erosion processes. The fight against over consolidation is closely related to both the ecological stability of arable land and the ecology of the environment in general. Therefore, according to the authors of [3], the ecological assessment of the state of arable land, as well as various technologies of mechanical soil cultivation, in the future should prevail over all others.

Soil compaction is highly dependent on the farming system. In primitive agriculture, the soil can experience only small loads with multiple passes of agricultural implements, while with a high degree of mechanization, it is accompanied by large loads on the soil.

In cotton cultivation, the soil profile consists of arable and subsoil layers. The periodically cultivated topsoil covers the subsoil, which is loosened much less frequently or not at all. This leads to dramatic changes in bulk density in the soil profile.

Compaction of the soil can reach a depth of 30-60 cm. The soil is compacted when the wheels of tractors act on it to the depth of the arable layer. All researchers point out that the greatest compaction from the tractors' passes is exposed to the surface layers of the soil from 0 to 20 cm, subsequent passes through the field cause a weak compaction in the upper layers compared to the previous one and an increase in density in the deeper ones.

It has been established that the compacting effect of the running systems of tractors and machines on the soil depends, on the one hand, on the humus content of the soils, their particle size distribution, structure, moisture and other physical properties, the nature of agricultural use and, on the other hand, on the design of the tractor and its running system, on its mass, specific pressure, axle load, slippage, travel speed, tire brand or track and suspension structure. The greatest soil compaction occurs most often in two cases: with excessive moisture and when machines are moving on freshly worked soil. It has also been established [4] when the soil is compacted, the filtration coefficient drops sharply due to a decrease in the number of non-capillary pores, aeration deteriorates and the concentration of carbon dioxide in the soil air increases. According to the authors of [5], an increase in soil density leads to a decrease in the moisture available for plants in the moisture content of a stable set.

By numerous passes of agricultural machines in the soil, the root system of plants develops poorly, the rate of root elongation decreases, the roots are strongly deformed, bent and have less branching. Compaction of the soil reduces the germination of seeds, increases the duration of germination and ultimately lengthens the growing season of plants.

At present, the study of the impact of running systems in the field on changes in physical, mechanical and technological characteristics, soil fertility and crop productivity is carried out mainly by three methods: "continuous rolling", "on the track outside the track" and "general assessment". The methods developed [4] for determining the characteristics of the processes occurring in the propeller-soil system made it possible to establish that the running systems of the tractor, by compacting the soil, as a result, affect the yield. It was found that with an increase

in the compaction effect on the soil, the yield of agricultural crops decreases. These data were obtained using the “continuous rolling” technique.

In medium loamy soils, the influence of the running systems of tractors on the agrophysical properties and productivity of agricultural crops was studied by the author of works [6]. He found that the compaction deformation extends to a depth of 40 cm and the plow layer deforms to a greater extent than the sub-plow layer, and its main compaction is noted during the first pass of the tractor. In the subsoil, permanent deformation accumulates. The increase in density in a layer of 20-40 cm after 10 passes of tractors for 5 years, even on physically ripe soil, is from 0.05 to 0.13 g / cm³.

The researcher also notes the deterioration of the soil conditions of plant life after the passage of tractors: the development of spring crops also deteriorates, the growth rate of plants slows down, the passage of development phases lengthens, and the accumulation of organic matter is slower.

This article studied the negative impact of the running systems of tractors and working bodies of tillage machines on the development of the root system of cotton and the cotton harvest. It has been established that the presence of a compacted layer in the subsoil leads to the suppression of microbiological processes and depletes the soil in nutrients.

Studies have found that most researchers propose measures that limit the compacting effect of the running systems of agricultural machines on the soil. They believe that the fight against soil overconsolidation should be carried out by improving the physical conditions of soil fertility, i.e. the cultivation of soil layers, the improvement of the technology of cultivation of agricultural crops and the design of machine-tractor units.

Studies have also established that so far the permissible loads on the soil have not been determined, and the properties of the soil when calculating the propellers are taken into account in terms of the limit of the bearing capacity without limiting the degree of its compaction and the requirements of crops for the physical conditions of fertility.

Therefore, the study of the harmful compacting effect of agricultural machinery on the soil, on the basis of which the development of methods and techniques for reducing the mechanical impact is the most important national economic task.

In laboratory-field experiments carried out on the takyr soils of the Karaulbazar massif, with an average soil hardness of 3.5-4.0 MPa, absolute moisture content of 12-13%, the traction resistance of the two-story plow PYa-3-35 was more than 30 kN. The increase in traction resistance is due to the formation of a compacted core on the plow blade and solid blocks. At the same time, the movement of the layer cut by the share on the dump becomes difficult, the soil deformation occurs with a compacted core. Taking this into account, in the subsoil, where the soil density is, as a rule, overestimated, working bodies should be used that exclude the formation of a compacted soil core.

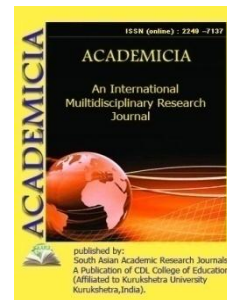
Studies have established that the formation of a compacted soil core was found in front of the subsoiler strut and the soil-dredging share in the working area of the plow sole. To exclude this phenomenon, we used knives-rippers with an opening angle of 45° as a working body of the soil deepener.

It was also found that additional loosening of the subsoil horizon contributes to an increase in cotton yield by 2.3-4.5 c / ha. An increased soil compaction of headlands was established, where its hardness reaches 1.95-2.80 MPa.

PUBLICATIONS

1. Olimov Kh.Kh, Murodov N.M., Murtazoev A.N., Abdualiev N.Kh. Found parameters of the construction of longitudinal pawl-creating device between cotton rows. International journal of advanced research in science, engineering and technology (IJARSET). Vol. 6, Issue 1. January 2019. 7885-7887.
2. Murodov N.M., Olimov Kh.Kh., Murtazoev A.N. Mechanization of technological processes for the formation of longitudinal ridges in the rows of cotton. - International scientific magazine, 2019.
3. Н.М. Муродов, Х.Х. Олимов, А.Н. Муртазов. Механизация технологического процесса для образования продольных валиков в междурядьях хлопчатника. Школа Науки, 2019.
4. Olimov Hamid Haydarovich, Murodov Nusrat Murtazoyevich, Murtazoyev Azizbek Nusratovich, Abdullayeva Nabiya Idrisovna. Studying the technologic process of the operating element for assembly of pawls formation. European science review, 2018.
5. N.Murodov, N. Abdualiev, A. Murtazoev. Device for forming longitudinal thresholds among rows of improved porosity. IOP Conference Series: Materials Science and Engineering, 2020.
6. Баходир Рустамович Ахтамов, Азизбек Нусрат Ўғли Муртазов. Проект гелиотеплицы, подогреваемой альтернативной энергией. Наука без границ, 2017.7 (12).
7. NM Murodov, Kh Olimov, AN Murtazoev. Issues of mechanization of the technological process of forming a pawl between the rows of cotton. Talented youth of Bukhara. Popular scientific journal, 2011.P.46-49.
8. Orif Khamraevich Uzakov, Azizbek Nusrat Ugli Murtazoev, Yunus Norovich Toshev. Physical Scientific Concepts And Their Education. Academic Research In Educational Sciences, 2021.C. 210-218.
9. Azizbek Murtazoyev. Mounted Mole-Leveler. Центр Научных Публикаций, 2020. С. 200-210.
10. Sitara Shodieva. Recommendations For Improving The Advertising State Of Irrigated Land In The Areas Of The Republic Of Karakalpakstan. Эффективность применения инновационных технологий и техники в сельском и водном хозяйстве, 2020.C. 252-254.
11. A.Jo'rayev, Didactic Potential Of E-Learning Complexes In The Training Of Future Teachers. Центр Научных Публикаций (Buxdu. Uz), 2021
12. Sayfullaeva DA Methods of mathematical description of the contours of patterns of garments, methods of linear-circular approximation. Young Scientist International Scientific Journal. 2016.- No. 11 part IV.-B.459-461

13. Sayfullayeva D.A Innovative and Individual Approach in Professional and Vocational Training of Young People with Disabilities. Eastern European Scientific Journal. Ausgabe 6-2017 Part I.- P.154-157
14. Dilafruz Ahmadovna Sayfullayeva. "Methodology of using innovative technologies in technical institutions". PSYCHOLOGY AND EDUCATION. Scopus International Journal.(2021) 58(1)
15. Сайфуллаева Д.А Пути повышения эффективности преподавания специальных дисциплин. International conference on science and education.Turkey.-2021. B.72-74
16. SayfullayevaD.A, Rustamov E.T, Rayimova D.D, Jabborova M. J., Faridov M. F. CHARACTERISTICS OF TECHNICAL CREATIVITY IN TECHNOLOGICAL EDUCATION. Innovative technologica methodical research journal.2021.B-37-41
17. Olimov Kakhramon Tanzilovich, Sayfullaeva Dilafruz Ahmedovna, Khimmataliev Dustnazar Omonovich, Ashurova Sanobar Yuldashevna, Gaffarov Feruz Hasanovich.Teaching Special Subjects for Students with Disabilities in Preparation for the Profession by Using Innovative Educational Technologies. International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-9 Issue-1S, November 2019.B.425-429
18. Sayfullayeva D.A., Juraev A.R., Toshev Yu.N. Innovative project of preparation of students for professional activity // Научно-методический журнал вестник науки и образования № 19 (97). Часть 2. 2020.C.48
19. AR Zhuraev, D.A. Saifullaeva, Sh.Bakhronova The process of education for the person, organized on the basis of modern educational technologies // Science and Education. № 2020.B.169-176
20. Akhtamov Bakhodir Rustamovich, Murtazoev Azizbek Nusrat ugli Project of a greenhouse heated by alternative energy Science without borders 2017.- №7 (12) .p. 32-35
21. Akhtamov B.R., Murtazoyev A.N. The Training Of Qualified Specialists In Higher Educational Institutions With A Technical Bias Путь Науки Международный научный журнал, № 6 (52), 2018,C.17-19
22. Akhtamov Bakhodir Rustamovich, Murodova Zebiniso Karimovna Carrying out classes on the subject Technology and design, taking into account the individual characteristics of students Science and education today № 12 (59), 2020, pp. 91-93



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IN THE WORK OF MIFTAHU-L-ULUM ABOUT AUXILIARY WORDS THAT MAKE A VERB

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ABSTRACT

This article describes the morphological changes of the verb phrase. In particular, changes in person-number suffixes are explained when auxiliary words in the conditional mood come with a verb. We also covered the semantic features of the auxiliary words that lead to the conditional tense. We have studied the morphological and semantic features of these auxiliary words based on Abu Yaqub Sakkoki's Miftahu-l-ulum. Sakkoki's approach to this is evidenced by the views of linguists before and after him.

KEYWORDS: Sakkoki, "Miftahu-L-Ulum", Verb, Conditional, Loading, Spending (Morphology), Meaning, Person-Number.

INTRODUCTION

A set of auxiliary words serves to connect the noun and the verb. Coming before the verb, it certainly has a certain syntactic effect on it. When these letters are connected, certain changes occur in the verbs, and this, of course, affects the meaning of the verb. Auxiliary words that cause the fall of the noun in the second person, the plural II and III in the verb, the singular muannas II, the change of the last consonant to the syllable, the fall of the faulty letter are called "jazm letters" (الحروف الجازمة). The word 'jazm' means 'to cut', 'to separate', 'to jazm', in the term 'to put the verb in the conditional tense'.

Saqqaqi narrated these letters under a separate subject, and in Miftahu-l-Ulum he called them "the letters that bring the verb after him in jazm (الحروف الجازمة)" [1: 42a]. The scientist carried out the coverage of the subject on the basis of a separate system. This logic-based system makes it easy for the reader to assimilate the information. Sakkoki also covered the subject in detail, covering complex aspects.

Starting with the number of letters that make up the subject: "The letters that make up the next verb are five and are divided into two types. The first type requires the verb to be present tense, and the number of such letters is four "[1:42a].

According to Sakkoki's peculiar logic-based method, it is distributed according to which form of the verb comes after the consonant letters. Also, the second aspect of the division, following Mahmoud Zamakhshari, took a group of words that were originally letters and were conditional. Mahmud Zamakhshari also divided the conditionals into two, one being the original letter and the other being the noun [11: 205]. Citing the verb that comes after him in jazm, stating that the number of letters that require it to come in the present tense is four:

He wrote, "The first of these is the infinitive load of the verb لم, which brings it in the conditional tense," and gave the following example: زيدا ألم أضرب [1: 42a].

Muhammad Khayr Halvani divided the jazm letters into two: "One comes before the present tense verb and does not give the conditional meaning, the other gives the conditional meaning and brings the two verbs in the conditional tense" [7: 102-105]. This scholar divided in terms of form and meaning and included in the second group the words that give the conditional meaning of the original noun.

The letter لم, first quoted by Sakkoki, represents absolute negation [1: 42b]. Completed in the past tense, it means a non-continuity that does not last at all in the present tense. For example: لَمْ يَلِدْ وَلَمْ يُولَدْ (He is unborn and unborn. Surat al-Ikhlās, 3).

Ali Jasim Salman gives the following verse as an example, stating that the verb that comes after this letter is dropped and that the dropped verb is explained from the meaning of the verb throughout the sentence:

ظننت فقيرا ذا غنى ثم نلته فلم ذا رجاء ألقه غير واهب

(As the owner of wealth, I considered myself poor, then I gained wealth, other than the giver, please did not meet the owner) [10: 193].

Linguists such as Saqqaqi, Zamakhshari, and Ibn Sarraj, who have an influential position in Arabic linguistics, say that words that are conditional are not letters. Ibn Sarraj described the peculiarities of these letters: "Even if we desire it to drop, we cannot drop it," he wrote [6: 156]. Without denying the evidence presented by Ali Jasim, the views of Sakkoki, Zamakhshari, Ibn Sarraj are strong. The evidence cited by Ali Jassim is a very rare case in Arabic poetry. If it was more expressive, other linguists would have quoted it as well.

About subsequent downloads that require conditional inclination: « لا [infinitive of the verb in the imperative mood] (return) and brings it in the conditional mood », about the next download: "The fourth is لام الأمر - [the third person, the letter added to the imperative verbs denoting the first person]. Its function is to indicate that the verb is in the imperative mood "[1:42b].

The next conditional tenses are prepositions that are written in conjunction with the verb to which it is attached. Although these prepositions formally require the verb to be conditional, they express the command in the sense. Sakkoki is content with the above as these downloads are simple, with no complexity.

If the 'lām' representing the command is from the largest to the smallest, it is called the 'lām' (اللام الدعائية) representing the command. When it is from small to large, it is called "lām" (اللام الدعائية), which represents prayer [9:53]. All the "lam" in the prayers in the Qur'an is a supplication to Allah.

If the first round brings a conditional tense, requiring that one verb after it be in the present tense form, the load of the second type, which expresses the conditional meaning, brings two verbs after it in the conditional tense, without conditioning the tense form. Sakkoki's statement on this subject is concise from the views of other scholars, the method of expression is understandable and covers complex features. Regarding the second type, the scholar wrote: "The second type is the conditional load of the verb, which requires a more modern form, and it is إن -- (if) for the condition and its answer", citing the following as an example: إن تضرب أضرب (agar ursang uraman); إن ضربت أضرب (agar ursang uraman) [1: 42b].

Sakkoki describes this load as a separate type because the load إن (if) affects two verbs. One of the differences of this load from the previous ones is that the verb comes after this load in past and present tense forms (وَإِنْ كَانَتْ لَكَبِيرَةً - although it is heavy. From Surat al-Baqara, 143; إِنَّ - If you help Allah, Allah will help you. Muhammad, verse 7). Above, Sakkoki also pointed out with examples that this load comes with the past tense verb. Ibn Hajib wrote that although the past participle comes in the form of a verb, its meaning will be in the future tense [3: 218]. Ibn Ya'ish, taking these features into account, called this load "the mother of the conditional loads" (أم حروف الشرط) [2: 264].

This load comes as a response to the second verb if the first verb is in the conditional sense, while the second verb is in the conditional mood. All linguists point out that both verbs that come after this load come in the conditional tense [4:44]. Abduqahir Jurjani wrote that after this loading, one verb in a sentence can be in the past tense, the second verb in the present tense, and the second verb can be replaced by a definite adjective derived from it [8:10].

Regarding the fall of the main load representing the condition, Sakkoki enumerated the places of the fall, following his predecessors, including Mahmud Zamakhshari [11: 208] [see 1: 42b].

This load is reflected in the sense, even if it falls.

The second verb, which comes after "lām" (لام النهي), which represents the negation of the command, has a conditional meaning and comes in the conditional mood without the load of إن. For example: لا تجهل تفز (don't be ignorant, [if you don't] you will succeed). In the semantic form لا تجهل، إن لا تجهل تفز.

According to the above case, Sakkoki: "When the letter of the condition is dropped, the verb comes in the conditional tense. The dropped letter must be in reversible mode. In the event of a discrepancy elsewhere in the above, the letter shall not be omitted. Example: لا تدن من الأسد يأكلك is not considered correct if it is in the form of load (do not approach the lion, if you do not approach it, it will eat you)" [1:42b].

From the above opinion of Sakkoki it can be understood that such a form should not be used if the content of the sentence is distorted in places where it is not semantically correct. The sentence cited as an example above is well-known among linguists, Ibn Ya'ish states: "The form of لا تدن من الأسد يأكلك is incorrect, the form of meaning is لا تدن من الأسد، إن لا تدن من الأسد يأكلك (do not approach the lion, do not approach). it will not happen" [2: 274]. Therefore, Sakkoki wrote,

"No one implies a condition where there is a mismatch between non-existence and a condition" [1: 42b]. Sakkoki cites the correct form of this sentence, which is as follows: "True [variant]: لا تدن من الأسد فإنه يأكلك" is in the form of load" [1: 42b]. The meaning of the sentence is: "Do not approach the lion, [if you approach] he will eat you." In order to express this meaning, according to Ibn Ya'ish, it can be given in the following two forms: one is لا تدن من الأسد يأكلك, and the other is [2:274] لا تدن من الأسد فيأكلك [2:274]

As for Sakkoki's sentence "After the word meaning desire," the following is an example:

لعل فاطمة وأمينة تكبران تقرأ لنا القرآن (perhaps Fatima and Amina will recite the Qur'an to us when they are older). In this sentence, the verb in the first part of the meaning of desire is in the form of a message, but it is in the form of a conditional wish. Although the verb in the second part is in the conditional mood, the message is in the mood. According to Sakkoki, the presence of the second verb in the conditional tense is due to the omitted إن load.

Sakkoki enumerated above that when the first part of speech contains a word denoting a question, the next verb contains the meaning of a condition, and comes in the form of this inclination without a conditional load. An example of this is: أين أبوك أزره (I will visit wherever your father is).

If there are prepositions in the sentence that reflect the meanings of the urge, then the second verb that comes after them is in the conditional mood, which is a sign of Sakkoki's idea "after the prepositions that reflect the meaning of the urge". An example of this is: ألا تبرون والديكم تكونوا مسرورين في الدارين (hey, be kind to your parents, you will be happy in both worlds).

Taking into account the omitted load in the above places, the conditional citation of the verb is calculated from the fact that there is a condition in the original sense. Therefore, even if there is no load, the condition comes when the verb comes in five places. Sakkoki listed them in his own concise style.

Continuing Sakkoki's view, he said: Therefore: إن احمر البسر كان كذا - (if the date is red, it will be like this, it is not acceptable to say it in the form), and gives the following examples: إن طلعت الشمس آتاك إلا في اليوم المغيم if the sun rises, I will come to you, except on a cloudy day

إن مات فلان كان كذا (if so-and-so dies, so be it)" [see 1: 42b].

Regarding the inaccuracy of such conditions, Sakkoki wrote: "These forms must be questioned, and it is not clear what the exact time is" [1: 42b].

Sakkoki describes a somewhat complicated situation: "In these places, the verb is in the way of expressing the unseen load, for the meaning of the conditional answer, while the second sentence is called قطع - (cut), استئناف - (new beginning)" [1: 42b].

Sakkoki is arguing here that a conditional participle is present, a conditional participle that follows a conditional participle. For example: وَإِنْ تُبْدُوا مَا فِي أَنْفُسِكُمْ أَوْ تُخْفُوهُ يُحَاسِبْكُمْ بِهِ اللَّهُ فَيَغْفِرْ لِمَنْ يَشَاءُ (Whether you reveal what is inside you or conceal it, Allah will call you to account, and will forgive whom He wills. (Surat al-Baqara, 284)

This verse has the characteristics of Sakkoki enumerated in the above description, and the فيغفر لِمَنْ يَشَاءُ (And forgives whomever He wills) part is called, as Sakkoki points out, "a sentence that begins anew (جملة استئنافية)." Continuing Sakkoki's opinion, he stated an important rule: "The

second [then the message] is called صفة-(adjective), if it is definite, حال-- (case)" and "in this case the word becomes only marfu" [see : 1: 42b].

Ibn Hisham Ansari فَهَبْ لِي مِنْ لَدُنْكَ وَلِيًّا. يَرِثُنِي (so give me a guardian from your Lord. Let him inherit me. Surah Maryam, verses 4-5) He said that the word يَرِثُنِي (He is my heir) is the quality of "guardian" [5: 84]. That is why Sakkoki wrote above that "the second [then the message that comes in the message] is صفة— (adjective)" [1: 42b].

Sakkoki enumerated these places above and emphasized an important rule: "in this case the word becomes only marfu" [1: 42b]. In both cases the verb comes after the conditional tense, but instead of the conditional tense it comes in the message tense (marfu '). This is in terms of meaning, because in the first example the adjective has been adjective, and in the second the message has come in the form of a conditional answer without expressing the condition of the executor of the action. In such cases, non-compliance is not against the rule.

Sakkoki writes about important information that has been overlooked by most scholars: "If in these forms the horse is considered to be the possessor of a cut-off speech, then the second part is in the following forms:

فَأَنَا أَخْلَعُ عَلَيْكَ، وَأَنَا أَضْرِبُكَ، ثُمَّ أَنَا أَضْرِبُكَ

[the message is inclined] "[1:42b]. The first part comes in the main consonant because it comes in the beginning, and if it is mubtado (possessive), the second verb comes in the raf (the inclination of the message) because it comes in place of the message.

Sakkoki comments on ف - ("fā"), which is widely used in conjunction with conditional pronouns:

"One of the features of ف - "fā" in the connecting function is that it comes in the second part of the condition [the condition follows the main part of the sentence]" [1: 42b]. This conjunction comes after the preposition: "As mentioned above, the verb in the second part is in the past tense, imperative, or past participle form, and if the second part does not mean the future tense, the second part is a participle or a noun." the second part comes at the beginning, "said Sakkoki [1:42b].

In his opinion above, Sakkoki lists when this load will come. If this preposition is a response to a conditional sentence in the form of a preposition, then of course this preposition precedes the preposition. For example: إِنْ تَالَّمَكَ سَايَا فَهُوَ الْم (if he teaches you something, he knows it). That is why Sakkoki said, "If the second part is a horse-cut speech" [1:42b].

If the preposition begins with a verb with the same form (الفعل الجامد), the same load is added to it. For example: إِنْ تَرَنْ أَنَا أَقَلَّ مِنْكَ مَا لَا وَوَلَدًا. فَعَسَى رَبِّي أَنْ يُؤْتِيَنِي خَيْرًا مِنْ جَنَّتِكَ (If you consider me inferior in terms of wealth and children, perhaps my Lord will give me something better than your garden. (Surat al-Kahf, 39-40). Since the second sentence in this verse begins with a verb, this load precedes it.

Pointing to the fact that this proposition is also placed when the preposition begins with a command verb, Sakkoki writes, "If the verb is a command [if]." For example: قُلْ إِنْ كُنْتُمْ تُحِبُّونَ اللَّهَ فَاتَّبِعُونِي يُحْبِبْكُمُ اللَّهُ (if you love Allah, follow me, [then] Allah loves you. Surah Al 'Imran, verse 31).

It would be easier to understand Sakkoki's phrase "if there is a return (absence of command) verb" with the following example. He said: **إِنْ لَا تَفْعَلْ خَيْرًا فَلَا تَفْعَلْ شَرًّا** (if you do not do good, do not do evil). In this example, because the second verb comes with a preposition, this prefix is added before it.

Even if the verb in the preposition is in the past tense form, the sentence "if it is in the past tense" can be added. For example: **إِنْ يَسْرِقْ فَقَدْ سَرَقَ أَخٌ لَهُ مِنْ قَبْلُ** (if he stole it, his brother had also stolen it before. Surah Yusuf, verse 77). In this verse, the word **سَرَقَ** (stolen) is a past tense form of the verb, so this load precedes it.

Sakkoki described the subject in a unique way, with a logical system that was considered difficult to observe by other scholars. He covered these downloads based on the views of his predecessors. He cited examples from Arabic poetry where he considered it necessary to cite evidence. Analyzing the subject in a unique way based on logic is an achievement of Sakkoki, an advantage that distinguishes him from other linguists.

REFERENCES

1. MU - Imam Abu Ya'qub Yusuf ibn Abu Bakr ibn Muhammad Saqqaki. Miftahu-l-ulum. Ankara National Library. Manuscript 26 Hk 192 No.. - 244 c.
2. Abu Al-Baqaa, live in Benali, live in Al-Mosli. Investigated by Dr. Emil Badia Yaqoub. Detailed explanation of Zamakhshari - Part IV. Beirut, Lebanon. Scientific Book House. 2001. p. 584.
3. Abu Omar Othman bin Hajeb. Dr. Fakhr Salih Suleiman achieved his decision. Amalie's eyebrow. - Oman. Daraman. No date. Page 9 96.
4. Abu Qassem Bin Ali Al-Hariri Al-Basri. Malha Al-Iraab - Jeddah. Asaad Muhammed Press. No date. page 48.
5. أبو محمد عبد الله جمال الدين بن هشام الأنصاري. تحقيق محمد محيا الدين عبد الحميد. شرح قطر الندى وبلا الصدى. - دمشق. دار الخير. 1990. صفحة 352.
6. Abu Bakr Muhammad Bin Sahil Bin Al Sarj Al-Nahwi Al-Baghdadi. Investigation by Dr. Abdul-Hussein Al-Fatli. Asset in grammar. The second part. - Beirut. Message Foundation. 1996. pg 464.
7. Dr. Muhammad Khair Al-Haluni. Investigated by Rahman Al-Najdi. clear in grammar. Heritage. Dar Al-Mamoun Heritage. 2000. p. 355.
8. Sheikh Al-Imam Abdul Qahar Al-Jurjani. Explanation of a hundred factors. Karachi. Al-Bushra Library. 2011. p. 33.121. حاشية الأجرومية. 1988. صفحة 33.121.
9. Ali Jassim Muslim. Encyclopedia of meanings of Arabic letters - Oman. Dar Rasama. 2003. p. 257.
10. العلامة محمود بن عمر الزمخشري. تحقيق الشربيني شريدة. المفصل في صنعة الأعراب. - القاهرة. دار الحديث. 2013. صفحة 359.



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AN OVERVIEW OF THE NEW MATERIALS OF THE PERMANENT MAGNETS

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ABSTRACT

Electric machines with permanent magnets are now being used in an increasing number of design methods. It is most importantly related to the development of novel long-lasting magnet materials (for example, Nd-Fe-B, a unique anisotropic combination) with high attractive exhibitions and relative ease of use. This research looks at contemporary permanent magnets. The attractive, warm, and mechanical characteristics of everlasting magnets, as well as their usefulness, are discussed in this article. This article also looks at places where everlasting magnets are used in many design fields.

KEYWORDS: Permanent Magnet, Magnetic Materials, Alloys, Sm-Co, Nd-Fe-B, Magnetic Parameters, Magnetic Properties.

INTRODUCTION

Magnetic materials are necessary for the world's people to have a good quality of life. Many of the gadgets we take for granted are made possible by them. The rising quality of life of people all over the world is posing raw material supply problems and spurring industrial innovation. We'll go through the basics of magnetic materials and how powder metallurgy plays a role. To

comprehend the fascination with magnets, it's essential to go back at their history and identify what makes one magnet superior to another. We'll take a brief look at the series of events that led to the discovery of rare earth magnets, the most powerful magnets presently accessible. Then we'll go through a few magnet-related applications and why they're so essential to our economy, our way of life, and the fundamental foundations of our technology. Finally, we'll discuss the difficulty of producing enough of these strong magnets, as well as research into even better materials.

Future technologies for an electric and sustainable society will need a high level of material awareness. Several materials are thought to be essential for long-term sustainability. The effect of the rare earth element (REE) business on the environment may be seen at many stages of the process, including mining and refining. In the mining sector, the effect of other minerals found in the same deposit locations may be more important than the REEs themselves. Emissions may occur during milling, separation, or subsequent stages of processing the material into an usable metal.

Line 1 depicts the dynamic evolution of material characteristics of ferrite magnets used in latches.

Line 2 consists of magnetic Alnico alloys (Al-Ni), which are used in radio and television equipment.

Lines 3 and 4 relate to new types of magnetic materials that have been created using rare-earth metals: Sm-Co line 3 and Nd-Fe-B line 4[1].

Figure 1 shows that the magnetic energy of samarium magnets is six to ten times greater than that of ferrite magnets. In reality, this implies that neodymium magnets with size comparable to an egg may cause finger shattering. That is the mechanical forces that are produced. Power, coercive power, heated solidity (up to 200 °C), and anti-consumption solidity Sintered magnets have a thickness of up to 8.5 gram/centimeter and a progress temperature of 700 °C. These characteristics indicate that Sm-Co is suitable for use in high-temperature or high-consumption environments.

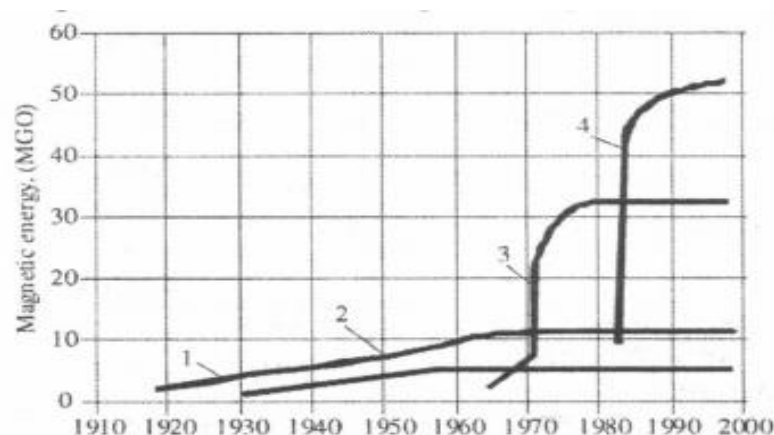


Fig 1: Shows That Behavior of Permanent Magnets Has Revolution Changes at Last Years

Direct alloying of initial components in a vacuum enlistment stove yields appealing mixtures with his characteristics [3]. Bullions bucks and smashes to a micron's worth of material. Magnets are ejected from a given residue in a variety of forms. Cakes made from stock material are baked at temperatures ranging from 1000 to 1200 degrees Celsius. The next item is mechanical handling, which includes hammering. Next, consider the benefits and disadvantages of various types of appealing materials. Strong mechanical strength, appealing characteristics strength across a broad temperature range, and high immersion force are the main areas of interest for alnico. These magnets, however, have very low coercive force. Ferrite materials have a strong coercive power, but they are also short and difficult to prepare. Similarly, a temperature has an effect on the attracting characteristics of such magnets [4].

As shown in Figure 1, there is a current focus in the area of PM research to bridge the performance gap between ferrite and RE magnets. It is proposed that a new magnet with an acceptable price/performance ratio of not more than approximately 1 \$/J would be economically efficient. A material with such characteristics may improve the performance and reduce the weight of existing ferrites-based devices, as well as lower the cost of RE magnet-based systems. Currently, bonded RE magnets, which are composites with PM powder incorporated in a plastic matrix, may cover the gap to some extent but at a significant cost. One way to bridge the gap between ferrites and NdFeB is to substitute less costly components for Nd. The cost-to-performance ratios of Ce-substituted NdFeB and SmCo compounds and alloys have been studied, and they show promise. Ce is a rare earth metal that makes up 66 parts per million of the earth's crust, compared to 41 parts per million for Nd. Uncommon earth magnets dependent on Sm-Co composites have great attractive qualities (high immersion power and coercive power), warm strength and insusceptibility of consumption, moreover. The fundamental impediments are significant expense of a samarium and cobalt and thusly wide application of Sm-Co magnets is badly arranged. As of now, the most viewpoint sintered lasting magnets is Nd-Fe-B.

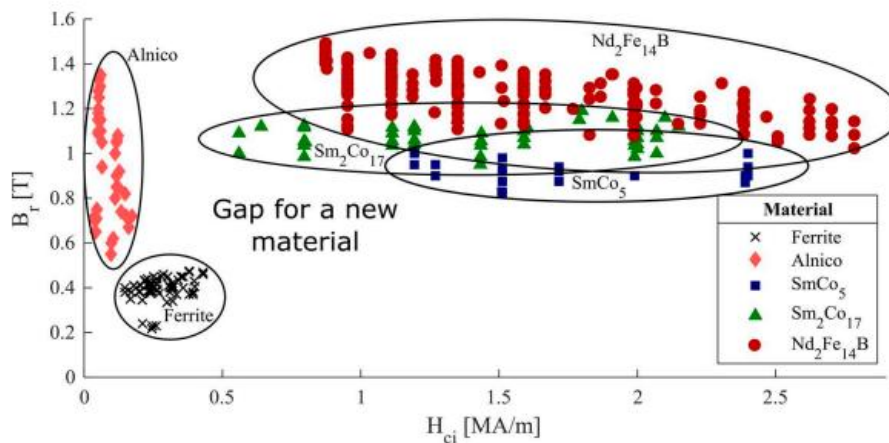


Figure 2. Different PM Materials Available On the Market and Their Properties, Illustrating the Gap between Ferrites and Rare-Earth (RE) Magnet.

To begin with, these magnets have most noteworthy BHmax and this worth don't reach limit.

Lasting magnets, compares powers, normally for regular machines and components (for example handfals and hundred kilograms). At present in our nation, creation of uncommon earth magnets leaves out a research center stage and this creation are grown quick rate on premise of a

adaptable innovation in a years ago. These days, such magnets are accessible for clients. Information of 000 "Chimcomplex" shows that lasting magnets Nd-Fe-B has special boundaries of qualities/cost. This clarify quickly a development of creation and presentation in different zones of designing such magnets[5].

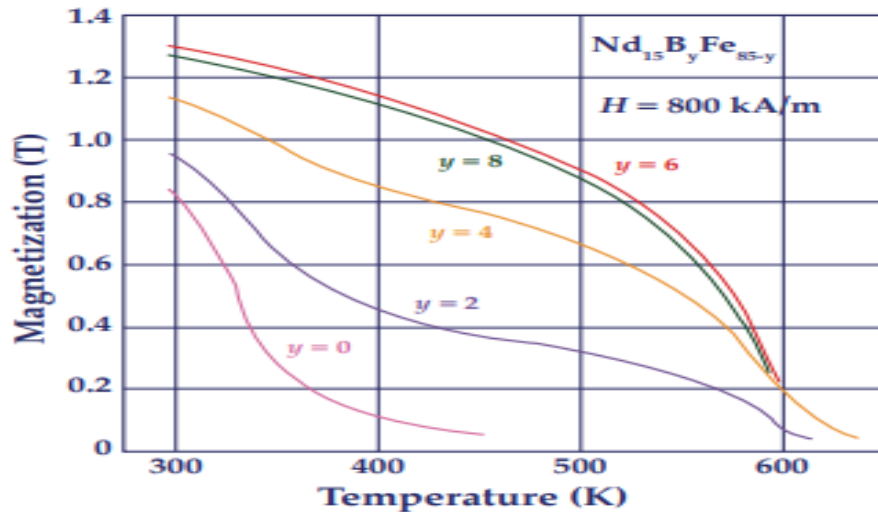
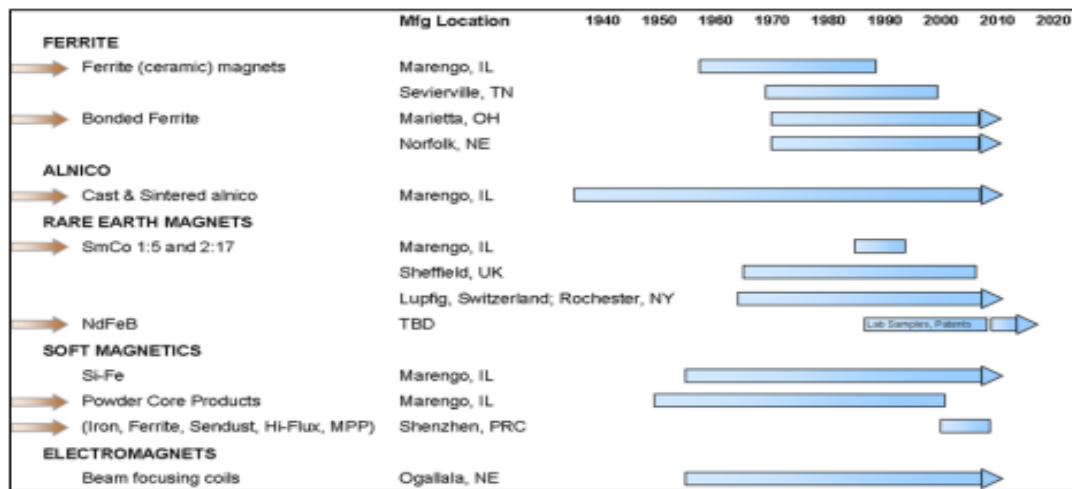


Figure 3: Magnetization vs temperature curves for $H = 800 \text{ kA/m}$ on five alloys containing different percentages of boron in $\text{Nd}_{15}\text{B}_y\text{Fe}_{85-y}$ system.

The magnetization versus temperature graphs for $\text{Nd}_{15}\text{B}_y\text{Fe}_{85-y}$ with $y = 0$ are shown in Figure 2. With rising temperature, the magnetization of the $\text{Nd}_{15}\text{Fe}_{85}$ binary alloy, which has around 0.8 T at room temperature, falls to a very tiny value at about 400 K. The Curie temperature of the NdFe alloy was predicted to be about 310 K based on a low field experiment. The alloy's magnetization rises as the amount of B added increases, peaking at approximately 6 atoms B. The development of a tetragonal phase with a high Curie temperature causes this rise. The Curie temperature of this phase was found to be 585 K using low field measurements. Arnold has amassed a vast knowledge base in a variety of materials over the past 70 years, including but not limited to those shown in Figure 1. Powder metallurgical manufacture is used to make the goods with tan arrows to the left. (Keep an eye out for these arrows; they'll be used throughout the text.) Arnold's product line-up and production sites have evolved as goods and markets have changed. Arnold has a unique insight and perspective on the magnetics sector because to his vast knowledge base.



REVIEW OF LITERATURE

Among all the papers published in the area of permanent magnet materials, Sergey Lutz discusses the use of unusual earth magnets to create tiny size and amazing devices with enduring magnets in a paper titled "a review of modern materials of permanent magnets by Boris Bochenkov." The demand for long-lasting Nd-Fe-B magnets from Russian manufacturers is consistently increasing by 25-30%. In comparison to conventional ferrites, alnico, and other materials, the fundamental piece of leeway of magnets Nd-Fe-B and Sm-Co consists in great attractiveness of material characteristics at small scales. New types of magnets have more appealing characteristics while maintaining their size. It's worth noting that force power or tractive effort boosts recruiting appeal. On the other hand, it reduces measurement and weight while maintaining the force of the hardware. Using extraordinary magnets may sometimes result in a significant reduction in energy consumption. It's worth noting that force power or tractive effort increases the appeal of enlisting. On the other hand, it reduces measurement and weight while maintaining the force of the hardware. The use of ground-breaking magnets may sometimes result in a reduction in energy consumption. In the year 1970, an Alloy Sm-Co broad appears on the market. Sm-Co has a high immersion rate these days. Quite likely the most advantageous position consists of such materials in comparison to other appealing materials with relatively little effort. These materials also have a high appealing progress temperature, ranging from 160 to 170 degrees Celsius. Nonetheless, Nd-Fe-B magnets with an operating temperature of 200 °C are now available. This allows them to be used in electric engines with long-lasting magnets [6].

DISCUSSION

This paper discusses about the mechanical forces that are generated Power, coercive power, heated solidity (up to 200 °C), and anti-consumption solidity are all characteristics of this material. Sintered magnets may be up to 8.5 gran/centimeter thick and have a progress temperature of 700°C. Sm-Co is suited for usage in high-temperature or high-consumption settings based on these properties. In a vacuum enlistment stove, direct alloying of starting components produces attractive mixes with his properties. Bullions bucks and crushes material down to a micron's value. Magnets are expelled in a number of ways from a given residue. Temperatures ranging from 1000 to 1200 degrees Celsius are used to bake cakes manufactured

from stock material. Mechanical handling, which includes hammering, is the third item on the list. Next, think about the pros and drawbacks of different attractive materials. The primary areas of interest for alnico are its high mechanical strength, attractive features strength over a wide temperature range, and strong immersion force. These magnets, on the other hand, have a very weak coercive force. Ferrite materials have a high coercive strength, but they're also short and tough to work with. Similarly, the attracting properties of such magnets are affected by temperature.

Uncommon earth magnets based on Sm-Co composites offer a lot of appeal (high immersion and coercive power), as well as warm strength and resistance to consumption. The main obstacles are the high costs of samarium and cobalt, which makes widespread use of Sm-Co magnets difficult. Nd-Fe-B is now the most widely used sintered long-lasting magnet. To begin with, these magnets have the highest BHmax, and this value does not exceed a certain limit. Magnets that last, compare powers, and are often used in ordinary machinery and components (for example handfals and hundred kilograms). Currently, in our country, the production of rare earth magnets does not take place in a research center, and this production has expanded at a rapid pace as a result of a flexible invention a few years ago. Clients may now get their hands on such magnets. The data from 000 "Chimcomplect" reveals that long-lasting magnets Nd-Fe-B have unique quality/cost limits. This clarifies the evolution of invention and presentation in many design zones, such as magnets, rapidly.

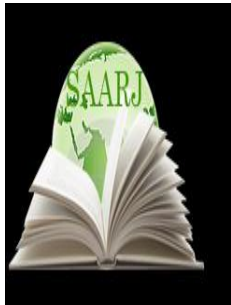
CONCLUSION

After considering attractive, warm, and mechanical characteristics, it is reasonable to conclude that magnets made of rare earth elements are usually appealing. High-energy sintered magnets Nd-Fe-B are now being considered for use in the rotor of an electric motor. Furthermore, this study demonstrates that Sm-Co is suitable for use in high-temperature or high-consumption environments. Currently, take notice of the automobile industry's capacity to create expansions. The underlying problem in the automobile business is the ineffective presentation of new materials and technological advances. As a result, a requirement direction entails using today's appealing elements and advances. To begin with, it is linked to a large number of electromagnetic devices (ranging from 50 to 100). Controllability, economy, comfort, and various machine limits are all characteristics of this device. It's also worth noting the increase in power from 2 kW to 20-50 kW, which allows for the use of new amazing devices for supply management and monitoring. In this vein, global manufacturers are switching to a two-level voltage system (14 and 42V or 12 and 36V). Increased control requests for new appealing materials and new innovations of appealing materials (for instance: the multifunction starter, generator and so forth).

REFERENCES

1. J. M. D. Coey, "Permanent magnets: Plugging the gap," *Scr. Mater.*, 2012, doi: 10.1016/j.scriptamat.2012.04.036.
2. . M. D. Coey, "Permanent magnet applications," *Journal of Magnetism and Magnetic Materials*. 2002, doi: 10.1016/S0304-8853(02)00335-9.
3. D. P. Arnold and N. Wang, "Permanent magnets for MEMS," *J. Microelectromechanical Syst.*, 2009, doi: 10.1109/JMEMS.2009.2034389.

4. W. D. Corner, "Permanent magnets," *Phys. Technol.*, 1988, doi: 10.1088/0305-4624/19/4/305.
5. D. Vokoun, M. Beleggia, L. Heller, and P. Šittner, "Magnetostatic interactions and forces between cylindrical permanent magnets," *J. Magn. Magn. Mater.*, 2009, doi: 10.1016/j.jmmm.2009.07.030.
6. K. J. Strnat, "Modern Permanent Magnets for Applications in Electro-Technology," *Proc. IEEE*, 1990, doi: 10.1109/5.56908.



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CYBER SECURITY LESSONS FROM NUCLEAR WEAPONS

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ABSTRACT

The term "revolutions in military affairs" is arbitrary, but some inflection points in technological change are larger than others: for example, the gunpowder revolution in early modern Europe, the nineteenth-century industrial revolution, the early twentieth-century second industrial revolution, and the nuclear revolution in the middle of the last century. We may also include the information revolution in this century, which has resulted in today's very fast development of cyberspace. Earlier information technology revolutions, such as Gutenberg's printing press, had significant political consequences, but the present revolution can be traced back to Moore's law and the thousand-fold reduction in computing power prices that happened in the final part of the twentieth century. Political leaders and experts are just now starting to understand the implications of this game-changing technology. Cyber security has mainly been the province of computer professionals and specialists until recently. This tiny group was like a virtual village of individuals who knew each other when the Internet was established 40 years ago, and they built an open system with no regard for security. While the Internet is not new, the commercial Web is just a few decades old, with a user base that has grown from a few million in the early 1990s to more than two billion now. This growing interconnectedness has generated both tremendous possibilities and significant weaknesses, which strategists are now grappling.

KEYWORDS: *Cyber War, Cyber Crime, Nuclear Reactor, Nuclear War, Space Technology.*

INTRODUCTION

The term "cyber" refers to computer and electromagnetic spectrum-related activity. The Internet of networked computers is part of the cyber domain, as are intranets, cellular technology, fiber-optic cables, and space-based communications. A physical infrastructure layer exists in cyberspace that adheres to the economic rules of competing resources as well as the political laws of sovereign authority and control[1]. This element of the Internet isn't a "commons" in the conventional sense. It also contains a virtual or informational layer, which is characterized by growing economic rewards on scale and political behaviors that make jurisdictional control difficult. Attacks may be launched from the informational domain, where costs are cheap, against the physical domain, where resources are limited and costly. Control of the physical layer, on the other hand, may have territorial and extraterritorial implications for the informational layer. Within cyberspace or in other areas outside of cyberspace, cyber power may generate desired results. Sea power, by analogy, refers to the capacity to utilize ocean resources to win naval battles on the seas, but it also relates to the ability to use the waters to influence wars, trade, and public opinion on land. The similar analogy may be used to describe airpower[2]. A complicated man-made environment is the cyber realm. Human enemies, unlike atoms, are sentient and deliberate.

Mountains and seas are difficult to shift, but cyberspace can be switched on and off with the flick of a switch. Moving electrons around the globe is less expensive and faster than moving big ships over vast distances via salt ocean friction[3]. The expenses of building multiple carrier task forces and submarine fleets create huge obstacles to entry, allowing the United States to claim naval supremacy. Nonstate actors and tiny nations, on the other hand, may play major roles in the cyber realm since the entrance hurdles are so low. One of the major power changes of this century, according to *The Future of Power*, is the dispersion of power away from governments. This larger tendency is shown by cyberspace. The biggest nations are unlikely to be able to exert as much control over this area as they have over others such as the sea, air, or space[4]. They have more resources, but they also have more weaknesses, and at this point in the technology's evolution, attack outnumbers defense in cyberspace. Although the United States, Russia, the United Kingdom, France, and China have more capability than other state and nonstate entities, it is difficult to talk about cyberspace supremacy. In fact, relying on sophisticated cyber systems to support military and commercial operations exposes big nations to new vulnerabilities that may be exploited by nonstate actors. The Pentagon invented the Internet four decades ago, and by most measures, the United States is still the top nation in both military and civilian usage. At the same time, the United States is more susceptible to assault than many other nations due to its higher reliance on networked computers and communication, and the cyber domain has become a significant source of insecurity. The phrase "cyber-attack" refers to a broad range of activities, including basic probes, website defacing, denial of service, espionage, and destruction[5].

Similarly, the phrase "cyber war" is loosely used to a broad variety of activities. It follows dictionary definitions of war, which vary from military combat to any antagonistic dispute (for example, "war between the sexes" or "war on poverty"). On the other hand, some people define cyber war as a "bloodless war" between nations that solely involves fighting in the virtual realm of cyberspace[6]. However, this sidesteps key problems like the interconnectedness of cyberspace's physical and virtual levels, which we addressed before. Hostile acts in cyberspace that have consequences that magnify or are comparable to significant kinetic violence are a more

appropriate definition of cyber war. Governments having a near monopoly on large-scale use of force in the physical world, the defense has a thorough understanding of the terrain, and assaults terminate due to attrition or fatigue. Resources and movement are both expensive. Actors in the virtual world are varied, sometimes nameless, physical distance is irrelevant, and offense is often inexpensive. The attack presently has the upper hand over the defense since the Internet was built for ease of use rather than security. This may not be the case in the long run as technology advances, including attempts to "reengineer" certain systems for increased security, but it is at this time[7].

The bigger party's capacity to disarm or kill the adversary, occupy territory, or employ counterforce tactics successfully is restricted. The most spectacular of the possible dangers is cyber war, which is still in its early stages. Cyber assaults on military and civilian targets may theoretically cause enormous disruption as well as physical damage if carried out by major nations with extensive technological and human resources. Interstate deterrence (but not traditional nuclear deterrence), offensive capabilities, and plans for network and infrastructure resilience if deterrence fails are among the responses to cyber war. It may be feasible to strengthen these processes with some basic standards in the future, but the world is still in the early stages of such a process[8]. If hacktivism is seen as mostly a nuisance at this point, there are four primary types of cyber risks to national security, each with a distinct time horizon and (in theory) various solutions: States are primarily linked with cyber war and economic espionage, whereas nonstate actors are usually associated with cybercrime and cyber terrorism. For the United States, the greatest expenses are now incurred via espionage and crime, but war and terrorism may become bigger risks in the next decade or two. Furthermore, as various players' affiliations and strategies develop, the categories may become increasingly entwined. "Sooner or later, terror organizations will acquire cyber-sophistication," says ADM Mike McConnell. It's similar to nuclear proliferation, but far less difficult." We're just now seeing glimpses of cyber war, such as an add-on to certain conventional assaults, such as the denial-of-service attacks that followed the conventional war in Georgia. Can we learn anything about the present cyber change from the nuclear revolution in military operations seven decades ago? The answer seems to be no at first sight[9]. The disparities in technology are just too big. Differences in the threshold for action and attribution are cited by the National Research Council—nuclear explosions are unmistakable, whereas cyber intrusions that plant logic bombs in the infrastructure may go unnoticed for long periods of time before being used, and even then, can be difficult to trace. The sheer destructiveness of nuclear technology is much more striking.

Cyber does not represent an existential danger, unlike nuclear weapons. As points out, the destruction or disconnection of cyber networks may return us to the 1990s economy, resulting in a massive loss of GDP, while a catastrophic nuclear conflict could send us back to the Stone Age. 10 Comparisons of cyber with biological and chemical weapons may be more appropriate in this and other aspects. Furthermore, cyber devastation may be disaggregated, allowing for the delivery of tiny doses of damage over time. While there are various degrees of nuclear devastation, they are always above a critical point or firebreak. Furthermore, although civilian and military nuclear technology overlap, nuclear technology was developed for use in war, and the distinctions in its use are more obvious than in cyber, where the Web has grown in popularity in the civilian sector[10]. The "dot mil" domain name, for example, is just a tiny portion of the

Internet, and 90 percent of military phone and Internet connections are routed via civilian networks.

Finally, nonstate actors have much reduced obstacles to entrance into cyberspace due to economic dominance and cheap costs. While nuclear terrorism is a significant threat, the hurdles to non-state actors getting access to nuclear materials remain high; hiring a botnet to cause havoc on the Internet is simple and inexpensive. However, ignoring the past would be a mistake, as long as we realize that metaphors and analogies are never flawless. "History never repeats itself, but it rhymes sometimes," as Mark Twain famously said. There are some important nuclear-cyber strategic rhymes, such as the superiority of offense over defense, the potential use of weapons for both tactical and strategic purposes, the possibility of first-and second-use scenarios, the ability to create automated responses when time is limited, the likelihood of unintended consequences and cascading effects when a technology is new and poorly understood, and the likelihood of unintended consequences and cascading effects when a technology is new and poorly understood. Even more significant than these technological and political parallels is the learning process that governments and corporate players go through as they attempt to comprehend disruptive technology and develop strategies to deal with it. Although official studies on computer and Internet vulnerabilities date back to 1991, and the Pentagon just published a new plan, few experts believe the country has established an effective national cyber security strategy.

DISCUSSION ON THE CYBER WAR

The uneven and slow history of nuclear learning should serve as a warning to some of the dangers and possibilities that lie ahead in the cyber realm. In the first half-decade after World War II, Ernest May characterized US military policy and the development of nuclear strategy as chaotic. He'd probably use the same phrase to describe the current state of cyberspace. Nuclear energy was first harnessed for military reasons, but it soon became apparent that it had significant civilian applications as well. During the early stages of nuclear energy research, it was predicted that electricity would become ubiquitous. Too inexpensive to meter" and an atomic reactor would provide a year's worth of fuel for vehicles The size of a vitamin pill pellet. The engineers' enthusiasm for their new invention is contagious. A political goal to encourage civilian applications of technology bolstered technology of nuclear power Fearful of anti-war and anti-nuclear protests. The government of Dwight D. Eisenhower sponsored an Atoms for Peace initiative. Volunteered to help promote nuclear energy throughout the globe. Other several nations took part. As a result, a strong local and international presence was established.

A global campaign for nuclear energy promotion that aided in the provision of materials required for India's nuclear explosion in 1974, France justified the sale of a reprocessing facility to Pakistan and the sale of a reprocessing plant to Germany. Enrichment technique was first introduced to Brazil in the mid-1970s. The Atomic Energy Commission and the Joint Atomic Energy Committee were established to provide civilian control of nuclear technology, but both became instances of regulatory capture over time. Strong economic interests, who are more concerned with marketing than with the truth security and regulation Late in Ford's presidency. The group was dissolved. However, after the 1974 oil crisis, it became an article. Nuclear power would be the energy of the future; that uranium would be the fuel of choice. It would be required to build reactors. Following the Carter administration, the non-governmental Ford-Mitre Report's suggestions, which were attempted in 1977, it hit a roadblock in its efforts to halt the growth of

the plutonium economy. Not just from outside, but also from the nuclear sector, there has been a whirlwind of response. Its domestic supporters in Congress. As previously said, the civilian sector plays an even greater role in the conflict. The issue of creating a national security policy is further complicated by the cyber realm. The Internet has evolved into a far more powerful tool. Nuclear energy has never been a major contribution to GDP. The personal than a policy restriction, the sector is at the core of the activity. That policy is intended to safeguard. Risk is unavoidable, and redundancy and backup plans are essential.

A plan must include resilience after an assault. The private sector owns and operates the infrastructure, while the government owns and operates the land. There are just a few little levers to operate. Proposals to establish a central agency in the executive branch as well as a joint committee on cyber security in Congress may be considered. It's important to be aware of the risks of regulatory capture and the formation of a cyber "iron triangle" including the executive branch, Congress, and business. In the cyber realm, there is a mismatch of economic incentives from a security standpoint. Up to a degree, businesses have a motivation to provide for their own security, but product price competition restricts that point. Furthermore, businesses have a financial interest to keep incursions that might undermine public trust in their goods and stock prices hidden. "The public (and, in many cases, the industry) awareness of this major national security danger is essentially negligible owing to the extremely small number of voluntary disclosures by victims of intrusion activity," according to a McAfee white paper. As a consequence, there is a scarcity of accurate data and a lack of national security investment. Furthermore, antitrust rules limit private-sector collaboration, and the complexity of determining responsibility in sophisticated software restricts the involvement of the insurance market. Different views and distrust hinder public-private cooperation. Something terrible will have to happen before markets begin to reprice security, as one attendee at a recent cyber security conference observed. Without collaboration, learning may lead to belief convergence. Governments operate in the best interests of their countries, but they may also act in the best interests of their citizens. How they define their passions, both in terms of how they describe their passions and how they define their passions.

It was unrealistic to believe that exports would stay entirely quiet. The instability of the weapons race, as well as the costs and dangers it involved, was a fourth area of general knowledge. These points of view evolved separately and in tandem, and it took more than two decades for them to come together in a formal way. Harmony would result from perfect agreement of views, which is very uncommon in global politics. Cooperation in the nuclear field arose from certain shared ideas as well as real and expected conflict. The linked cyber realm necessitates a degree of collaboration and governments being aware of the issue by its very nature. Some commentators compare internet to the wild west, however unlike the early days of nuclear power, cyberspace includes a variety of private and public governance sectors. Certain technical Internet protocol standards are established (or not) by agreement among engineers in the nonprofit Internet Engineering Task Force. Despite the existence of certain cooperative frameworks, such as the European Convention on Cyber Crime, they are still weak, and governments continue to concentrate on the zero-sum rather than positive-sum aspects of these games.

Simultaneously, some of these problems may be undergoing some autonomous learning. For example, Russia and China have refused to join the Cybercrime Convention and have sheltered behind plausible deniability by encouraging "patriotic hackers" to get into their systems.

However, if the costs outweigh the advantages, their views may shift. "Russian cyber-criminals no longer obey hands-off regulations when it comes to homeland targets, and Russian authorities are starting to abandon the laissez-faire attitude, and China is suffering increasing cyber-crime expenses on its own," for example. Independent learning, as in the nuclear realm, may lay the basis for subsequent active collaboration. Crises aren't the only way to learn, of course. Players may learn the importance of collaboration in maximizing their payoffs over time by playing iterated games of prisoner's dilemma in circumstances with a long shadow of the future. Early steps in nuclear cooperation paved the way for subsequent steps without necessitating a shift in the overall relationship's competitive character. Informal "Track Two" discussions, such as the Pugwash Conferences, bolstered these government actions. There have been no significant cyber-crises to far, but denial-of-service assaults on Estonia and Georgia, as well as the Stuxnet strike on Iran, hint to what is to come. As previously said, some experts believe that markets will not adequately price security in the private sector unless there is a visible catastrophe. Other types of learning, however, are possible. In the case of industrial espionage, for example, China has little incentives to limit its conduct since the advantages greatly outweigh the risks. Spying has been practiced since the dawn of time and does not contravene any specific rules of international law. Nonetheless, governments have created rules of the road to restrict espionage and participated in tit-for-tat retribution patterns to provide an incentive for collaboration. While binding treaties prohibiting governments from engaging in espionage are impossible to conceive, a process of iterations (tit for tat) that establishes rules of the road that minimize harm in practice is feasible.

To prevent "defection lock-in," which may lead to unintended escalation, it's helpful to participate in conversations that might lead to shared views of redlines, if not completely accepted standards, as happened during the Cuban missile crisis. Discussion helps to put particular distinctions into a larger perspective a shadow of the future. Concerns about crisis management and accidents prompted the establishment of the hotline, as well as the early 1970s Accidents Measures and Incidents at Sea seminars. Similarly, the two sides found a shared interest and started cooperating on nonproliferation problems in the mid-1960s, long before bilateral arms control agreements on matters of arms race stability in the 1970s. Nuclear learning and agreements progressed at various speeds in different sectors, contrary to the popular belief that nothing is resolved in a contract until everything is settled. It's probable that the cyber domain will be similar. As we've seen, there are already certain agreements and organizations in place that deal with the fundamentals of Internet operation, such as technical standards and names and addresses, as well as the beginnings of a normative framework for cybercrime.

However, it is probable that agreement on difficult topics like as cyber incursions for espionage and war preparation would take longer. Nonetheless, the inability to envision a broad consensus does not have to stymie progress on specific problems. Indeed, breaking down word assaults into individual acts that may be handled independently may provide the greatest chance of success. As previously stated, the military may be under civilian authority while maintaining its own operational culture. It is tasked with entertaining worst-case scenarios due to its nature and purpose. It does not necessarily learn the same lessons as its civilian counterparts at the same pace. Early in the SALT negotiations, Soviet military officials protested about the Americans' practice of sharing classified military material in front of the Soviet delegation's civilian members. The exercise resulted in increased communication on the Soviet side. At the same

time, Soviet military commanders lacked a basic grasp of American institutions and the function of Congress in relation to nuclear matters. Their participation in armament negotiations aided in the development of a more sophisticated generation of younger leaders. "It's difficult to address the topic with the military," Foreign Minister Andrei Gromyko said, "but the more interaction they have with the Americans, the simpler it will be to transform our troops into something more than martinets."

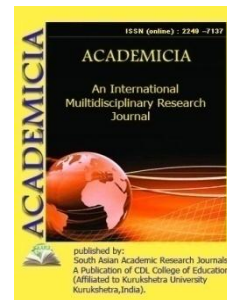
CONCLUSION AND IMPLICATION

If taken too literally, historical parallels may be hazardous, because the distinctions between nuclear and cyber technology are vast. Cyberspace is fresh and dynamic; much as nuclear technology was when it was first developed. When we consider how lengthy and difficult it was to create a nuclear strategy, much alone worldwide nuclear cooperation, it may assist to put the challenges of creating a cyber-security strategy into perspective, especially the element of state collaboration. Nuclear education was sluggish, halting, and insufficient. The intellectual and political rivalry between the United States and the Soviet Union was much more intense than it is now between the United States and Russia or the United States and China. The partnership has much fewer positive threads of dependency. Despite the intensity of the zero-sum game, rules of the road and cooperative agreements were developed to assist maintain the parallel positive-sum game. The good news is that this is the case. The bad news is that cyber technology provides nonstate actors much more power than nuclear technology, and the dangers they represent are certain to grow. The cyber domain's transnational, multifactor games raise a new set of issues about what national security means. National and unilateral security responses, focusing on cleanliness, redundancy, and resilience, are some of the most significant security responses. However, it is probable that major countries will eventually realize that cooperation against nonstate actors' insecurity would need a higher priority in attention. At this point in cyber technological development, the globe is a long way from such a reaction. However, such reactions did not emerge until the third decade of the nuclear age. The World Wide Web has only been around for two decades.

REFERENCES

1. T. Rid, "Cyber War Will Not Take Place," *J. Strateg. Stud.*, 2012, doi: 10.1080/01402390.2011.608939.
2. T. J. Junio, "How Probable is Cyber War? Bringing IR Theory Back In to the Cyber Conflict Debate," *J. Strateg. Stud.*, 2013, doi: 10.1080/01402390.2012.739561.
3. M. Sleat, "Just cyber war?: Casus belli, information ethics, and the human perspective," *Rev. Int. Stud.*, 2018, doi: 10.1017/S026021051700047X.
4. M. Durante, "Violence, Just Cyber War and Information," *Philos. Technol.*, 2015, doi: 10.1007/s13347-014-0176-5.
5. M. Robinson, K. Jones, and H. Janicke, "Cyber warfare: Issues and challenges," *Comput. Secur.*, 2015, doi: 10.1016/j.cose.2014.11.007.
6. N. Kshetri, "Pattern of global cyber war and crime: A conceptual framework," *J. Int. Manag.*, 2005, doi: 10.1016/j.intman.2005.09.009.
7. P. Dombrowski and C. Demchak, "Cyber War, Cybered Conflict, and the Maritime

- Domain,” *Nav. War Coll. Rev.*, 2014.
8. B. K. Mishra and A. Prajapati, “Modelling and Simulation: Cyber War,” *Procedia Technol.*, 2013, doi: 10.1016/j.protcy.2013.12.447.
 9. J. Andress and S. Winterfeld, “Chapter 16 - The Future of Cyber War,” *Cyber Warf. (Second Ed.*, 2014.
 10. A. Sharma, “Cyber wars: A paradigm shift from means to ends,” 2009, doi: 10.3233/978-1-60750-060-5-3.



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METHODS OF STUDYING THE MEDIA TEXT

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ABSTRACT

Thus, with a discursive approach, each specific text is viewed through the prism of socio-ideological connections, taking into account the social interests and political views of participants in mass communication, the people who created and perceive it. The ultimate goal of discourse analysis is to identify and describe the connections between language, power and ideology that are usually hidden for a mass audience. The method of critical linguistics— a relatively new direction in linguistics is quite close to the method of discourse analysis. The purpose of the method of critical linguistics is to detect and study ideologically colored components of the text. At the same time, special attention is paid to the analysis of mass media texts as texts that are deeply ideologies by nature.

KEYWORDS: *Unemployment, Employed, Labor Force, Job Market, Trade Union, Minimum Wage.*

INTRODUCTION

Media texts are fundamentally interdisciplinary in nature and are the object of study of a variety of sciences: linguistics, sociology, psychology, stylistics, cultural studies, political science, and intercultural communication. Among the most effective and common methods of studying media texts are the following.

Methods of linguistic analysis are a group of methods of semantic, stylistic, morphological, syntactic analysis, traditional for the linguistics of the text, the material for which are media texts. These methods allow us to identify the patterns of organization of each level of the media text, the stable compatibility of units characteristic of different genres and media topics, the features of various tropes and stylistic techniques from the point of view of the implementation of the general communicative perspective of the media text. The use of these methods of media text research has a long and fruitful tradition.

The method of content analysis, or content analysis (from English content – content) is "a research method aimed at a systematic, objective, quantitative data-based study of the content of communication", its purpose is to "identify and count the cases of the use of selected text units, and then on this basis to study the messages, images and representations contained in media texts in a broader social context" (B. Berelson). Based on the statistical calculation of specially selected text units (and not only verbal ones), the content analysis method provides the researcher of mass communication with the widest range of possibilities.

There are several classical studies that are still a reference point for researchers. For example, Berelson and Salter, after analyzing 198 short articles in the issues of the most famous, studied the nationality and role of their heroes, the attitude towards them. According to the results, American minorities are theorized much less and described much more negatively.

In the history of content analysis, it is also known that during the Second World War, Lasvel and Leets conducted a study of the intentions (intentions) of the editorial office of the newspaper "True American", which became the main argument for accusing the newspaper of pro-fascist sympathies and contributed to its closure in court. The authors took the slogans of Hitler's agitation as a unit of analysis and calculated whether the accused newspaper actually confirmed or refuted them.⁴⁴

Content analysis of texts about Russia in the English-language press of 2006-7 allows us to conclude that negative trends are increasing in the perception of the image of Russia and its leader in the West, which is manifested in an increase in the total number of text fragments containing references to the KGB, FSB, Lubyanka, Stalinism, totalitarian regime, Bolshevism and other anti-democratic symbols.

A content analysis of the media texts of V. Putin and D. Medvedev revealed that both politicians use the words "us", "our", "we" (about 90 uses of Putin), "Russia", "people", "about the new", "state", "countries", "development", "crisis" equally actively, and this, of course, may be a consequence of the Medvedev-Putin tandem. However, in Putin's speech, the rating of the use of the word "I" (47 uses) is significantly higher than that of Medvedev, he often says "must" (48 uses) and almost never "should" (during his last direct line-2009, he never used it). A similar analysis of President Medvedev's speeches revealed a high rating of the use of "must" (86 – in the president's message and other speeches), that is, according to psychologists; there is a certain psychological complex of must-.

The method of discursive analysis (discourse analysis). The concept of discourse and the method of discourse analysis developed on its basis allows us to focus not only on the external formal features of the text, but, and this is especially important, on a number of extra linguistic factors accompanying its production and actualization. "Discourse (from the French discourse - speech) is a coherent text in combination with extra linguistic - pragmatic, socio-cultural, psychological, etc.

factors: text taken in the event aspect; speech, considered as a purposeful social action, as a component involved in the interaction of people and the mechanisms of their consciousness (cognitive processes). Discourse is speech immersed in life."

The concept of discourse significantly expands the possibilities of describing the text, emphasizing the importance of studying extra linguistic factors accompanying communication.

"Discourse is not limited only to the framework of language. He also studies the entire content of communication: who communicates, with whom, why, in what social status and socio-historical situation, through what channels, how do I interact with the various types of communication involved in the act of communication".

Media discourse, thus, has a normalizing, regulatory effect on communicative situations: this or that discursive space of mass media is a kind of field of what can or should be said or understood, as well as "said" and "understood": not only the topic chosen by the author determines the content and method of its description in the media text - the very choice of the topic is predetermined by media discourse as a "mode of knowledge production".

Thus, the study of the media text as a "node in the network" (M. Foucault) of mass communication makes it possible to understand not only the principles of its internal organization, but also the conditions of its appearance, the rules for the formation of certain meanings and the specifics of the effectiveness of specific mass messages.

One of the classic examples of using the method of discourse analysis of media text is the works of the famous Dutch scientist T. van Dijk: "Analysis of news as discourse" and "The structure of news in the press". Considering news as a special kind of discourse, Vol. van Dijk formulates an important conclusion regarding the entire corpus of mass communication texts: "the structures of media texts can be adequately understood only in one case: if we analyze them as a result of the cognitive and social activity of journalists in the production of texts and their meanings, as a result of the interpretation of texts by newspaper readers and television viewers, produced on the basis of their experience of communication with the media".

Thus, with a discursive approach, each specific text is viewed through the prism of socio-ideological connections, taking into account the social interests and political views of participants in mass communication, the people who created and perceive it. The ultimate goal of discourse analysis is to identify and describe the connections between language, power and ideology that are usually hidden for a mass audience.

The method of critical linguistics – a relatively new direction in linguistics is quite close to the method of discourse analysis. The purpose of the method of critical linguistics is to detect and study ideologically colored components of the text. At the same time, special attention is paid to the analysis of mass media texts as texts that are deeply ideologies by nature.

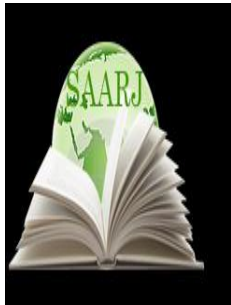
The founder of the media educational theory of the development of critical thinking, British scientist L. Masterman, believes that there are four areas of critical study of media products: 1) who is responsible for the creation of media texts, who owns and controls the media? 2) how is the desired effect achieved? 3) what are the value orientations of the world created in this way? 4) how does the audience perceive it?

REFERENCE

1. President Of The Republic Of Uzbekistan ShavkatMirziyoyev Received The Address To The Meeting. https://uza.uz/oz/politics/zbekiston-respublikasi-prezidenti_Mirziyoyevning-the-Republic-of-Uzbekistan-Supreme-25-01-2020.
2. PF-5953 of the president of the Republic of Uzbekistan on March 2, 2020 "Five priorities of development of the Republic of Uzbekistan in 2017-2021 strategy of action on the direction

"science, enlightenment and digital state program on implementation in the "year of economic development" on " decree.

3. Abdurakhmonov Q.X. Labor economics: theory and practice. The textbook. Again
4. and filled 3rd edition. T.: "", 2019. Fan 552-p.
5. Zakirova N.K., Abdurakhmanova G., Sagidullin F.R. Transformational for International scientific review innovation v. 2020. №LXX. - 24-28.
6. Frey C. B., Osborne M. A. the future of employment: how responsive are jobs to somputerisation. - Oxford Martin Working Papers. – 2018. https://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment



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SPECIFIC WAYS TO IMPROVE MATHEMATICAL LITERACY IN THE PROCESS OF SENDING STUDENTS TO HIGHER EDUCATION

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ABSTRACT

This article describes specific and convenient ways for entrants to solve math assignments in higher education entrance exams.

KEYWORDS: *Mathematical Ability, Mathematical Literacy, Problem, Perpendicular, Intersection, Mathematical Forms, Theorem, Polynomial, Equation, Inequality.*

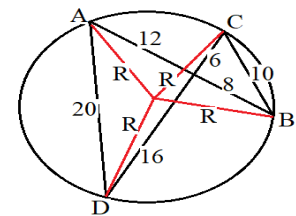
INTRODUCTION

Today, the capacity building of knowledge, skills and abilities in the preparation of students for higher education institutions requires adequate training. To do this, we need to pay more attention to solving complex examples and problems in tests, which is important for the work to be effective.

Below are comments on solving some examples that have raised many questions by applicants.

1 -Problem. The two vertices of a circle are perpendicular to each other, and one of them divides from the point of intersection into 8 and 12 pieces, and the other into 6 and 16 pieces. Find the radius of this circle.

Solution: We get an AB vatar in a circle and a CD vatar perpendicular to it. Let point E be the point of intersection of them and point O be the center of the circle. and a right-angled triangle is formed. According to the Pythagorean theorem, $CB = 10$ and $AD = 20$ is derived. $\triangle CEB \triangle AED$



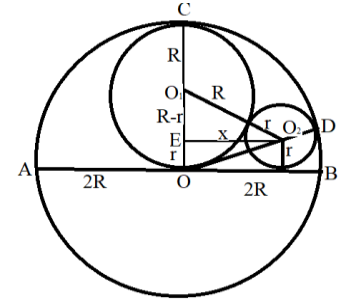
$AO = OD = CO = OB = R$ According to the theorem on intersecting waters, $\widehat{AD} = \angle AOD = \alpha$
 $\widehat{CB} = \angle COB = \beta$

we create. It follows that. . We apply the theorems of cosines to $\triangle AOD$ and $\triangle COB$ and add them step by step. In that case It turns out that $\angle AED = \angle CED = \frac{\widehat{AD} + \widehat{CB}}{2} = 90^\circ = \frac{\alpha + \beta}{2}$
 $180^\circ \beta = 180^\circ - \alpha$
 $4R^2 = 500R = 5\sqrt{5}$

2 - Problem. AB is the diameter of the intersecting circle, the center of which is drawn in the middle of the circle and the second circle striking the arc of the circle.

Solution: If we define the radius of the second circle as R , then the radius of the first circle is equal to $2R$. we draw a section EO_2 passing through the center of the third circle and parallel to AB ,

where EO_1O_2 formed a right triangle. $r = \sqrt{\frac{2}{\pi}}$



We apply the Pythagorean theorem:

$$O_1O_2 = R + r \quad O_1E = R - r \quad EO_2 = x \quad x^2 = 4Rr \quad x = 2\sqrt{Rr}$$

Now we apply the Pythagorean theorem to $\triangle EO_1O_2$

$OD = 2R$ we find we equate the x s found above. hence we send to The surface of the second circle is equal. $O_2D = r \quad O_2O_1 = 2R - r \quad OE = r \quad x^2 = 4Rr \quad 4Rr = 4R^2 - 4Rr \quad 4Rr = R^2 - Rr \quad Rr = R - r \quad R = \frac{2}{\pi}$ So, Answer: $8S = 4\pi r^2 = 4\pi \frac{2}{\pi} = 8$

3 - Example. Polynomial: if given $P(x) = ax^3 + bx^2 + cx + d$

if $P(1) = P(2) = P(3) = 0, P(4) = 2a = ?$

Solution: $ax^3 + bx^2 + cx + d = a(x - x_1)(x - x_2)(x - x_3)$

$$P(x) = a(x - 1)(x - 2)(x - 3)$$

$$P(1) = P(2) = P(3) = 0 \quad P(4) = 22 = a(3)(2)(1) \quad 6a = 22 \quad a = \frac{11}{3}$$

4 - Example. $(1 + tg7^0)(1 + tg8^0)(1 + tg37^0)(1 + tg38^0) = ?$ Calculate

$$\begin{aligned} & (1 + tg7^0)(1 + tg8^0)(1 + tg37^0)(1 + tg38^0) \\ &= (1 + tg7^0)(1 + tg8^0)(1 + tg(45^0 - 8^0))(1 + tg(45^0 - 7^0)) \\ &= (1 + tg7^0)(1 + tg8^0) \left(1 + \frac{1 - tg8^0}{1 + tg8^0}\right) \left(1 + \frac{1 - tg7^0}{1 + tg7^0}\right) \\ &= (1 + tg7^0)(1 + tg8^0) \left(\frac{1 + tg8^0 + 1 - tg8^0}{1 + tg8^0}\right) \left(\frac{1 + tg7^0 + 1 - tg7^0}{1 + tg7^0}\right) = 4 \end{aligned}$$

5 - Example. $7^{2010} \cdot 5^{2010}$ find the remainder when the expression is 24.

Solution: We use comparisons and their properties:

$$7^2 \equiv 1 \pmod{24} \quad 7^{2010} \equiv 1 \pmod{24} \quad 5^2 \equiv 1 \pmod{24} \quad 5^{2010} \equiv 1 \pmod{24}$$

$$- \begin{cases} 7^{2010} \equiv 1 \pmod{24} \\ 5^{2010} \equiv 1 \pmod{24} \end{cases} 7^{2010} \cdot 5^{2010} \equiv 0 \pmod{24} \text{ Answer: residual 0}$$

6 - Example. if $xy + \sqrt{(1+x^2)(1+y^2)} = \sqrt{5}$

$x\sqrt{(1+y^2)} + y\sqrt{(1+x^2)} = ?$ find.

Solution: We define the second equation as z

$$xy + \sqrt{(1+x^2)(1+y^2)} = \sqrt{5}$$

$x\sqrt{(1+y^2)} + y\sqrt{(1+x^2)} = z$ We square both equations:

$$(xy)^2 + (1+x^2)(1+y^2) + 2xy\sqrt{(1+x^2)(1+y^2)} = 5$$

$$x^2(1+y^2) + y^2(1+x^2) + 2xy\sqrt{(1+x^2)(1+y^2)} = z^2$$

$$(xy)^2 + 1 + x^2 + y^2 + x^2y^2 + 2xy\sqrt{(1+x^2)(1+y^2)} = 5$$

$$x^2 + x^2y^2 + y^2 + x^2y^2 + 2xy\sqrt{(1+x^2)(1+y^2)} = z^2$$

From the above equation we separate the following equation:

$$1 = 5 + z^2z^2 = 4 \quad z = \pm 2 \quad \text{Check: So } z > 0 \quad z = 2$$

7 - For example.. Arithmetic progression The sum of all three consecutive terms is $40. a_1 a_2 a_3 \dots a_6 a_7 a_8 a_3 = 6a_1 + a_8 = ?$

Solution: Similarly $a_1 + a_2 + a_3 = 40a_3 = 6a_1 + a_2 = 34a_2 + a_4 = 34$

$$- \begin{cases} a_1 + a_2 = 34 \\ a_2 + a_4 = 34 \end{cases} = a_1 - a_4 = 0 \quad a_4 + a_5 = 34$$

$$+ \begin{cases} a_1 - a_4 = 0 \\ a_4 + a_5 = 34 \end{cases} = a_1 + a_5 = 34 \quad a_5 + a_6 + a_7 = 40$$

$$- \begin{cases} a_1 + a_5 = 34 \\ a_5 + a_6 + a_7 = 40 \end{cases} = a_1 - a_6 - a_7 = -6a_6 + a_7 + a_8 = 40$$

$$+ \begin{cases} a_1 - a_6 - a_7 = -6 \\ a_6 + a_7 + a_8 = 40 \end{cases} = a_1 + a_8 = 34 \text{ Answer: 34}$$

8- Example. $f(x) = 2f(\operatorname{ctgx}) = ?$ A) $2\sin x \cdot \operatorname{tgx}$ B) tgx C) $\cos x$ D) $2\cos x \cdot \operatorname{ctgx} \frac{x^2}{\sqrt{1+x^2}} \frac{1}{2}$

$$\text{Solution: } 2f(\operatorname{ctgx}) = 2 \cdot \frac{\operatorname{ctg}^2 x}{\sqrt{1+\operatorname{ctg}^2 x}} = \frac{2 \cdot \operatorname{ctg}^2 x}{\sqrt{1+\frac{\cos^2 x}{\sin^2 x}}} = \frac{2 \cdot \operatorname{ctgx} \cdot \operatorname{ctgx} \cdot \sin x}{\sqrt{\sin^2 x + \cos^2 x}} = \frac{2 \cdot \cos x \cdot \operatorname{ctg}^2 x}{\sqrt{1}} = 2\cos x \cdot \operatorname{ctgx}$$

9 - For example. If so, find the value of the expression. $n = \log_{1,4} 3 \frac{7^{2n} - 5^{2n}}{7^{2n} + 2 \cdot 7^{2n} \cdot 5^{2n} + 5^{2n}}$

Solution: We potentiate the function, that is, we convert it from a logarithmic expression to an exponential expression. Now let's simplify the expression: $n = \log_{1,4} 3 \cdot 1,4^n =$

$$3 \left(\frac{14}{10}\right)^n = 3 \left(\frac{7}{5}\right)^n = 3 \frac{7^n}{5^n} = 37^n = 3 \cdot 5^n$$

$$\begin{aligned} \frac{7^{2n} - 5^{2n}}{7^{2n} + 2 \cdot 7^{2n} \cdot 5^{2n} + 5^{2n}} &= \frac{(7^n - 5^n)(7^n + 5^n)}{(7^n + 5^n)^2} = \frac{(7^n - 5^n)(7^n + 5^n)}{(7^n + 5^n)(7^n + 5^n)} = \frac{7^n - 5^n}{7^n + 5^n} \\ &= \frac{3 \cdot 5^n - 5^n}{3 \cdot 5^n + 5^n} = \frac{2 \cdot 5^n}{4 \cdot 5^n} = \frac{2}{4} = 0,5 \end{aligned}$$

10 - Example. find the product of the function. $y = \ln x^{\ln x^{\ln x}}$

$$\text{Solution: } y = \ln x^{\ln x^{\ln x}} = \ln x^{\ln x \cdot \ln x} = \ln x \cdot \ln x \cdot \ln x = \ln^3 x$$

$$y' = 3 \ln^2 x \cdot \frac{1}{x} = \frac{3 \ln^2 x}{x}$$

11 - Example. $x^2 + y^2 + |z - 2xy| - 2x + 4y - 5$ If the expression reaches the smallest value, find xyz .

$$\text{Solution: } x^2 - 2x + 1 - 1 + y^2 + 4y + 4 - 4 + |z - 2xy| - 5 = (x - 1)^2 + (y + 2)^2 - 10 + |z - 2xy|$$

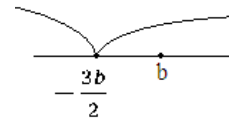
In the resulting expression always takes a positive value when the numbers are squared, which means that the smallest value of these numbers is 0. Equating the square numbers to 0, we find the values of x and y : $(x-1)^2 = 0$ Now the expression looks like this: $(x - 1)^2 + (y + 2)^2 - 10 + |z - 2xy| = 0 + 0 - 10 + |z - 2xy| = -10 + |z - 2xy|$ $(y + 2)^2 - 10 + |z - 2xy| = 0$ $(x - 1)^2 (y + 2)^2 (y + 2)^2 = 0$ $x = 1$ $y = -2$

Given that the value of the expression under the module is always positive, its smallest value is 0, in which case it is the smallest value of the expression. $(x - 1)^2 + (y + 2)^2 - 10 + |z - 2xy| = 0 + 0 - 10 + |z - 2xy| = -10 + |z - 2xy|$ $-10 + |z - 2xy| = 0$ $|z - 2xy| = 10$ $z - 2xy = 10$ $z = 2xy + 10$ $z = 2 \cdot 1 \cdot (-2) + 10 = -4 + 10 = 6$ $xyz = 1 \cdot (-2) \cdot 6 = -12$

12 - Example. If a and b are real numbers and, then find the largest integer value of the product ab . $a^2 + 3ab + 5b^2 = 80$

$$\text{Solution: } a^2 + 3ab + 5b^2 = 80, a, b \in \mathbb{R} \quad ab_{\max} = ?$$

$$y = a^2 + 3ab + 5b^2 - 80 \quad y'_a = 0$$



here it is not necessary to check the signs, because as a result of derivation a single point is found, at which point the expression reaches either max or min. Substituting the found value into the expression we find the value of b .

$$y'_a = 2a + 3b = 0 \quad 2a = -3b \quad a = -\frac{3b}{2} \quad a^2 + 3ab + 5b^2 = 80 \quad \left(-\frac{3b}{2}\right)^2 + 3\left(-\frac{3b}{2}\right)b + 5b^2 = 80$$

$$\frac{9b^2}{4} - \frac{9b^2}{2} + 5b^2 = 80 \quad \frac{11b^2}{4} = 80 \quad 11b^2 = 320 \quad b^2 = \frac{320}{11}$$

$$ab_{\max} = -\frac{3b}{2} \cdot b = -\frac{3b^2}{2} = -\frac{3}{2} \cdot \frac{320}{11}$$

13 - Example. Find the face of the painted sphere, drawn inside a quarter circle on a square whose side is equal to 1 unit.

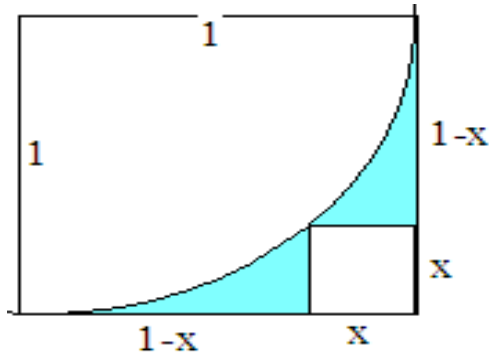


Figure 1

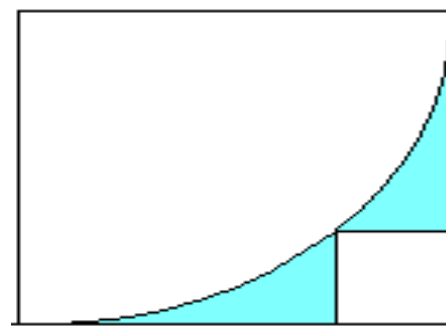
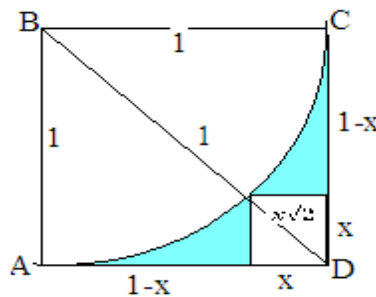


Figure 2



Solution:

$$S_{soxa} = S_{kvadrat} - S_{sektor} - x^2 S_{soxa} = 1 - \frac{\pi}{4} - x^2$$

We apply the Pythagorean theorem to a right triangle ABD or BCD:

$$1^2 + 1^2 = (1 + x\sqrt{2})^2 = 1 + 2x\sqrt{2} + 2x^2$$

$$2x^2 + 2x\sqrt{2} - 1 = 0 \Rightarrow x = \frac{2 - \sqrt{2}}{2} \Rightarrow x^2 = \frac{3}{2} - \sqrt{2}$$

$$S_{soxa} = 1 - \frac{\pi}{4} - \left(\frac{3}{2} - \sqrt{2}\right) S_{soxa} = \frac{4\sqrt{2} - 2 - \pi}{4}$$

14 - Example. ABCD trapezoid $AB \parallel DC$. $\angle ABC = 2 \angle ADC$, $|AB| = 4$, $|BC| = 13$. Find the length of the base.

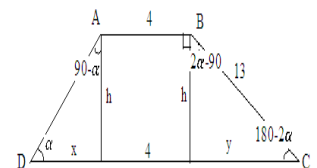
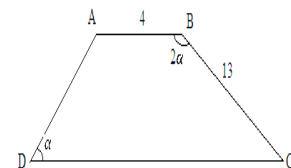
Solution: We use the sine theorem: from: $\frac{x}{\cos \alpha} = \frac{h}{\sin \alpha} \frac{h}{\sin 2\alpha} = \frac{13}{1} =$

$$\frac{y}{\sin(2\alpha - 90^\circ)}$$

$y = -13 \cos 2\alpha$ it follows that we reduce the resulting equations to the 1st proportion. from which we find x: $h = 13 \sin 2\alpha \frac{x}{\cos \alpha} =$

$$\frac{13 \cdot 2 \sin \alpha \cos \alpha}{\sin \alpha} x = 26 \cos^2 \alpha = 26 \cdot \frac{1 + \cos 2\alpha}{2}$$

$$x = 13 + 13 \cos 2\alpha \text{ we replace: } x = 13 - yx + y = 13DC = x + y + 4DC = 17$$



15 - Example. In an equilateral ABCD trapezoid, the AC is perpendicular to the diagonal CD. If, find. $AD = 4|AB|^2 + |BC|^2 = 11|AB|$

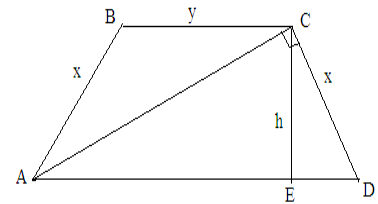
Solution: $AE = \frac{4+y}{2} ED = \frac{4-y}{2} x^2 + y^2 = 11$

$$x^2 - \left(\frac{4-y}{2}\right)^2 = h^2 h^2 = \frac{4+y}{2} \cdot \frac{4-y}{2}$$

$$x^2 = \frac{16-y^2}{4} + \frac{(16-8y+y^2)}{4} = \frac{32-8y}{4} = 8-2y$$

$$11-y^2 = 8-2y^2-2y-3=0$$

$$y = \pm 3y = -1x^2 + 9 = 11x = \sqrt{2}$$



16- Example. Two circles with radii 9 and 4 try from the outside. Find the radius of the circle that is trying to be their arcs and their total effort.

Solution:

$$16-8r+r^2+x^2=16+8r+r^2$$

$$81-18r+r^2+(12-x)^2=81+18r+r^2$$

$$x^2=16r(12-x)^2=36r144-24x+16r=36r$$

$$144-24x=20r36-6x=5r$$

$$x = \frac{36-5r}{6} x^2 = \frac{(36-5r)^2}{36}$$

$$x^2 = 16rx^2 = \frac{(36-5r)^2}{36} = 16r$$

$$36^2-360r+25r^2=16r \cdot 36$$

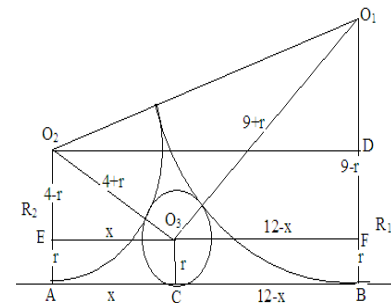
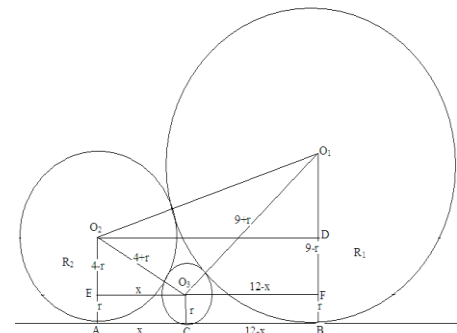
$$25r^2-360r+1296-576r=0$$

$$25r^2-936r+1296=0$$

$$D=876096-129600=746496=864^2$$

$$r_{1,2} = \frac{936 \pm 864}{50}$$

$$r_1 = 36r_2 = 1,44$$



17 - Example. $\begin{cases} x^2 + y^2 - 2x - 4y \leq -1 \\ 3x - 2y + 1 \geq 0 \end{cases}$ Calculate the area of the sphere formed by the set of points (x y) satisfying the system of inequalities.

Solution: Substituting the given system of inequalities, we make it as follows.

$$\begin{cases} x^2 - 2x + 1 + y^2 - 4y + 4 \leq -1 + 1 + 4 \\ 2y \leq 3x + 1 \end{cases} \quad \begin{cases} (x-1)^2 + (y-2)^2 \leq 2 \\ y \leq \frac{3x+1}{2} \end{cases} \quad \text{The radius of}$$

inequality 1 in the system gives the surface of a circle of radius 2, and inequality 2 gives us a straight line that divides the circle into two equal parts and does not exceed the intersection. This means that the area formed is a semicircle with radius 2. And his face,

$$S = \frac{\pi R^2}{2} = \frac{4\pi}{2} = 2\pi \text{ ga teng.}$$

REFERENCES

1. Academiciaan international multidisciplinary research journal "Methods for the development of stochastic competence in mathematics lessons at school", Toshboyeva S.R
2. Toshboyeva, S. R., Turg'unova, N. M. (2021). The role of mathematical olympiads in the development of individual consciousness. ISJ Theoretical & Applied Science, 04 (96), 247-251.
3. Toshboyeva, S.R. (2020). "Competent approach in teaching probability theory and mathematical statistics" EPRA International Journal of Research and Development (IJRD), November 2020.
4. Gafurova M.A. Formation of mathematical competence in students by creating a new problem from the given problem. Khorezm "Ilmsharchashmalari" 2020 Issue 7, 5 p.
5. <http://dtm.uz> site
6. 6.test@dtm.uz
7. Davr Press Publishing House
8. "A set of questions on mathematics". T-2018



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THE IMPACT OF CLIMATE CHANGE ON NEPALESE AGRICULTURE

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ABSTRACT

Climate change is caused by the exponential increase of CO₂ and other greenhouse gases in the atmosphere. Agriculture, biodiversity, forestry, people's health, snow cover, and aquatic and mountainous ecosystems all suffer as a result. Climate changes such as temperature, solar radiation, or precipitation have the ability to affect agricultural output. Despite many attempts to mitigate the effects of climate change, Nepalese agriculture continues to face challenges. The nation saw a 1.8° C increase in temperature from 1975 to 2006, with an average of 0.06° C/yea. Climate change has caused Nepal to suffer regular droughts, catastrophic floods, landslides, and a variety of impacts on agricultural products. According to a study conducted at Khumaltar on CO₂ enrichment technology, rice and wheat yields rose by 26.6 percent and 18.4 percent, respectively, owing to double CO₂, 17.1 percent and 8.6 percent due to temperature rise. A crop simulation model used to investigate the impacts of CO₂, temperature, and rain on rice and wheat yields in NARC found a favourable effect in all areas, but a negative effect in maize, particularly in Terai. In Nepalese agriculture, the time has come for authorities to devise adaptive strategies to minimize the impacts of recent unpredictable weather patterns in order to prevent incalculable natural catastrophes and sufferings.

KEYWORDS: Agriculture, Climate, Greenhouse, Yield.

1. INTRODUCTION

Climate change is occurring. Climate change is a phenomenon brought on by greenhouse gas emissions from fuel combustion, deforestation, industrialization and urbanization, which results in changes in solar energy, temperature, and precipitation. It poses a serious threat to people's lives all over the world, affecting water resources, agricultural production, coastal areas, fresh water, vegetation, including forests, snow cover and melting, geological processes such as landslides, desertification, and flooding, as well as food security and human health in the long run[1].

Instead of agriculture, greenhouse gas emissions are the focus. Water vapor, nitrous oxide (N_2O), carbon dioxide, methane (CH_4), and chlorofluorocarbons are the primary gases that contribute to greenhouse. The three major greenhouse gases, CO_2 , CH_4 , or N_2O , are responsible for about 88 percent of global warming. Harrison and Aiyer identified the potential of CH_4 emissions from rice fields as early as 1913. The concentration of CH_4 gas in the atmosphere is currently increasing at a rate of 3% each year. By 2100, methane levels are projected to rise by 3.0 to 4.0 ppm, potentially causing significant climate change. According to a research performed at the Nepal Agricultural Research Council in Khumaltar, the average seasonal methane emission from rice fields under rain-fed circumstances was 28 kg/ha/season. In rice fields with 50 percent nitrogen and 15 cm stubble, the maximum average methane gas was 49.03 kg/ha. A minimum of 7.7 kg/ha of methane gas was found in the control fields. More research on GHGs in different eco-zones is required to more precisely quantify and verify their effect on agriculture[2].

Thailand or India, respectively, released 49 and 45 kg/ha of methane. Nepal has fewer emissions than developed countries due to a lack of irrigation infrastructure as well as fertilizer usage. The greatest methane emission from rice was measured at 367 kg in Korea. It may be because of increasing chemical fertilizer usage and better irrigation system.

1.1. Agriculture, as well as the weather, are both important factors.

Weather is an atmospheric condition that has an impact on agriculture on a surface timescale of minutes to weeks. During the monsoon season, which lasts from June to September, Nepal receives more than 80% of its annual precipitation. The effects of increasing temperatures and unpredictably wet weather on crops have a direct influence on agriculture and food production. The quantity of rain that the monsoon brings has an effect on production. Agriculture is susceptible to short-term weather changes, which have an impact on crop yield. Droughts are caused by a lack of rain and increasing temperatures, while heavy rain in a short period of time reduces ground water recharge by accelerating runoff and causing floods. Both of these factors have a negative effect on agriculture. Regular weather patterns are also disrupted by climate change, causing monsoon intensity and duration to fluctuate[3].

1.2. The impact on Nepal's agriculture industry Nepal's economy is based on agriculture:

Increasing temperatures and CO_2 emissions help important crops grow to some extent. Improved photosynthetic processes, water use efficiency, physiologic period shortening, or soil microbial activity, for example, may result in increased agricultural production. Negative effects include increased respiration, fertilizer use efficiency, shift in agricultural zone, increase in insect pest population, desertification, increased soil erosion, evapo-transpiration, and malnutrition in a world overflowing with food due to reduced protein and mineral nutrients content in various

crops. A decrease in fertile land in some places and an increase in others has an effect on agriculture. As a consequence, the world is confronted with a tough problem. Increased CO₂ aids plant development, and yields will improve by 40% if CO₂ levels are doubled. With rising CO₂ concentrations, Annex 1 reveals some promising outcomes[4].

1.3. Climate Change Evidence in Nepal and Nepalese Agriculture:

1.3.1. General:

- The twelve hottest years between 1975 and 2007 (e.g. 2006 was the warmest year)
- Excessive runoff and poor groundwater recharge were caused by late or pre-monsoon precipitation, atypical precipitation, fewer wet days, and strong rainfall events.
- In the terai areas, extreme fog conditions have lately been recorded.
- In Kathmandu, the traditional rainfalls of Jestha and Ashar (mid-July) have been moved to Shrawan and Bhadra. It has had a detrimental impact on paddy output.
- Due to a rise in air temperature in the alpine environment, precipitation is decreasing and glaciers are receding (AX010 tiny glacier mountain is disappearing at an alarming pace).
- The number of frost days in the KTM valley is reducing, winter has arrived a month later than usual, and snow has fallen in Kathmandu.
- An unexpected snowfall in the Darchula region of the nation recently hampered the gathering of valuable medicinal plants Yarsagumba.
- Mosquitoes from the Terai and the Mid-Hill may live in the highlands.

1.3.2. Agriculture:

Early monsoon caused a rain shortfall in the Eastern Terai in 2005/06, reducing agricultural output by 12.5 percent on a national scale. Due to a lack of rain, almost 10% of agricultural land was left fallow, although the midwestern Terai saw severe rain and floods, reducing output by 30% in the year. Early crop maturation as a result of rising temperatures may allow for more crops in the same agricultural cycle (NARC annual report). There has been a shift in climatic zones throughout the nation. Natural vegetation extinction was also documented, including native basmati rice types, some local wheat, maize, and other agricultural crops. • The cold wave in Nepal in 1997/98 had a significant effect on agricultural output, with decreases in potato, toria, sarson, rayo, lentil, and chickpea production of 27.8, 36.5, 11.2, 30, 37.6, and 38 percent, respectively[5].

1.3.3. Objectives:

- To familiarize students with the idea of climate change and its implications for agriculture.
- Assisting policymakers in developing solutions for dealing with climate change and its effects

1.4. Climate Change's Impact On Agricultural Lands and Agro-Ecozones:

Plains, hills, mid hills, high hills, and mountains are some of Nepal's agricultural zones. Changes in agri-zones result in changes in the zone's cropping pattern. Climatic variables have the ability

to alter the distribution of agricultural crops ecologically. The loss of biodiversity might be catastrophic if climatic zones shifted quickly as a result of climate change. Cold-water fish, plants, pasturelands, tree lines (apple trees), and cattle are all affected (Chauri). Temperature rises in the Terai area inflict greater harm to agricultural sectors, whereas in the hills and mountains, it is more beneficial for agriculture. Cropping patterns, as well as vector-borne diseases of humans and animals, are anticipated to change in higher eco zones as temperatures rise. Some lands that are currently unsuitable due to weather conditions may become desirable in the near future. Maize, chilli, tomato, and cucumber, for example, are now widely used in the country's Mustang region[6].

Fertility of the soil and water availability with more CO₂ as a natural fertilizer, more food can be produced. Increased CO₂ availability may decrease the minerals available in soil, resulting in more robust development of food crops. Increased warmth may decrease soil organic carbon, soil micronutrients, and accelerate decomposition by stimulating the soil's microbial community. The four largest rivers coming from the Himalayas. Crops, cattle, and horticulture are all heavily reliant on the available water resources in the nation. Changes in temperature and weather are a significant cause of changes in soil moisture availability. Increased evapo-transpiration owing to rising temperatures will need more water to alleviate drought. The physiological active phase and crop output are governed by water availability. Monthly temperature rises of +2o C and +4o C disrupted evapo-transpiration and evaporation, according to research. Reduced watertable, increased evapotranspiration, soil erosion, landslides, floods, flooding of standing crops, and reduced soil fertility are all possible vulnerabilities as air temperatures rise.

1.5.Climate Change Impacts on Major Crops and Livestock:

1.5.1. Rice:

Rice is the world's second most significant crop, with 525 million tons produced from 148 million hectares. It is grown at an elevation of 300-2300 meters above sea level. Rice output in South Asia must quadruple by the year 2020. Raised CO₂ and temperature in the NARC at Khumaltar resulted in increases in rice production of 17.07 and 26.58 percent, respectively, even when the temperature in the chamber was increased by 6.2o C and 7.36o C. (Annex 2 and The greenhouse effect caused by doubling carbon dioxide was measured at 1.16o C, resulting in plots that were 9.51 percent higher than the ambient plots. The nitrogen content of rice grew by 16.3 percent as the temperature rose, but dropped by 9.8 percent when CO₂ levels doubled. Due to the rise in temperature, panicle initiation, blooming, heading, milking stage, and crop maturity time have all reduced by 7,4,4,4, and 6 days, respectively[6].

1.5.2. Wheat

Wheat is the world's most significant crop, and Nepal's third. It covers 20% of the entire cereal land and accounts for 18.8% of the country's total cereal output. Wheat growth and production are heavily influenced by climatic factors such as rain and temperature. Even with a temperature rise of 6.94o C and a doubling of CO₂, an experiment performed in an Open Top Chamber at Khumaltar showed an increase in wheat production of 8.63 and 9.74 percent (Annex 4 and 5). The greenhouse effect caused by doubling CO₂ was just 0.18o C and resulted in plots that were 9.74 percent higher than the ambient plots. Due to the rise in temperature, physiological development phases such as panicle initiation, heading, blooming, milking, and physiological

maturity reduced by 14, 5, 9, 6 and 14 days, respectively. Increased CO₂ levels in the C₃ pathway in rice and wheat contributed to higher yields[7].

Under high CO₂, wheat output rose by 41.5 percent in the Terai plain, 24.4 percent in the hill, and 21.2 percent in the mountain. The yield dropped by 1.8 percent in the Terai, but increased by 5.3 percent in the hill and 33.3 percent in the mountain when the temperature rose by 4 degrees Celsius under irrigated conditions. According to a research performed in India, there would be a modest reduction in potential yield of 1.5-5.8% in the subtropical zone, but a 17-18% decrease in the tropical zone. In a climate change scenario, it seems that rainfed wheat production would suffer more in Terai than in the mid-hill environment. At all degrees of temperature increase, the extra rains had a positive effect on wheat production.

1.5.3. Maize:

Maize is Nepal's second most important crop, although it is the main crop in the hills. The planting date of maize is determined by the availability of soil moisture during the pre-monsoon period. In the hills, relaying or mixed cropping are typical techniques to guarantee crop harvest. At mid-altitude, millet and soybean are extensively relayed, while peanuts and beans are also utilized as maize relay crops. Because it uses the C₄ photosynthetic pathway, its grain production is less affected by rising CO₂ levels in the atmosphere. In the terai, maize output rose by 9.0%, 4.9 percent in the hills, and 15.5 percent in the mountains. However, the yield fell by 26.4 percent in the terai, -9.3 percent in the hills, but climbed to 26.8% in the mountains as the temperature rose by 4 degrees. As a result, temperature response to maize crop is better in the highlands than in the terai and hills[8].

1.6.Crops for horticulture:

On 255 thousand hectares, fruits and vegetables are produced. In the current scenario, the impacts of climate change on horticulture crops are quickly becoming a concern. Tropical fruits (banana, mango, papaya) and other crops such as croton have been adopted in the mid hills, while off-season blooming has been recorded in high altitude crops such as peach, pear, and apple. The reaction of temperature and CO₂ in tomatoes was studied using an open top chamber, which revealed that increasing CO₂ boosted tomato output by 279 percent and fruit number by 205 percent when compared to field conditions. According to several studies performed in other countries, increasing CO₂ in potatoes reduced the amount of components such as iron, zinc, manganese, and sulphur. The concentration of oleic acid in soybean seeds increased as the temperature rose, whereas the concentration of linolenic acid dropped (Thomas et al., 2003). In strawberries, for example, ascorbic acid and glutathione rose by 13 as well as 171 percent from ambient to ambient + 600 ppm CO₂ conditions, respectively (Agriculture Research Service). When compared to plants cultivated in ambient air. The sourness of oranges rose by 75% when the CO₂ concentration of the air was increased. Because of the rise in carbon dioxide gas, vitamin C (antioxidant) levels have increased by around 5%. (Kimball and Mitchell, 1981). The quantity of important vitamins in fruits and vegetables increases when CO₂ levels rise in the environment, which helps to enhance human health[9].

1.7.Diseases and pests Parameters of climate change:

The growth and spread of pests and illnesses are influenced by temperature, rainfall patterns, and humidity. In the presence of a host plant, a rise in temperature or CO₂ will result in an increase

in pest population and disease severity. It accelerates the insect and pest reproductive cycle. As bug populations grow, there is a greater need for pesticides, which unwittingly harms both the environment and human civilization. Climate change will exacerbate the spread of pests and illnesses in tropical areas. Plain environment pests and diseases may eventually migrate to hills and mountains. Some diseases of key Terai crops (such as rust and foliar blight) have evolved in the hills and mid-hills, posing a threat to agricultural output[10].

1.8. Research On Nepalese Agriculture's Ability To Adapt To Changing Climate:

- Increased heat, drought, and insect resistance in crops.
- Increased irrigation efficiency via the use of drip and sprinkler irrigation.
- Water and nutrient management research in different agro-ecologies to address climate change.
- Green manuring crops including cover crops are being studied in order to maintain soil moisture, organic matter, and micronutrients.
- Models for climate prediction and its application are being researched.
- New technologies for a low-carbon economy are being researched.
- Land utilize planning, watersheds, vulnerability assessment, or resource management are all areas of research.
- Research into yield gap analysis to better understand the variables that cause climate change.

1.9. Improvements in Agricultural Productions Strategies:

- Encourage rural populations that rely on agriculture to attend seminars, workshops, training, and general education.
- Identifying current climate change problems affecting agricultural industries.
- Strengthen the Agricultural Research Station and commodities program in order to conduct effective climate change research.
- Interactive communication to farmers on climate change and its effects on agriculture in order to transfer technology.
- Preserving genetic resources to prevent biodiversity extinction.
- Crop insurance policies for social and food security.
- A shift in national policy in favour of farmer incentives, such as agricultural input subsidies and agricultural investment.

1.10. Recommendations:

The following key policy suggestions should be given top priority:

- Build irrigation infrastructure to mitigate drought risks.
- Develop minimal tillage and zero-tillage rice, wheat, and maize crops to minimize soil carbon and water loss.

- Develop heat- and drought-resistant kinds and breeds, as well as insect pest-resistant cultivars, and improve IPM mechanisms (integrated pest management).
- Develop safe agrochemicals to reduce agricultural pest and disease damage.
- To deal with weaknesses, develop collaboration and coordination among neighbouring countries.
- Create a climate-forecasting system to mitigate risks.

2. DISSCUSSION

The exponential rise of CO₂ and other greenhouse gases in the atmosphere causes climate change. As a consequence, forestry agriculture, biodiversity, human health, snow cover, including aquatic and mountainous ecosystems all suffer. Temperature, solar radiation, and precipitation all have the potential to influence agricultural production. Despite many efforts to minimize climate change's impacts, Nepalese agriculture continues to confront difficulties. Between 1975 and 2006, the country's temperature rose by 1.8 degrees Celsius, with an average annual rise of 0.06 degrees Celsius. Droughts, severe floods, landslides, and a range of effects on agricultural goods have all been induced by climate change in Nepal. Because climate change is real and happening now, there is a need to identify and adapt to its effects in order to deal with the agricultural sector's vulnerabilities. Nepal, as a developing nation, is becoming more susceptible as a result of climate change. However, other study results from other nations indicated that grain or food quality had deteriorated. Increases in temperature or CO₂ levels are also threatening to cause a hidden-hunger issue in humans by reducing the necessary nutritional content of food crops. The total effect of climate change on agricultural sectors is expected to be detrimental in the long term, according to the findings.

3. CONCLUSION

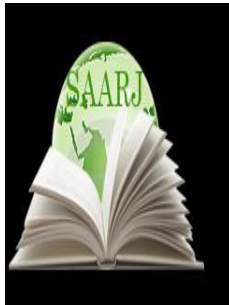
Climate change is real and underway, so there is a need of impact identification and adoption to cope with vulnerabilities in agricultural sector. Nepal being a least developed country, it is moving towards vulnerable situation due to climate change. As it is known, its effects cannot be completely controlled but effective planning and change in human habit towards a low carbon economy can slower down possible disasters. Enriched CO₂ has shown positive impact on yield of major crops in all geographical zones. However, some research findings from other countries showed reduction in grain and food quality. Increase in temperature and CO₂ levels is also threatening to bring hidden-hunger problem in human by lowering essential nutrients contents in food crops. It is concluded that overall impact of climate change in agricultural sectors will have negative impacts in the long run.

REFERENCES

1. G. Malla, "Climate Change and Its Impact on Nepalese Agriculture," *J. Agric. Environ.*, 2009, doi: 10.3126/aej.v9i0.2119.
2. R. P. Devkota and U. Bhattarai, "Assessment of climate change impact on floods from a techno-social perspective," *J. Flood Risk Manag.*, 2018, doi: 10.1111/jfr3.12192.
3. S. Poudel and K. Kotani, "Climatic impacts on crop yield and its variability in Nepal: Do they vary across seasons and altitudes?," *Clim. Change*, 2013, doi: 10.1007/s10584-012-

0491-8.

4. R. K. Mehta and S. C. Shah, "Impact of Climate Change on Water Availability and Food Security of Nepal," *Hydro Nepal J. Water, Energy Environ.*, 2012, doi: 10.3126/hn.v11i1.7206.
5. B. Joshi and G. R. Joshi, "Climate change perception and determinants of adoption of agricultural practices in Rasuwa district of Nepal," *Nepal J. Environ. Sci.*, 2016, doi: 10.3126/njes.v4i0.22726.
6. S. Downs, A. Payne, and J. Fanzo, "Healthy and sustainable diets: The development and application of a policy analysis framework," *FASEB J.*, 2016.
7. P. K. Ghosh, "Economic valuation of the use and non-use Attributes of a costal wetland for better management of its resources," *Theor. Appl. Genet.*, 2010.
8. K. L. Maharjan and N. P. Joshi, "Climate change in nepalese context: Impacts, mitigation issues, and relation with poverty," in *Advances in Asian Human-Environmental Research*, 2013.
9. World Bank, "Nepal: Trade and Competitiveness Study," *Foreign Trade, FDI, Cap. Flows Study*, 2003.
10. B. World, "Nepal: Trade and Competitiveness Study," *Foreign Trade, FDI, Cap. Flows Study*, 2003.



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A REVIEW PAPER ON ARTIFICIAL INTELLIGENCE

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ABSTRACT

This article examines the topic of artificial intelligence, with an emphasis on embodied AI. It also examines artificial consciousness models, agent-based artificial intelligence, and artificial intelligence philosophical commentary. It concludes that there is virtually no agreement or formalism in the area, and that the field's accomplishments are limited. The large percentage of recommended plans versus suggestions that have been implemented in the literature is an unusual characteristic. For a number of reasons, including cost and a lack of knowledge in the area, professionals in the field are reluctant to build robots. Because of its skills in the image and semantic domains, AI has many potential applications in medical imaging. As a result, the major issues facing AI in radiology include improving healthcare safety and quality (personalized and participatory radiology), improving workflow (and therefore medical imaging accessibility), and developing medical imaging for screening and public health (predictive and preventive radiology).

KEYWORDS: *Artificial, Consciousness, Embodied Intelligence, Intelligence, Machine Intelligence*

1. INTRODUCTION

There have been numerous literature surveys during the fifty years that artificial intelligence (AI) has been a recognized and active subject. However, encapsulating the field chronologically or

conceptually is very challenging. The reason for this, we believe, is that there has never been a groundswell of effort that has resulted in a recognized accomplishment. Nonetheless, the novice must learn a substantial body of material before trying to deal with what has so far shown to be a hydra-headed monster. This review tries to organize the literature in a comprehensible manner. Figure 1 shows the global Artificial Intelligence[1]–[6].



Figure 1: The above figure shows the global Artificial Intelligence [weforum].

A historical narrative is presented, followed by a discussion of various apparent themes. For general AI, two methods were developed: the “top down” approach, which began with higher-level functions and implemented them, and the “bottom up” approach, which began at the neuron level and worked its way up to higher-level functions. Allen Newell created the "Logic Theorist," a theorem-proving software, in 1956.

Artificial intelligence (AI) is changing service by performing a variety of activities, posing a significant source of innovation while also posing a danger to human employment. To address this double-edged effect, we propose a theory of AI job substitution. The idea identifies four intelligences that are needed for service activities—mechanical, analytical, intuitive, and empathetic—and explains how businesses should choose between people and robots to do those duties. Mechanical intelligence comes before analytical intelligence, analytical intelligence comes before intuitive intelligence, and intuitive intelligence comes before empathic intelligence, in a predictable sequence. According to the hypothesis, AI job replacement happens at the task level rather than at the job level, and that it happens first for "lower" (easier for AI) intelligence tasks. AI replaces part of a service job's duties at first, a step known as augmentation, and then proceeds to completely replacing human labor once it has the capacity to do so. As AI replaces lower-level intelligences with higher-level intelligences, the relative relevance of intelligences for service workers changes over time. An significant consequence of our hypothesis is that, as

AI takes over more analytical jobs, analytical abilities will become less essential, emphasizing the need of "softer" intuitive and empathic skills for service workers[7]–[10].

AI will eventually be capable of executing intuitive and empathic activities, allowing for new forms of human–machine collaboration in service delivery but simultaneously posing a serious threat to human employment. By the 1980s, AI researchers had realized that developing artificial intelligence was much more difficult than they had anticipated. As a result, Brooks came to think that the way ahead in consciousness was for researchers to concentrate on developing separate modules based on various elements of the human brain, such as a planning module, a memory module, and so on, which could then be integrated to produce intelligence. With the advancement of computer and robotics technology in recent years, there has been a widespread effort to create embodied intelligences. However, because to the unique nature of this area, the many efforts are nearly completely unrelated. Because creating actual robots is difficult and unsuccessful, there has been a trend toward computer simulation, dubbed "Artificial General Intelligence," in which virtual agents in a virtual reality environment try to attain intelligent behavior.

Artificial intelligence (AI) refers to intelligence shown by machines rather than natural intelligence expressed by people or animals. Leading AI textbooks describe AI as the study of "intelligent agents," or systems that understand their surroundings and take actions that increase their chances of accomplishing their objectives. However, most AI researchers reject this definition, which uses the term "artificial intelligence" to denote computers that imitate "cognitive" activities that people identify with the human mind, such as "learning" and "problem solving." Advanced online search engines (such as Google), recommendation systems (like YouTube, Amazon, and Netflix), comprehending human speech (like Siri or Alexa), self-driving vehicles (like Tesla), and competing at the top level in strategic gaming systems are all examples of AI uses (such as chess and Go). The AI effect is a phenomenon that occurs when computers grow more competent and activities thought to need "intelligence" are frequently eliminated from the concept of AI. Optical character recognition, for example, is often left out of AI discussions despite the fact that it has become a commonplace technique.

Since its inception as an academic field in 1956, artificial intelligence has gone through many waves of optimism, disappointment, and funding cuts (known as an "AI winter"), followed by new methods, success, and renewed investment. Throughout its history, AI research has attempted and rejected a variety of methods, including replicating the brain, modelling human problem solving, formal logic, huge knowledge libraries, and copying animal behavior. Extremely mathematical statistical machine learning dominated the area in the early decades of the twenty-first century, and this approach has proven highly effective, helping to tackle many difficult issues in business and academics.

The different sub-fields of AI research are focused on specific objectives and the application of certain technologies. Reasoning, knowledge representation, planning, learning, natural language processing, vision, and the capacity to move and control things are all classic AI research objectives. One of the field's long-term objectives is general intelligence (the capacity to solve any issue). AI researchers utilize search and mathematical optimization, formal logic, artificial neural networks, and techniques based on statistics, probability, and economics to address these issues. Computer science, psychology, linguistics, philosophy, and a variety of other disciplines are all used in AI.

1.1 Models of Consciousness:

It is impossible to examine this subject and abstract a narrative thread since there have been many suggestions for a structure of consciousness/control, nearly all of which have not been realized and are completely unconnected. As a result, there is no overarching organizational theme, and we are left to report on specific concepts. We accomplish this in a methodical and unobtrusive manner, despite the fact that many of them push the boundaries of plausibility and even believability. The rare instances when a simulation has been programmed will be noted. There is no evidence that the ideas will result in embodied intelligence. The challenge is to get a robot to think about the essential outcomes of actions without making it think about all the irrelevant outcomes.

Minsky, in his landmark work "Society of Mind," published in 1988 (with a nod to Brookes op. cit.), thinks that consciousness is the product of numerous tiny modules, which he refers to as agents. Each agent has no significant intellect on its own, but when they collaborate at various levels, they form a cognitive system. The Global Workspace Theory was originally suggested in 1988, and it is often characterized in terms of a theatre. A spotlight shines on one part of the stage in this metaphor, but numerous activities take place in the background outside the spotlighted region. This relates to awareness focusing on just one item at a time, while numerous other things are running in the background. Many other researchers have used this idea. This is one of the rare innovations that has gained widespread acceptance rather than fading into oblivion. Block (1994) tried to categorize several forms of awareness. The two most important distinctions are between Phenomenal Consciousness, which is concerned with our feelings and experiences, and Access Consciousness, which is concerned with information processing and behavioural control.

Chalmers (1995) distinguished between the "hard issue," namely, raw emotion, and the difficulty in implementing it, and the "easy problem," namely, the functional regions of consciousness such as planning, remembering, and so on.

Kitamura, Otsuka, and Nakao proposed an eight-level hierarchical model in 1995. Consciousness occurs at a level when activity at a lower level is blocked, allowing the higher-level job to be completed. This model's simulations are said to exhibit animal-like behavior.

CBA (Conscious Based Architecture) is a method for determining at what level an autonomous robot can function without the need to learn. CBD is divided into five levels, each of which corresponds to the various degrees of consciousness observed in living things ranging from single-celled organisms to primates. He got to the conclusion that at level three, learning ability becomes a necessity. The distinction between the narrative self and the minimum self the minimal self is solely concerned with what is going on right now, while the narrative self-needs memories of the past and is capable of planning.

1.2 How AI works:

Vendors have been rushing to advertise how their goods and services utilize AI as the buzz surrounding AI has grown. What they call AI is often only one component of AI, such as machine learning. For developing and training machine learning algorithms, AI needs a foundation of specialized hardware and software. Although no one programming language is associated with AI, a handful stand out, including Python, R, and Java. AI systems, in general,

operate by consuming vast quantities of labelled training data, evaluating the data for correlations and patterns, and then utilizing these patterns to forecast future states. By analyzing millions of instances, a chatbots given examples of text conversations may learn to create realistic interactions with humans, and an image recognition program can learn to recognize and describe things in pictures.

1.3 Deep learning in medical imaging:

Deep neural networks are a kind of learning algorithm that has led to significant improvements in task performance, particularly in the area of medical imaging. Until recently, traditional pattern recognition learning systems were made up of two parts: a feature extractor that was hand-programmed and a machine-learning algorithm that classified the picture. The automated classification of a lung nodule as benign or malignant is a good example. The feature extraction step entails

- Segmenting the nodule.
- Choosing and extracting nodule characteristics such as borders, density, enhancement, roughness.

Entropy that are important for distinguishing between a benign and malignant tumour. These characteristics are organized into vectors. The machine-learning method for analyzing these vectors is chosen in the following step in order to properly identify the nodule. Image segmentation and the selection of essential features for extraction are very difficult processes that may lead to mistakes. It is almost difficult to demonstrate that the best characteristics for addressing the issue have been chosen. Convolutional neural networks are critical for overcoming this barrier because they combine the two stages, i.e., extracting the features and categorizing the picture, drastically changing the paradigm. To enable future categorization, the image features do not need to be extracted initially. Deep learning networks take the pixels in an image or an area of an image as input and convert them into a judgment or classification through many processing layers (thus the term "deep"). The intermediate, or hidden, layers are in charge of extracting visual characteristics that were not explicitly coded by the network designer but learnt by the network via an examination of the handlabeled data given during the training phase. The procedure is carried out from start to finish, from raw data analysis to picture classification, with the network handling the intermediate stages. Figure 2 shows the Classical steps of machine learning.

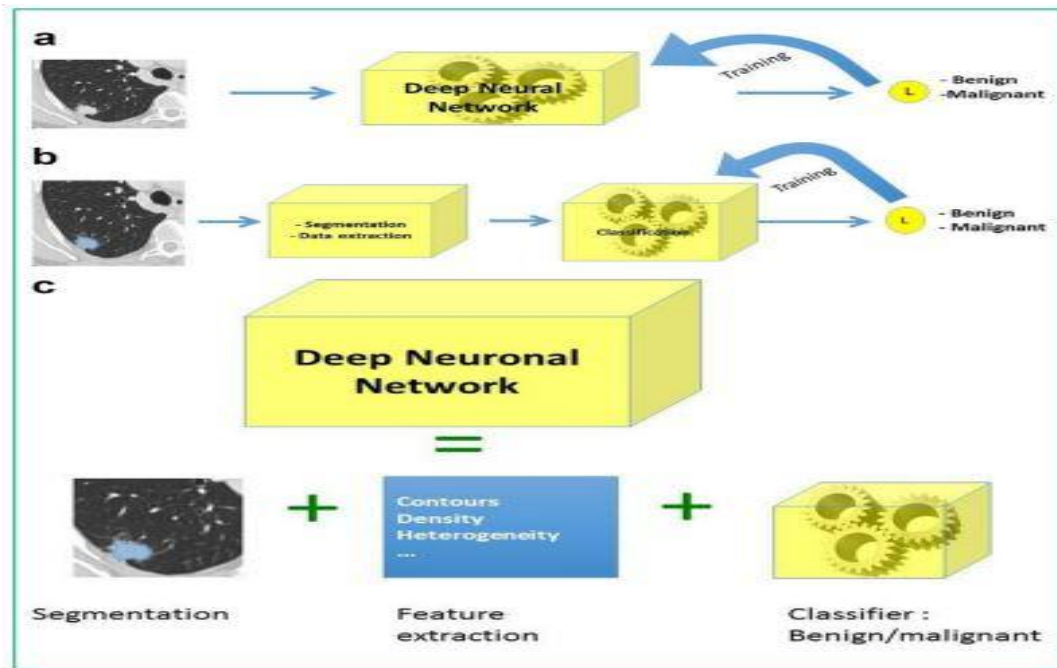


Figure 2: The above figure shows the Classical steps of machine learning.

1.4 Applications and future prospects:

Because of its skills in the image and semantic domains, AI has a lot of promise in medical imaging. As a result, healthcare safety and quality improvement (personalized and participatory radiology), workflow optimization (and therefore medical imaging accessibility), and the development of medical imaging for screening and public health are the major issues addressed by AI in radiology (predictive and preventive radiology).

2. DISCUSSION

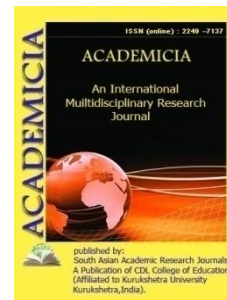
Artificial intelligence (AI) is changing service by performing a variety of activities, becoming a significant source of innovation while also posing a danger to human employment. To address this double-edged effect, we propose a theory of AI job substitution. Mechanical, analytical, intuitive, and empathic intelligences are needed for service activities, according to the idea, and businesses should choose between people and robots to do those duties. Mechanical intelligence comes before analytical intelligence, analytical intelligence comes before intuitive intelligence, and intuitive intelligence comes before empathic intelligence. According to the idea, AI job replacement happens at the task level rather than at the job level, and that it occurs first for “lower” (easier for AI) intelligence tasks. AI replaces part of the duties of a service job at first, a stage known as augmentation, and then proceeds to completely replacing human labor once it has the capacity to take over all of the tasks of a job. As AI replaces lower-level intelligences with higher-level intelligences, the relative relevance of the intelligences for service workers changes over time. A significant consequence of our hypothesis is that as AI takes over more analytical jobs, analytical abilities will become less essential, emphasizing the need of “softer” intuitive and empathic skills for service workers. AI will eventually be capable of executing even intuitive and empathic activities, allowing for new forms of human-machine collaboration in service delivery but simultaneously posing a serious threat to human employment.

3. CONCLUSION

The author has discussed about the artificial intelligence, it focuses on the most of the work, especially in the field of embodied AI. The World of Warcraft is an example of a large field of agent-based systems, many of which are commercial. This has not been touched in a long time. The fragmented character of the claimed effort makes it difficult to comprehend, or maybe useless to comprehend. Perhaps the only two ideas that academics have agreed on are Baar's Global Workspace Theory, Brooks, and Minsky's agent-based model, which were developed separately. A peculiar feature of the literature is the high proportion of suggested plans versus proposals that have been executed. Practitioners in the field are hesitant to construct robots for a variety of reasons, including expense and a lack of competence in the subject. After digesting all of these documented attempts, two fundamental conclusions must be drawn: first, the researcher is free to move ahead unfettered since there is no existing formalism in the area; second, the researcher is free to go on unfettered because there is no existing formalism in the field. Second, despite a 33 million-fold (Moore's law) increase in computing, the area's accomplishments are disappointing - the industry is still a long way from creating a robot with the intelligence and functionality of a cockroach.

REFERENCES

1. I. Contreras and J. Vehi, "Artificial intelligence for diabetes management and decision support: Literature review," *Journal of Medical Internet Research*. 2018, doi: 10.2196/10775.
2. D. Hassabis, D. Kumaran, C. Summerfield, and M. Botvinick, "Neuroscience-Inspired Artificial Intelligence," *Neuron*. 2017, doi: 10.1016/j.neuron.2017.06.011.
3. K. W. Johnson *et al.*, "Artificial Intelligence in Cardiology," *Journal of the American College of Cardiology*. 2018, doi: 10.1016/j.jacc.2018.03.521.
4. H. Lu, Y. Li, M. Chen, H. Kim, and S. Serikawa, "Brain Intelligence: Go beyond Artificial Intelligence," *Mob. Networks Appl.*, 2018, doi: 10.1007/s11036-017-0932-8.
5. M. Butterworth, "The ICO and artificial intelligence: The role of fairness in the GDPR framework," *Comput. Law Secur. Rev.*, 2018, doi: 10.1016/j.clsr.2018.01.004.
6. "Artificial intelligence and medical imaging 2018: French Radiology Community white paper," *Diagnostic and Interventional Imaging*. 2018, doi: 10.1016/j.diii.2018.10.003.
7. M. H. Huang and R. T. Rust, "Artificial Intelligence in Service," *J. Serv. Res.*, 2018, doi: 10.1177/1094670517752459.
8. A. Bansla and N. Bansla, "Artificial intelligence," *Int. J. Appl. Eng. Res.*, 2012, doi: 10.4018/ijeei.2018070102.
9. G. Hessler and K. H. Baringhaus, "Artificial intelligence in drug design," *Molecules*. 2018, doi: 10.3390/molecules23102520.
10. P. Hamet and J. Tremblay, "Artificial intelligence in medicine," *Metabolism*., 2017, doi: 10.1016/j.metabol.2017.01.011.



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IN THE DRAMA "HAMLET" AND "ABULFAYZKHON" TRAGIK PAFOS

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ABSTRACT

This article is a comparative study of the use of tragic pathos in the tragedies "Hamlet" and "Abulfayzkhon", the synthesis of this concept with conflict and drama, and its peculiarities. Pathos is the backbone of a work of art, in other words, the backbone, as a criterion that determines the genre and essence of any tragic work. The article analyzes pathos from this perspective.

KEYWORDS: *Tragedy, Pathos, Psychology Of Heroes, Aesthetic Category, Tragic Character, Philosophical Thinking, Renaissance, Personality Tragedy, Conflict, Internal Monologue.*

INTRODUCTION

Aristotle argues that Pathos is a heroic tragedy, manifested through mental anguish and evokes similar feelings in the viewer [1; 219]. Later, especially since the Renaissance, pathos began to be understood not as a feature of the human heart, but as a feature of the work to evoke certain emotions, so it was used more in connection with concepts such as style, heroism, upliftment, tragedy.

While Gegel interprets pathos in connection with the "family, homeland, church, glory, friendship, pride, honor, love" inherent in the characters of the work, according to V. Belinsky, it is an "idea-passion" associated with the creative personality. the world comes from the senses of perceiving the world. G

G. Pospelov interprets it as one of the important members of the artistic content. In the Dictionary of Literary Criticism: "If, in the Aristotle-Gegel tradition, pathos was associated with more characters, starting with Belinsky, with the creator (subject), now the term art modes encompassing the subject-object-addressee trinity has become more active." interpreted as [1; 220]

Literary critic I. Ganiev thinks about the main criteria that define the genre of dramatic work, what criteria should be used in defining the genre in ancient and modern literature: "... Such a criterion cannot be the basis for the description of all types of works "[2; 27]. The scholar argues that his focus is on the formal aspect, without denying the differences in content in the genre classification of the lyrical work. He tries to prove his point on the example of the types of musammat based on the structure of the band, as well as the genres of rubai and fard. He also explains why some experts include Abulfayzkhan in the genre of drama and some in the genre of tragedy, and recalls that Aristotle founded the rule that pathos is the main criterion in the genre classification of dramatic works.

It is well known that when Aristotle speaks of the internal division of tragedy, he distinguishes three situations: "Passion ... is an act of destruction or suffering." The genre of tragedy is based on a sharp turn, a sudden knowledge, a passion. it has to change because of a mistake. " From the above, it can be said that the backbone of tragedy is tragic pathos, and if there is no pathos, none of the evils like death, murder can be a tragedy.

A. Karyagini: "In drama (in dramatic works in general - emphasis ours - Sh.Sh.) everything is related to conflict. Everything that does not depend on it is superfluous. Conflict determines the whole structure of a dramatic movement, not its moment "[3; 155]. So, since everything in a drama is closely related to conflict, since conflict defines the whole structure of a dramatic work, first of all, tragic, dramatic, or comic pathos must be reflected in that conflict. The main conflict in Abulfayzkhan seems to be two dynasties, in Hamlet two brothers, or more precisely, close relatives: a disagreement between an uncle and a nephew. is in the middle of development. It is this objective development that has condemned these two dynasties and their close relatives to destruction from the very beginning. and admits that it is low, in which case a strong tragic pathos blows. Such a conflict can be described as a catastrophic conflict.

At the time of Hamlet's creation, Shakespeare was 37 years old. The tragedy was staged in 1601 and published in 1603. A year later, the first edition was seriously edited and expanded. Shakespearean A. Anikst points out that in the second edition the philosophical essence of the tragedy was deepened, the image of the protagonist Hamlet was changed, his concept of man as a human being was shown in all its complexity. At that time, the author was 40 years old, and his creative maturity was at its peak. As many admit, Hamlet is the pinnacle of Shakespeare's literary legacy. The world literature still does not know a second work that can occupy this height. Indeed, Hamlet is the guardian of the family, the devotee of society, the faithful and conscientious citizen of the state, the leader of honor and dignity, the faith, the hope of the declining country, the heir to the throne, who bleeds from betrayal. It embodies all the virtues of a true human being, and that is why it is still loved and revered in the hearts of the peoples of the world, in different climatic zones, even after centuries.

The similarity between "Hamlet" and "Abulfayzkhan's tragedies" is reflected in the psychology of the heroes, their pain and inner feelings. In Hamlet, Claudius secretly kills his brother, Hamlet's father, and seizes his throne, continuing his humiliation and marrying his brother's wife. Both Claudius and even Abulfayzkhan, who became the killer of his seven children, create their own tragedy.

Tragedy, understood as an aesthetic category, has a tragic meaning in the full sense of the word, a contradiction that is inevitable in a particular dramatic situation. A tragic situation is an

irreconcilable contradiction, a tragic situation that cannot be resolved positively. When we say solution, we mean the hero's own tragedy, his own confession, his own confession, his own destruction.

When Hamlet thinks about what is happening, he has doubts and suspicions, and there seems to be "some mystery." A thousand and one fantasies tell Hamlet, who lives in agony, that his friends have seen his father's ghost. He meets his father's ghost and learns the truth. His father enters and tells the details of his death.

Claudius, who was a wicked, hypocritical slave to the ghost Hamlet, was able to flatter the princess with flattery, his love was like heaven, he broke his covenant on the day of his marriage, he fell into the arms of an infidel who was many times lower than himself, and his brother put him in the garden. He says that he killed a bullet in his ear while he was asleep and bequeathed it to his son:

Oh, that horror, horror, horror! Nomusila or
If it doesn't burn your heart out, the attempt is futile.
The bed where the kings of Denmark slept
Don't let prostitution serve shame.
Almighty revenge no matter what
You keep your soul pure, don't touch your mother.
A fair judge to him, his worthy answer -
Tangritaolo-yu, again a pang of conscience. [4; 242].

Hamlet is shaken by the words spoken by his father's ghost. The feeling of hatred that arose in his heart was so great that those around him thought he was insane. He then asks the actors to perform the story of his father's death on stage, and during the show, he watches the actions of his uncle, Claudius, now King of Denmark and mother of her husband. When he admits that what he has heard is a bitter truth, he shouts, "Denmark is a prison."

The universal popularity of the tragedy is due to the strong pathos in it, and the inner monologues of the protagonists in the play are expressed in a very touching, truthful, objective way. There is no doubt that Hamlet's painful words and insulting words towards his mother ignite feelings of pity and hatred in the psyche of the reader and the spectator.

In the tragedy Hamlet, Hamlet's friends are told, "Oh my God! Put me in a pistachio shell and I still feel like a master universe. Just save me from these oppressive fantasies "[3; 265], in his words embodies the cry of the awake Person, the groan of the heart, who deeply understands the essence of the universe and man, what life and death are. Hamlet's friends are overwhelmed by the mysterious death of his father, the loss of all his joy and enthusiasm for training after learning of his mother's betrayal. But when he explains that the reason for this is completely different, how much Hamlet is crushed inwardly, how a thousand and one uncontrollable fantasies run through his mind, and how the desire for revenge pervades his whole soul, takes on an entirely different form.

In Hamlet, King Claudius appears to be unable to forgive himself in the scene of his self-immolation. As he tries to pray, he struggles, explaining that he has fallen into a grave sin and will not be forgiven: "I have fallen, I have fallen to get up, but, Well, it is permissible to beg here." Claudius lives in two appearances, two I. One of them justifies himself, the other sharply condemns. Claudius tries to repent, but now he decides for himself that even the doors of repentance are closed. At the same time, it is clear that his conscience is not yet completely dead.

If my guilt is used against me,
The seal of disbelief and reproach on my forehead:
My brotherhood! Flashing only,
I strive, I can't but pray.
I know that this sin is unforgivable,
I'm ugly, I don't know where to start,
It is my job to live in such a miserable state [4; 307].

In Claudius' view, in order to pray, to repent, he must return what he has taken, but he cannot dare to do so, turning away from the crown, the kingdom, the princess, the glory, and returning to himself. In the scene of his attempt to pray, he said, "It is said that the answer is the power of repentance, but what if the path of repentance is completely closed? Suffering, suffering! My heart is black with death. My soul is sinking in the mud! " his words actually sound like a verdict against him. He realizes what he has done, regrets what he has done, tries to apologize, and even orders a quick bend to his knees. He also knows that when he does so, the lead in his heart will melt and he will be as soft as a baby. If he had been able to stand firm in those thoughts, the tragedy probably would not have happened. However, the difference and uniqueness of the tragedy from other genres also decides the end of the tragedy in a small moment.

In the tragedy "Abulfayzkhan", when Khan was alone, he said to himself: "... I will kill, I will kill. I will shed blood until I have no enemy left in the world. Ulfat's word is true. The kingdom is a tree irrigated with blood, "he said, and his speech clarifies his policy, worldview, and spiritual world. Just like King Claudius in Hamlet, he is dissatisfied with himself, anxious, skeptical and afraid of everything. At the same time, he knows and feels his actions, and therefore his sense of fear increases. He wanders in the whirlpool of events leading to his own tragedy, seeking salvation, looking for a way out, but unable to find the right path. Because he has no desire to return to the right path. The mood of the khan, who is forced to embrace his own tragedy, worsens as events unfold, which he constantly takes with him. Between the two grasses, between good and evil. "I'm tired of shedding blood," he said. I killed my brother. I killed a lot of my friends. I saw my father, Farhod, who cared for me like a father, under his feet. (Holding his eyes) Ugh ... my eyes are full of blood. I can't sleep at night. My eyes are soft, all the dead, all that I have killed will turn me around, pass me by in a daze. They scare me, they laugh at me! " [5; 137] He reveals himself, confessing the conflicting feelings in his psyche, the excruciating pain, the exhaustion without the torment of suffering. But like Claudius, instead of acknowledging the truth, he tries to avoid it, and thus draws closer to his own unhappiness, becoming a victim of his own behavior.

Farhod, who supported him, executed his father at Ulfat's word. As in Hamlet, the khan is surrounded by flatterers, cowards and hypocrites who put their own interests above all else. The first scene of the tragedy begins with the chess game of QaziNizam and Mirvafa. In the short dialogue between Abulfayzkhan and Ulfat, who entered the circle, the khan's household's slyness, cunning and flattery are clearly visible:

“Abulfayzkhan. Where, who is stronger?

Ulfat. Both of Haqqani's slaves play well.

Abulfayzxon. Which side are you on?

Ulfat. I applaud and watch, we have nowhere to go.” [5; 130].

All the words and actions in the text are symbolic, that QaziNizam and Mirvafa are good "players" in life, and that the salt of life is like a game of chess. appears. Ulfat Khan becomes an "impartial spectator" because he does not know which side he is on. Reminiscent of Polonius in Hamlet, this character is ready to do anything to please his master. Ulfat and Poloni are extremely cunning, cunning, meticulous people, but they have no personality. At the end of the tragedy, as they say, both of them perish.

Abulfayzkhan, like Claudius, is evil and pursues his own interests in everything. The king tries to kill his nephew, his nephew, and achieves his goal through Laert, and the khan also kills his sons. Farhod, the most just and popular man next to him, beheads his father with Ulfat's hand.

If Claudius is married to the Princess, Abulfayzkhan, in his own words, will try to force the daughter of a "close father-like" relative. However, the father went against his wishes and refused: “We sacrificed ourselves to the khan. Let them not want our honor anymore” [5; 132]. The khan, ignorant, cowardly, and revengeful of praise, thus loses his strong, trustworthy, wise counselor.

Considering that tragedy is a means of aesthetic analogy, it is worth remembering that the Canadian scholar Northrop Fray applied the term to literature, explaining the author's attitude to the protagonist of the work of art under the concept of "modus". However, he did not draw any definite line between general aesthetic views of art and literary genres. Russian scholar V.Tyupa, on the other hand, sees the same concept as the author's ideological and emotional assessment. Uzbek literary critic D. Kuronov explains the mode not only as an ideological-emotional relationship or the author's emotionality, but also as a peculiar manifestation of the typology of the protagonist [1; 57]. Indeed, it is impossible to draw a convincing conclusion about the characteristics of a particular novel without determining how the author's reality and approach to the protagonist emerge. The famous English writer, playwright and critic Somerset Maugham (1874–1965), speaking of prose writers, said: "They should pay more attention to the perfection of the essence of the world." In this sense, based on our observations of the literary process, it is safe to say that Uzbek prose writers now pay special attention to the modes of satire, tragedy, satire, drama in the expression of self-awareness and self-expression. It can be said that these ideas also apply directly to the work of Fitrat.

It should be noted that Shakespeare's translators G. Gulom, M. Shaykhzoda, J. Kamol also showed their positive results in the creative world in such areas as artistic mastery, philosophical and social pathos.

In the system of literary connection, tradition and innovation, literary commonality, "literary similarity", terminology, commonality in the events of works, ideological pathos, that is, the concept measured by the essence of harmony, closeness to each other. For example, works in harmony with each other in the ideological direction, such as freedom, liberty, good-evil, good-evil; plot similarity in the reality of the work: ChingizAitmatov's story "Face to face", V. Rasputin's story "Live and forget", S. Ahmad's interpretation of events related to the fate of war refugees in the novel "Horizon"; such commonalities and similarities can be seen in countless examples. Representatives of the world system of comparative studies (communication) (Zhirmunsky, Veselovsky, Zhupokaeva, Konrad, Khromchenko, D. Dyurshin, A. Dima) and well-known representatives of Uzbek literature M. Kushjanov, I. Sultanov, U. Normatov, O. Sharofiddinov, E. Karimov and others promote the criteria for the study and evaluation of bilateral works on the basis of freedom and mutual equality. At the same time, the next follower of a great writer (such as Firdavsi or Navoi, Pushkin or Tolstoy, Gorky or Aitmatov) completely rejects the obligation and worship of the creators. For example, A. Aripov's pen is not the first Dante, but the inspiration of many other great artists of the East and West: Yassavi, Navoi, Makhtumkuli, Pushkin, Lermontov, Byron, Aitmatov, Khamzatov, I. Kuliev and a number of other great philosophers. .

The purpose of diligently identifying the phenomena of literary creativity and comparative study of the works of two or more writers and poets is to determine whether the originality of the creators, whether their originality has remained in the state of imitation, to generalize unique literary achievements.

The tragic character of Hamlet, Claudius, Abulfayzkhan, Farhod is a multifaceted complex personality of the father, who cannot give up the inner contradictions, conflicting views, thoughts and passions of his character. Their self-struggle, their inner self-contention, their passionate suffering, are universal, and this is the essence of their individual character. As a tragic protagonist, Hamlet is able to look straight at the realities of life, and although his heart is broken after hearing the ominous news, the child and the man are tormented to the extreme between the two. He thinks of fulfilling his father's will, of taking revenge on his uncle. Claudius refrains from murder and revenge, even if he has the opportunity to kill him while he is praying. Shakespeare showed the concept of man in Hamlet's heart through the same episode.

Is it revenge for the killer to die?
At the time of prostration, when one is free from sins,
What if he was on a long journey?
No!
Back to the sword, until a terrible opportunity.
Either when he is angry or when he is drunk,
In sleep or in unclean peace, in the bosom of pleasure
Or a frantic asnozib "[4; 130].

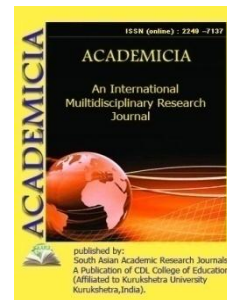
In this situation, the nobleness of Hamlet's nature, in a confusing and complicated situation, seems to exaggerate the feeling that kept him from revenge. The Crown Prince lives with the most original, the most glorious idea, and at the same time becomes the cause of his own destruction by not killing Claudius. Hamlet, who can look straight into the eyes of death,

survives Claudius' planned plot to commit suicide, then returns to his own tragedy, to the palace. Unlike Claudius, he obeys the dictates of his heart, not his desires. Even though Claudius sometimes thinks about how dangerous he is going, even though he knows that he is going downhill, he cannot find the strength, the will, to turn from evil.

The fact that tragedy is a complex and contradictory unity within a single event develops step by step in the image of Hamlet, Claudius, Abulfayzkhan and reaches its culmination. There is no excuse for Hamlet's killing of Polonius, the insanity and drowning of his lover Ophelia, leading to Laert's death. But it is also unfair to condemn him for any of these things. What sets him to this tune is lofty purpose, steadfast faith, honor, and pride. VG Belinsky described the tragic heroes as "innocent culprits". In "Hamlet" and "Abulfayzkhan" good and evil, love and betrayal, happiness and tragedy, nobility and humility go hand in hand.

REFERENCES

1. Quronov D, Mamajonov Z, Sheralieva M. Dictionary of Literary Studies. Tashkent: Akademnashr. 2010. -b.
2. G'aniev I. Poetics of Fitrat dramas. T.: Fan, 2005. i 27-p
3. Karyagin A. Drama is an aesthetic problem. M.: 1971. 155-156-b.
4. Vilyai Shakespeare. Selection. The first volume. T.: Fan, 2007. 265-p
5. Fitrat A. Country grief. Publishing and Printing House named after G. Gulom, T.: 2008. 137-p



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THE IMPACT OF GEORGE ORWELL'S WORK ON WORLD AND UZBEK LITERATURE

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ABSTRACT

The article deals with the social reality of two writers (George Orwell and Murad Muhammad Dost) who lived and worked in two different historical periods, in two different national-cultural contexts, and whose creative credo and style are close to each other. Thought about the problems of originality. The concept of society, which is a very important and global problem for the development of society and fiction, as well as the dialectic of multi-layered imagery in the artistic interpretation of this topic are summarized in the example of English and Uzbek literature.

KEYWORDS: *social content, multi-layered metaphor, personality and society, artistic mode, socio-moral character, reality of social life, philosophical thinking, personality tragedy, subconscious layer, time and space, conflict. Authoritarian system, human freedom, divine truth, nature and society.*

INTRODUCTION

George Orwell's conception of the individual and society, the historical reality of the period in which he lived, the various situations and contradictions, the authoritarian regime and its oppression of human freedom, rights, prohibitions, apostasy, the dramatic shift in the balance between nature and society, in order to perceive the truths you want to express, you need to be aware of the political and social system, spiritual and moral views, different literary currents and schools, literary processes in England (in the West in general) in the first half of the twentieth century.

Naturally, a writer like George Orwell, who was able to philosophically and figuratively express universal problems in the status of art, did not appear on the ground. His life and work have been studied, and his books have been translated into various languages. The fact that J. Orwell's non-

fiction novel "1984" and the story "The Barn" were written during the most difficult period of history - the years of World War II - encourages any reader or researcher to think deeply. It can be said that the events of both works took place during the former Soviet period.

A person who reads or analyzes a work, interprets familiar scenes, the socio-political situation, ideological pressures, the violation of human rights and freedoms, authoritarianism, chaos, treachery, fraud, a group of violent people who want to change history for their own nefarious purposes. society is manifested. From the course of events described in the two plays, from the struggles to dominate each other in the form of animals, it is clear that the ultimate goal is the greed for power. This disgusting oppression is used as a tool to disguise the feeling of violence and the pursuit of freedom. It is as if in the Barn, humanity - the rescued animals - has achieved equality and freedom. In short, the play explores the dictatorship of animals (metaphor), the totalitarian, atheistic system of the former Soviet Union that has ruled for nearly 70 years.

According to the famous Romanian conservative A. Dima, the main purpose of comparative literature is to study three types of phenomena: a) direct inter-literary relations - translation, influence, assimilation; b) genetic similarities that are not in a genetic brotherhood, but are manifested in the study of a particular subject, myth, image, genre, or similar literary current; (the theoretical basis that is most important for our research is exactly this second phenomenon); c) peculiarities of national literature. [1; 121]

aspects. [1; 121]

A. The analysis and interpretation of samples of English and Uzbek literature on the basis of mutual typological similarities, which are not in the genetic brotherhood, as noted by Dima, but based on similarities in subject, myth, image, genre and idea, plot, are likely to give new conclusions for national literature. To do this, we first need to look at the history of complex literary works of the early twentieth century, which added to the treasury of world literature, the literary currents of the early twentieth century, which is a natural basis for the formation of George Orwell's worldview, philosophical concept and multi-layered style.

One of the most famous artists in the Western world in the early twentieth century was James Joyce (1882-1941). His "Ulysses" is a famous philosophical-social, psychological novel with a complex style, the fame of which was one of the beginnings of a new era in world literature, such as Marcel Proust (France), Franz Kafka (Austria-Hungary). James Joyce is also one of the pioneers of a new trend called the "stream of consciousness" with his work. J. Orwell, one of the leading intellectuals of his time, could not be without the works of these famous people.

Second, the literature of the early twentieth century is more complex, rich in paradoxes, belonging to different national cultures, such as Germany, Austria, the Czech Republic, Switzerland. The influence of Kafka's novels such as "America" (1911-1916), "Castle" (1922), "Process" (1915-1918) on the works of J. Orwell can be felt.

One of the most famous in the Western literary world in the early twentieth century was Herman Hesse (1877-1962), who exaggerated the problem of human rights and values in intellectual novels. His novel *The Desert Wolf* became popular at the beginning of the last century. The spiritual crises of humanity are discussed. Since this also falls into the category of stylistically complex works, we observe that it is essentially close to the works of J. Orwell.

Another master of world literature of the twentieth century is the Nobel Laureate E. Hemingway (1899-1961). His "Goodbye, gun!" and *The Old Man and the Sea*, which were very popular at the time, have not lost their popularity. The author's philosophical conception of "Man can be crushed, but he cannot be defeated" is in line with the idea of J. Orwell's works.

A. Camus (1915-1960) is one of the writers who was contemporary with J. Orwell and had a worthy place in the treasury of world literature, which was close in style. Camus's philosophical work *Caligula*, known as the Drama of Ideas and the Study of the Concept of the Absurd, was also very popular in its time. If you want to be a philosopher, you have to write novels," he said. It is impossible not to be unaware of the work of this famous contemporary of J. Orwell.

J. Orwell writes in his diaries that one of the representatives of another world literature, the French writer Jules Verne, loved his works and even read them over and over again up to eight times. It is known that J. Verne (1828-1905) was one of the founders of the science fiction novel genre. »(1867-68)," 20,000 kilometers under water "(1869-70)," Fifteen-year-old Captain "(1878)," Floating Island "(1895), more than 65 science fiction, adventure and author of socio-critical novels, short stories and short stories

In his novel *Claudius Bombarnak*, J. Verne, who has never been to Central Asia, describes his history, geographical location and climate, and the customs of the indigenous peoples in a way that is close to reality. From the language of the protagonist, the work focuses on the image of Tashkent, Samarkand, Bukhara, describes Bukhara as "Rome of Turkestan", describes the historical monuments, streets and neighborhoods of Samarkand, gardens and people [2; 436]. The author's "Mysterious Island" (1941), "Children of Captain Grant" (1957), "Wonderful and strange adventures of Uncle Antifer" (1969), "20,000 kilometers under water" (1973). While hundreds of prophecies in adventures such as Conflicts between parents and children, kinship, friendships, surrogacy, drug addiction, the technocratization of the times, authoritarianism, deprivation of the past - mancortization. The confirmation of these prophecies in the XX century can be seen in ChingizAitmatov's novel "Day of the Century". Universal problems such as the suppression of human dignity and rights, the intensification of ideological struggles, the growing threat of war, the attempt of humanity to change the wheel of history, the weakening of human relations.

J. Orwell's novel "The Barn" and "1984" novels, which are the object of our research, are ideologically similar to the English dystopian novels of his time, V. Golding's "Lord of the Flies" and O. Huxley's "Brave New World". Especially in world literature. Russian scholars have carried out fundamental work on the study of the influence and poetics of J. Orwell's works "1984", "Cattle" on world literature.

J. Orwell was a unique talent and a multifaceted activity, he worked in several jobs simultaneously until mid-1945: as a literary critic, writer, poet, screenwriter, journalist, essnavis, VVS employee and reporter, I. Sylone, A. France, a skilled storyteller in radio games based on the works of H. Wells, GH He is a punctuation and punctuation commentator on the plays of Andersen and Shakespeare and O. Wilde, as well as a member of the leading poetic magazine *The Voice*, which consists of 6 parts.

Orwell's work had a very strong influence on the literature of the twentieth century. Although his work was banned in the former USSR for not conforming to Soviet ideology, it also had a major impact on Russian literature. The most influential writers of Western literature, who had a

significant impact on the work of M. Bulgakov, E. Zamyatin, A. Platonov, A. Akhmatova, who were persecuted by the Red Censorship, were J. Joyce, F. Kafka, T. Literary influence plays an important role in the work of word artists such as Mann M. Proust.

"I am convinced," wrote A. Coestler in an article published in The Observer on January 29, 1950, that future literary scholars see Orwell as the connecting link between Swift and Kafka. Life in the context of super-totalitarianism — Orwell's horror. Life itself is the horror of Kafka. So, perhaps (I hope), in the twentieth century, people read Kafka, and Orwell is left to literary critics. But today he is more important than Kafka. " Indeed, true writers have been with humanity for thousands of years because in their works there are more eternal problems than time, conflicts between the individual and society, human dignity and rights, the eternal paradox between right and wrong, oppression, betrayal and hypocrisy, faith. and the struggle between unbelief, goodness, and hatred is fully reflected in philosophy and wisdom in high art.

Half a century after the death of George Orwell's books, it took third place in world rankings: the Bible, Marx, Orwell's works. Orwell chief expert Victoria Chalikova said six months before her death: "Honestly, I wouldn't want us to understand Orwell to the end. This can only happen when society believes in alternative, an alternative to totalitarianism that society's ideological vanguard offers today, it is not humanistic, it does not give the common man what he wants ... "[3; 4]. It is difficult to fully comprehend the bitter truth of life hidden in the core of these words of a selfless scholar who has devoted his entire life to the study of the life and work of the writer, to the study of his works. The reason is that Orwell's work is brutal, a reflection of a totalitarian face that considers itself an absolute ruler, the most powerful of all, and can almost convince others of it as well.

This mirror reflects the truth, the most abominable, black deeds of tyranny, the masks are completely exposed. One can see the original image of the Red Empire, which deceived the peoples with the slogans of freedom, peace, equality, friendship, separated them from themselves, and enslaved the working people with endless sweet promises.

In the works of Orwell and M.M. Dost, the theme of war, the complications he left behind, and the losses he suffered as a result are widely covered. The fate of the heroes depends on the war or the policy of the Communist Party, which is the case in all their works. The incurable wound left in the human heart due to war, the suppression of human freedom by totalitarian ideology, the violation of human rights are manifested in a variety of situations. Wars are usually either for the homeland, or for the wealth, territory, wealth of other people. Orwell predicted the threat of war as early as 1931, and by 1936 he had predicted the inevitability of war. "It was a strange war. When the first bullets were heard in 1936, all the anti-fascists in Europe breathed hope. Finally, a country emerged that was at war with fascism. The Japanese ruled over Manchuria, Hitler wiped out his rivals in Germany, Mussolini bombed the Abyssinians ... But when the Franco coup against the moderate left government in Spain began, the world shook. Moreover, the war against Franco almost turned into a revolution. The people rose up both to be free from it and against the legitimate government capitalism that Franco defended. The world in Spain is not divided into two - into four. " [3; 4]. Political unrest led to the outbreak of war. As mentioned above, many countries of the world are on fire, the lives of nations have been disrupted, causing the deaths of so many innocent people, young people, minors. Orwell's predictions were confirmed in practice, but the writer resisted the war as much as possible, highlighting the

tragedies caused by the war in his works. These were the first moves on the eve of the start of the next World War II. The movement soon spread throughout the world.

World War II also brought together volunteers from all over the world: intellectuals, artists, philosophers. In the trenches of bloody battles, patriotic writers such as Exupery and M. Sholokhov fought side by side for the freedom of mankind. Among them was J. Orwell. He saw with his own eyes all the horrors of war, and bitterly cursed those who aspired to domination.

Any artist, first of all, is a child of his time. During Orwell's time, the British Empire was losing one of its colonies and losing its dominance in the world. The writer understood the situation in the country very well, and the reasons for this are unique. Firstly, his ancestors were Indian missionaries, secondly his profession was a journalist and finally the third writer was educated at the famous Ketono Science Furnace where he grew up with over 50 ministers. The national idea and mission needed to be reconsidered at a time when mistakes in Britain's foreign and domestic policies were leading to the country's loss of its former dominance in the world. These issues were discussed directly in journalism, and Orwell, Priestley, Auden, and McNeys led the debate. It is natural that this problem is indirectly reflected in the literature of that period. An artistic interpretation of the same problem can be seen in the works of Huxley, Green, Powell, Isherwood, Orwell, and Vo Lewis. In the USSR, when the Red Empire began to stand on its own two feet and began to exert its influence on the world, unrest reigned in Britain, Italy, and a number of other Western countries. Orwell's work has kept pace with the times, leading other writers to become more interested in his work. This reason has two bases, both negative and positive. On the downside, the working people in Europe believed in an equal and free life in the USSR, more precisely, they were convinced that Orwell's works seemed ideologically wrong to some artists of the same profession.

One of the problems facing fiction and the state was to reconstruct public consciousness, how to act in a dangerous situation, how to react to news. It is a historical fact that socialist ideas have influenced Western countries. Remember M. Bulgakov's "Seeds of Kasofat". As shown in The Barn, Orwell was able to see the truth as the animals outside the farm began to acknowledge the violence of life, and revealed to the world the mystery and details of those horrific crimes described in the story. This is the reason why his books have not been published for some time, even in England and America.

In the typology of English prose of the thirties there is an interrelationship between genres, an internal balance. Essays, travels, autobiographies, biographies, and inter-genre typologies of the novel typical of English literature have shown that genres develop under the influence of the general spiritual and intellectual climate of the period, a climate of traditional European liberalism in the 1930s closely related to the processes of deep thinking about the danger of the onset of totalitarianism. In English literature, classical genres gave way to new literary forms and ideas. At the same time, Uzbek literature, more precisely for 30 years, our national literature took a completely new path. Classical literary genres have been replaced by entirely different forms. The emergence of the dramatic genre, the reflection of the most important socio-political problems in the novel genre, instead of didactic, intimate, religious literature, modern literature developed rapidly, fiction was reformed in both form and content. The occurrence of this phenomenon, of course, has a certain internal and external basis. Based on the above, it can be concluded that the main reason for the change in form and content in English and Uzbek literature is related to the socio-political system, the dominant ideology.

It is acknowledged in world literature that Orwell's work has influenced many representatives of world literature, and the views, ideas, and imagery methods he has put forward have inspired writers of different nationalities. X. Norburn, U Lamberts, R. Bradbury, C. Vonnegut, T. (USA); Lynchon, I. Vough, K. Fitzgibbon, L. Hartley, K. Segal, E. Vergess, A. and T. Clarkov, in England, M. Kunder (Czech Republic, Slovakia, Poland) T. Konwicki (Hungary); The influence of J. Orwell is clearly felt in the works of D. Dalos, B. Pekic (Yugoslavia).

In addition, among the representatives of various spheres of cultural and social life (animators, film and television cinematographers, artists, musicians, historians, psychologists, political scientists, sociologists, cultural scientists) there is a lot of work dedicated to the works of J. Orwell. Also, the author's works have been studied by philosophers, literary critics, linguists, critics, writers, while translators have translated the author's works of various genres into 65 languages of the world. All this is the basis for determining the place of Orwell's work in world literature, proving once again that his works are widely popular.

While Orwell's works became popular in the West in the 1940s, in the former USSR, despite pressure and persecution, they began to spread secretly among the free-thinking intelligentsia only after the 1980s. In our country, only after independence, or more precisely in the 20s of the new century, the work of J. Orwell spread. Thanks to the hard work of translator Karim Bahriev, the author's novel "1984" and the story "Molkhona" were published in Uzbek for the first time in book form. For almost 80 years since the creation of these works, our nation has been unaware of these masterpieces of art related to its past and destiny. Repressed with accusations of being an enemy of the Soviet government, an opposition writer, and anti-party, these works synthesized sciences such as philosophy, ethics, aesthetics, religion, science, and politics that enhanced human intellectual and political potential. Oruel's works in the field of science play an important role in building a free civil society and educating the younger generation in the spirit of national ideology.

As we noted above in this chapter, when we observe similar (close or common) literary currents that are not genetically related, but similar in subject, idea, image, genre, metaphor, the multi-layered imagery characteristic of J. Orwell's complex style is also seen in Uzbek national literature.

For example, in OmonMukhtor's works such as "Man in the Mirror", "A Thousand and One Images", "Plato", "Fuu", "Ruin on the Hill" KhurshidDostmuhammad's novels Bazar and Donishmand Sisypus, short stories such as Nigoh, Panoh, Oromkursi, Chayongul, and the story of Jajman are mythological. and artistic synthesis in the context of metaphors. One of the main principles of the writer's work is the strengthening of the plot dynamics of the play's drama and the wrapping of its philosophical concept into symbolism, various myths in the synthesis of social allusions, and the problems of Islamic spirituality are expressed symbolically. This reminds us of the qualities characteristic of George Orwell's intricate style.

In UlugbekHamdam's novels "Balance", "Rebellion and Obedience", "Sabo and Samandar" divine truths, Islamic values are described in the context of social philosophical, moral content of the time and the bitter truths of the hero. In this sense, it can be observed that in the work of the writer there is an artistic synthesis of world literature. Wrapped in symbolism and metaphor, the writer's ruthless approach to aggression against human freedom is reminiscent of the spirit and style of J. Orwell's works, a rebellious spirit against injustice and injustice.

People's writer of Uzbekistan ErkinAzam's works such as "Mother's apple", "Father's birthday", "Poet's wedding", "Days other than holidays", "Guli-Guli", "Noise", "Country of applause and applause" Looking through the eyes of the protagonists, social satire predominates. E.Azam pays special attention to the diversity of characters and the image of the psyche, depicts the changing image of the period through the fate of socio-moral problems of the heroes, instills in their minds, actions, basic ideas of character and worldview. In short, the ironic attitude to the reality of E.Azam's work is extremely strong.

Another modern Uzbek writer, ShoyimButaev, described the tragedies of the time and personality, the atrocities of the atheist and dictatorial regimes, and the ideological pressures in his short stories "Garden in the Sunflower", "Old Carriage", "People from the Soviet Union", and "One Day Guest". describes the abominable consequences of the totalitarian regime that gave rise to the psychology of muteness in the minds of our people. From this point of view, the works of Sh. Butaev are close to the works of M. Bulgakov, J. Orwell.

The story of the "Gift of Gift" takes place in the place where he was born and grew up, as in other works of the writer [4; 8-21]. A film based on this story was made and it is still one of the favorite films of our people. There is definitely a slight difference between the story in the story and the film script.

The end of MM Dost's novel "Lolazor" is a serious event in the new Uzbek literature, which is an important stage in the development of our national novel. This work has proved the limitless possibilities of the novel's thinking - the diversity of images and interpretations, the approach to man, the ways of its artistic rediscovery, "- said the literary critic RahmonKochkor in his concluding remarks [5; 559].

It can be said that while J. Orwell is the link that connects J. Swift and Kafka, the work of M. M. Dost is the bridge that connects the pre-independence and post-independence periods. Like the English writer, he reveals the realities of the time, the essence of the socio-political system, the evil purpose of totalitarian ideology, and the complications of the people's psyche left by the dictatorship through irony and metaphor. Where the divine criteria are violated, everything is derailed, the human psyche is tarnished, man is in decline, the state is in crisis.

REFERENCES

1. Dima A. Principles of comparative literature. - M.: Progress, 1977. -121.
2. National encyclopedia of Uzbekistan. T.: ME Publishing House of Uzbekistan, 434-p.
3. VyacheslavNedoshivin. RossiyskayaGazeta - Federal, 2013.№ 135 (6111)
4. M.M.Do'st. Sovchilikhangomasi // Youth magazine, 1984. Issue 12. 18-21-b.
5. Ram R. An anecdote left by Alexander the Great. / M.M.Do'st. Lolazor.T.: Sharq, 1998. 559-p.



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WORK FROM HOME WORK CULTURE: A NEW NORMAL AND ALTERNATIVE TO TRADITIONAL WORK CULTURE

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ABSTRACT

Global pandemic COVID-19 has left many workers being unable to travel to work in order to limit the transmission of the virus. In fast-paced urban areas, both companies and workers are looking for alternate work options. Most, if not all, employees were forced to operate from home due to the epidemic. As a result, Work from home(WFH) has become a strategic concern for most firms. Companies and employees should be considered WFH while formulating plans. Even though working from home is now available, the current situation provides a unique look at how well the arrangement works. This information might be useful for future legislation that alters the present arrangement of working hours. Examining the problems that businesses and employees in India face requires the use of a SWOT analysis and an exploratory approach. Determining if this employment arrangement is temporary or permanent will also be considered.

KEYWORDS: Covid-19, Pandemic, Work from Home, Work Arrangement, Work Culture

INTRODUCTION

In the wake of the COVID-19 epidemic, people have had to rethink a variety of behaviors, from trade to pleasure to basic travel and daily activities. In terms of economics, this has affected not only people but also entire countries, halting a wide range of economic activities. Despite numerous predictions and warnings, including those from public health specialists, the situation remained a significant change that required planning, training, and facilitation on the part of all

involved. Despite this, the breadth and solution remained unfathomable and a massive undertaking. COVID-19 began to circulate among people in December of 2019. Due to the fact that respiratory droplets are the primary mode of infection, it is presently believed that this virus is disseminated through direct contact with other persons. Masks, social distance, and good hand washing are now the only measures available to combat viral transmission. (Centre for Health Protection [CHP] 2020a). At the end of January 2020, “the WHO designated COVID-19 an international public health emergency (World Health Organisation 2020). Since then, the virus has swiftly spread throughout the country”.

Too far, more than 60 million verified cases and more than one million confirmed fatalities have been documented (World Health Organisation 2020). Several governments have imposed and reinstituted strict lockdowns in response to the COVID-19 epidemic, including the closure of non-essential businesses and the restriction of non-essential gatherings. Numerous countries urge their citizens to stay home whenever feasible in order to avoid face-to-face contact with one another.

There were a lot of questions and misunderstandings about how to balance work and life before the epidemic. In response to COVID-19, a large number of firms have opted to experiment with WFH. As of the end of May 2020, 35.2 percent of the U.S. workforce will be working from home, up from 8.2 percent in May 2018. According to WFH, 71.7% of the employees it assessed could do their duties effectively (Bick, Blandin, and Mertens 2020). To limit the spread of WFH, certain governments have set restrictions for government workers, while private firms have received warning notifications.

Before the pandemic, many people wanted to go for WFH, but it was considered unfeasible in India's heavily populated cities. Compact dwellings might be a problem for home workers who need a quiet, dedicated space to accomplish their jobs. Each individual in metro areas has an average living space of about 161 square feet, which is around 25 percent less than Tokyo and 60 percent less than Singapore (Ng 2018). Years have passed since city workers began to believe that they are required to be physically present at work in order to accomplish their responsibilities properly. In response to the epidemic, many WFH employees are now working remotely, and it's doing well. In a city with such a high population density, the possibility that WFH may serve as one of many future models is of great relevance. In this first-of-its-kind study, three criteria will be evaluated. For starters, WFH will be better understood via this study.

COVID-19 pandemic and work from home

To deal with and defend themselves against the COVID-19 epidemic, several places have adopted diverse methods, and India is no exception. COVID-19 was first detected in India on 27 January 2020. India has been infected multiple times so far. Current circumstances are causing a second wave. While its neighbors have dealt with the outbreak differently, India has not. It has also instituted restrictions on public gatherings, closed schools, and unique work arrangements that include WFH and remote working for urban employees in addition to the lockdown. In the beginning, India appeared to have been able to limit the disease's transmission and keep infection rates low. Rural residents were largely healthy until the second wave of illnesses. Eventually, after a high rate of infection, educational institutions reopened and social distance was relaxed. When it comes to controlling the spread of COVID-19, India was lauded as a success story. Some have credited the government's fast response to the COVID-19 situation. After a few

months, again widespread of COVID-19 bring the second wave in India which force several states to the government to force strict implementation of COVID-19 guidelines and restrictions. As a result of government rules, such as the suspension of dine-in dining services, there was a great deal of debate, especially among those who could not attend WFH owing to the nature of their employment, who complained about the inconvenience and lack of places to eat. Just one day after the new regulation went into effect, the government decided to restore daytime dine-in services. Towards the end of July, certain anti-epidemic efforts were relaxed, including a major vaccination push.

When asked about the worldwide employment trend for 2018, 85% of employees in large cities reported that they were expected to work within traditional office hours, with no flexible working choices given (Randstad Hong Kong, n.d.). Before the pandemic, WFH was only available to a small number of people. In a paper issued in the early 2000s, the government predicted that Indians would not readily embrace teleworking in the short to medium term (Planning Department 2002). Coronavirus has impacted the lives of many people. Publicly funded university staff and civil servants (excluding those providing emergency and critical public services) were the first employees in India to be authorized to engage in the WFH program as a tactic to assist in minimising viral transmission in the country. There were a few private companies that allowed their employees to join in the WFH mode.

After the epidemic, companies may want to pay more attention to the working alternative they choose. WFH looks to be the internet platform of choice for several different multinational corporations. In India, a second wave of the epidemic prompted a separate study, which revealed that most employees surveyed had experienced WFH for at least one day each week and that they anticipated continuing to endure WFH for at least one or two days per week following the pandemic. When working in a large metropolis, it is possible for a substantial part of the population to do so, which has led to renewed discussion over the feasibility of such work practices. Work-life balance (WLB) has been questioned by some, while others have argued that WFH not only improves employee productivity but also gives greater flexibility in working arrangements. Indians are assimilating WFH, which was launched in reaction to the epidemic, with ease, because of the high level of technological sophistication they enjoy.

Work from home: an overview

COVID-19 infection can be minimized by using WFH, a COVID-19 infection prevention option. Many schools of thought have been made aware of WFH for many years, but it's not a new concept by any means. Nilles (1988) first suggested the notion of WFH in 1973, calling it "telecommuting" or "telework". A variety of names have been used to describe WFH over the past four decades, including remote work and flexible workplaces. Employers who can work in flexible environments, especially from home, by utilizing technology to perform job tasks, are considered flexible workers. Gajendran and Harrison (2007) In particular, noted that telecommuting involves performing activities outside of the employee's primary or core offices for at least a portion of their workday utilizing electronic media to connect with people inside and outside the business.

The COVID-19 pandemic may affect 37 percent of U.S. occupations, including economic activity, corporate management, and professional and scientific services, according to recent research by Dingel & Neiman (2020). There are certain jobs that cannot be performed at home.

These include those in the health care, agricultural, and hospitality industries. Whilst WFH is gaining in popularity across the world, experts have segregated it into its advantages and disadvantages

Both employers and employees benefit from WFH. A few examples of the benefits include decreased time spent traveling, avoidance of office politics, and the use of less office area. Other benefits include greater enthusiasm, greater gender diversity (women and careers), and healthy workforces with lower absenteeism and turnover numbers. Caulfield (2015) Employees discovered ways to save commute time and the value of travel time. Research has shown that telework may reduce turnover while boosting employee productivity, workplace participation, and employee commitment, among other things. The same is true for e-working. It may increase productivity, adaptability, professional advancement, and work-life balance, as well as cut travel time. As a further benefit, Purwanto et al. (2020) claimed that WFH may give employees more flexibility in their work schedules and allow them to save money on their commutes to and from work.

While WFH does have its advantages, it also has its downsides. According to Purwanto et al. (2020), there are certain downsides to working from home, such as the fact that employees are responsible for their energy and internet bills. In their study, Collins and Moschler (2009) found that working from home separated workers from their peers and that managers were worried about productivity losses. Deterioration of colleague relationships might also result (Gajendran and Harrison 2007). As a result of the blurring lines between work and family life (Baruch 2000; Kazekami 2020), employees may become overworked (Grant et al. 2019). In a similar vein, Eddleston and Mulki (2017) found that WFH is related to remote employees' difficulty to disconnect from work.

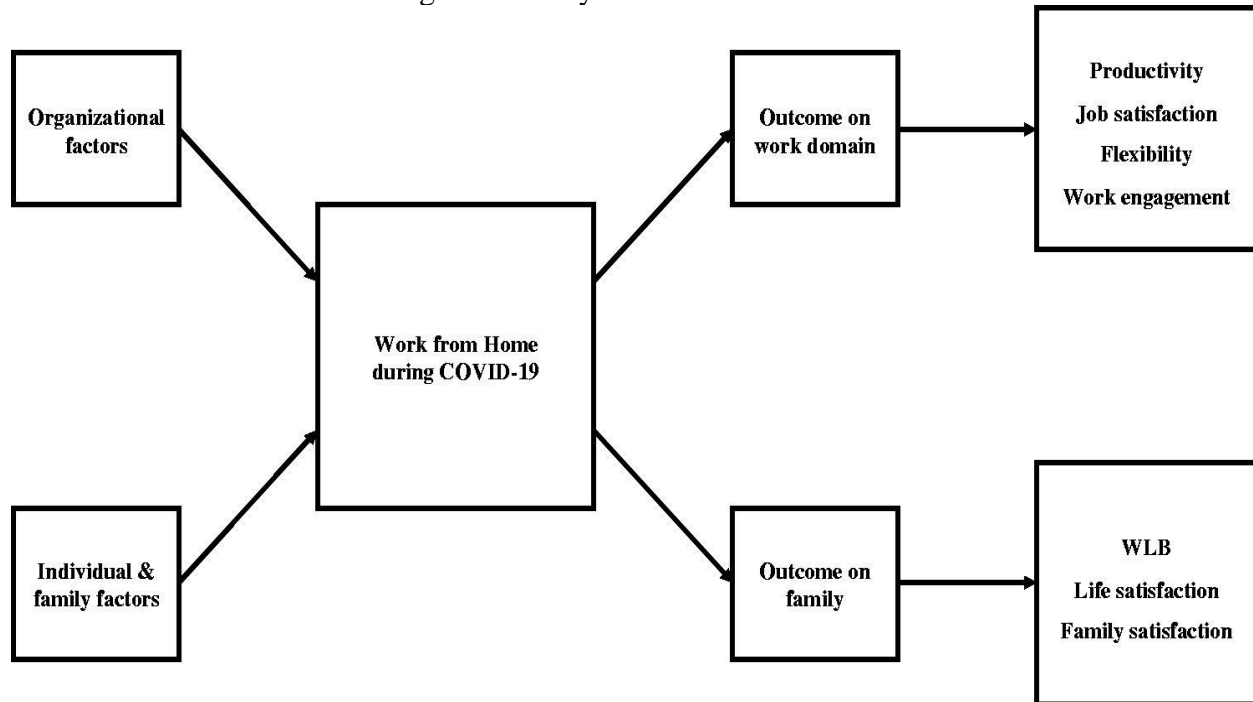
Working from home has been found to increase WLB. E-working would enhance WLB, and e-workers found it easy to merge work and non-work lives. E-workers found that e-working increased their productivity. Working from home increases workplace satisfaction. A favorable relationship exists between WFH and the contentment with one's family life.

Most countries have made WFH a policy priority in order to combat the epidemic. Employers and employees will both be influenced by these rules in some manner.

Work from home: a framework of investigation

Based on current research on WFH, telecommute, e-working, and flexible workplace practices (including remote work), the current study's program has been proposed. As soon as the COVID-19 pandemic breaks out, the WFH study will be led by a framework that evaluates whether or not the WFH setup will be temporary or permanent. According to the suggested paradigm, WFH is influenced by two factors: organizational and personal. To find out how these characteristics impacted WFH, the authors set out to investigate. As illustrated in Figure 1, the next section provides detailed explanations of the framework's parts.

Figure 1. Analytical Framework



As a result of working from home, workers must consider two primary considerations. Employees' work would first be affected by "organizational variables." The importance of organizational variables in WFH setups has been explored in many studies (e.g. Baker, Avery, and Crawford 2007; Grant et al. 2019). Employees' desires to work from home are only a few examples. There is also assistance for staff well-being and IT from the corporation, among other things (Baker, Avery, and Crawford 2007). Other organizational characteristics include the level of trust inside the organization and the level of trust held by management. WFH is associated with organizational trust and management trust, as established in prior studies. A culture of trust in an organization—trust among colleagues and managers—is required for teleworking or electronic working, according to Baruch's study from 2000 and Grant's study from 2019 as well as Baker, Avery, and Crawford's study from 2007. WFH and these variables are tightly linked, according to prior research.

SWOT analysis

Considering the availability of technology, India has the potential to make WFH considerably more prevalent. It is regarded to be one of the most technologically sophisticated cities, with 92 percent of its people using the internet (The World Bank Group 2020). Most urban residents already have the requisite technology, i.e. a stable internet connection, to participate in WFH. The majority of people, on the other hand, appear to have a hard time carving out a distinct workstation in their modest houses. Given that Hong Kong has just recently adopted WFH, it is important to evaluate the potential and drawbacks of WFH through the use of an analytical framework such as a SWOT analysis. WFH's strengths, limitations, opportunities, and dangers were analyzed, and the results are given in a self-explanatory report.

Figure 2.

SWOT analysis of the situation of Hong Kong		
	Work-from-Office	Work-from-Home
STRENGTHS	Networking opportunities/face-to-face interaction Opportunities for collaboration Prevent miscommunication/effective supervision Separation of work and personal life Greater sense of belonging Better onboarding for new employees A focused environment Greater access to technology No risk of information leaks	Flexible arrangement No office distractions (e.g. no office noise) Autonomy/freedom Cozy/Familiar environment (reduced stressed) Time saving / No commuting Money saving (e.g. spend less on renting office spaces) Work-life balance Reduce absenteeism
WEAKNESSES	Lack of flexibility Sedentary lifestyle Workplace conflict (e.g. office politics) Noisy workplace (e.g. loud conversations) Time wasted in unnecessary meetings Irrelevant side conversations Commuting expenses Higher operating costs (e.g. utility bills)	Distractions (e.g. family members, household duties) Uncomfortable environment (e.g. living in a small space) Lack of supervision Communication barriers Missing social interactions/loneliness Lack of hardware support Blurred lines between work and personal life Unhealthy lifestyle (e.g. lying on the sofa all day) Not favored by all employees Injustice
OPPORTUNITIES	Maintain a professional appearance (e.g. build lasting relationships with clients)	Hybrid models New talents from around the world
THREATS	Less workforce diversity (e.g. married women, & elderly) Traffic-related air pollution	Cybersecurity (e.g. data theft) Privacy (e.g. loss of corporate/employee/customer data) No WFH policies and regulations Extra expenses associated with home work High competition (e.g. job may be outsourced to cheap overseas labour)

DISCUSSION

People all around the world, especially in metropolitan areas where dual-family workers are on the rise, now have the opportunity to experience WFH with COVID-19. Having to take care of elderly parents and/or small children in addition to working in a difficult workplace has put the WLB of the workforce under scrutiny. WFH appears to have been well received by companies and employees in India, according to preliminary studies. A further study reveals that the present WFH framework is riddled with holes. As a result, there is more discontent with the absence of regulations for doing successful home working.

WFH must take into account the opinions of the people it serves in addition to the efficiency of its operations. Early on, an overwhelming majority of comments were favorable. More than 80 percent of workers, according to a survey done in April 2020, said they desired at least partial WFH measures to be in place, with percentages ranging as to how many days of the week that should be. Seventy-two percent of respondents strongly agreed that they had more time to rest, and sixty-eight percent strongly agreed that work-related stress had lessened (60.7 percent

strongly agree). In addition, 45 percent of respondents said that companies give enough assistance for implementing a WFH plan (Wong and Cheung 2020). This was the most common opinion, but not the majority, indicating that there was still space for improvement, even in the early days. In the same research, the majority of respondents agreed with all of the problems mentioned, including a lack of equipment, family disturbance, and poor communication with coworkers. In another research, almost 80 percent of workers reported feeling psychologically calm while working from home. 73 percent of workers favor and support WFH initiatives, while 83 percent support flextime, and 77 percent approve shortened working hours (Sun Life 2020).

Even while employees in Hong Kong first appeared to be in favor of WFH practices, it is obvious that several difficulties must be solved. Dissatisfaction with the core resources, such as restricted or no access to resources such as office papers, is highlighted in research (FastLane 2020). Considering that this is a novel work practice, both employers and employees are likely to be unprepared for this circumstance. A lack of flexibility and tolerance by companies has resulted from employees producing irregular or delayed work. The fact that just 32 percent of businesses have invested in new kinds of communication technology, and even fewer have done so in other areas, suggests that employers have been making some attempts (FastLane 2020). The peculiar working environment in Hong Kong, according to another study, makes WFH less advantageous for workers, who lack the separation between personal and professional areas. In addition to living in multigenerational households, people in this region have less space than their western counterparts, which leads to multiple distractions and an imbalance between work and home life, according to the poll. According to the same poll, 68 percent of workers said they missed going to work, as well as the personal connection, professional atmosphere, and face-to-face interaction for better cooperation (JLL 2020).

CONCLUSION

Many studies have shown that the WFH, which was formerly greatly sought, is not the best choice for most workers. WFH remains popular, although not in its present form. To regulate and make WFH possible, there need to be stronger government regulations and laws in place. In terms of policy, planning and execution are needed in order to successfully adapt to online work performed from a distance. The judgment did not specify how to end meetings and resume work in person. Because workers don't know what WFH is, they don't have access to software, formal papers, or appropriate workspace. Unless this technique becomes the new standard, it must be properly trained. After the epidemic, when WFH is no longer a mandate, but a flexible choice, the working balance may become apparent

REFERENCES

- Arntz, M., B. Y. Sarra, and F. Berlingieri. 2019. "Working from Home: Heterogeneous Effects on Hours Worked and Wages." ZEW-Centre for European Economic Research Discussion Paper No. Mannheim, Germany, 19-015. Retrieved from 10.2139/ssrn.3383408.
- Bae, K. B., and D. Kim. 2016. "The Impact of Decoupling of Telework on Job Satisfaction in U.S. federal Agencies: does Gender Matter?" *The American Review of Public Administration* 46 (3): 356–371. doi:10.1177/0275074016637183.

- Baker, E., G. C. Avery, and J. Crawford. 2007. "Satisfaction and Perceived Productivity When Professionals Work from Home." *Research & Practice in Human Resource Management* 15 (1): 37–62.
- Baruch, Y. (2000). Teleworking: benefits and pitfalls as perceived by professionals and managers. *New Technology, Work and Employment*, 15(1), 34–49. doi:10.1111/1468-005x.00063
- Bick, A., A. Blandin, and K. Mertens. 2020. "Work from Home After the COVID-19 Outbreak." CEPR Discussion Paper No. DP15000.
- Bloom, N., J. Liang, J. Roberts, and Z. J. Ying. 2015. "Does Working from Home Work? Evidence from a Chinese Experiment." *The Quarterly Journal of Economics* 130 (1): 165–218. doi:10.1093/qje/qju032.
- Bray, C. 2020. "HSBC to Let Hong Kong Employees Work Up to Four Days a Week at Home." *South China Morning Post*, November 18.
- Caulfield, B. 2015. "Does It Pay to Work from Home? Examining the Factors Influencing Working from Home in the Greater Dublin Area." *Case Studies on Transport Policy* 3 (2): 206–214. doi:10.1016/j.cstp.2015.04.004.
- Centre for Health Protection. 2020a. Frequently asked questions on coronavirus disease 2019 (COVID-19).
- Choy, G. 2020. "Coronavirus: Hong Kong's Workers Have Lunch in Parks, Construction Sites, as Dine-In Ban Kicks in Amid Third Wave." Accessed 29 July.
- Collins, J. H., and J. J. Moschler. 2009. "The Benefits and Limitations of Telecommuting." *Defense AR Journal* 16 (1): 55–66.
- Delanoeije, J., and M. Verbruggen. 2020. "Between-Person and Within-Person Effects of Telework: A Quasi-Field Experiment." *European Journal of Work and Organizational Psychology* 29 (6): 795–808.
- Dingel, J. I., and B. Neiman. 2020. "How Many Jobs Can Be Done at Home?" *Journal of Public Economics* 189: 104235. doi:10.1016/j.jpubeco.2020.104235.
- Dizaho, E. K., Salleh, R. and Abdullah, A. 2017. "Achieving Work-Life Balance Through Flexible Work Schedules and Arrangements." *Global Business & Management Research* 9 (1s): 455–465.
- Dutcher, E. G. 2012. "The Effects of Telecommuting on Productivity: An Experimental Examination. The Role of Dull and Creative Tasks." *Journal of Economic Behavior & Organization* 84 (1): 355–363. doi:10.1016/j.jebo.2012.04.009.
- Eddleston, K. A., and J. Mulki. 2017. "Toward Understanding Remote Workers' Management of Work-Family Boundaries: The Complexity of Workplace Embeddedness." *Group & Organization Management* 42 (3): 346–387. doi:10.1177/1059601115619548.
- Gorlick, A. 2020. "The Productivity Pitfalls of Working from Home in the Age of COVID-19." *Stanford News*. Accessed 17 June 2020.

Grant, C., Wallace, L., & Spurgeon, P. (2013). An exploration of the psychological factors affecting remote worker's job effectiveness, well-being and work-life balance. *Employee Relations*, 35, 527–546. doi:10.1108/ER-08-2012-0059

Grant, C. A., L. M. Wallace, P. C. Spurgeon, C. Tramontano, and M. Charalampous. 2019. "Construction and Initial Validation of the e-Work Life Scale to Measure Remote e-Working." *Employee Relations* 41 (1): 16–33. doi:10.1108/ER-09-2017-0229

Gregory, A., and S. Milner. 2009. "Editorial: Work-Life Balance: A Matter of Choice?" *Gender, Work & Organization* 16 (1): 1–13. <http://usir.salford.ac.uk/id/eprint/1737/>. doi:10.1111/j.1468-0432.2008.00429.x. [Crossref], [Web of Science ®], [Google Scholar]

Kalliath, T., and P. Brough. 2008. "Work-Life Balance: A Review of the Meaning of the Balance Construct." *Journal of Management & Organization* 14 (3): 323–327. doi:10.5172/jmo.837.14.3.323.

Kazekami, S. 2020. "Mechanisms to Improve Labor Productivity by Performing Telework." *Telecommunications Policy* 44 (2): 101868. doi:10.1016/j.telpol.2019.101868.

Mello, J. A. 2007. "Managing Telework Programs Effectively." *Employee Responsibilities and Rights Journal* 19 (4): 247–261. doi:10.1007/s10672-007-9051-1.

Messenger, J. C., and L. Gschwind. 2016. "Three Generations of Telework: New ICTs and the (r)Evolution from Home Office to Virtual Office." *New Technology, Work and Employment* 31 (3): 195–208. doi:10.1111/ntwe.12073

Nilles, J. M. 1988. "Traffic Reduction by Telecommuting: A Status Review and Selected Bibliography." *Transportation Research Part A: General* 22 (4): 301–317. doi:10.1016/0191-2607(88)90008-8.

Noda, H. 2020. "Work-Life Balance and Life Satisfaction in OECD Countries: A Cross-Sectional Analysis." *Journal of Happiness Studies* 21 (4): 1325–1348. doi:10.1007/s10902-019-00131-9.

Purwanto, A., M. Asbari, M. Fahlevi, A. Mufid, E. Agistiawati, Y. Cahyono, and P. Suryani. 2020. "Impact of Work from Home (WFH) on Indonesian Teachers' Performance during the COVID-19 Pandemic: An Exploratory Study." *International Journal of Advanced Science and Technology* 29 (5): 6235–6244.

Robertson, M. M., W. S. Maynard, and J. R. McDevitt. 2003. "Telecommuting: Managing the Safety of Workers in Home Office Environments." *Professional Safety* 48 (4): 30–36.

Sardeshmukh, S. R., D. Sharma, and T. D. Golden. 2012. "Impact of Telework on Exhaustion and Job Engagement: A Job Demands and Job Resources Model." *New Technology, Work and Employment* 27 (3): 193–207. doi:10.1111/j.1468-005X.2012.00284.x.

Shaw, S. M., J. Andrey, and L. C. Johnson. 2003. "The Struggle for Life Balance: Work, Family, and Leisure in the Lives of Women Teleworkers." *World Leisure Journal* 45 (4): 15–29. doi:10.1080/04419057.2003.9674333

Ting, V., E. Cheung, and L. Cheng. 2020. "Hong Kong Third Wave: Government Tightens Preventive Measures as Number of Covid-19 Cases Hits Record High of 113."

Varick, M., N. DaSilva, and K. Arrington. 2010. "Moderators of the Curvilinear Relation between Extent of Telecommuting and Job and Life Satisfaction: The Role of Performance Outcome Orientation and Worker Type." *Human Relations* 63 (1): 137–154. doi:10.1177/0018726709349198.

Wong, H. K. A., and J. Cheung. 2020. "Survey Findings on Working from Home Under COVID19." Lingnan University.

World Health Organization 2020. "Coronavirus Disease (COVID-19) Situation Report – 202." Accessed 9 Aug 2020. https://www.who.int/docs/default-source/coronaviruse/situation-reports/2,02,00,809-covid-19-sitrep-202.pdf?sfvrsn=2c7459f6_2 [Google Scholar].



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APPLICATION OF OPTICAL FIBER IN MAGNETIC RESONANCE

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ABSTRACT

Due to a rising need for applications in medicine, Magnetic Resonance (MR)—compatible sensors based on various methods have been developed during the past several decades. There are a number of technical options for creating MR-compatible sensors, but the one based on optical fibers has a number of advantages. The high elasticity and small size allow miniaturized fiber optic sensors (FOS) to be designed with metrological characteristics (e.g., accuracy, sensitivity, zero drift, and frequency response) suitable for most common medical applications; the immunity to electromagnetic interference and the lack of an electrical connection to the patient make FOS suitable for use in high electromagnetic fields. These two characteristics increased the potential function of FOS in medicine, making them particularly appealing for use in MRI. This article gives an overview of MR-compatible FOS, with an emphasis on the sensors used in medicine to measure physical characteristics (i.e., temperature, force, torque, strain, and position). The operating principles of the most promising FOS are examined in terms of their respective benefits and drawbacks, as well as their medical applications.

KEYWORDS: *Fiber Optic Sensors, Fiber Bragg Grating MR-Compatibility, MRI Interferometry, Sensor.*

1. INTRODUCTION

Magnetic resonance imaging (MRI) is a radiological imaging method that creates images of the body's architecture and physiological processes. Strong magnetic fields, magnetic field gradients, and radio waves are used in MRI scanners to create pictures of the body's organs. MRI scans do not utilize X-rays or ionizing radiation, which sets them apart from CT and PET scans. MRI is a kind of nuclear magnetic resonance (NMR) imaging technique that may also be utilized in other NMR applications, such as NMR spectroscopy. For medical diagnosis, staging, and follow-up of illness, MRI is extensively utilized in hospitals and clinics[1]. MRI pictures of soft-tissues, such as the brain or belly, have greater contrast than CT images. However, since the measures are typically longer and noisier with the subject in a long, restricting tube, it may be regarded as less pleasant by patients. Implants and other non-removable metal in the body may also represent a danger, preventing certain individuals from successfully having an MRI scan[2].

Historically, the earliest use of optical fibers in medicine was for the lighting of interior organs during endoscopic operations. Over time, the same technology has been used to accomplish various activities, including laser treatments and the development of transducers for monitoring parameters of interest for both therapeutic and diagnostic reasons. Despite the fact that Fiber Optic Sensors (FOS) have been around for forty years and have certain benefits over other established technologies, their market has only expanded significantly in the past decade, owing to improvements in essential optical components and lower prices[1]. FOS is now used to monitor a variety of chemical and physical characteristics of medical relevance. Intrinsic sensors, in which the optical fiber acts as a medium for conveying light whose characteristics (e.g. intensity, frequency, phase) are modulated by the measurand extrinsic sensors, in which the optical fiber acts as a medium for conveying light whose characteristics (e.g., intensity, frequency, phase) are modulated by the measurand [3]. The fundamental components of FOS (e.g., light source, photo detector) may be deployed distant from the sensing element in this second class of sensors, allowing for the development of compact sensors and hybrid systems. FOS is attractive for a variety of applications that take place inside or near the magnetic resonance scanner, in addition to the well-established applications in industrial and medical fields. Immunity from electromagnetic interferences, combined with good metrological characteristics and small size, make FOS attractive for a variety of applications that take place inside or near the magnetic resonance scanner[2].

Magnetic Resonance Imaging (MRI) has grown in significance in clinical imaging since its debut in the early 1970s, exceeding even the most hopeful expectations of researchers. The increasing number of exams based on this method, as well as the introduction of novel procedures in clinical practice that are conducted under MRI supervision, has prompted research into new sensors that may be used in this situation. FOS is one of the MR-compatible applications that may be used to enhance surgical operation results as well as patient monitoring. The temperature of patients undergoing MRI-guided hyperthermia treatments, the evaluation of deflection and force on needles during MRI-guided operations and the estimate of physiological parameters (e.g., heart rate and breathing monitoring) are all examples of those uses. There are many applications for such sensors in research procedures. The ASTM standard F2503 addresses MR safety issues including the usage of equipment in the MR environment. There are three categories in the standard: "MR safe," "MR conditional," and "MR unsafe." "MR-safe" refers to an item that poses no known hazards in all MR environments; "MR-conditional" refers to an

item that has been shown to pose no known hazards in a specific MR environment under specific use conditions; and “MR-unsafe” refers to an item that poses known hazards in all MR environments. Despite the fact that the ASTM F04.15.11 MR Standards subcommittee agreed to drop the phrase “MR compatible,” it is still widely used in medical and technical practice. It is critical to distinguish between the phrases “MR-safety” and “MR-compatibility”[3]. MR compatible means that a gadget is “MR safe” when used in an MR environment and has been tested. It has not been shown to have a major impact on the quality of diagnostic information, nor has it been shown to have a substantial impact on the quality of diagnostic information. The MR device has an impact on operations.

Fiber optic technology is especially well suited to developing “MR-compatible” sensors in this light. Because of its tolerance to electromagnetic forces, it can: (1) be safe; (2) not degrade picture quality. (3) Ensuring that the sensors' functionality is not harmed. Furthermore, the material that was utilized to construct the. Magnetic fields within the MR-scanner are not perturbed by optical fibers, which is a critical element for the scanner's performance. The preservation of diagnostic information's quality. This article gives an overview of “MR-compatible” FOS, with a particular emphasis on sensors. Used to measure temperature, force, torque, strain, and position throughout a variety of medical procedures procedures[4]. Throughout the article, we provide a critical assessment of the most promising and widely used technologies. techniques. We divided them into three categories for clarity's sake: I Fiber-based FOS Bragg on grating technology; (ii) FOS based on intensity; (iii) FOS based on interferometric methods. Moreover, the fundamentals of measurement, potential medical uses, and benefits and disadvantages of each technique are discussed.

1.1 Working Principle:

Temperature and strain may be sensed using MR-compatible sensors based on fiber Bragg grating (FBG) technology, which have been developed in a variety of configurations. Hill et al. utilized electromagnetic waves to locally alter the refractive index of the optical fiber core, which led to the development of the FBG in the area of thermal and mechanical measurements. Meltz et alwork, [5]. published 10 years later, aided the spread of FBGs by describing a more successful, holographic method for grating creation. FBGs have been used in a variety of areas, including telecommunications and the design of FOS, because to the features of photosensitivity technology and its natural compatibility with optical fibers. Despite the FBG sensors' many advantages, their widespread use was hampered by their high cost and production challenges, which were finally solved in the 1990s. Several research groups have developed sensors based on FBG in the past decade. Different studies provide detailed descriptions of the properties of these sensors, their manufacturing method, and their medical uses[6]. The working concept of an FBG is based on radiation reflection produced by the Bragg grating: when a fiber optic containing an FBG is probed with polychromatic radiation, the FBG only reflects a limited range of wavelengths. As a function of the effective refraction index of the core (n_{eff}) and the spatial period of the grating, the center wavelength of such a range, termed Bragg wavelength, may be written as follows: Temperature and strain affect n_{eff} , allowing sensors to be designed to detect temperature and strain, as well as other physical characteristics linked to them (e.g., pressure, force, vibrations, and flow).

For FBG-based transducers, certain solutions may be used to make them selectively responsive to strain or temperature. A reference FBG is usually added to the primary sensor to reduce the

impact of unwanted effects and improve the measuring system's repeatability. Sensors with excellent metrological properties, such as good precision, wide bandwidth, big dynamic range, and high strain and temperature sensitivity (typical values range from 0.64 pm/ to 1.2 pm/°C, and 6.8 pm/°C to 13 pm/°C, respectively) may be developed using FBG technology. Furthermore, since several gratings with different Bragg wavelengths may be written on a single fiber, this technique allows for multiplexing. On the other hand, in order to prevent a reduction in performance (e.g., resolution and accuracy), the measurement chain should use a costly equipment to identify the wavelength of reflected light (i.e., an optical spectrum analyzer). Finally, interferometric methods such as the Sagnac, Fabry-Perot, and Michelson interferometers may be used to implement Fiber Optical Fiber (FOS). Both intrinsic and extrinsic FOS may be developed using these methods. In the first instance, the fiber serves as a conduit for radiation that is modulated by a detecting device at the fiber's tip. In the second, the fiber itself acts as a sensor element, causing interferences that are modified by the measurand. Fabry-Perot interferometry is the most frequent interferometric configuration used to create FOS. Its sensing method is based on two semi-reflective mirrors that partly transmit and partially reflect the light that travels through the fiber.

Electromagnetic waves interact constructively and destructively with themselves and generate fringes as a result of numerous reflections. The optical path, which is linked to the distance between the mirrors, determines the intensity of these fringes. As a result, these FOS may be utilized as supplementary elements to measure the factors that affect the distance between the two mirrors.

1.2 Medical Applications

Biocompatibility, broad bandwidth, and compact size are the key features that make FBG technology especially suited for medical applications. Furthermore, fiber optics' resilience to electromagnetic fields and low interference with the electromagnetic fields utilized in MRI make this technology appealing for creating "MR-compatible" sensors. Some research groups have suggested FBG-based sensors for monitoring temperature in MRI, which is critical for a variety of applications: for example, Rao and colleagues created a cardiac output estimate measurement chain with a resolution of 0.2 °C and an accuracy of 0.8 °C. During MRI-guided hyperthermia treatments, this technique is also used to monitor tissue temperature. Temperature does play an important role during hyperthermia, and monitoring it may aid the physician in adjusting the heat exposure. The metrological performance of widely used temperature sensors, on the other hand, is influenced by the electromagnetic fields employed during the process to produce hyperthermia. To address this issue, Webb and colleagues developed a five-FBG measuring system that enables them to take temperature readings during hyperthermia therapy of the kidney and liver in live rabbits.

Other researchers investigated the possibility of employing FBGs to monitor temperature in hyperthermic swine pancreatic tissue. In a subsequent study, the same authors measured tissue temperature using 12 small size FBGs (1 mm length) in an attempt to improve spatial resolution, and used an ad hoc designed MR-compatible polymethylmethacrylate (PMMA) mask to precisely arrange the optical applicator and the FBGs inside the tissue. This technique has also been utilized to monitor temperature during prostate cryosurgery and liver cryosurgery, where the MRI compatibility was tested experimentally. The monitoring of strain and other associated parameters is the second use of FBGs in MRI. Several research has focused on using FBG

sensors to measure ventilatory movement and respiratory rate during the past decade. Witt and Colleagues suggested a system with various FOS and an FBG-based sensor to detect thorax circumference changes for monitoring respiratory motions. De Jonckheere and colleagues developed two MR-compatible sensors for capturing thoracic and abdominal motions in sedated patients during MRI examinations for a similar purpose. Because of their great sensitivity to strain, they used an FBG-based sensor implanted in an elastic bandage to monitor thoracic motions. Grillet et al. developed three sensors for respiratory monitoring in an MRI setting, one of which is based on FBG. Silva et al., who used FBG sensors to monitor both respiratory and heart rate. who evaluated the feasibility of employing FBG sensors for respiratory monitoring and cardiac activity within a 1.5 T MRI scanner, used a similar method[7]. Large amounts of study have recently been dedicated to the use of FBG sensors in minimally invasive surgery. The FBG sensors are helpful in this situation to give feedback on the force exerted to the patient's tissue in order to prevent injuring tissues during the application of surgical knots.

With a resolution of 0.1 N, a measurement error of less than 0.1 N, and a measurement range of up to 10 N, Song and colleagues created a flexible and sterilizable FBG force sensor system for minimally invasive robotic surgery[8]. Iordachita and colleagues developed a force measuring system for retinal microsurgery that allows for 0.25 mN resolution in estimating contact forces at the tool tip. reported the development of a small FBG sensor (15 mm in diameter and 20 mm in height) to give force/torque feedback during robot-assisted prostate surgery. This can measure axial force with 0.1 N precision ranging from 20 N to 20 N, and torque with 1 Nmm resolution ranging from 200 NM to 200 NM. Three FBG sensors were used by Park and colleagues to detect needle deflection during MRI-guided operations.

2. LITERATURE REVIEW

J. Ballato[3]Propose that The goal of this article is to examine the current state of the art in optical fiber pressure sensors for medical applications. Because of their compact size, electromagnetic interference immunity, and adaptability for remote monitoring and multiplexing, optical fibers offer intrinsic benefits. Optical fiber-based pressure sensors are minimally invasive for many medical applications, as well as lightweight and flexible, making them ideal for in vivo monitoring. This implies that the sensor may be put directly within a patient for purposes such as urodynamic and cardiovascular monitoring. With specific reference to these application areas, this article provides an overview of current advances in optical fiber-based pressure measurements.

K. Kong[9] Propose that Raman spectroscopy is an optical method that uses inelastic light scattering by vibrating molecules to identify chemical fingerprints in cells, tissues, and biofluids. The ability to use advanced optical technologies in the visible or near-infrared spectral range (lasers, microscopes, fiber-optics) has recently led to an increase in medical diagnostic applications of Raman spectroscopy due to its high chemical specificity, minimal or no sample preparation, and the ability to use advanced optical technologies in the visible or near-infrared spectral range (lasers, microscopes, fiber-optics). Raman spectroscopy can identify and quantify molecular changes in cells, tissues, or biofluids that are either the cause or the consequence of illnesses, according to the central premise of this area. Multivariate calibration and classification models based on Raman spectra may also be built on huge "training" datasets and then used to fresh patient samples to achieve quantitative and objective diagnosis. Spontaneous Raman

spectroscopy has a reputation for being a low-signal method that requires lengthy acquisition periods.

T. Abitbol[10] Propose that Because of its renewable nature, anisotropic form, outstanding mechanical characteristics, high biocompatibility, tailorable surface chemistry, and intriguing optical features, nanocellulose is gaining popularity in the areas of material science and biomedical engineering. Photonics, films and foams, surface alterations, nanocomposites, and medical devices are some of the major topics of nanocellulose research discussed. Nanocellulose fibers offer enormous promise in a variety of applications, ranging from flexible optoelectronics to tissue regeneration scaffolds. We want to share some of the current enthusiasm around nanocellulose research, which stems from the green nature of the particles, their intriguing physical and chemical characteristics, and the wide range of applications that this material may influence.

3. DISCUSSION

The advent of magnetic resonance imaging (MRI) is without a doubt the greatest significant milestone in biomedical research and treatment during the past two decades. To give you a sense of the social and economic consequences, the Organization for Economic Co-operation and Development (OECD) health data show that there are more than 20,000 MR scanners in OECD nations, and demand for high-field equipment (7 Tesla or higher) is growing globally. MRI has become a "can't do without tool" in medical disciplines such as cardiology, surgery, orthopedics, and neurology, owing to its capacity to examine and distinguish soft tissues. Furthermore, MRI's great spatial resolution, along with its ability to acquire functional characteristics of the investigated tissue indirectly, make it essential for investigating organ functions and imaging-guided invasive treatment. In the aforementioned situation, the need for "MR-compatible" sensors that can monitor physical parameters within the scanner and offer real-time feedback on the patient's condition and/or the impact surgical operations have on tissue is rapidly increasing. We evaluated the most promising work concepts used to develop "MR-compatible" sensors using optical fiber technology in this article. Transducers created for measuring temperature, force, torque, strain, and position received specific attention, with an emphasis on their operating principles, benefits and disadvantages, and medical applications. We divided the "MR-compatible" sensors into three groups based on their operating principle, using a variety of categorization criteria.

FBG sensors, intensity-based sensors, and interferometry-based sensors are the three types of sensors. For two primary objectives, "MR-compatible" sensors based on FBG technology have been used. For starters, they provide real-time monitoring of critical parameters during therapeutic invasive operations, resulting in better procedure results. Examples of such applications include: (i) tissue temperature assessment and control during hyperthermia or cryoablation done under MRI guidance; and (ii) monitoring of needle deflection and/or force used during MRI-guided treatments. Second, FBG has been used to track physiological characteristics that are of interest (e.g., respiration and heart rate). For comparable purposes, interferometric and intensity-based FOS have been used. Intensity-based FOS have several drawbacks, including undesired drift caused by variations in light intensity and bending losses; on the other hand, their measurement chain is simple and inexpensive. As a result, they are appropriate for a variety of medical applications that do not need precise metrology, such as respiration rate monitoring. The usage of FBG sensors provides for improved sensitivity and

resolution, as well as multipoint measurements, and they are unaffected by variations in input light intensity, despite the fact that they need an optical spectrum analyzer, which is a costly and large instrument. As a result, when high performance is critical to improving the operation outcome, FBG technology is suggested (e.g., needle deflection in microsurgery). the lack of an electrical connection with the patient, and the small diameter of fiber optics are significant advantages over conventional transducers that drive the market growth of this technology (for example, FISO Technologies inc. and Camino Laboratories Inc. manufacture pressure and temperature sensors for medical applications). FOS is also an excellent option for meeting the increasing need for MR-compatible sensors because to its resilience to electromagnetic fields. Ad hoc developed FOS for medical applications has been commercially accessible in recent years; for example, Micron or Inc. and Opsense Inc. provide MR-compatible FOS for displacement, temperature, and pressure monitoring.

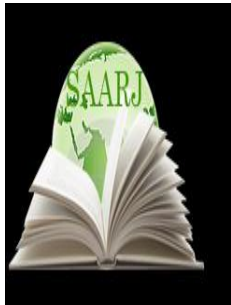
4. CONCLUSION

Finally, fiber optic sensor technology is a critical enabler for the creation of MRI-safe motion control systems, which are essential for modern medical research. Magnetic fields have no effect on fiber optic sensors since they are passive. Between the MRI Scanner (Zone 4) and the MRI Control/Equipment Rooms, optical fiber offers an excellent all-dielectric communication medium. MRI safe fiber optic sensors, made from the right materials, offer electromagnetic transparency for safe usage in and near the MRI Scanner's high electromagnetic field intensity. Even when utilized within the MRI bore, they are durable, simple to install, and do not produce artifacts or adversely impact imaging findings.

REFERENCES

1. L. Mescia and F. Prudeniano, "Advances on optical fiber sensors," *Fibers*. 2014, doi: 10.3390/fib2010001.
2. J. Ballato, H. Ebendorff-Heidepriem, J. Zhao, L. Petit, and J. Troles, "Glass and process development for the next generation of optical fibers: A review," *Fibers*. 2017, doi: 10.3390/fib5010011.
3. S. Poeggel, D. Tosi, D. Duraibabu, G. Leen, D. McGrath, and E. Lewis, "Optical fibre pressure sensors in medical applications," *Sensors (Switzerland)*. 2015, doi: 10.3390/s150717115.
4. M. E. Bosch, A. J. R. Sánchez, F. S. Rojas, and C. B. Ojeda, "Recent development in optical fiber biosensors," *Sensors*. 2007, doi: 10.3390/s7060797.
5. M. Hernaez, C. R. Zamarreño, S. Melendi-Espina, L. R. Bird, A. G. Mayes, and F. J. Arregui, "Optical fibre sensors using graphene-based materials: A review," *Sensors (Switzerland)*, 2017, doi: 10.3390/s17010155.
6. A. F. Bin Omar and M. Z. Bin MatJafri, "Turbidimeter design and analysis: A review on optical fiber sensors for the measurement of water turbidity," *Sensors*. 2009, doi: 10.3390/s91008311.
7. L. Alwis, T. Sun, and K. T. V. Grattan, "[INVITED] Developments in optical fibre sensors for industrial applications," *Opt. Laser Technol.*, 2016, doi: 10.1016/j.optlastec.2015.09.004.

8. C. Holmes *et al.*, "Integrated Optical Fiber-Tip Cantilevers," *IEEE Sens. J.*, 2017, doi: 10.1109/JSEN.2017.2748699.
9. K. Kong, C. Kendall, N. Stone, and I. Notingher, "Raman spectroscopy for medical diagnostics - From in-vitro biofluid assays to in-vivo cancer detection," *Advanced Drug Delivery Reviews*. 2015, doi: 10.1016/j.addr.2015.03.009.
10. T. Abitbol *et al.*, "Nanocellulose, a tiny fiber with huge applications," *Current Opinion in Biotechnology*. 2016, doi: 10.1016/j.copbio.2016.01.002.



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IMPROVEMENT OF METHODOLOGICAL PEDAGOGICAL SKILLS OF DEVELOPING CREATIVE ACTIVITY OF PRIMARY SCHOOL STUDENTS

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ABSTRACT

Today, the teacher requires the use of advanced pedagogical and new information technologies in the educational process. Proceeding from the above, based on our experience, we will describe our thoughts on the ways of teaching and learning through the use of interactive techniques in the lessons. We think that it will provide practical assistance to our colleagues in increasing the effectiveness of training. It also becomes one of their close assistants in the performance of a responsible task, such as the selection of students for their direction and the formation of skills in preparation for an independent life. Below we give recommendations on the application of modern methods of teaching on the basis of some topics in the cross-section of classes.

KEYWORDS: *Collaborative Activity Of The Teacher And Students, Knowledge, Skills And Skills To The Students Through Training*

INTRODUCTION

Education is a collaborative activity of the teacher and students, in the process of which the development of the individual, his / her knowledge and upbringing are also carried out. In the lessons, the teacher achieves his knowledge, skills and skills to the students through training, while the students will have the ability to use it as a result of their assimilation. In the process of learning, students use different forms of assimilation, that is, they rely on specific discrepancies in the perception, processing and application of the assimilated information. In the educational process, issues of education and training in the form of interaction of teachers and students at the time of classes, independent performance of students, extracurricular work are solved.

The purpose of education is formed in accordance with the need of society. Therefore, the purpose of education should be appropriate and proportionate. It was noted that the purpose of education in the scientific literature is to create the right, accurate, appropriate use of the opportunities, skills and skills, develop logical and creative thinking, increase communicative literacy, integrate the National idea, form shargona education, the expression of spiritual enrichment of a person. On the basis of educational purpose, the culture of their communication is improved by independent thinking, increasing oral and written literacy, developing logical thinking. On the basis of educational purpose, spiritual, ideological, spiritual education is provided. In the process of language learning, it becomes possible to approach the cultural and moral values of the people.

One of the great wise." as long as you live with the anxiety of the future, give your children good knowledge, read". It would not be a mistake if we say that the reforms carried out in the educational system of our country in the real sense were not a work aimed at achieving efficiency in a two-year or short period, but a change in the real sense for several hundred years. This shows that the wise policy lies at the time of the idea that all the children of our country – my children, they should be stronger, educated and of course happy than us, worrying about the future of our president, our future generation.

It is known that the introduction of advanced pedagogical and new information technologies in education not only increases the effectiveness of training, but also plays an important role in the upbringing of an independent and logical thinking, comprehensively high spiritual person by applying the achievements of Science in practice.

Currently, interest in the application of interactive methods and information technologies in the educational process is increasing day by day. One of the reasons why this happens is that by this time, in traditional education, students are taught to acquire only ready-made knowledge, while the use of modern technologies teaches them to search for the knowledge they possess, independently study and think, analyze, and even draw the final conclusions themselves. The teacher in this process creates conditions for the development, formation, acquisition and education of the individual and at the same time performs the function of management, directing.

It gives a positive result if used in the lessons of repetition or strengthening of the game-tasks in the training. The choice of what kind of a game task should depend on the type of lesson, the level at which students are taught to perform the game tasks, their level of knowledge, the possibilities of independent creative work, the ability to quickly restore the learned in memory, the extent to which creativity is also formed.

In education, attention is paid to the issue of thinking the personality of the reader, understanding the thoughts of other people and teaching this idea to make literate statements in oral and written form, the main role is played by the perfection of an independent thinking, speech culture developed literate person. The lifestyle, cultural creativity of the nation is studied on the basis of its rich historical heritage.

MATERIALS AND METHODS

Today, the teacher requires the use of advanced pedagogical and new information technologies in the educational process. Proceeding from the above, based on our experience, we will describe our thoughts on the ways of teaching and learning through the use of interactive techniques in the

lessons. We think that it will provide practical assistance to our colleagues in increasing the effectiveness of training. It also becomes one of their close assistants in the performance of a responsible task, such as the selection of students for their direction and the formation of skills in preparation for an independent life. Below we give recommendations on the application of modern methods of teaching on the basis of some topics in the cross-section of classes. You use it with a creative approach, and in response to the thoughts of our first president: "let's look for answers to the question of what we are doing today, in order to arouse pride and pride in our children, a sense of loyalty to our sacred Mother Earth; we hope that you will add your own sense of achievement.

The use of interactive techniques and educational games, modern information and communication technologies in primary classes will help students to think independently, expand their creative search and logical thinking circles, as well as connect with life what they have learned in the lessons, increase their interest. Effective use of the conditions created on the basis of such modern requirements of teachers, organization of lessons on the basis of advanced pedagogical and Information Communication Technologies guarantees the quality of the educational process.

It will give a positive result if it is used in the lessons of repetition or strengthening of the game-tasks during the lessons. The choice of what kind of a game task should depend on the type of lesson, the level at which students are taught to perform the game tasks, their level of knowledge, the possibilities of independent creative work, the ability to quickly restore the learned in memory, the extent to which creativity is also formed.

In education, attention is paid to the issue of thinking the personality of the reader, understanding the thoughts of other people and teaching this idea to make literate statements in oral and written form, the main role is played by the perfection of an independent thinking, speech culture developed literate person. The lifestyle, cultural creativity of the nation is studied on the basis of its rich historical heritage.

CONCLUSION

In our opinion, the main requirements for educational games are as follows:

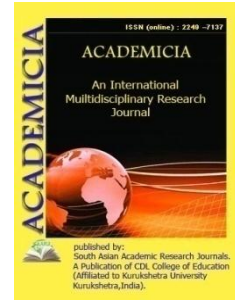
1. Educational games should be suitable for the age of students;
2. The games should be in proportion to the essence of the subject matter under consideration;
3. The timing of educational games must be clearly defined;
4. Educational games should have both educational and educational significance;
5. The purpose, significance of educational games should be determined.

As long as the above requirements are met, the effectiveness of the lesson will increase, and modern technologies will serve the effectiveness of Education.

REFERENCE

1. "Total net enrollment rate in primary education". Our World in Data. Retrieved 7 March 2020.

2. Annex III in the ISCED 2011 English.pdf Navigate to International Standard Classification of Education (ISCED)
3. Powell, Jen; Moser-Jurling, Jennifer."What Is Primary Education?". learn.org. Retrieved 18 September 2019.
4. Gray, Peter."A Brief History of Education". Psychology Today. Retrieved 8 March2021.
5. UrinovaFeruzaUljaevna, SharofutdinovaRanoShavkatovna. DOI: 10.5958/2249-7137.2021.00358.X "Development and education of preschool children" ACADEMICIA. An International Multidisciplinary Research Journal. (Double Blind Refereed & Peer Reviewed Journal).ISSN: 2249-7137 Vol. 11, Issue 2, February 2021.
6. Oljayevna O., Shavkatovna S. The Development of Logical Thinking of Primary School Students in Mathematics //European Journal of Research and Reflection in Educational Sciences. – 2020. – T. 8. – №. 2. – C. 235-239.



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PSYCHOLOGICAL FACTORS OF INCREASING LABOUR PRODUCTIVITY

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ABSTRACT

The construction industry is a work environment that poses many dangers to workers, with many hidden factors that affect work awareness. Construction companies need to ensure a balance between productivity and safety in the work environment. The purpose of this study was to identify relationships between the feeling of safety in the work environment, proactive work behaviour, job satisfaction, work skills, team performance, and health risk indicators, such as heart rate, among construction workers of different ages. Based on previous research, we examined the hypothetical perception model.

KEYWORDS: *Construction Worker; Age; Heart Rate; Body Mass Index (BMI); Structural Equation Modelling.*

INTRODUCTION

Productivity is an indicator of the economic efficiency of employees. The concept of labour efficiency is broader than the concept of productivity, which includes not only economic aspects (actually labour productivity), but also psychophysiological and social aspects. If the following requirements are not met, the growth rate of labour productivity will inevitably decrease unfavourable sanitary-hygienic and harmful working conditions for human health; waste of working time due to illness; reduction of the most active period of human labour; additional leave, etc. In a market economy, it is more important to calculate productivity by the volume of goods sold, because the increase in work in progress and the accumulation of unsold products

have no positive economic significance. Many factors affect the level of labour productivity and its dynamics. Factors are the driving forces and causes that affect changes in labour productivity. Some of them contribute to the increase in labour productivity, others may lead to a decrease in productivity: the first group of factors increases labour-power, the organization of labour and production, the improvement of social conditions of workers, the second group adversely affects the organization of production and labour. Deficiencies in development include the negative impact of negative elements in social conditions.

Some enterprise or organization level factors can be divided into internal and external types. Internal factors include the level of technical equipment of the enterprise, the efficiency of the technology used, the level of energy supply of labour and production, the effectiveness of the incentive systems, training and retraining of personnel, improving the staff and the team, as well as everything related to its leaders. External factors include changes in product types and their level of labour due to changes in government orders and market demand, as well as supply, socio-economic changes in society and regions, the degree of cooperation with other enterprises, the maturity of logistics, natural conditions, etc. It is accepted to combine all factors into three main groups according to their internal content and essence: Material and technical factors of increasing labour productivity (including increasing the technical and energy supply of labour based on continuous development of science and technology), organizational factors (their implementation (impact) is related to the fact that the development of science and technology acquisition, provision of the material base of production (equipment, technology) and implementation of various, and in many cases more complex organizational measures do not happen by themselves, but only by participants in social production. occurs only as a result of the active labour activity of the victims). Labour productivity reserves are the opportunity to make fuller use of all the factors of productivity growth, including labour productivity, through the improvement of equipment, technology, production, labour and management organization. Reserves are closely linked to factors that increase labour productivity. There are several classifications of labour productivity reserves, all of which are divided into two major groups: reserves for improving the use of live labour (labour) (organization of labour, working conditions, improving the working capacity of workers, staffing and their placement) [1].

Issues related to the creation of organizational conditions for continuous work, as well as ensuring a high material and moral interest of employees in the results of work) reserves for more efficient use of fixed and revolving funds (fixed assets (machinery, mechanisms, apparatus, etc.) include better use reserves in terms of power and time, as well as more economical and full use of raw materials, supplies, components, fuel, energy and other revolving funds). Reserves are divided into reserve reserves and perishable reserves on the basis of usability. For example, equipment is not fully deployed in terms of capacity and work shifts, and labour reserves that have been studied but have not yet been implemented are reserve reserves. Waste of working time includes the production of unsuitable products, excessive consumption of fuel is included in the reserves of destruction.

The concept of reserves is the waste of time in production (including idle time during shifts and during the day, delays in work and absences from work not planned), the non-production of labour (tools and labour) irrational use of materials, as well as unplanned overuse of labour due to disruption of established technological processes). Reserves are divided into current and future reserves depending on the period of use. Current reserves will be realized without significant

changes in the technological process and without additional capital investment, the reorganization of production of future reserves will require the installation of more sophisticated equipment, capital investment and more time for preparatory work. Reserves are divided into economic, sectoral and domestic production reserves, depending on the location of identification and use. National economic reserves include, first of all, rich natural resources, their comprehensive use, and so on. Network reserves include reserves, the use of which, in general, increases the productivity of employees in the network (specialization of enterprises, concentration and combination of production, improvement of equipment and technology, etc.). Domestic production reserves are important in increasing labour productivity because ultimately, they are all identified and implemented directly in enterprises.

Productivity indicators and ways to increase it. A system of general, specific and auxiliary indicators is used to assess the level of labour productivity. Aggregate indicators include the value of the average annual, average monthly, average daily, and average hourly output produced by a single worker. Specific measures are the time taken to produce a unit of a particular type of product or the time a person spends per day or per person per hour to produce a particular type of product in kind. Auxiliary indicators describe the time spent per unit of a particular type of work or the volume of work performed per unit of time. The aggregate indicator of labour productivity depends not only on the average annual output of one employee but also on the share of their total number of industrial production workers, as well as on the number of days they worked and the length (duration) of the working day. There are several ways to increase productivity:

- a) increase production by making full use of the production capacity of the enterprise, because when production increases, only the variable part of the consumption of working time increases, while the constant remains unchanged. As a result, the time spent on product production is reduced;
- b) intensification of production, improvement of its quality, the introduction of complex mechanization and automation of production, application of advanced equipment and production technology, organization of production, logistics and other factors in accordance with the plan of organizational and technical measures reduction of labour costs in the production of goods by reducing the waste of time at the expense of improvement. The construction industry is labour intensive compared to other industries, and many construction workers face workloads that exceed their individual physical capabilities. Many construction sites are characterized by poor work environments, such as poor scaffolding, working from heights, high temperatures, and humidity. Long-term physical workloads can lead to chronic fatigue, injuries, illness, and health risks, which may, in turn, reduce on-site productivity. The US Bureau of Labour Statistics reported that over 43,000 workers experienced fatal occupational injuries on construction sites between 2003 and 2010. In addition, studies have shown that 37.9% of US workers experience severe fatigue, leading to fatal consequences related to worker safety, health, and productivity. These strict work conditions are in a similar environment at construction sites around the world. According to a survey by the Ministry of Health, Labour and Welfare, 323 workers died from work-related accidents in the Japanese construction industry in 2017; these accounted for more than 30% of all industry deaths in Japan [2]. Moreover, the most frequent cause of death was falls/descent (N = 135) that occurred during construction work on buildings and houses. Construction is one of the most dangerous industries, given the high frequency of occupational deaths and accidents.

While occupational health and safety is a priority in the industry, it has been pointed out that Japanese construction practices do not comply with sustainability policies.

The construction industry serves as the industrial base in every country and is considered the biggest contributor to national economies. Therefore, it is imperative for the entire construction industry to ensure the expected productivity, in consideration of working conditions and the working environment for workers, and to ensure workers' good health and safety. The primary causes of occupational accidents depend on the nature of the work, workers' behaviour, and on-site dangers in the working environment. Moreover, safety management at construction sites may be difficult to implement on a broad scale. Safety measures in the working environment and workers' awareness of occupational safety are important countermeasures against occupational accidents. Given the relationship between construction workers' age and safety, with older workers shown to be more conscious of safety and to have more professional knowledge and experience compared to young workers, studies have shown that young workers are at a higher risk of accidents than are old workers. Careful concentration on work can reduce unforeseen events. In this study, we conducted a questionnaire survey on safety awareness in construction work among workers from two age groups in a Japanese construction company. The health risks associated with a high resting heart rate among young and older workers have been shown to have a negative effect on workplace productivity and safety awareness in construction work. In particular, regular monitoring of biological information, such as heart rate, and physical information, such as BMI, can help facilitate an enduring work relationship between construction companies and workers by fostering a sense of awareness among older workers. Our study found that health risk indicators, the feeling of safety, job satisfaction, awareness of work skills, and proactive work behaviours in the workplace are suggested to affect workplace productivity. By having a quantitative understanding of workers' health risks and awareness, construction companies can improve workers' Quality of Work (QoW) and well-being. Construction projects involve several daily business problems, and therefore HRM is important in building sustainable development projects. At the construction site, the workforce experiences changes as the project progresses, and the different skills, experiences, and health and safety risks of several workers must be managed. Previous studies on these workers have conducted interviews and questionnaire surveys and created research reports based on HRM, but few have analyzed biological information and physical characteristics. Further research on this can facilitate the management of construction site productivity through teamwork by gaining an awareness of workers. The findings of this study have several limitations. First, the study used a self-reporting method that could result in differences between workers' provided and actual resting heart rate, height, and weight. Future research should seek to include observable data to better understand the potential consequences for workers. Second, the study focused on workers at a Japanese construction company and infers causality in their awareness.

CONCLUSION

Organizational activities at Japanese construction sites are characterized by high levels of worker empowerment, continuous improvement through teamwork, and a positive attitude towards quality and safety. Including these strong points of the Japanese construction industry, future studies may need to investigate more construction workers, including factors such as organizational culture, job engagement, and job crafting behaviour, to confirm the reported results. Third, worker perceptions are very complex because they are influenced by factors other

than age, such as previous experience, physical characteristics, and private situations, which further research should address. Last, the model hypothesis used in this study is diverse, with many side effects and adverse effects, as well as endogenous problems. The suggested results possibly depend on a case study of workers in a Japanese construction company, and the extent of the generality of the results needs further discussion.

REFERENCE

1. Leung, M.-Y.; Chan, I.Y.S.; Cooper, C.L. Stress (2014). Management in the Construction Industry; John Wiley & Sons: West Sussex, UK, 2014.
2. Hakro, S., & Jinshan, L. (2019). Workplace Employees' Annual Physical Checkup and During Hire on the Job to Increase Health-care Awareness Perception to Prevent Disease Risk: A Work for Policy-Implementable Option Globally. *Safety and health at work*, 10(2), 132-140.
3. Chen, Y., McCabe, B., & Hyatt, D. (2017). Impact of individual resilience and safety climate on safety performance and psychological stress of construction workers: A case study of the Ontario construction industry. *Journal of safety research*, 61, 167-176.
4. E-Stat Statistics of Japan. Estimate of Construction Investment: Construction Statistics Guidebook. Available online: <https://www.mlit.go.jp/toukeijouhou/chojou/stat-e.html> (accessed on 7 February 2020)
5. Tamura, N., & Tanaka, T. (2016). Japan's Recent Tendencies of Accidents in Building Facilities and Workers' Accidents in the Environment of Extreme Temperature. *Procedia Engineering*, 146, 278-287.
6. Abdurakhmanov Q.H., Bozorov N., Volgin N. (2001). «Mehnat iqtisodiyoti va sotsiologiyasi». Tashkent: «O'qituvchi», 280-326 pp.
7. Abdurakhmonov Q.H, Kholmo'minov Sh.R. (2004). «Mehnat iqtisodiyoti va sotsiologiyasi». Tashkent, 126-143 pp.
8. Dodoboev Yu.T., Khudoyberdiev.A. (2001). «Mehnat iqtisodiyoti va sotsiologiyasi». Fergana, 64-84 pp.



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AN OVERVIEW OF DEEP LEARNING

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ABSTRACT

Deep learning technologies has been a significant study area in the field of machine learning with the advent of big data, and it has been extensively used in image processing, natural language processing, voice recognition, and online advertising, among other applications. This paper covers various aspects of deep learning techniques, such as common deep learning models and optimization methods, commonly used open source frameworks, existing problems, and future research directions. To begin, we'll go through some of the applications of deep learning; Second, we go through several popular deep learning models and optimization techniques. Finally, we go through several popular deep learning frameworks and platforms. Finally, we emphasize deep learning's future development by introducing the most recent deep learning acceleration technology.

KEYWORDS: *Deep Learning ,Data Corporation, Image Processing , Natural Language Processing Recognition Of Speech*

1. INTRODUCTION

The rise of different applications in the Internet area has led to the exponential expansion of data scale, owing to the fast development of technologies such as cloud computing, Big data, and Internet of things. According to the International Data Center's study, According to the International Data Corporation (IDC), worldwide total data would be 22 times more in 2012 than it was in 2011[1]. By 2020, the amount of ZB will have increased to 35.2. Big data has a lot of

promise and has a lot of value. Human civilization is undergoing change and growth, but it is also encountering severe issues[2]. "Overload" is a term used to describe a situation where How can I get useful information from a website fast and efficiently. Managing a wide range of complicated data has become a significant problem. Deep learning has made significant progress in recent years. advances in image processing, voice recognition, and natural language comprehension Deep learning can map because of the fast advancement of deep learning technologies. by automatically learning features from diverse data in the same hidden space. Obtains a consistent data representation from multi-source heterogeneous data[3]. This document was written by examines many elements of deep learning methods, such as typical deep learning models. learning and optimization techniques, widely used frameworks, actual issues, and so on. path of future research The rest of this document is laid out as follows: The second section delves further into the topic. Deep learning has many uses. The typical models of deep learning. The optimization techniques. We introduce frequently.

Deep learning systems and frameworks that are open source were utilized. The sixth section contains information on Deep learning acceleration technology The difficulties and possibilities are discussed. learning to the depths Section 8 brings our study to a close and suggests areas for further research[4]. Deep learning is a form of machine learning that is entirely based on artificial neural networks. Because neural networks are designed to imitate the human brain, deep learning is likewise a human brain mimic[5]. We don't have to explicitly program anything in deep learning. Deep learning is not a new idea. It has been around for quite some time. It's all the rage these days since we don't have nearly as much processing power or as much data as we have today[6]. As processing power has increased rapidly over the past 20 years, deep learning and machine learning have entered the scene. This is a depiction of a solitary neuron in the human brain, which has about 100 billion neurons[7]. Each neuron is linked to thousands of its neighbors. The issue is, how can these neurons be recreated in a computer. As a result, we construct an artificial neural network, which consists of nodes or neurons[8]. We have neurons for input and output values, and in the hidden layer, there may be a large number of neurons linked.

1.1 Application of Deep Learning:

- **Image Processing:** Deep learning's first use was image recognition. Using deep convolutional neural networks to learn the end-to-end mapping connection between low-resolution and high-resolution pictures for image identification for the first time in 2014. DenKer.obtained the greatest results at the time by using a convolutional neural network to identify handwritten digital. Using a deep convolutional neural network, developed the Faster R-CNN object identification technique. For image identification, incorporated sparse priors into deep convolutional neural networks in 2015. Autoencoder to categorize pictures, and support vector machines were trained for image classification. In the 2016 ImageNet Competition, deep learning accuracy surpassed 97 percent for image recognition, developed CNNH (Convolutional Neural Network Hashing), a supervised depth hashing method.
- **Recognition of Speech:** Deep learning technology has been used in voice recognition in recent years. At the end of 2016, Baidu, HKUST, and SOGOU all claimed that their accuracy of Chinese voice recognition based on deep learning had surpassed 97 percent. Microsoft's research on deep neural network-based voice recognition has totally altered the basic technological

foundation of speech recognition. The deep neural network model has resulted in significant improvements in speech recognition accuracy. Deep neural network models are being utilized in voice recognition algorithms used by well-known Internet businesses (Baidu, HKUST, and SOGOU). They used a convolutional neural network (CNN) to extract voice features in [12]. developed a multilayer perceptron-based voice synthesis model for speech recognition. They utilized the LSTM technique to extract voice characteristics, which significantly increases feature efficiency. G. E. Hinton replaced the Gaussian mixture model (GMM) in the conventional model with DBN in 2012, and the findings indicated that the error rate on the TIMIT core test set fell to 20.7 percent, a considerable improvement. Recently, Google developed a speech recognition system based on the feedforward sequential memory network, which employs a high number of convolutional layers to directly model the whole sentence speech signal and better convey long-term speech relevance. Baidu used deep convolutional neural networks to improve speech recognition by combining visual geometry group networks with deep convolutional neural networks. As a result, the recognition error rate has decreased significantly[9].

- Natural Language Processing (NLP): Deep learning is also used for natural language processing. Recurrent neural network (RNN)-based vector constant length representation model for machine translation. In natural language processing, artificial neural networks have gotten a lot of attention. Similar models were employed in statistical machine translation tasks, who assessed them using the bilingual assessment understudy rating method[10]. For common natural language processing problems like semantic role labeling, Karlen used embedding and multi-layered one-dimensional convolutional architectures. Investigated the neural network model further and discovered that adding many recursive layers improves performance. Using embedding techniques to map words into a vector representation space, and then representing the language model using nonlinear neural networks. A RNN search model for Machine Translation. Part-of-speech tagging, dependency grammar analysis, naming body identification, semantic role tagging, and Twitter sentiment analysis are just a few of the tasks that deep learning methods have been applied to in the area of natural language processing. Sentiment analysis of Chinese microblogs, machine translation, question answering, dialogue system, and so forth.

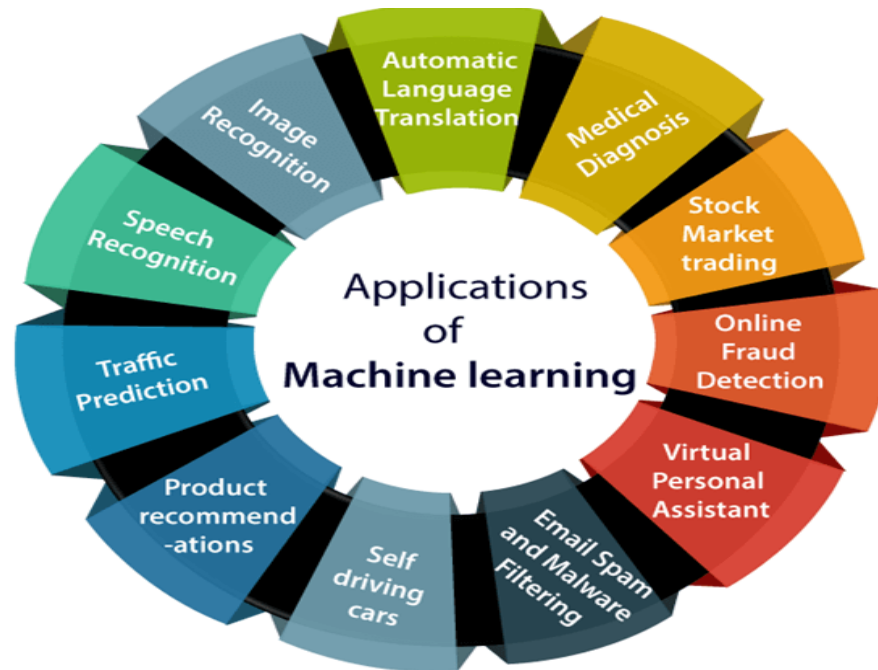


Figure 1: Diagrammatic Representation of Application Deep Learning [JAVATPOINT]

1.2 Model of Deep Learning:

- Auto encoder: Auto encoder is a backpropagation-based unsupervised learning method that sets the target values to be identical to the inputs. The auto encoder (AE) concept in 1986 and used it to process high-dimensional complex data. By rebuilding the input data to create the output data, the auto encoder may extract the hidden feature. The fundamental construction of an auto encoder is a three-layer neural network, with input layer x , hidden layer h , and output layer y , with the output layer and input layer having the same size, as. The input and output layers of auto encoders contain the same neurons, while the intermediate layer has more than the input layer. The output layer reconstructs the input data by training the network, then maximizing the similarity between the input and output data. The similarity is represented by the training error. Assuming that the input signal is x , the signal transforms to z when it reaches the hidden layer, which can be represented using the following formula:

$$z = g(Wx + b)$$

The sigmoid function and the rectified linear unit function, which are also known as active functions, are frequently employed when $g()$ is a nonlinear function. W is the input layer's link weight to the hidden layer, and b is the hidden layer's bias. The decoding layer decodes the signal y and sends it to the output layer, where it is converted to z :

$$y = f(W'z + b')$$

Where W' is the hidden layer's link weight to the output layer, and b' is the output layer's bias. y is regarded as an x prediction. The weight matrix W' is, in general, restricted to the transpose of the weight matrix W : $W' = W^T$. The reconstruction error is typically described as mean square error or cross entropy, depending on the kind of data.

- Boltzmann Machine with Restrictions: In 1986, Hinton and Sejnowski proposed the Boltzmann Machine (BM). The Boltzmann Machine is a kind of feedback neural network that is made up of random neural networks. The Boltzmann Machine is made up of visible units (visible variables, i.e. data samples) and hidden units (hidden variables), with each visible unit connected to all hidden units. The visible variables and hidden variables are binary variables with states of 0 or 1, with 0 representing a suppressed neuron and 1 representing an active neuron. In addition, Boltzmann machine (RBM). The visible layer V and the hidden layer H are shown in Fig. 2, which is a schematic representation of RBM. Input the training data to the visible layer, then the hidden layer identifies the input data's characteristics; the neurons are disconnected within the same layer but completely linked between the two layers. The combined probability distribution of two layers is represented by equation. Restricted Boltzmann machine training is quicker than Autoencoder training. Using the stochastic gradient descent technique, presented a more efficient optimization algorithm in. RBM's conventional training technique requires a large number of sample steps, resulting in a low training efficiency. Hinton's suggested contrastive divergence addressed the issue. Deep deconvolution network to learn hierarchical structural characteristics from the bottom layer to the top layer directly from the global picture by concatenating several convolutional sparse Autoencoder and maximum pooling layers.

Many expansion models based on the limited Boltzmann machine have been proposed by certain academics. suggested incorporating discriminative learning into the RBM's generative learning algorithm so that it could be better used to discriminative tasks like categorization. The RBM model is immediately cascaded into a multi-layer structure in, which is referred to as a deep Boltzmann machine. For learning the latent characteristics of picture pixel blocks Deep SparseAuto encoder model. The restricted Boltzmann machine may be cascaded to create a deep neural network, which can be optimized using the layer-by-layer training technique used convolution operations to expand the deep belief network, allowing the model to learn possible feature representations straight from the initial 2D picture.

There are various hierarchical generation models than the RBM-based deep structure. To create a deep belief network, a multi-layered directed sigmoid belief network was cascaded with RBM in. By adding a Gaussian kernel in, Restricted As input signals, the Boltzmann machine accepts continuous variables. By changing the structure of the RBM or probability distribution, the restricted Boltzmann machine may be expanded to tackle increasingly complicated problems. In these models, a more complicated energy function is typically specified, which reduces the efficiency of learning and inference.

- Deep Neural Network: The input and output layers, as well as numerous hidden layers, make up deep neural networks (DNN). DNNs can solve linear and non-linear problems by calculating the probability of each output layer by layer using an activation function that is suitable for the issue. DNNs are often used in image interpretation and voice recognition, among other applications. DNNs are full-connected neural networks in essence. Multi-layer perceptron is another name for a deep neural network (MLP). The hidden layer transforms the input feature vectors, which subsequently reach the output layer, where the classification result is obtained. It was a two-category linear classification model that was primarily used for linear classification and had poor classification performance. Because early discrete transfer functions have some limitations for multiplayer perceptrons, we may overcome this issue by

using continuous functions like the tanh or sigmoid functions. The number of neurons and hidden layers may be increased to create DNNs.

- Convolutional Neural Networks (CNNs): Except for the input and output layers, Convolutional Neural Networks (CNNs) include convolutional, pooling, and fully-connected layers. CNNs may decrease complexity and parameters by sharing weights, which improves the generalization ability of the neural network, and by pooling neurons to make the network more resilient. CNNs have been used to analyze multi-dimensional data for picture comprehension in recent years. When using a CNN to analyze a multi-dimensional picture, the image is immediately fed into the network, bypassing the time-consuming feature extraction and data reconstruction procedure that conventional image processing methods need. To generate two-dimensional feature maps, a convolutional neural network must learn a collection of two-dimensional filtering templates and perform a convolution operation with the feature map x . The previous layer's feature map is convoluted with a convolution kernel in the convolutional layer, and the output of the convolution result after the activation function forms the neurons of the next layer of the feature map, resulting in the next layer corresponding to a specific feature map of the features. Convolution, nonlinear activation function, and maximum pooling are the three processes in each convolutional layer. Various convolution kernels may be used to extract different characteristics from the preceding layer of feature maps using convolution.

2. DISCUSSION

Deep learning (also known as deep structured learning) is a kind of machine learning technique that uses artificial neural networks to learn representations. There are three types of learning: supervised, semi-supervised, and unsupervised. Deep-learning architectures like deep neural networks, deep belief networks, deep reinforcement learning, recurrent neural networks, and convolutional neural networks have been used in areas like computer vision, speech recognition, natural language processing, machine translation, bioinformatics, drug design, medical image analysis, material inspection, and board game programs. Information processing and dispersed communication nodes in biological systems inspired artificial neural networks (ANNs). ANNs vary from biological brains in a number of ways. In particular, neural networks are static and symbolic, while most live creatures' organic brains are dynamic (plastic) and analogue. In deep learning, the term "deep" refers to the usage of many layers in the network. A linear perceptron cannot be a universal classifier, but a network with a no polynomial activation function and one hidden layer of unlimited width may, according to early research. Deep learning is a more recent version that has an unlimited number of layers of bounded size, allowing for practical application and optimization while maintaining theoretical universality under moderate circumstances. For the purposes of efficiency, trainability, and understandability, deep learning layers are also allowed to be heterogeneous and vary significantly from physiologically informed connectionist models, thus the "structured" component.

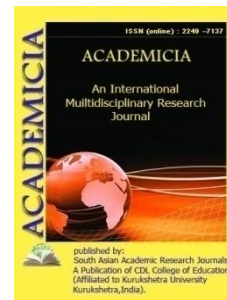
3. CONCLUSION

Deep learning, as a major machine learning research path, heralds the beginning of artificial intelligence research. We carefully presented the current advances in deep learning due to the fast changes in the field. To begin, we presented many widely used deep learning neural network models, evaluated two widely used parallel deep learning training models, and compared the

benefits and drawbacks of the two models' training techniques. Then we looked at some of the most popular deep learning open source frameworks, compared their application capabilities, and looked at a few industrial research platforms. Finally, we focused on current neural network hardware accelerator research. Deep learning technology's future growth is still full with possibilities and difficulties, yet it is very promising. Deep learning models such as Deep Feedforward Neural Networks (D-FFNN), Convolutional Neural Networks (CNNs), Deep Belief Networks (DBNs), Auto encoders (AE), and Long Short-Term Memory networks are all examples of deep learning models (LSTMs). These models may be thought of as the basic architectures of deep learning today. We also spoke about related ideas like Restricted Boltzmann Machines and robust back propagation, which are important for a technical grasp of these models. Given the versatility of network topologies, which allows for “Lego-like” model creation, an infinite number of neural network models may be built using the basic architectural building blocks described in this study. As a result, a fundamental knowledge of these components is essential for being prepared for future AI advancements.

REFERENCES

1. S. Min, B. Lee, and S. Yoon, “Deep learning in bioinformatics,” *Briefings in bioinformatics*. 2017, doi: 10.1093/bib/bbw068.
2. G. Litjens *et al.*, “A survey on deep learning in medical image analysis,” *Medical Image Analysis*. 2017, doi: 10.1016/j.media.2017.07.005.
3. R. Miotto, F. Wang, S. Wang, X. Jiang, and J. T. Dudley, “Deep learning for healthcare: Review, opportunities and challenges,” *Brief. Bioinform.*, 2017, doi: 10.1093/bib/bbx044.
4. M. M. Najafabadi, F. Villanustre, T. M. Khoshgoftaar, N. Seliya, R. Wald, and E. Muharemagic, “Deep learning applications and challenges in big data analytics,” *J. Big Data*, 2015, doi: 10.1186/s40537-014-0007-7.
5. J. Ker, L. Wang, J. Rao, and T. Lim, “Deep Learning Applications in Medical Image Analysis,” *IEEE Access*, 2017, doi: 10.1109/ACCESS.2017.2788044.
6. L. Deng and D. Yu, “Deep learning: Methods and applications,” *Foundations and Trends in Signal Processing*. 2013, doi: 10.1561/20000000039.
7. Y. Guo, Y. Liu, A. Oerlemans, S. Lao, S. Wu, and M. S. Lew, “Deep learning for visual understanding: A review,” *Neurocomputing*, 2016, doi: 10.1016/j.neucom.2015.09.116.
8. Y. Lecun, Y. Bengio, and G. Hinton, “Deep learning,” *Nature*. 2015, doi: 10.1038/nature14539.
9. A. Karatzoglou and B. Hidasi, “Deep learning for recommender systems,” 2017, doi: 10.1145/3109859.3109933.
10. D. Ravi *et al.*, “Deep Learning for Health Informatics,” *IEEE J. Biomed. Heal. Informatics*, 2017, doi: 10.1109/JBHI.2016.2636665.



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A LOOK AT HOW SOLAR CHIMNEY INTEGRATED SYSTEMS MAY BE USED FOR ROOM HEATING AND COOLING

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ABSTRACT

In the residential sector, traditional indoor climate comfort systems account for a significant portion of energy usage. Passive design is a method of lowering building energy demand by reducing the amount of electricity used by mechanical systems. Solar chimneys are an unique passive architecture that uses solar energy to build up stack pressure as natural draught components. The installation of a solar chimney increases the efficiency of domestic space heating and cooling while also lowering greenhouse gas emissions. This article gives a summary of current developments in the field of solar chimney research. To enhance the degree of thermal comfort, the building industry has a propensity to use integrated solar chimney designs. The most frequent solar chimney-based integrated setups were summarized in this article. In addition, each system's difficult elements and suggestions were discussed. Combined energy systems based on solar chimneys have long been considered as effective green building design solutions. Each system has its own set of advantages and disadvantages, and there is no universal standard for ranking these systems in order of performance. More trials are needed to address issues that may arise in their commercial uses. More research is needed in order to create optimization methods and control systems. A desired control system reacts to residents'

demands in an unobtrusive manner, allowing them to alter a state if it is deemed thermally unpleasant, and provides quick feedback.

KEYWORDS: *Solar Chimney Earth-Air Heat Exchanger Phase Change Material (PCM) Cooling Cavity Water Spraying System Trombe Wall.*

1. INTRODUCTION

Buildings account for a significant portion of global and regional energy consumption. Heating and cooling account for a broad range of percentages of total building energy consumption, ranging from 18 percent to 73 percent globally. Researchers were worried about new methods for decreasing energy consumption in building design a few decades ago. Bioclimatic design, for example, entails the use of energy-saving methods in building construction in conjunction with the use of renewable energy sources such as solar energy [1]. One difficult issue is achieving thermal comfort via bioclimatic architecture. It has a large overall environmental effect and may contribute considerably to climate change. All structures were naturally ventilated until the advent of modern mechanical systems. Since energy and the environment have become two major concerns in building design, scientists have taken a keen interest in reviving old architecture. The solar chimney (SC) is one of the earliest passive ventilation techniques. It has been used for millennia, most notably by the Persians in the Middle East and the Romans in Europe. It is a new design that maximizes ventilation effect by generating a significant temperature increase in the chimney in order to allow solar radiation to pass through Solar chimneys, Trombe walls, and double-skin facades all work in the same way because they are open chambers that use insolation to induce air flow. The Trombe wall is a huge structure that is primarily used to heat the building.

However, with the right adjustments, cooling may be accomplished as well. Solar chimneys are mostly used to improve night ventilation, although they may also be utilized during the day. They may be connected to the building's walls or placed on the roof. The most frequent chimney design is vertical. However, it has a detrimental effect on the building's aesthetics. As a result, laying the collector along the roof slope is both less expensive and less visible. The use of a solar chimney is not restricted to residential or commercial structures. For livestock housing, Rahman and Chu suggested a natural draft chimney instead of artificial ventilation. Reduced ventilation costs resulted in increased chicken production efficiency and profitability. Industrial locations have distinct design elements and comfort criteria, which are outside the scope of this article. According to the literature review, there is a substantial amount of literature on SC. There has been a rising interest in implementing new methods that take use of solar chimney integrated systems in recent years. Integrated space heating/cooling systems have been the subject of a few studies. As a result, the goal of this paper is to contribute to recent advancements in solar chimney use for building ventilation.

Furthermore, it demonstrates the potential and efficacy of future solar chimney-based integrated systems [2]. The section is organized in a logical order, beginning with an overview of the analytical and numerical advances of solar chimneys and ending with references to experimental research in the area. Section 3.1 contains a detailed description of the EAHX-SC system; Section 3.2 discusses PCM-enhanced solar chimneys; discusses water consuming systems based on SCs; and Section 3.4 concludes with a brief report on PV-based solar chimneys. . Solar chimney

independent building applications The use of wind or sun energy for ventilation became outdated in the twentieth century as mechanical ventilation systems became more widely available and people's lifestyles changed. As a consequence, prior to the 1980s, solar chimney research and development was rather restricted. The issue of decreasing greenhouse gas emissions and the necessity for effective ventilation has reawakened interest in solar chimneys in recent decades. Many current studies focus on model experiments and theoretical examinations to investigate the effects of solar chimney design, orientation, and climatic factors on ventilation performance. The primary goal of most solar chimney research was to improve natural ventilation by using various design factors. The breadth of the chimney, stack height, chimney orientation, and absorber materials, for example, were all of practical concern. According to Khanal and Lei's study, the majority of works in this field were based on pure experiments or an experimental method combined with numerical modeling. The experimental findings of Afonso and Oliveira revealed that the breadth of the chimney had a greater impact on ventilation rate than its height.

According to Mather and Mathura the optimal absorber inclination angle ranges between 40° and 60° depending on the location latitude. While Hamdy and Fikry discovered that the optimal tilt angle of a solar collector needed to give the greatest ventilation efficiency for their experimental model was 60° , Mathur and Mathur showed that this inclination angle was about 45° . For winter applications, the optimal tilt angle results in a small increase in chimney air flow rate, thus it may not be worth the risk of building instability. The increased ventilation rate during the summer months, on the other hand, is noteworthy, and choices must be taken with care. Ong [10] created a mathematical model of a wall-type solar chimney that was stable. The model anticipated the solar chimney's thermal performance as well as the velocity of air flow down the chimney. For chimneys with a gap-to-height ratio smaller than 1:10, analytical modeling of velocity and temperature profiles in the chimney demonstrated excellent agreement with previous tests. It seems that obtaining steady state radiation is challenging due to the variable nature of solar irradiation. Mart and HerasCelemin developed a dynamic model for assessing the solar chimney's performance using real-time meteorological data. The SC's potential for providing nighttime ventilation in Mediterranean regions was also discussed. Lee and Strand investigated the effects of chimney height, absorber wall solar absorption, glass cover solar transmittance, and air gap width under various climate conditions. Among the four input factors, it found out that the air gap width had the least effect on ventilation improvement. A tiny solar chimney with an absorber length smaller than 1 m was proposed by Mathur and Bansal. Because it could be integrated in a normal window without requiring significant structural changes, the system installation took precedence over the previous designs. Their thorough study also showed that when the air gap was expanded, the airflow rate rose. The air volume supplied to or withdrawn from a place (usually a room or home) divided by the volume of the space is measured in air change per hour (ACH). The temperature would approach the ambient if the amount of air supplied to the interior areas was adequate. Natural ventilation offers thermal comfort for occupancy at an ambient temperature of $20\text{--}26^\circ\text{C}$ [3]. There is no universal formula for determining the ideal ACH for a naturally ventilated home. The fact that ACH is dependent on a variety of architectural factors such as building layout, resident count, and building purpose makes it a difficult component to manage. The majority of the research [did not use an optimum number to calculate its value.

Computational fluid dynamic (CFD) techniques grew in popularity in solar chimney research as rapid numerical systems were developed. In most cases, CFD gives all essential flow statistics throughout the whole area of interest. Pressure fluctuations and heat distribution in the chimney are of practical relevance in the case of a solar chimney. Laminar flow algorithms were created to model airflow and heat transfer in the solar chimney before the introduction of commercial software packages. The solar chimney's flow characteristics are more akin to a turbulent flow regime. The accurate description of turbulence modeling in the literature is given special attention. k – models are believed to present more accurate forecasts of velocity and temperature profiles as reported by experiments. The k models outperformed the other models for boundary layer flows under unfavorable pressure gradients, according to this study. As a result, they have become the primary research technique in solar chimney studies. In contrast to a one-dimensional approach, a multi-dimensional analysis supported by the CFD technique can capture prevailing flow phenomena like reverse flow. When air entrainment happens at the chimney outlet and air penetrates lower into the chimney, reverse flow occurs. Reverse flow through the solar chimney should be avoided because it reduces the flow rate, which is undesirable for ventilation. Khanal and developed an inclined passive wall solar chimney design with an inclined passive wall (glazing) and a vertical active wall (absorber) to avoid reverse flow (IPWSC). The research confirmed that there is an optimal chimney height-to-gap ratio for suppressing reverse flow and inducing maximum ventilation rate [3].

2. DISCUSSION

2.1. APPLICATION:

Solar chimney, in contrast to natural stack ventilation methods that may result in a poor stack effect, is clearly more promising. because it enhances the temperature differential between inside and outside Increasing solar gain is one way to do this. One of the most significant advantages of a SC is that it may be utilized forth need for cooling and the supply of cooling in space is referred to as space cooling. The insulation is in full swing. Solar chimneys are usually thought to be inappropriate for residential use. areas with low levels of solar radiation or hot, dry climates However, by combining a wall and a roof solar chimney, AboulNaga and Abdrabboh [enhanced the chimney night ventilation efficiency. The air flow rate was three times higher than that of a normal person. Rooftop solar chimney on its own The system was placed on a single home in the United States. Al-Ain is a city in the United Arab Emirates. The height of the ideal wall chimney in relation to the with an intake height of 3.45 m, the maximum air flow rate (almost 2.3 m/s) was achieved. a distance of 0.15 m for a flat volume, an ACH number of up to 26 was obtained. It is sufficient to overcome the significant cooling load for aim a hot environment, construction is necessary. Rachapradit Khedari, Rachapradit Kediri, Rachapradit Kediri, Rachapradit Khedari, Rachapradit Khedari, in a single-room home (25 m³) with an air conditioner (AC), there is a chimney. Bangkok is the capital of Thailand. The home with the solar chimney had a lower average temperature. Compared to a standard AC, an AC consumes 10–20 percent less electricity. House. The size of the solar chimney aperture was utilized to regulate the ventilation rate. An experimental study revealed that a 5 cm² opening for When used with an air conditioner, the SC unit was the most efficient. A SC was built on the top of a 12 m³ cabin room by Imran, Jalil. Iraq. The chimney was 2 m wide and long, with three distinct airflows. 50, 100, and 150 mm gap thicknesses The ideal inclination angle into get the greatest air flow rate, the angle was set to 60°. The system has the potential to cause This area requires 4–35 air changes each hour. It

may be put to good use as a storage area. Mechanical ventilation is not required for cooling. Figure 1 shows the Structure of double pass roof solar collector. (a) Space heating mode (b) Natural ventilation mode. Dampers are indicated by Latin numerals- Tuyeres are indicated by Roman numerals- AC1 air channel 1- AC2 air channel 2- IP insulation plate- AP absorber plate- GC glass cover [4].

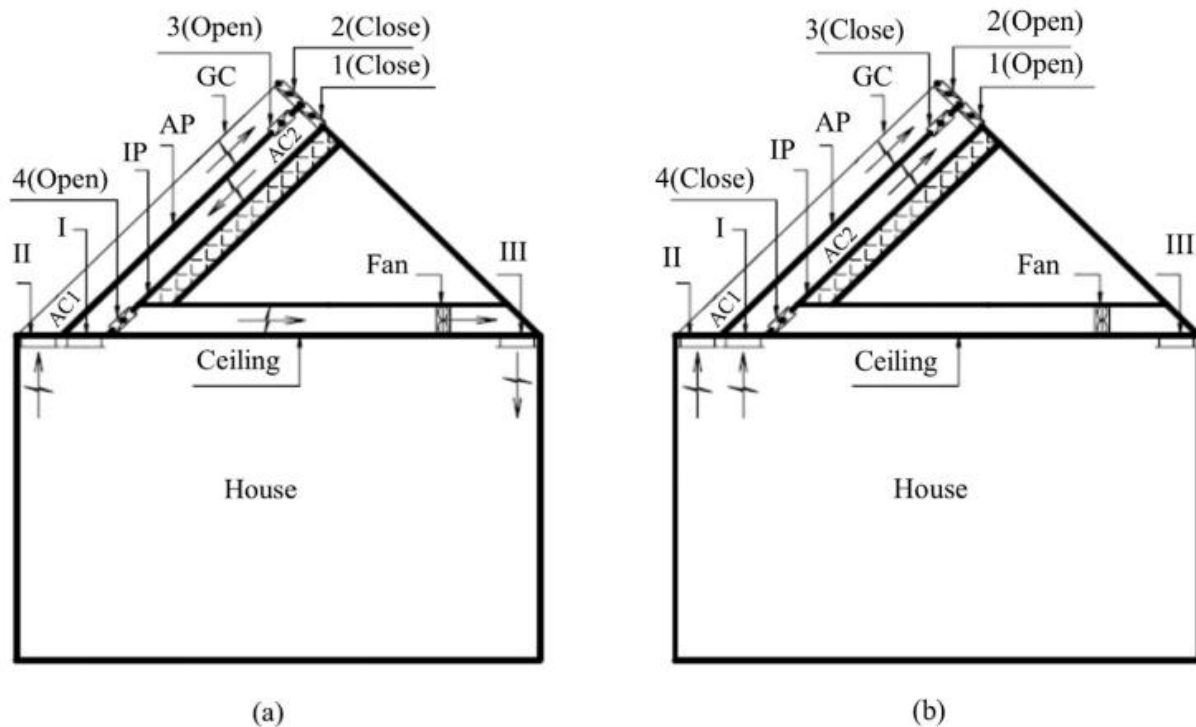


Figure 1: Structure Of Double Pass Roof Solar Collector. (A) Space Heating Mode (B) Natural Ventilation Mode. Dampers Are Indicated By Latin Numerals- Tuyeres Are Indicated By Roman Numerals- AC1 Air Channel 1- AC2 Air Channel 2- IP Insulation Plate- AP Absorber Plate- GC Glass Cover.

2.2. ADVANTAGE:

Solar chimney, in contrast to natural stack ventilation methods that may result in a poor stack effect, is clearly more promising. because it enhances the temperature differential between inside and outside Increasing solar gain is one way to do this. One of the most significant advantages of a SC is that it may be utilized forth need for cooling and the supply of cooling in space is referred to as space cooling. The insulation is in full swing. Solar chimneys are usually thought to be inappropriate for residential use. Areas with low levels of solar radiation or hot, dry climates However, By combining a wall and a roof solar chimney, AboulNaga and Abdrabboh enhanced the chimney night ventilation efficiency. TheThe air flow rate was three times higher than that of a normal person. Rooftop solar chimney on its own The system was placed on a single home in the United States. Al-Ain is a city in the United Arab Emirates[5]. The height of the ideal wall chimney in relation with an intake height of 3.45 m, the maximum air flow rate (almost 2.3 m /s 3) was achieved. a distance of 0.15 m. For a flat volume, an ACH number of up to 26 was obtained.(321 meters)3 It is sufficient to overcome the significant cooling load for aln

a hot environment, construction is necessary. Rachapradit Khedari, Rachapradit Kediri, Rachapradit [6] Khedari, Rachapradit Kediri, Rachapradit Khedari, In a single-room home (25 m³) with an air conditioner (AC), there is a chimney. Bangkok is the capital of Thailand. The home with the solar chimney had a lower average temperature. Compared to a standard AC, an AC consumes 10–20 percent less electricity house. The size of the solar chimney aperture was utilized to regulate the ventilation rate. An experimental study revealed that a 5 cm² opening for When used with an air conditioner, the SC unit was the most efficient. A SC was built on the top of a 12 m³ cabin room by Imran, chimney was 2 m wide and long, with three distinct airflows. 50, 100, and 150 mm gap thicknesses. The ideal inclination angle is To get the greatest air flow rate, the angle was set to 60°. The system has the potential to cause This area requires 4–35 air changes each hour. It may be put to good use as a storage area. Mechanical ventilation is not required for cooling [7].

2.3. WORKING:

According to the studies described above, the bulk of solar chimney research focused on passive cooling. However, in certain areas, space heating is more important than natural cooling, particularly during the winter. Because SC works better for space cooling, there are few SC applications for space heating in the literature. The use of a solar chimney for space heating was shown by Haghighi and Maerefat. They demonstrated a computer simulation of natural convection in a 2D chamber with a chilly exterior environment. The numerical modeling was compared to previous experimental and numerical studies published in the literature. A parametric analysis was also conducted to obtain a better understanding of the factors that affect ACH and room air temperature. The findings indicated that optimizing the air gap, inlet, and outlet sizes resulted in a maximum ACH of 0.2 m for a space measuring 4.0 m 4.0 m 3.125 m without air in filtering. The effect of ambient air temperature on ACH is likewise shown to be insignificant. Furthermore, the system seemed to be capable of delivering a pleasant interior environment despite a low solar intensity of 215 W/m² and a low ambient temperature of 5 °C. The SC systems previously described were just cooling or heating devices. The use of SC for both space heating and cooling is a unique design. Zhai, Dai [28] proposed a feasible configuration that may decrease heating and cooling demand throughout the year without adding complexity to the system. They looked at a single-pass roof solar collector and a double-pass roof solar collector that were both placed on a single typical Chinese common home. Roof solar collectors were solar air collectors with a single or double pass that were placed on the building's roof. The double pass roof solar collector, which was created by combining a double pass solar air collector with the building's southern roof. Dampers 1, 2, 3, and 4 were placed to transition between space heating and natural ventilation in the winter and summer, respectively. Indoor air may enter air channel 1 (AC1) via tube II, acquiring heat from sun radiation, by shutting dampers 1 and 2 and then opening dampers 3 and 4. Then it goes into air channel 2 (AC2), where the absorber plate heats it up. It pours into the air duct once tube I am closed. The heated air is blown into the room by the fan via tube III. The space is naturally ventilated thanks to the reverse cycle. Indoor air enters air channels 1 and 2 via tubes I and II, respectively, by shutting dampers 3 and 4 and opening dampers 1 and 2. Because the air in the channel heats up and rises, the stack effect will ultimately appear. The findings revealed that a two pass roof solar collector performed better for both room heating and natural ventilation. It has a 10 percent better immediate efficiency than a single pass roof solar collector. A number of papers in the literature

have been examined. Various research techniques to handle different elements of a SC design may be found in the literature.

Application for Author Location Methodology is a key argument. Performance at high inclination degrees and gap widths (major findings/observations) Thailand • In a hot humid environment, a comparison of air velocity and temperature distribution in the SC with dry air and wet air Modeling of CFD numerically[8] • With the exception of a slight increase in air temperature, increasing the air relative humidity reduces air velocity at the inlet and outlet of the chimney • The air temperature distribution is relatively similar to the dry-air model • A small opening height-to-gap ratio of 0.25 is recommended for SCs with moist air hang, he Cooling of the space To explore SC airflow rate, a plume model based on energy balances and thermal boundary layer theory is being developed. Modeling and analysis • Unlike previous analytical models, the plume model considers both vertical and horizontal density changes throughout the chimney. Six experimental data sets were selected for plume model validation. For reasonably high velocity circumstances, a turbulent boundary layer may be added to the plume model to enhance it even further. The plume model produced encouraging results in terms of forecasting SC air flow rate and indicating the presence of the ideal chimney gap width. The model's inability to anticipate complex flow phenomena such as reverse flow is one of its limitations. Solar chimney independent building applications as space heating or cooling methods were discussed in the preceding introduction. For at least two reasons, the effectiveness of a natural ventilation system is directly dependent on the residents. First and foremost, the inhabitants must be warm and comfortable. Second, they are likely to have some influence over the system. Integration of solar chimney with other technologies is recommended to significantly improve its performance for the aim of increasing interior thermal comfort. The goal of this article is to go through the most popular solar chimney-based integrated systems.

In most cases, integrated systems were followed by a consideration of their basic features and suggestions for improving the system in order to create a more sustainable future. Pipes placed several meters under the earth, using soil as a natural consistent temperature source, are an innovative way to circulate air throughout the structure. The earth's undisturbed temperature refers to the temperature of the soil 2–3 meters under the surface, which is mostly stable. In the winter, this temperature is greater than the surface temperature, and in the summer, it is lower. An earth air heat exchanger (EAHX)[9] is a technology that may be used to improve ventilation via a cooling or heating effect. Mihalakakou and Santamouris proposed a comprehensive numerical model for predicting EAHX thermal performance. Their model was created in the TRNSYS environment and could be used for future study with ease. The pipe length, pipe radius, air velocity, soil depth, and the temperature differential between ambient air and soil all have a significant influence on EAHX performance. The heat transfer capacity may be increased by increasing the burial depth and length of the pipes, as well as lowering the airflow rate. According to Bansal and Misra, the material of underground pipes had no effect on EAHX performance, thus a less expensive piping material is acceptable. To simulate the EAHX, Ramirez-Dávila and created a three-dimensional finite volume CFD algorithm. Three climatic conditions were studied: one with severe heat in the summer and low temperatures in the winter (Ciudad Juárez, Chihuahua), another with moderate weather (Mexico City), and the third with hot weather (Merida, Yucatán). For the cities of Cads. Juárez, México City, and Mérida, simulations were performed for sand, silt, and clay soil textures, respectively. According to them,

the EAHX potential for space heating and natural ventilation may be quite different. In Cads. Juárez and México City, the average air temperature decreased by 6.6 and 3.2 degrees Celsius in the summer and increased by 2.1 and 2.7 degrees Celsius in the winter, respectively. Mérida EAHX winter thermal performance, on the other hand, was superior to its cooling effect [10].

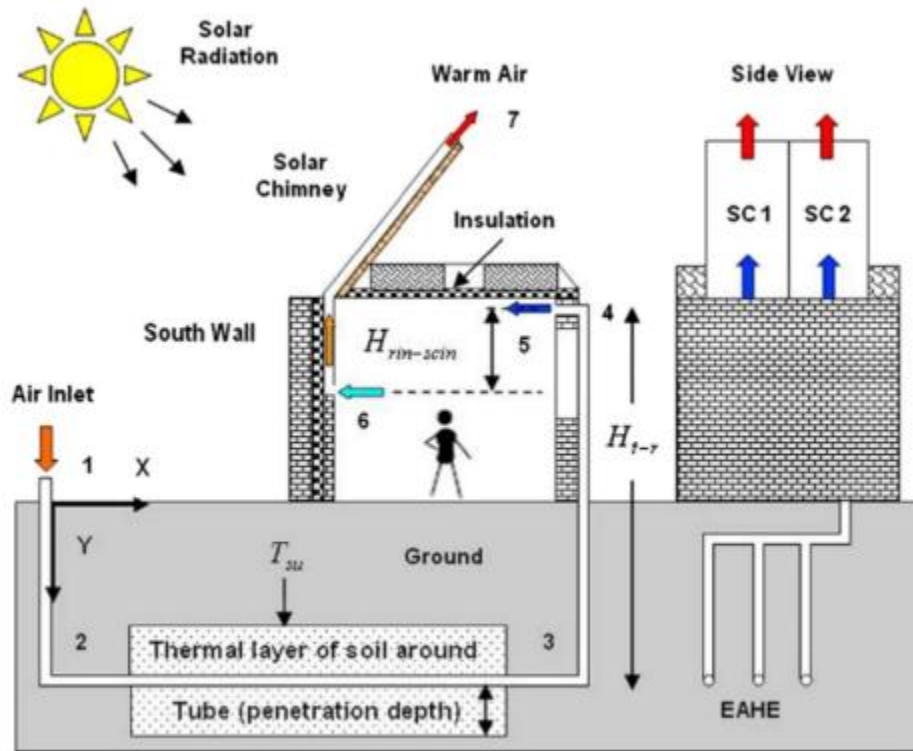


Fig. 3. Schematic diagram of integrated earth-air heat exchanger and solar chimney [48].

Figure 2: Schematic diagram of integrated earth-air heat exchanger and solar chim.

3. CONCLUSION

The use of a solar chimney as a passive technique to improve natural ventilation and therefore decrease the demand for supplemental energy for thermal comfort is highly recommended. Solar chimneys have been widely researched computationally and experimentally during the past several decades. Solar chimneys are ineffective in hot, dry, or humid climates, as well as in areas with little insulation. As a result, research into the creation of a combination system may be an option. To combine solar and geothermal energy, a solar chimney with an earth-air heat exchanger is recommended. The system is chosen primarily because it can provide room heating in the winter and cooling in the summer. Its application, however, is highly reliant on the latitude and altitude of the site, as well as the soil type, water table, soil moisture, and structure design. A model that is optimized based on parametric analyses of the coupled system would disclose even more about the system's efficacy. Further study, including the impact of ice formation in the winter, dynamic functioning, and real-world experimental settings, is needed to fully comprehend the system's performance. PCM has been studied for heating and cooling applications in buildings since the 1930s. Because PCM can only affect these factors, the temperature of the air and surrounding surfaces are the main parameters of human comfort needs

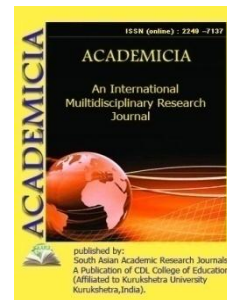
for PCM-technology. The study on incorporating PCM with a solar chimney was discussed in this article. PCM's ability to minimize temperature variations, particularly peak temperatures, makes it a good choice for solar chimney construction. The incorporation of PCM in SC is the simplest and most cost-effective of the suggested setups. Further study on the selection of the appropriate PCM for the system is needed. Because appropriate ventilation is a top priority, the designer is keen to develop a situation in which an EAHXSC system is equipped with PCM in future study. It should be emphasized that in order to convince building users, the performance of a PCM-enhanced SC should be evaluated in real-world scenarios. As a result, it seems that further research in this area is required.

Solar chimney-based water-consumption systems are best suited to areas with a hot and dry environment. The system may be configured in a variety of ways. Water-consuming systems substantially improve the solar chimney's thermal efficiency. The absence of adequate accessible water resources to satisfy water demands within an area is the most significant drawback for broad public usage of the linked system. As a result, designing the least-water-consuming and most-optimized system is a difficult task. In the literature, hybrid photovoltaic-thermal (PV/T) systems have received a lot of attention. Combining photovoltaic panels with a roof solar chimney is a novel concept. The system's capacity to improve ventilation while also generating energy makes it a suitable design. The suggested systems' architecture includes uncontrollable factors such as weather and local attitudes. Physical processes are involved, and they are complex. Furthermore, key factors like as wind pressures, interior temperatures, and building leaks may all be subject to significant error. The first law of thermodynamics or energy analysis was used to examine all of the aforementioned integrated systems. Energy efficiencies, on the other hand, are unable to tell us how close a system's performance is to perfection. Energy analysis reveals the possibility of better matching the energy supply and demand. N. Monghasemi, A. Vadiiee Renewable and Sustainable Energy Reviews Exergy may also be thought of as a meeting point for energy, the environment, and the economy. This may be a good chance for research to compare SC integrated systems based on energy analysis. The investigation of these systems is still under progress. As a result, there is no strict judgment at this level to determine which system is better. It is determined that each system has its own set of advantages and disadvantages that may be appropriate for one area but not for another.

REFERENCES

1. N. Monghasemi and A. Vadiiee, "A review of solar chimney integrated systems for space heating and cooling application," *Renewable and Sustainable Energy Reviews*. 2018.
2. Y. Gao, J. Liu, X. Yuan, K. Zhang, Y. Yang, and Y. Wang, "Air-conditioning system with underfloor air distribution integrated solar chimney in data center," in *Procedia Engineering*, 2017.
3. L. Zuo, Y. Yuan, Z. Li, and Y. Zheng, "Experimental research on solar chimneys integrated with seawater desalination under practical weather condition," *Desalination*, 2012.
4. M. A. Aurybi, S. I. Gilani, H. H. Al-Kayiem, and A. A. Ismaeel, "Mathematical evaluation of solar chimney power plant collector, integrated with external heat source for non-interrupted power generation," *Sustain. Energy Technol. Assessments*, 2018.
5. Y. Wang, Z. Fang, L. Zhu, Z. Yang, J. Wang, and L. Han, "Study on the integrated

- utilization of seawater by solar chimney,” *Taiyangneng Xuebao/Acta Energiæ Solaris Sin.*, 2006.
6. S. Lal and S. C. Kaushik, “CFD simulation studies on integrated approach of solar chimney and borehole heat exchanger for building space conditioning,” *Period. Polytech. Mech. Eng.*, 2018.
 7. Z. L. Fang, J. G. Kong, L. Zhu, Y. P. Wang, and Q. W. Huang, “Property of airflow under collector of integrated solar chimney system,” *Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/Journal Tianjin Univ. Sci. Technol.*, 2008.
 8. O. Manca, S. Nardini, P. Romano, and E. Mihailov, “Numerical investigation of thermal and fluid dynamic behavior of solar chimney building systems,” *J. Chem. Technol. Metall.*, 2014.
 9. G. Quesada, D. Rousse, Y. Dutil, M. Badache, and S. Hallé, “A comprehensive review of solar facades. Opaque solar facades,” *Renewable and Sustainable Energy Reviews*. 2012.
 10. S. Lal, S. C. Kaushik, and P. K. Bhargav, “Solar chimney: A sustainable approach for ventilation and building space conditioning,” *Int. J. Dev. Sustain.*, 2013.



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ICT - AS A MEANS OF ACHIEVING NEW EDUCATIONAL RESULTS IN TEACHING NATURAL DISCIPLINES IN SECONDARY SCHOOLS

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ABSTRACT

The new quality of education is determined by the maturity of new educational results, and the modeling of educational systems allows us to take into account the conditions that ensure the achievement of these results. The article describes a model of the education system that ensures the modern quality of generations education is modeled in the context of students achieving new educational results with the help of information and communication technologies, management activities of teachers to create conditions for the implementation of requirements for the development of basic educational programs of general education in the conditions of functioning of the school information and educational environment.

KEYWORDS: *Education System, Modern Quality Of General Education, New Educational Results, State Educational Standards, Modeling*

INTRODUCTION

The Decree of the President of the Republic of Uzbekistan "On the strategy of action for the further development of the Republic of Uzbekistan" outlines the important tasks of developing education and science, significantly improving the quality of general secondary education, in-depth study at a high level of foreign languages, computer science and mathematics, physics, chemistry and biology.

Modern approaches to the learning process, fundamental reforms carried out today in the teaching of all academic subjects are inextricably linked with the use of modern innovations and interactive means in the educational process, the professional competence of teachers, and the intellectual potential of students.

Based on the goal and objectives of teaching biology in secondary educational institutions, it is required to create a modern informatized educational environment that provides for the targeted use, along with educational and methodological complexes, electronic resources aimed at developing basic and subject competencies in biology among students, developing skills in using information technologies and competencies for working with information.

Teaching subjects in all institutions of the continuing education system, in particular biology, is due to the fact that throughout the study of biology, materials are prepared for presentation on each topic, and the most suitable means are used in the educational process.

The general requirements for the development of educational and methodological complexes of a new generation in general subjects are reflected in the State educational standards for general secondary and secondary specialized, vocational education: "Multimedia applications to textbooks include video, audio sources, animation, tables, texts and dictionaries, covering materials on academic subjects using information and communication technologies in accordance with state educational standards and curricula, contributing to the effective assimilation of the content of academic disciplines and the development of self-education skills, helping to control knowledge and consolidate it, enriching the main content of the academic subject. " The above emphasizes the need to use electronic educational resources in all general education subjects.

Visual aids that serve to increase the effectiveness of teaching scientific disciplines are created on the basis of specific practical programs. Teachers are required to prepare such software and master the competencies of their implementation; in this matter, there is a need to involve programmers directly. In many cases, electronic means are created that combine scientific sources on an integration basis in two scientific disciplines. If each student is able to independently use a computer, then the opportunities to introduce him to the world of inventions and research are expanding. Modern education is mainly based on teaching programs, visual presentation techniques, computational operations using a computer and mobile means. In any study, it is impossible to do without electronic educational resources, electronic means and technologies for their use, therefore, an informatized learning environment is considered as an effective scientific and practical tool.

The use of high-quality electronic means and the correct connection to the educational process create optimal conditions for students to accept the necessary information, process it, master basic and subject competencies, control them, develop creative abilities, introduce additions and changes in the educational process, and continuously check the results of education. In addition, opportunities are created for diagnosing and predicting student activities, developing recommendations for designing future lessons, determining the order of educational and cognitive activities of students aimed at consolidating certain information.

This article reflects the issues of using electronic educational resources in biology lessons, existing electronic educational tools in general education schools, organizing the activities of a biology teacher in an informatized educational environment, problems of computerization of the science of biology, information obtained through answers to the questionnaire, conclusions on their analysis ...

Efficiency in biology lessons in most cases is achieved through adherence to didactic laws and the purposeful introduction of scientifically grounded forms, methods and techniques into the

educational process. Acquaintance of students with the world of animals, their way of life, reproduction and development occurs through obtaining scientific information from a textbook and teaching aids.

The activation of the educational process is implemented on the basis of innovative approaches in the education system, through the use of modern technologies and programmed teaching aids, tests and other non-traditional teaching aids. Electronic learning tools also help to increase student engagement in many academic disciplines.

The use of electronic means in biology lessons is associated with new methods of their implementation. The use of electronic educational resources in biology is associated with the fulfillment of certain conditions:

clarity and variety of information presented (color illustrations, audio-video recordings, animation and other types);

implementation of feedback (a system of tests to determine the degree of assimilation, ensuring quick control);

self-control skills training with the aim of active and accelerated assimilation of educational materials;

constant "maintenance" of teaching aids and enrichment of new information, that is, the purpose of electronic teaching aids is to synthesize the main educational material with additional new information with the prospect of its possible use in the future.

The use of electronic educational resources in teaching biology also provides a solution to educational problems. With the help of electronic educational resources, the effectiveness of assimilation of educational material in biology, the development and consolidation of vital skills and abilities is achieved:

1) the clarity and accessibility of the presentation of the most difficult topics and concepts is ensured, for example, familiarization with the external and internal processes occurring in the body of animals, it becomes possible to visually observe and track them (through the monitor); 2) specific methods of studying the structure and location of organs in animal organisms are organized; 3) the use of CD and DVD consoles with the display of short popular science films directly related to the habitat of animals, helps to form students' notions about the lifestyle of animals, their distribution area, animal species, interaction and relationship with nature; 4) the integration of electronic resources into the educational process contributes to the development of skills for independent acquisition of knowledge.

On the basis of the research results, a didactic model of the effective use of electronic educational resources and its implementation in the educational process was created.

The level of development of knowledge and skills of students within the framework of the studied topic depends on how the quality and quantity of visual aids corresponds to the requirements and objectives of teaching biology at a particular stage. Thanks to electronic resources, it is possible to present a color image of animals, their external and internal structure, functioning systems, a variety of species of the animal world, and more.

The prepared electronic educational resources were introduced into the educational process in biology in 7 grades of secondary schools. Particular attention was paid to the choice of topics in accordance with the SES, the program and the textbook, the use of resources was carried out taking into account the competence-based approach and focusing on international standards in assessing the quality of education. On the basis of the developed didactic model, a methodological system was created, aimed at increasing the efficiency of using electronic educational resources in biology.

When choosing the elements of the didactic system used in teaching technology, it is necessary to take into account the nature and orientation of the educational and cognitive activity of students. Practice shows that, as a rule, 7-8 minutes of a lesson is devoted to the theoretical part, followed by a discussion, work in small groups is organized in order to consolidate knowledge. In the first 7-8 minutes, the highest assimilation efficiency is observed, then the motivation for cognition weakens (over the next 15 minutes). It becomes necessary to keep the attention of students as long as possible.

It was noted above that the reasonable quality and quantity of visualization involved will help maintain the attention and cognitive activity of students at the level necessary for effective assimilation. These can be drawings of animals in color, diagrams of their external and internal structure, images of functioning systems, habitats and other visual materials.

Large sections of zoology were selected for the study: Protozoa, Mollusks, Worms, Amphibians, Reptiles, Mammals (by class) and electronic resources prepared in the form of animation with a dynamic effect in the Makromedia Flash program.

The main difference between this program and the main ones is that it includes a complex of materials in multimedia format on all topics of the section - about morphological and physiological processes in the body of animals, presented in a series of animations, videos, drawings, infographic information.

For independent study in the educational resource posted "Red Book" of Uzbekistan in PDF form. In biology lessons, additional material is interesting information about the classes of animals or individual animals in the block for biology lessons in grade 7 "The World of Amazing Animals". These materials can be consulted when organizing extracurricular activities in biology. The resources include photos of excursions and videos.

It should be admitted that the created program aimed at increasing the effectiveness of biology lessons is not without some shortcomings. Along with the widespread introduction of technological elements into the modern educational process, one should also remember about innovative methods of increasing the effectiveness of biological education.

As for extracurricular and extracurricular work in biology, its main content is the presentation of additional information about the morphological and anatomical structure of animals, the functioning of life support systems. Extracurricular activities are aimed at consolidating theoretical knowledge and practical skills and abilities.

In the process of extracurricular work, it is advisable to organize short-term observations of the development of animals at different stages of their life. For example, the breeding period (by observing the fish in the aquarium, or the moment the egg is opened and a canary chick or chick is "born", the development and growth of a kitten or puppy). Students can use living examples to

follow the behavior and development of animals in different periods, such observations will help form in schoolchildren a feeling of love for nature and a desire to protect and preserve the animal and plant world. Electronic educational resources are an effective means of innovative orientation, helping to enrich the theoretical knowledge and practical skills of 7th grade students, to form their research skills.

In order to prepare students for the international knowledge assessment system in educational institutions of the secondary education system, one should focus on the parameters of the PISA, TIMSS systems, where it is proposed to use a set of computerized test tasks in several academic subjects.

In this regard, there is a need to develop a didactic system for using computerized non-standard tests in biology in grade 7 for lessons, extracurricular and extracurricular activities. We have prepared blocks of test items on 10 topics from the section "Mammals". These are mainly self-assessment tests. Working with non-standard tests requires some explanation.

A program for editing tests in the process of computerizing non-standard tasks has also been created. When using them, teachers are advised to use an editor program. This creates the ability to update test material, enter new information, and change test questions as needed.

In the pedagogical literature, the thesis that the new quality of education is determined by the formation of new educational results is increasingly heard. In this context, the processes of modeling educational systems are of fundamental importance, since this makes it possible to take into account the maximum possible number of conditions that ensure the achievement of the planned results. One of such conditions, in our opinion, is the use of information and communication technologies.

We only note that the structure of the model is made up of four interrelated and interdependent blocks (target, organizational and content, diagnostic and effective and functional). Let us dwell in detail on the diagnostic-resultant component, since, in our opinion, it is of interest from a procedural point of view.

The selection of criteria and indicators of this component is due to the need to assess both the effectiveness of the activities of a general education institution and the quality of education of students.

The criteria were: the presence of mechanisms for identifying the educational needs of participants in the educational process in the organization of the educational process based on ICT, which is a toolkit for studying the social order for training using ICT on the part of the participants in the educational process;

- the formation of a set of conditions for achieving new educational results through ICT, associated with the degree of development of the telecommunications infrastructure, the ability to receive, transmit information and data through various channels;
- the formation of the system of advanced training of teachers and executives in the field of ICT, represented by elements that characterize the elaboration of a set of measures to study the needs of teachers in professional development in terms of mastering ICT and the possibilities of an educational institution for in-house advanced training;

- the development of the organizational mechanisms for the use of ICT tools in the educational process, characterized by the presence of an information (electronic) representation of the educational process management system and the information and educational environment, which makes it possible to judge
- the effectiveness of the management decisions taken;
- the availability of mechanisms for information and methodological support for the achievement of new educational results by students when using ICT in the educational process, allowing to assess the completeness and quality of the provision of information necessary for the implementation of interaction
- between different actors of the information society;
- the development of monitoring of the use of informatization means in an educational institution, ensuring the achievement of new educational results by students, which makes it possible to judge the degree of effectiveness of the use of informatization means and the variety of educational, teaching and methodological and other resources used;
- the effectiveness of the use of informatization means in the educational process for the achievement of new educational results by students, represented by the results of achieving subject, metasubject results through reliance on the educational environment, its subject aspects.

Each of the selected criteria has its own content, indicators that make it possible to judge the formation of the information and educational environment, focused on the achievement of new educational results.

The criterion characterizing the presence of mechanisms for identifying the educational needs of participants in the educational process in organizing the educational process based on ICT is represented by three indicators, namely:

the existence of regulations for studying the needs of participants in the educational process in training using ICT;

taking into account the results of surveys, questionnaires in the development program of an educational institution, in the content of a part of the curriculum formed by the participants of the educational process, the plan of extracurricular activities and other local regulations of the educational institution;

the presence of the practice of studying the level of satisfaction of participants in the educational process with the use of ICT when achieving new educational results.

It is possible to talk about the formation of a complex of conditions for achieving new educational results through ICT if an educational institution has.

It is obvious that the conditions we have identified contribute to the adequate selection and substantiation of criteria and indicators of the effectiveness of the functioning of the educational system in the aspect of students achieving new educational results through information and communication technologies. At the same time, within the framework of the model under consideration, the managerial activity of pedagogical workers of a general educational institution is associated with the creation of conditions conducive to the implementation of the requirements

for the results of mastering the basic educational programs of general education in the conditions of the functioning of the information and educational environment of the school.

LITERATURE:

1. Dzhuraev R.Kh., Garakhonova L.M. Media education as a factor in improving the quality of schoolchildren's learning / Education throughout life. Continuing education in the interests of sustainable development / Materials of the 11th international conference. 2013. Issue 11. Part 2.
2. R.Kh.Dzhuraev, L.M. Karakhanova. Model of the organization of research activities of 10th grade students in teaching physics and biology // International journal of discourse on Innovation, integration and education. Volume: 02 Issue: 01 | January 2021. –P. 296-300. <http://www.interscience.uz>
3. Karakhonova LM Continuity of computer-based learning in education (on the example of biological sciences) // Continuing education // -Tashkent, 2012. № 6. -B. 38-42.
4. Garakhonova L.M. Media information literacy and media education in lifelong education // Uzluksiz t'alim // -Toshkent. 2017. No. 5. –B. 52-58.



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EFFECTIVENESS OF INDEPENDENT WORK IN THE EDUCATIONAL PROCESS

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ABSTRACT

Organizing and directing independent work is a responsible and difficult task for every teacher. Fostering student activism and independence should be seen as a necessary part of the whole educational process. This is one of the most important tasks facing any teacher. Independent work serves as a tool that encourages students to acquire deep and solid knowledge, logical thinking, creative research, and self-assessment.

KEYWORDS: *Independent Work, Independent Education, Students, Education System, Independent Activity, Botany, Zoology, Human And Human Health, General Biology, Deep And Solid Knowledge Of The Student, To Train Young People In Practical Work In Agriculture, Medicine, Plant Growing And Animal Husbandry.*

INTRODUCTION

Organizing and managing students' independent learning processes is a responsible and complex pedagogical activity for every teacher. The formation of activity and independence is important in developing students' independent thinking. This is an important issue for every teacher.

When thinking about the formation of independence in students, it is necessary to pay attention to two interrelated aspects. First, to strengthen students' desire to learn; while the independent acquisition of knowledge consists of teaching to form one's own worldview, and the second consists of teaching one to apply the acquired knowledge in practical training and independent activity.

The demand of our society for modern schools is that they can solve scientific, social, industrial problems creatively, think critically, defend their views and beliefs, systematize their knowledge through independent study. It is the development of a person who is constantly replenishing and renewing his skills and is able to apply them in life.

The teacher should be a guiding star, showing students the methods of learning, guidance, which is the scientific organization of students' mental work, that is, setting the desired goal. acquisition, the ability to choose ways and means to achieve a goal, and the development of skills and abilities to allocate time correctly. In the formation of a well-rounded person, it is necessary to systematically start independent work, which should become a problem-solving activity with the help of special learning tasks - independent work.

In accordance with the requirements of the "National Program of Personnel Training" and the "Law on Education", the development of educational institutions of the republic is carried out on a large scale. Due to the main objectives of education, special attention is paid to the high level of development of all disciplines, including biology.

Organizing and directing independent work is a responsible and difficult task for every teacher. Fostering student activism and independence should be seen as a necessary part of the whole educational process. This is one of the most important tasks facing any teacher.

In the formation of students' independent learning and comprehension activities in the educational process, firstly, to teach students to acquire independent knowledge in order to develop independence in learning and comprehension activities, and secondly, to apply their knowledge independently in teaching and practice should be taught.

Independent work serves as a tool that encourages students to acquire deep and solid knowledge, logical thinking, creative research, self-assessment.

On the basis of biological science the levels of structure of life (cell, tissue, organ, organism, species, population, biocenosis, biosphere) are studied. Knowledge is given about the structure and life activities of living organisms, their changes in the process of individual and historical development, the need for rational use and protection of natural resources.

Together with pedagogical theorists, philosophers, psychologists, sociologists and physiologists, they theoretically substantiate this aspect of the problem in terms of the main personal qualities of the modern man, studying the main quality of modern development - initiative, independence, creative activity.

Theoretically, the study of the essence of independent work can develop independent learning: learning, practical and organizational-technical BP Esipov (60s) justified the role, place, tasks of independent work in the learning process. The one-way verbal teaching method remains ineffective in shaping students' knowledge, skills, and competencies. Students' independent activity grows due to changes in the purpose of education, knowledge, skills, focus on creativity, as well as the computerization of education.

In the process of in-depth study of the nature of living natural phenomena, the formation of students' scientific outlook, their ecological and hygienic education, behavior in nature, orientation of young people to agriculture, medicine, plant growing, It is planned to train them in practical work on animal care, as well as to prepare them for higher education.

Students are taught a wide range of general biological knowledge on the basis of teaching botany, zoology, human and human health, as well as various branches of general biology.

Independent work helps students to consolidate the knowledge and skills they have acquired in the classroom. It takes a lot of work and a lot of repetition. It develops students' ability to memorize knowledge for a long time and play an important role in using it when needed.

Students develop activism, initiative and creativity through independent work. Independent work develops students' ability to systematically complete tasks in various subjects, to complete the work begun, to do independent work consciously, to cultivate in students a desire to learn. Most importantly, they become accustomed to the right approach to learning, which is a student's duty.

Well-known educator KDUshinsky said: He is a slave. ” The teacher should act as an organizer in the classroom and in extracurricular activities, and skillfully use methods that ensure students' learning activities, especially independent work activities.

Independent work encourages students to apply their knowledge to life experiences. Develops a tendency to mental activity, cultivates a love of work. Independent learning requires an individual approach to students. Independent work develops students' psychological abilities - attention, memory, thinking. Wise qualities, such as perseverance in achieving one's goals, are nurtured and will not be forgotten for a long time, and knowledge will be of high quality. Therefore, in the pedagogical process, one of the most complex and urgent issues is the formation of conscious work, mental abilities, independent work skills of students.

In the process of preparing an independent lesson, the student develops the skills to perform the task in an orderly manner, to distinguish important aspects of the material being studied, to think about the content of the material, to relate to previous topics, to compare.

Tasks given to students for independent training should be meaningful, interesting, cultivate the quality of will of students (endurance, perseverance, completion of the work begun).

The teacher should not rush to help students in any case, teach them to overcome difficulties themselves. The task of the teacher in the organization of independent lessons should be to teach students to feel responsible, to have a conscious attitude to work.

At school, the student spends two and a half hours of his daily work on independent work in clubs, sports, newspapers, additional literature, news, the Internet, computers, e-mail, world events and current developments. learns and independently develops and acquires the necessary knowledge and skills in his chosen profession, specialty.

At the beginning of the year, teachers introduce students to an independent work plan and recommend that they complete it in the following ways:

- Independent study of the topic with the help of electronic textbooks;
- Presentations at scientific and practical conferences, seminars and events;
- work with the textbook, independent reading, study of materials on the subject;
- Writing abstracts, creative works;
- creation of exhibitions, booklets, tables, models, forms, models;
- preparation of drawings, diagrams, schemes;

- answering questions, exercises, solving problems and examples, checking the correctness of the answers;
- An interesting issue in the study of each subject, taking into account its characteristics - examples, the organization of all kinds of didactic games;
- written and oral control;
- Perform practical tasks, laboratory work;
- create interactive methods, crossword puzzles, rebuses and other interesting games;
- organization of targeted trips;
- Historical records (bibliography);
- Development of tests on topics (on at least 4-5 topics).

The student chooses to do independent work independently. The teacher, on the other hand, assists him with tips, guidelines, and instructions, and records the student's independent work assessments in the group journal as a current control during the consultation.

We recommend the following for the teacher's role in organizing and managing independent work:

- To teach students to work independently in theoretical and practical classes, extracurricular activities in special subjects;
- organization of independent work with a group of students or individually;
- Development of guidelines and handouts for independent work and assignments, assistance and advice to students;
- Monitoring and evaluation of independent work.

Karshi Pedagogical College has developed a schedule for independent work planning for teachers, and work is being done on the basis of this schedule.

Independent work planning schedule (In the amount of hours allocated according to the curriculum)

	Independent work topics	Form of execution	Contents (introduction, main part, conclusion), publications	Size (how many pages)	Deadline for receipt and completion of the assignment		Points for the work done
					Deadline for receipt of the assignment	Term of completion of the assignment	

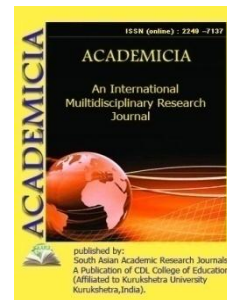
The best way to ensure that students are not indifferent to learning is to develop in them the skills to work independently from an early age, from the first day of school, to pursue independent work in the subjects taught in colleges and lyceums and to pursue their chosen profession. is to send.

Independence is one of the most important human qualities. Students develop the ability to apply the acquired quality knowledge and skills in life and practice. Today's quality knowledge is tomorrow's high efficiency.

In conclusion, when using modular educational technologies in biology lessons, students need to understand the instructions on the tasks to be performed, the organization of learning activities, independent learning, serves for quality performance of educational tasks, finding answers to questions, overcoming problematic situations, active participation in educational debates, questions and answers, discussions and mental attacks

LITERATURE:

1. O'zbekiston Respublikasi Prezidentining 2017 yil 7 fevraldagi "O'zbekiston Respublikasini yanada rivojlantirish bo'yicha Harakatlar strategiyasi to'g'risida"gi PF-4947-son Farmoni. O'zbekiston Respublikasi qonun hujjatlari to'plami, 2017 y., 6-son, 70-modda.
2. Ibodova M.N.. Biologiyadan o'quvchilarning muvaffaqiyatli ishlarini axborot resurslari vositasida takomillashtirish metodikasi (akademik litseylar misolida). Pedagogika fanlari bo'yicha falsafa doktori (PhD) dissertatsiyasi avtoreferati. –Toshkent. 2019. 52-bet.
3. Ibodova M.N. Virtual borliq texnologiyasining biologiya ta'limida qo'llash imkoniyatlari // Biologiya fani rivojlanishining zamonaviy tendensiyalari . Respublika ilmiy-amaliy anjumani materiali. – Toshkent, 2019. – B. 32–34.
4. Tolipova J.O., G'ofurov A.T. Biologiya o'qitish metodikasi. Oliy o'quv yurtlari uchun darslik.-T.: TDPU, 2012, - 226 b.
5. R.Kh.Dzhuraev, L.M. Karakhanova. Model of the organization of research activities of 10th grade students in teaching physics and biology // International journal of discourse on Innovation, integration and education. Volume: 02 Issue: 01 | January 2021. –P. 296-300. <http://www.interscience.uz>



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APPLICATION OF DEEP LEARNING IN FOOD

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ABSTRACT

With a significant number of successful examples in image processing, voice recognition, object identification, and other areas, deep learning has shown to be an advanced technique for big data analysis. It's also being used in food science and engineering recently. This is the first review in the food realm that we are aware of. We gave a short introduction to deep learning in this article, as well as comprehensive descriptions of the structure of several common deep neural network designs and training methods. We looked at hundreds of papers that utilized deep learning as a data analysis technique to address issues and difficulties in the food domain, such as food identification, calorie estimate, fruit, vegetable, meat, and aquatic product quality detection, food supply chain, and food contamination. Each study looked at the particular issues, datasets, preprocessing techniques, networks and frameworks utilized, performance obtained, and comparisons with other popular solutions. We also looked at the possibility of using deep learning as an enhanced data mining technique in food sensory and consumption studies. Deep learning surpasses other techniques such as manual feature extractors, traditional machine learning algorithms, and deep learning as a potential tool in food quality and safety inspection, according to the results of our study. Deep learning's promising achievements in classification

and regression issues will spur further study into using deep learning to the area of food in the future.

KEYWORDS: *Computer Vision, Deep Learning, Food Quality, Food Recognition, Spectroscopy.*

1. INTRODUCTION

Human health depends on a balanced diet natural goods have long been used as food, and they may be treated to suit customer demand. Types, compositions, nutrients, and processing methods of food (both natural and processed) are all important considerations for a balanced diet. It is true that people from various parts of the world eat in different ways. It is critical to understand food characteristics (types, compositions, nutrients, and processing methods, for example) in order to check food quality and safety for consumers all over the globe. The ability to determine food characteristics quickly, accurately, and automatically is a practical need in everyday living [1]. Food characteristics have been detected using modern methods such as electronic noses, computer vision, spectroscopy and spectral imaging, and so on. These methods can collect a significant quantity of digital data on food characteristics. The importance of data analysis in these methods is critical since the huge quantity of data contains a lot of redundant and unnecessary information. How to deal with such a huge quantity of data and extract valuable characteristics from it is a pressing and essential problem, as well as a difficulty when it comes to putting these methods into practice (APP).

To deal with the large amount of data, many data analysis methods have been developed, including partial least squares (PLS), artificial neural network (ANN), support vector machine (SVM), random forest (Bossard, Guillaumin, Principal component analysis (PCA), wavelet transform (WT) (Ma, 2017), independent component correlation algorithm (ICA), scale-invariant feature transform, and speedup Various techniques have shown to be very useful in dealing with these types of data [2]. Deep learning has been widely studied as an effective machine learning algorithm and is now attracting more attention from a variety of fields, including remote sensing, agriculture production, medical science, robotics, and healthcare (Miot Deep learning has shown substantial benefits in automatically learning data representations (even for multidomain feature extraction), transfer learning, handling huge amounts of data, and achieving improved performance and accuracy. In majority of the examined papers, convolutional neural networks (CNNs) and its derivative algorithms have been identified as important techniques for automatically learning deep characteristics of input digital material for future classification or regression tasks. CNN can effectively handle the vast quantity of data produced by food quality and safety assessment equipment (spectroscopy, electronic nose, digital cameras, and so on). CNN has been shown to be successful in picture analysis (two-dimensional data), and has since been extended to one-dimensional and three-dimensional data to handle more varied data formats [3].

Deep learning is now being used in the food industry to analyze RGB and spectra pictures of food. However, since comprehending and implementing deep learning is a tough task for academics and employees in the food sector, researchers are working on it. The goal of this study is to give a thorough review of recent research development in the APP of deep learning in the food sector, as well as to provide advice to researchers and employees in this field. A brief

overview of deep learning Machine learning has been used in a variety of areas as a useful tool for data processing. Traditional machine learning methods are typically complemented with a human feature extraction method due to the inability to evaluate raw natural data [4]. Machine learning capabilities may be enhanced by adding more sophisticated structures to accomplish deep data representation as hardware processing and storage capabilities improve. For detection, classification, or regression, a computer may use representation learning to extract features from raw data. Deep learning is a kind of representation-learning technique that uses a deep ANN comprised of many layers of neurons to improve multilayer representation (nonlinear modules).

Many difficult issues can be addressed quickly and effectively because to the deep learning method's high feature learning capabilities. Deep learning models show impressive skills in classification and regression problems when sufficient data support is given that accurately reflects the issue. Deep learning is beginning to be used in the area of food science, mostly for food category identification, fruit and vegetable quality detection, food calorie estimate, and so on, thanks to its great capacity of automated feature learning. In the section "Deep learning applications in food," we'll go over everything in depth. CNN, which consists of a number of components (convolutional layers, pooling layers, fully connected layers, and so on), is one of the most widely used machine intelligence models for large data analysis in a variety of fields. Figure 1 shows a typical CNN model design for classification tasks. Convolution operations are carried out by traversing input matrices using convolution kernels, which may be thought of as feature extraction filters [5]. Unlike filters used in traditional image processing methods, where the parameters must be manually specified, the parameters within the kernel may be learned automatically using deep learning. Convolutional layers are made up of a collection of convolution kernels, each of which has its own set of parameters (channels, kernel size, strides, padding, activation, and so on) that should be adjusted and optimized for the specific issue at hand. Pooling layers subsample the calculated output from the convolutional layer. High-level features representing the original input may be learned using a set of chained convolutional layers and pooling layers. The fully connected network (FNN) block, which is made up of completely connected neural units, is often employed as a classifier or to produce numerical output for regression problems that utilize the learnt feature map.

1.1 Application of Deep Learning In Food

Diets and eating habits may have an impact on human health. Diabetics, allergic individuals, and others, in particular, should keep a close eye on and manage their eating habits. Food categorization and identification are essential tasks that assist humans in keeping track of their regular meals. Food images are one of the most significant sources of information on the qualities of food. Furthermore, for food appearance analysis, image sensing is a very simple and low-cost information collection method. The vast differences in food form, volume, texture, color, and components make food identification a difficult job for natural goods like food and processed food. Food identification and categorization are also affected by the backdrop and arrangement of food items. Image analysis is now the most often utilized pattern in food identification and classification, because to the widespread usage of CNN. *Calorie Calculation for Food:* Dietary health has become more important as living conditions have improved. Many individuals are interested in keeping track of their daily diet in order to better regulate nutrient intake, reduce weight, manage diabetes or food allergies, and improve dietary habits in order to stay healthy [6]. One of the most worried indices is food calorie. Many smartphone APPs have

been created for tracking daily meals, which include not only item names but also calorie information created calories, a smartphone app that estimates food calories from pictures. The system's functioning may be broken down into five stages., the CNN models and training procedures for each component are detailed. To begin, a fine-tuned Google Net CNN model was used to determine whether or not the picture recorded was food. Second, to identify the meal, a fine-tuned Google Net architecture was used.

- *Vegetable Quality Detection:* Because vegetables are high in vital nutrients, they are an important component of a balanced diet. Vegetables are susceptible to pests, infections, mechanical damage, and other impacts during production, transit, storage, and sales, all of which decrease their economic worth and may harm customers' health. Used the SAE technique (2018). They created a classification method for cucumber flaw identification based on hyperspectral imaging that integrated the stacked sparse autoencoder with CNN. The size and color variety of cucumber surface imperfections complicates the identification technique based on the average spectrum of the whole sample. As a result, using a search window spanning the whole picture, a CNN model was initially utilized to filter out the defective areas based on the image in RGB channels. The mean spectra of the defected area were input into a stacked sparse autoencoder (SSAE) for deep feature representation and classification if the region within the search window was deemed to be defected. The mean spectra of the whole spectrum picture, on the other hand, were utilized. With 91.1 percent accuracy, the proposed CNN-SSAE model beat the single SSAE system, which used the mean spectra of the whole defective cucumber as the input.
- *Fruit Quality Detection:* Fruit, like vegetables, is an essential source of nutrition for humans. Fruit production and sales face the same issues as vegetable production and sales, such as pests, illness, bruises, and so on. Additionally, fruit is a high-value agricultural commodity. Fruit freshness, nutritional content, and safety assurance are additional factors to consider. Fruit and vegetable quality detection is a popular and difficult research topic right now. Deep learning combined with image processing or spectral sensing has been extensively utilized as an effective and nondestructive fruit quality detection technique to address issues including variety categorization, nutritional content prediction, illness, and damage detection in recent years. Rodriguez, Garcia, Pardo, Chavez, and Luque-Baena (2018) utilized deep learning technology to discriminate amongst plum types (Black Splendor, OwentT, and Angelino) at early maturity stages. To create the dataset, photographs of samples of various kinds and maturities were taken. The suggested approach split the pictures first to eliminate the undesirable backdrop, and then used CNN to classify the images based on the recorded images. As a CNN model, the Alex Net architecture was selected. In various gathered datasets, the categorization accuracy varies from 91 percent to 97 percent.
- *Meat and Aquatic Product Quality Detection:* For protein provision, aquatic items (such as fish, shrimp, and so on) and meat (such as pig, mutton, beef, and so on) have become significant parts of the human diet. Multiple chemical makers may be used to monitor food safety in the aquatic manufacturing process. For fast nondestructive quality detection of aquatic goods (for example, chemical characteristics of fish muscle prediction), spectral sensing and machine intelligence have been extensively utilized in recent years Data analysis techniques such as partial least squares regression (PLSR), SVM, LR, and others may be used to estimate quality, freshness, and nutritional content of samples using spectral data [7]. Deep

learning techniques have recently been brought into this field to replace conventional machine learning methods, thanks to adequate proof of excellent feature learning and data analysis capacity. A deep learning model for predicting shrimp freshness using visible/near-infrared hyperspectral data. The deep characteristics of the samples were generated using the SAE model, and logistic regression was used to identify the freshness grade of shrimp using the deep features acquired. For shrimp freshness grade categorization, the suggested approach yielded positive results (96.55 percent and 93.97 percent in calibration and prediction sets, respectively).

- *Contamination of Food:* Food may be contaminated with toxic and harmful chemicals as a result of the environment or human factors affecting food throughout any phase of planting or feeding, growth, harvesting or slaughtering, processing, storage, transportation, and sale, among others, before consumption. Food contamination may cause gastrointestinal infectious illnesses and damage to human health, and as a result, it is gaining worldwide attention. Song, Zheng, Xue, Sheng, and Zhao used DNN to develop an evolving approach for forecasting gastrointestinal infection morbidity caused by food contamination. The study was designed to predict the morbidity of gastrointestinal infectious diseases using a large amount of contaminant-related data (from 227 types of contaminants in various concentrations and 119 types of commonly consumed foods in the investigated region) collected in the previous week, as well as previously recorded morbidity data. The dataset's large data of contaminant indexes was given by food safety departments in the target area in central China, while the morbidity data was provided by gastrointestinal departments at hospitals in the corresponding studied region. To extract hidden features for contamination indices, a deep demisingauto encoder, which is a structure similar to SAE with several hidden layers, was built, and the recovered representation was utilized for supervised learning to predict morbidity. With a mean average percentage error of 21.16 percent and a success rate of 58.50 percent, the proposed ecogeography-based optimization (EBO)-based approach for the calibration of the DDAE model outperformed conventional ANN and deep demisingauto encoder trained by other methods. The authors came to the conclusion that the deep learning model has significant skills in dealing with partial and defective data. More possible contamination characteristics will need to be considered in the future [8].
- *Food categorization and recognition:* Diets and eating habits may have an impact on human health. Diabetics, allergic individuals, and others, in particular, should keep a close eye on and manage their eating habits. Food categorization and identification are essential tasks that assist humans in keeping track of their regular meals. Food images are one of the most significant sources of information on the qualities of food. Furthermore, for food appearance analysis, image sensing is a very simple and low-cost information collection method [9]. The vast differences in food form, volume, texture, color, and components make food identification a difficult job for natural goods like food and processed food. Food identification and categorization are also affected by the backdrop and arrangement of food items. Image analysis is now the most often utilized pattern in food identification and classification, because to the widespread usage of CNN.

2. DISCUSSION

Feature learning is the most important benefit of deep learning technology. Traditional machine learning methods deal with categorization problems based on hand-crafted features or utilize raw data as input. Deep learning techniques are more capable than conventional approaches in learning representational characteristics from a dataset during the training phase. Another feature of deep learning is the capacity to transmit knowledge. We discovered that the majority of the studies mentioned in the section "Food recognition and classification" used pertained CNN models based on large datasets (such as ImageNet) and fine-tuned the models on their target datasets, which could reduce the difficulty and time required to train a model (even if the dataset was much smaller). Furthermore, several authors used CNN features to train another classifier, such as SVM, in order to transfer information from the CNN model to the new classifier [10]. Deep learning technology, unlike traditional data analysis techniques, requires a more sophisticated model structure and computing effort, which has previously restricted its development and use. Many tools have developed to assist researchers get a fast start making a deep learning-based APP, owing to the worldwide focus on deep learning and the contributions of scientists. It seems that programming is tough.

Complicated neural network models, but we can rapidly construct the necessary network with the assistance of these existing frameworks. Model by calling several duplicate network structures and stacking them on top of each other encapsulated function interfaces encapsulated function interfaces. In terms of hardware, a graphics processing unit (GPU) in conjunction with a Compute Unified Device. The NVIDIA CUDA Deep Learning Toolkit and the NVIDIA CUDA Architecture Toolkit may offer. Deep learning computations may be accelerated using both hardware and software. These toolkits help popular deep learning frameworks run faster. as already stated Acceleration software and hardware are very useful. Reduce computation time and have the ability to fulfill deadlines real-time data processing needs. However, there is no denying that deep learning has flaws. Due to a lengthy training period and hardware limitations, Added to that, there's a lot of complexity and a lot of hyper parameters. The optimization efforts for the model would be very difficult. As well as time-consuming. GPUs for computer acceleration, as well as corresponding CPUs and other gear, are extremely costly. It will take considerably longer to train a DNN using just this method. The computing hardware is comprised of CPUs. In addition, deep learning

For training, large data is required, as is the collection of dependable big data. Another tough issue is the dataset. Data gathering and annotation will consume a significant amount of time and effort. a few public datasets for. The results of academic study and a challenge competition were gathered and analyzed. Experts or volunteers may hand-label items, or they may be directly labeled. Machines would download data from the Internet; as a result, there would be some errors are unavoidable. It should also be mentioned that the only the dataset's features can be understood by a trained network. Used as a training tool Incomplete datasets are described in certain published datasets.

3. CONCLUSION

We looked at a huge number of recent papers for this study. linked to the deep learning in food APP, detailed description of the. DNNs were used to process food picture, spectrum, text, and other data. The suggested structure, training techniques, and final evaluation result of DNNs

were used to process food image, spectrum, text, and other data. Information in each of the articles examined When it comes to performance, we compared deep learning to other widely used techniques and found that in the research we looked at, the deep learning method outperformed the others. We came to a conclusion. The benefits and drawbacks of deep learning techniques a thorough examination of the issues and prospects for the future in the field of food deep learning It is, to the best of the writers' knowledge, The first study of deep learning applications in the food industry. The goal of this review is to motivate scholars and professionals in the field. This area to conduct additional food-related studies using deep learning techniques, to offer accurate answers to classification or regression issues and to put them into operation for the benefit of the food industry. Inspection of the quality and safety of food for human consumption. Finally, we've arrived.

- The use of deep learning and multisource data fusion, including RGB pictures, spectra, smell, taste, and other sensory data
- The development of full-automatic information, and so on, would be examined to create a more complete evaluation of food. Acquisition equipment/systems for food with a steady signal output. Appropriate venues for exchanging global food data should be investigated in the. future, since food-related big data is currently difficult to get by.

As a result of the use of automated or even manual data management and sharing technologies that aren't comprehensive

- the data science potential of deep learning technologies. Food-related sectors that are seldom investigated, such as mining, may be assessed. Sensory and consumption of food, food supply chain, and so forth, and
- Successful deep learning instances, such as in the food industry (for example, in the food industry).Picture recognition, a recipe suggestion app with intelligence, andfruit quality assessment system) may be converted into products that are useful.

REFERENCES

1. Percik, R., and M. Stumvoll. "Obesity and cancer." *Experimental and clinical endocrinology & diabetes* 117.10 (2009): 563.
2. D. Craig, et al. "The Okinawan diet: health implications of a low-calorie, nutrient-dense, antioxidant-rich dietary pattern low in glycemic load." *Journal of the American College of Nutrition* 28.sup4 (2009): 500S-516S.
3. Ford ES, Giles WH, Dietz WH: Prevalence of the metabolic syndrome among US adults: findings from the third National Health and Nutrition Examination Survey. *JAMA* 287:356–359, 2002.
4. risaPouladzadeh, PallaviKuhad, Sri Vijay Bharat Peddi, AbdulsalamYassine, ShervinShirmohammadi "Mobile Cloud Based Food Calorie Measurement" The 4th International IEEE Workshop on Multimedia Services and Technologies for EHealth (MUST-EH), ICME, China, July 2014.
5. N. Ryu, Y. Kawahawa, and T. Asami, "A Calorie Count Application for a Mobile Phone Based on METS Value," *Sensor, Mesh and Ad Hoc Communications and Networks*, 2008.

6. E. Thammasat, "The statistical recognition of walking, jogging, and running using smartphone accelerometers," in Biomedical Engineering International Conference (BMEiCON), 2013 6th, 2013, pp. 1–4.
7. Yue Y, Jia W, Sun M. Measurement of food volume based on single 2-D image without conventional camera calibration. Proceedings of IEEE 34th Annual Conference on Engineering in Medicine and Biology; 28 August–1 September; San Diego, CA. 2012. pp. 2166–2169.
8. Krizhevsky, A., Sutskever, I., and Hinton, G. on "ImageNet classification with deep convolutional neural networks." in NIPS'2012.
9. N. Srivastava and R. Salakhutdinov, "Multimodal Learning with Deep Boltzmann Machines", Proc. Neural Information and Processing System, 2012.
10. Ranzato, M., Monga, R., Mao, M., Yang, K., Le, Q.V., Nguyen, P., Senior, A., Vanhoucke V., Dean J. and Hinton, G.E., "On Rectified Linear Units for Speech Processing", in ICASSP, 2013.



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MATERIALS, MODELS, AND APPLICATIONS OF THERMOELECTRIC COOLING

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ABSTRACT

This paper examines current developments in thermoelectric materials, modeling techniques, and applications. Thermoelectric cooling systems offer a number of benefits over traditional cooling technologies. There are no mechanical moving components, no working fluid, and the device is small, light, and reliable. Direct current is used, and the cooling and heating modes may be switched simply. In this research. The history of thermoelectric cooling has been briefly discussed initially. The development of thermoelectric materials was then discussed, as well as the accomplishments of the previous decade. Summarized. Modeling methods have been used to enhance the performance of thermoelectric cooling systems. Both thermo element modeling and thermoelectric cooler (TEC) modeling have been reported. includes one-dimensional and three-dimensional versions of the classic simple energy equilibrium model numerical compact model, and models. Thermoelectric cooling applications have now been completed. Household refrigeration, electronic cooling, scientific application, and automobiles were all examined. With summaries for commercially available thermoelectric modules and thermoelectric refrigerators, air conditioning and seat temperature control are covered. This research is anticipated to be helpful to Design, modeling, and analysis of thermoelectric cooling systems.

KEYWORDS: *Thermoelectric cooling Thermoelectric Material Modeling Application.*

1. INTRODUCTION

Thermoelectric cooling, also known as cooling technology using thermoelectric coolers (TECs), offers many benefits, including high dependability, the absence of mechanical moving parts, small size and weight, and the absence of a working fluid. It also has the benefit of being able to be powered by direct current (DC) electric sources such as photovoltaic (PV) cells, fuel cells, and automobile DC electric sources. The major drawbacks of thermoelectric cooling are its high cost and poor energy efficiency, which has limited its use to situations where energy availability, system dependability, and a quiet operating environment are more essential than system cost and energy efficiency. Though the thermoelectric cooling effect was discovered in the nineteenth century, it was not widely used until the 1950s, when the fundamental physics of thermoelectric materials was well established [1].

A thermoelectric module is a solid-state energy converter made up of a group of thermocouples connected electrically and thermally in series. When a voltage in the proper direction is supplied via the linked junction, a thermocouple is made up of two distinct semiconducting thermo elements that produce a thermoelectric cooling effect (PeltiereSeebeck effect). In order to improve heat transmission and system performance, thermoelectric modules often include two heat sinks connected to their hot and cold sides. Thermoelectric cooling is progressively becoming more integrated into people's everyday lives, in addition to its military, aeronautical, industrial, and scientific uses [2]. Thermoelectric cooling equipment, such as PC processors, portable food and beverage storage, temperature-control vehicle seats, and even thermoelectric air conditioners, are extensively utilized for electrical cooling. The scientific community has invested a significant amount of time and attention into thermoelectric cooling research. Modeling and analysis of thermoelectric modules, solar-based thermoelectric technologies, cooling, heating, producing electricity, and waste heat recovery are all excellent review articles on thermoelectric technology and uses. In 2004, Riffat and Ma published a review on COP improvement in thermoelectric cooling systems. Recent research suggests two possible paths to significant progress in thermoelectric cooling: 1) improving the intrinsic efficiencies of thermoelectric materials, and 2) improving the thermal design and optimization of thermoelectric cooling systems using currently available thermoelectric modules. The emphasis of this study is on the evolution of thermoelectric cooling over the last decade, with a focus on advancements in materials, modeling and optimization methods, and applications.

A good thermoelectric material should have a high Seebeck coefficient, high electrical conductivity (or high power factor), and low thermal conductivity, as indicated by the main criteria of merit $ZT = \frac{S^2 \sigma}{\kappa}$ at T/k . However, since these three factors are linked, researchers must use the Wiedemann-Franz rule. S Seebeck coefficient, V/K α ratio of Thomson heat to thermal conduction DT temperature differential between hot and cool sides, K emissivity, ZT dimensionless figure-of-merit Greek symbol electrical resistivity, ρ U m r density, kg/m^3 g combination heat transfer coefficient of radiation and convection in Eq. (8) $W/m^2 K$ α ratio of Joule heating to thermal conduction) s electrical conductivity, S/m σ $5.67 \times 10^{-8} W/m^2 K^4$ s Thomson coefficient, V/K ϕ electric scalar potential, k_B Boltzmann constant n n -type thermo element p constant pressure p p -type thermo element N ambient c cold side κ conduction e thermo element h hot side m mean/average \max maximum n n -type thermo element p constant

pressure p p-type thermo element N ambient Temperature value independent of the overheat obtain the best ZT , adjust these conflicting settings. To some degree, the ability to decrease material thermal conductivity, particularly lattice thermal conductivity, is essential for thermoelectric material performance optimization. Bulk alloy materials such as Bi_2Te_3 , PbTe , SiGe , and CoSb_3 are common thermoelectric materials, with Bi_2Te_3 being the most prevalent. A ZT value of less than one is typically processed. Increases in ZT were moderate from the 1960s through the 1990s. Theoretical predictions after the mid-1990s indicated that nanostructure engineering might significantly improve thermoelectric material efficiency.

Meanwhile, traditional bulk materials incorporating nanostructured constituents have been investigated and shown to reach excellent efficiency, thanks to current synthesis and characterisation methods. As a result, improvements in the ZT factor have come from two main methods in recent years: 1) bulk samples including nanoscale constituents, and 2) nanoscale materials themselves. Researchers have discovered that excellent thermoelectric materials are the so-called "phonon-glass electron-crystal (PGEC)" materials [3], in which high mobility electrons are free to transfer charge and heat but the phonons are disturbed at the atomic scale from transporting heat. Skutterudites, clathrates, and half-Heusler alloys are some of the most common bulk thermoelectric materials, and they're all made via doping. Low-dimensional materials, such as 2D quantum wells, 1D quantum wires, and 0D quantum dots, process the electron charge carriers' quantum confinement effect, potentially increasing the Seebeck coefficient and therefore the power factor. Furthermore, the many surfaces created will scatter phonons more efficiently than electrons, resulting in a reduction in thermal conductivity that is greater than the reduction in electrical conductivity. Recently shown a liquid-like behavior of copper ions surrounding a crystalline sub lattice of Se in Cu_2xSe , resulting in a lattice thermal conductivity that is inherently extremely low, allowing for high ZT in this basic semiconductor. The findings point to a new approach and direction for high-efficiency "phononliquid electron-crystal" thermoelectric materials, which involves investigating systems in which a crystalline sub lattice for electronic conduction is surrounded by liquid-like ions. ZT values of about 1.0 are presently seen in the finest commercial thermoelectric materials. According to Harman in 2005, the maximum ZT value in research is about 3. Table 1 shows that other best-reported thermoelectric materials have figure-of-merit values of 1.2×10^{-2} at temperatures between 600 and 800 K. Thermoelectric coolers with a ZT value of 1.0 are predicted to function at just 10% of Carnot efficiency. A device with a ZT value of 4 may achieve 30 percent Carnot efficiency (equivalent to home refrigeration). However, raising ZT to 4 has proven to be a difficult task. Bell has said that if the average ZT approaches 2, thermoelectric material-based residential and commercial solid-state heating, ventilation, and aircooling systems would be feasible [4].

2. DISCUSSION:

2.1. APPLICATION:

Three-dimensional modeling captures temperature distribution along and across the thermo element, resulting in higher performance than one-dimensional modeling. More computing work, on the other hand, is needed. Simply extending to three dimensions yields the governing equation for three-dimensional modeling. Thermoelectric material characteristics are sometimes regarded as constants to minimize computational costs. constructed a transient three-dimensional constant property model for a single thermocouple (two thermo elements) with mesh grid 3146, and found that the numerical and experimental results were in close agreement. A generic three-

dimensional temperature-dependent property thermo element model with temperature and electric potential field coupling was described by Temperature-dependent properties and heat losses to the environment have substantial impacts on cooling capacity and COP, according to the findings. Unstable nonlinear second-order partial differential equations must typically be solved in one-dimensional and three-dimensional models. Numerical techniques are widely used in research, and numerical analysis software tools including MATHEMATICA, COMSOL Metaphysics, and ANSYS have been used. Many studies have utilized and verified the simplified energy equilibrium model, which has a similar structure to, where a , R , and K are the Seebeck coefficient, electrical resistance, and thermal conductance of the thermoelectric module, respectively. Module cooling power output and COP may be estimated using this model after these temperature independent module characteristics are known. The producer of commercially accessible thermoelectric modules, on the other hand, may not disclose material specifications[5] for the thermoelectric module. Palacios et al. [50] developed an analytical method for extracting internal parameters from performance curves. Chen and Snyder also derived the following equations to get the thermo element Seebeck coefficient a , electrical resistivity r , and thermal conductivity k using operating parameters Q_{max} , DT_{max} , and $IMAX$. age 14 $Q_{max}Th DT_{max} NT^2 h I_{max}$ Thermoelectric modules a , R , and K are then computed using Esq. from the material's electrical resistivity and thermal conductivity. The second method to get thermoelectric module cooling capacity (Q_c) and electrical power input (P) is to utilize thermo element cooling capacity (q_c) and thermo element electrical power input and multiply with thermo element numbers. Because a thermoelectric cooler comprises of thermo elements, it is acceptable to numerically model each thermo element in a thermoelectric cooler for thermoelectric cooler modeling. Chen et al. published a three-dimensional numerical analysis for a small thermoelectric cooler with 8, 20, and 40 thermocouple pairs. Thermal and electrical conductivity were maintained constant whereas the Seebeck coefficient was regarded as temperature dependent. When thermocouples within a module are scaled down, the cooling power and COP of the module increase significantly, according to the forecast. However, since the mesh grids for simulating each p-type and n-type thermo element must be very tiny, this method is both computationally costly and complex. Additionally, thermal and electrical contact resistance will complicate the modeling procedure modeling the thermoelectric cooler as a single bulk is considerably simpler than modeling each thermo element separately [6].

2.2. ADVANTAGE:

Electronic equipment, such as PC CPUs, produce a significant quantity of heat during operation, posing a significant thermal management issue since electronic devices must operate at a consistent temperature. For reliable operation, the maximum electronic device junction temperature should be kept below 85 C in most instances [42,77]. A high-performance electronic package's maximal heat flow may be about 200 W, and it's still rising. Passive cooling technologies, such as the micro-channel sink, that use air or water as the working fluid cannot completely satisfy the heat dissipation requirement, and active cooling techniques must be used. Conventional bulk cooling systems are excessively large due to the restricted installation area in electronic packaging. Because of their compact size, excellent dependability, and lack of noise, thermoelectric coolers coupled with air or liquid cooling methods on the hot side have a lot of promise. Phelan et al. examined existing and prospective tiny refrigeration cooling methods for high-power microelectronics, concluding that only thermoelectric coolers are commercially

accessible in small sizes at this time. The thermal resistance between the cooler and the ambient air has a considerably greater impact on the thermoelectric cooler's performance than the thermal resistance between the chip and the cooler. Naphon and Wiriyaart tested liquid cooling in a mini-rectangular fin heat sink with and without a thermoelectric cooler for the CPU and discovered that the thermoelectric cooler had a significant impact. Thermoelectric coolers work better at lower thermal loads, such as 20 W, when coupled with an air cooling device for the hot side. Instead, a thermoelectric air cooling device may not be as effective as an air cooling heat sink for a high thermal load. Thermoelectric coolers, when used in conjunction with a water cooling system in electronic equipment, often operate better at a greater thermal load, such as 57 W. Chein and Huang investigated the use of thermoelectric coolers in electronic cooling for both air and liquid cooling methods in a theoretical study. In their research, the greatest cooling capacity was found to be 207 W. Nan fluids have showed promise for liquid cooling since they are a superior alternative to water and can improve cooling power output. R134a is presently used as a refrigerant in the majority of vehicle air conditioning systems. R-134a does not deplete the ozone layer, however it does contribute to global warming. The refrigerant leakage issue in cars is far worse than in stationary air conditioners. Compact size, no moving parts or working fluid, compatibility with vehicle electrical system voltage, and ease of switching between heating and cooling modes are all benefits of thermoelectric coolers. As a result, thermoelectric coolers seem to be particularly well suited to automobile applications. Yang and Stabler provided a review of thermoelectric materials in automotive applications. A new thermoelectric air-conditioner for a truck cab was proposed by Luo et al. The cooling system's COP was found to be 0.4e0.8 at temperatures ranging from 46 to 30 degrees Celsius. They also discovered that by improving system design and manufacturing technique, cooling performance may be enhanced much further. Researchers used a thermoelectric device to regulate the temperature of the vehicle seat in addition to the air conditioning system. Hyeung-Sik et al. Created a temperature-controlled carseat system that uses a thermoelectric device to cool or heat the vehicle. Experiments were used to verify the device's performance, which was built using a one-chip microcontroller. The Climate Control Seat (CCS), created by Gentherm (formerly Amerigon), is a thermoelectric device that provides thermal comfort to automobile and truck drivers. The automobile sector has already created a significant cooling device market for thermoelectric cooling devices, which will continue to grow in the next decades [7].

2.3. WORKING:

Using fine mesh and coarse mesh in various areas, these so-called compact models can solve the multistage problem. For thermoelectric coolers, Chen and Snyder devised a compact modeling method. It is shown that a significant amount of grid has been reduced and computational speed is about 100 times faster, with results almost as accurate as the physical model (numerical study includes all coupled thermoelectric as well as components that provide losses and other parasitic effects). Techniques for enhancing the cooling system's efficiency When designing a thermoelectric cooling system, one must consider both the system cooling power output and cooling COP, as well as the performance of the thermoelectric modules and the heat sink design. As a result, designing a thermoelectric cooling system involves a trade-off between cooling capacity and COP. There are three ways for improving the performance of thermoelectric cooling systems. The first is through the design and optimization of thermoelectric modules, such as thermo element length, number of thermocouples, thermo element length to cross-

sectional area ratio slenderness ratio, and thermo element with non-constant cross section area. The second approach relates to cooling system thermal design and optimization, which includes investigations of heat sink geometry, allocation of the heat transfer area and heat transfer coefficients of hot and cold side heat sinks, thermal and electrical contact resistances and interface layer analysis, and more effective heat sinks with the operating state of the thermoelectric cooling system heat sink coolant, and coolant mass flow.

A number of system optimization techniques have been used. Optimized thermo element physical parameters (length, cross-sectional area, and number of thermo elements) using evolutionary algorithms. Limekiln and Yaakov proposed a graphical method to the design of thermoelectric cooling systems that was user-friendly and intuitive. The temperature entropy analysis was given by Chakra borty et al. to show the cooling cycle of a thermo element. Instead of the widely used iterative method, Zhang proposed a generic simple approach for optimizing thermoelectric coolers. Several writers have used the dimensional less analysis approach, which has the benefit of lowering optimal design parameters. The dimensionless entropy production number based on thermal conductance was developed by Wang et al. to assess the external irreversibility in the thermoelectric cooling system, which takes into account both the first and second laws of thermodynamics. Lee created new dimensionless groups to express key thermoelectric device characteristics including the thermal conduction ratio, convection conduction ratio, and load resistance ratio. Summaries may be inferred as follows based on the research papers mentioned in this section: Many thermoelectric cooling applications, such as electronic device cooling and air conditioning, may be satisfied by the simplified energy equilibrium model for thermoelectric cooler. To better capture the system performance when thermoelectric modules are used with time-varying temperature distribution and cooling power output, 1D or 3D transient modeling is required [8].

For simplicity, thermoelectric thermo physical characteristics are often considered as independent of temperature in 3D models. Although the Seebeck coefficient, electrical conductivity, and thermal conductivity of p-type and n-type thermo elements vary in one thermoelectric module, these differences are insignificant in numerical studies. As a result, in the simulation, only one set of Seebeck coefficient, electrical, and thermal conductivity will be utilized. It's difficult and time-consuming to model temperature change in all thermo element to capture module performance. When modeling a system with heat sinks on both the hot and cold sides, an energy equilibrium model or compact model may be used to simplify the numerical research process. The temperature-dependent Seebeck coefficient is associated with the Thomson effect. The positive Thomson coefficient increases thermoelectric cooling performance by 57%, while the negative Thomson coefficient decreases cooling performance. The Thomson effect, on the other hand, is typically modest and insignificant in commercially available thermoelectric coolers. Snyder et al. proposed the 'Thomson cooler,' predicting that with comparable ZT, a greater hot/cold side temperature differential than the conventional Peltier cooler could be obtained. Both COP and cooling capacity are affected by thermo element length, and this effect becomes stronger as the length of the thermo element decreases [9].

3. CONCLUSION

This paper examines the evolution of thermoelectric cooling over the last decade in terms of material advancements, modeling methods, and applications. Nanotechnology allows for a substantial improvement in ZT factor thanks to advancements in thermoelectric materials. Bulk

samples comprising nanoscale constituents and low-dimensional materials are the two main methods. New thermoelectric materials with higher ZT factor values may lead to breakthroughs in a variety of thermoelectric device applications. In this study, several thermoelectric modeling methods have been summarized. Implicated models save time and effort while sacrificing some modeling accuracy. Model selection is heavily influenced by the modeling objective. Thermoelectric cooling device performance may be improved in three ways: 1) via thermoelectric module design and optimization, 2) through cooling system thermal design and optimization, and 3) by improving the operating state of the thermoelectric cooling system. Domestic refrigeration, electronic cooling, scientific uses, and automotive applications are among the most common thermoelectric cooling applications. Thermoelectric home air conditioning systems are being developed by researchers in the hopes of competing with their vapor-compression equivalents. The performance of thermoelectric and conventional vapor compression air conditioners was compared by Riffat and Quid. The real COPs of vapor compression and thermoelectric air conditioners are in the range of 2.6e3.0 and 0.38e0.45, respectively, according to the findings.

Thermoelectric air conditioners, on the other hand, offer a number of advantages over their vapor-compression equivalents. They may, for example, be constructed into a planar construction that can be readily handled on walls and provide a quiet operating environment, making them ideal for home usage. An experimental and computational analysis of a thermoelectric air-cooling and air-heating system was reported by Cosnier et al. [47]. By providing an electrical intensity of 4 A and maintaining a 5 C temperature differential between the hot and cold sides, they were able to achieve a cooling power of 50 W per module with a COP of 1.5 to 2. Cheng et al. [104] developed a solar-powered thermoelectric generator. The temperature differential between the interior and exterior of the refrigerators is measured in degrees Fahrenheit (DT). Applied Thermal Engineering 66 (D. Zhao, G. Tan) (2014) 15e24. For green building applications, a 21 cooling module with a waste heat regeneration unit is available. The technology is capable of producing a temperature differential of 16.2 degrees Celsius between the ambient environment and the model home, according to the results. The thermoelectric device cooling COP, on the other hand, is modest, ranging from 0.2 to 1.2 in this research [10]. Thermoelectric cooling systems for small-scale space conditioning applications in buildings were explored. Under the input electrical current of 4.8 A, a thermoelectric cooling unit was constructed and produced up to 220 W cooling capacity with a maximum COP of 0.46 for each modul. Thermoelectric cooling applications, on the other hand, are not restricted to these fields. When high-quality thermoelectric materials are produced and thermoelectric cooling devices approach greater performance efficiency, more applications emerge.

REFERENCES

1. D. Zhao And G. Tan, "A Review Of Thermoelectric Cooling: Materials, Modeling And Applications," *Applied Thermal Engineering*. 2014.
2. Z. Liu, L. Zhang, G. Gong, H. Li, And G. Tang, "Review Of Solar Thermoelectric Cooling Technologies For Use In Zero Energy Buildings," *Energy Build.*, 2015.
3. A. Kane, V. Verma, And B. Singh, "Optimization Of Thermoelectric Cooling Technology For An Active Cooling Of Photovoltaic Panel," *Renewable And Sustainable Energy Reviews*. 2017.

4. R. Weerasinghe And T. Hughes, "Numerical And Experimental Investigation Of Thermoelectric Cooling In Down-Hole Measuring Tools; A Case Study," *Case Stud. Therm. Eng.*, 2017.
5. S. B. Riffat And X. Ma, "Improving The Coefficient Of Performance Of Thermoelectric Cooling Systems: A Review," *Int. J. Energy Res.*, 2004.
6. J. Skovajsa And M. Zalesak, "The Use Of The Photovoltaic System In Combination With A Thermal Energy Storage For Heating And Thermoelectric Cooling," *Appl. Sci.*, 2018.
7. G. Tan And D. Zhao, "Study Of A Thermoelectric Space Cooling System Integrated With Phase Change Material," *Appl. Therm. Eng.*, 2015.
8. Y. W. Chang, C. C. Chang, M. T. Ke, And S. L. Chen, "Thermoelectric Air-Cooling Module For Electronic Devices," *Appl. Therm. Eng.*, 2009.
9. D. Enescu And F. Spertino, "Applications Of Hybrid Photovoltaic Modules With Thermoelectric Cooling," In *Energy Procedia*, 2017.
10. L. Nulhakim, "Uji Unjuk Kerja Pendingin Ruangan Berbasis Thermoelectric Cooling," *Simetris J. Tek. Mesin, Elektro dan Ilmu Komput.*, 2017.



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SEMANTIC STRUCTURE OF PROVERBS

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ABSTRACT

The proverbs are historical features of humanity. Most of the scientists agreed that the proverbs are folklore speech. Yes, of course, because the people established these proverbs. Where was not only the person's point of view but also general people's outlook is expressed. Proverbs and sayings play important role in language. They give emotionality, expressiveness to the speech.

KEYWORDS: *Linguistic Features, Sayings, Pragmatics, Concept, Morphosyntactic Constructions.*

INTRODUCTION

Proverbs have certain pure linguistic features that must always be taken into account in order to distinguish them from ordinary sentences. As **learning process**, transfer supports the learner's selection and remodeling of input structures as he progresses in the development of his interlanguage knowledge. As **production process**, transfer is involved in the learner's retrieval of this knowledge and in his efforts to bridge linguistically those gaps in his knowledge which cannot be side-stepped by avoidance [2, 22].

Proverbs are morphosyntactic constructions of different kinds, structures and functions, with their unique grammatical peculiarities. Translator ought to know the rules of translation, furthermore the history, slang, life, customs and traditions of the people. Especially in proverbs, we can mention the semantic, syntactic, lexical and grammatical features. As we know, the proverb is a brief saying that presents a truth or some bit of useful wisdom. It is usually based on common sense or practical experience. Because we can say the proverbs from our own life, from difficulties.

Proverbs and sayings include some certain features of historical development and the culture of people. With learning of national proverbs, we can have information about this or that people habits, traditions, culture its status in society.

As a rule proverbs also have semantic, syntactic, grammatical categories. The semantic sphere of proverbs is very wide and we cannot limit them. The proverbs describe the every branch of people's life: the economical, psychological, cultural and etc. The fact is that proverbs and sayings are similar in meaning in spite of their diversity in form and language. To prove they said above some examples:

A bird in hand is worth two in the bush.

Un tiens vaut mieux que deux tu'auras.

Un chien vivant vaut mieux qu'un lion mort.

Лучшие синицы в руках, чем журавль в небе.

Nasiya saryog'dan, naqd o'pka yaxshi.

Even if the form, the word structure and the stylistic structure of these proverbs are different they have the same meaning. The proverbs change their meaning and form very rare, they have long living features. The spreading of any proverb among people is implemented as slow as it is created. Proverbs are retest by geographic area which is going to admit it only after that the proverb can become its property. Many scholars tried to do the researches to show the differences between proverbs and sayings in order to point out their border of limit. One of the outstanding Russian scholars the author of "Dictionary of vivid Russian language" and "The proverbs of Russian nation" V.I. Dalwrote: "Saying is the bud and proverb is the fruit" [1, 183]. So from this point of view we can see that proverbs express the full finite meaning and saying is a phrase which expresses the figurative meaning. The sayings are considered to be the half part of the proverbs.

Proverbs and sayings are separate genres, which are different from each other. The meaning and explanation of these terms in Turkish language show that the semantically their meanings are various and this fact confirms our above given ideas. For example in the dictionary, "O'zbektiliningizohlilug'ati" there are given two meanings. The first meaning is that, it does not express complete meaning and it is emphatic phrase and wise words. This explanation can express the folk saying. Another meaning refers to Arab word "masal" that (in English means fable) was changed phonetically. The explanation can be used for emphatic phrase and incomplete meanings that is sayings [4].

There differences between proverbs and sayings:

- when there is tow logical counters became complete composition the brief summarizing thought appeared. That explains the lack of spare word or description.
- to express the idea straightly and logically proverbs are characterized by their features. Every proverb values or appreciates any event both positively and negatively. Such kind of features serves to make the proverbs popular among people.
- Proverbs express wise and complete idea and sayings express the description of something but do not give complete meanings. They consist of one compositional composition.
- Proverbs can be used in neutral figurative meaning. These features of proverbs widen the sphere of their usage thematically. That's why proverbs are famous among different nations and people. Sayings are characterized by limited usage in one or two nations who are near to each

other geographically and in non related languages. For example in Russian «заморить человека» means to eat something has no equivalent or component in Uzbek or English languages and translated by analogy. The same way of translation is used while translating such sayings as “qovuntushurmoq” and etc.

- The sayings are the means of devices or pointing in speech the function of proverbs is to prove any event or situation.

We know that proverbs also have some functions in phraseology. Proverbs do not function as mere optical phrase mongering. As a rule, they are used for some practical, pragmatically purposes in various circumstances of everyday communication. With the aid of a proverb on poetic adornments of speech; neither are they used, normally, to meet man's needs for philosophy can aim to provide an endorsement to his statements and opinions, forecast something, express doubts, reproach someone with something, accuse someone of something, justify or excuse somebody, mock somebody, comfort somebody, jeer at somebody's misfortune, repent something, warn against something, advise something or interdict somebody from doing something, and so on, and so forth. It is unthinkable to consider the proverb apart from such pragmatic functions.

Unfortunately, paremiologists have so far only some vague ideas of the functions of proverbs. Moreover, the proverb lies just somewhere on the borderlands between language and folklore, and shares its functions with both of them, and one cannot say there is a notable agreement between the conceptions of different authors on the functions of language or folklore, neither is there a notable unity in the terminology used by different authors who have written on these matters. We accept here a simpler and widespread scale, namely the set of three degrees:

Statement→evaluation→prescription

We suppose, however, this scale should fit in with the nature of the proverb, and it has, incidentally, the virtues that it operates with concepts general enough, and allows to consider the set of its sub functions (or functional aspects) as a unified system. The functional aspects mentioned are in certain relationship with grammatical moods of the sentence. Hence the illusion may arise that proverbs can be classified functionally straight on the ground of their “superficial” grammatical moods, so that the proverbs with stating (designative, informative) function were represented with indicative sentences, and those with normative (prescriptive, evocative) function, respectively, with imperative sentences. This illusion, however, would be immediately shattered against two complications. Proverbs often have scatological and abusive references, reflecting the crude and uncouth pattern of life.

The proverbs in this sense function as important social documents. What is mirrored in these proverbs show how poor the common people were who these poor vulgar people were, how they struggled to survive in tough circumstances, and what their philosophy of life was. These are random selections from Korean proverbs which typically portray the life of the common people. They show a picture of a poor man, who does not like rich men, and who hates the noble, ruling' class. Although he is always victimized, he is secretly longing for the days when he can have his revenge. Meanwhile he has to be quiet and careful not to make mistakes. All he can do is to help educate his children for a future opportunity. As we mentioned that English proper nouns include people's names (Mary, Tony, Lucy), geographical names (Egypt, the Amu-Darya), names of institutions (the United Nations; the Art gallery), places in the city (Big Ben; Tenth Avenue),

historical and other events (the French Revolution; the Jazz Festival), nationalities (Chinese; Uzbek), weekdays (Thursday), months (March) and other notions, objects or places that are capitalized and used as names. These examples show how to differentiate the semantic category of phraseological units. But in history to show the time, place, addition we can use the proper nouns. As we know, proverb is a figurative saying, devoted on the level of conceptual thinking in the consciousness of the language collective and it is expressed in a stereotyped formula. By these notions we can mentioned the history or culture of this or that country. By the knowledge embedded in proverbs is the resource of the rational of a given ethnos, its ethno psychic basis, we can learn the physiological inner-world of the irrational form. That is why we can have difficulties to gain a deep insight into proverbs of a foreign language, to identify or to guess the main characteristic features or the relevant boundaries of the generalized meaning (sphere of use). This apparently shows to the specificity of the proverb structure and its structurally difficult semantic mechanism. If we analysis the semantic structure of a proverb it should be considered in the synthesis of three basic dimensions. They are: **logical**, **verbal** and **conceptual** thinking. **The logical thinking**, because there would be logical relations between objects and phenomena existing in the universe and in the **verbal**, a communicative unit, there is connection and is essentially linked with speech; and **conceptual**, the reasoning and conclusion given in it are based on conceptual operation.

The great linguist S. Levinson, defined goals and objectives of the theory of pragmatics, regards study of the nature of metaphor as he thought prerogative and object of research of a pragmatist. In his view, a pragmatist should find out how a metaphorical expression is constructed and recognized, whereas the task of psycholinguistics and psychology is the creation of an analogy-based theory of thinking. Because by the proverbs we can notice such an approach, in his opinion, will facilitate the approximation of the linguistic and extra linguistic spheres [3]. Here is example:

Every bird couples with the same species.

Every pot has its lid"

Every Jack has his Jill.

Everyone finds his/her match

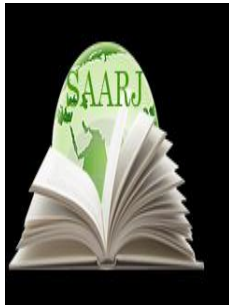
Let analyze the proverb as is clear, in order to create a similar semantic model ("*everyone finds his/her match*"), both ethnics offer identical as well as different metaphorical images. The information given on the surface level in each unit is the basis of the generalized meaning embedded on their deep level. It sometimes shows the result of the experience gained such as the observation (on the laws of nature, everyday objects, etc.) in the process of the cognition of the world, and in some cases - on the recording of proper names (sometimes historical persons). Each proverb united in the given semantic model, upon the actualization in a relevant context, expresses the identical concept coded in them, the wide meaning, by a different semantic coloring. In other words, the similar underlying meaning recorded in each on the implicit level has a different connotation (sometimes positive as well as negative, in other cases unequivocally positive or negative).

One of the ways of enriching English phraseology is the formation of new phraseological units from the existing ones, when a new phraseological unit arises in the language as a result of the

isolation of the components of the existing phraseological unit. Proverbs being phraseological units serve as a source of phraseological derivation, i.e. they give birth to new phraseological units. The number of the phraseological units formed from proverbs is rather large. We can prove our theory with examples: formation of new phraseological units by means of isolation of the final components of the proverb: “a silver lining” from the proverb “every cloud has a silver lining”; “wait for dead men's shoes” from the proverb “he goes long barefoot who waits for dead men's shoes”; “stand on one's own” from the proverb “every tub must stand on its own bottom”.

USED LITERATURE:

1. Даль В.И. Пословицы русского народа. В 2 т. Т 1. – М.: Художественная литература, 1994. – 383 с.
2. Kohn K. The Analysis of Transfer' in: Kellerman E., and Sharwood Smith
3. M. (eds.): Crosslinguistic Influence in Second Language Acquisition. – Oxford: Pergamon Press, 1986.
4. Levinson S.C. Pragmatics. – CUP, 1994.
5. https://n.ziyouz.com/books/uzbek_tilining_izohli_lugati



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SOCIO-PSYCHOLOGICAL AND PROFESSIONAL-ETHICAL ASPECTS OF COMBATting AGAINST CORRUPTION IN THE ACTIVITIES OF CUSTOMS AUTHORITIES

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ABSTRACT

This article is devoted to the problem of combatting against corruption in activities of customs authorities, which emphasizes the need of consideration of social, psychological and occupational factors in prevention of corruption.

KEYWORDS: *Democratic Reforms, Corruption, Corrupt Behavior, Socio-Psychological Factors, Professional Ethics, Social Phenomenon, Corrupt Situation, Corrupt Mind And Worldview, Non-Corrupt Culture.*

INTRODUCTION

In the context of further deepening of democratic reforms in our country, combatting against corruption is one of the most pressing issues. However, true justice, honesty and legitimacy must prevail in all areas of building a strong civil society. Corruption, on the other hand, undermines the economic and administrative system of any state.

It is no coincidence that the President of Uzbekistan Sh. Mirziyoyev in his Address to the Oliy Majlis said: "...we cannot achieve the lofty goals we have set for ourselves unless all members of our society get vaccinated with the "honesty vaccine". We must move to prevent the consequences of corruption at an early stage." [1]

Customs is an integral part of the country's economic security system. The presence of corruption in the customs authorities primarily affects the economic situation of the state, as the replenishment of the country's budget depends on the extent to which the fiscal functions of the customs are fully fulfilled. Therefore, the issue of combating corruption is also a very important issue in the activities of national customs authorities.

At present, the customs authorities of Uzbekistan are actively working in the field of combating corruption in accordance with national and international law. In particular, Uzbekistan has joined the World Customs Organization's Arush Declaration, the UN Convention against Corruption and the Istanbul Action Plan.

In June 2003, the 101st Session of the Customs Cooperation Council of the World Customs Organization adopted an updated version of the Arush Declaration. It develops recommendations on anti-corruption measures and strategies for the customs administrations of the countries. According to this document, the practical basis of national customs programs should be as follows:

1. Leadership and commitment;
2. Actions based on the law;
3. Transparency;
4. Automation;
5. Reforms and modernization;
6. Inspections and inquiries;
7. Code of Ethics;
8. Personnel management;
9. Ethics and organizational culture;
10. Relations with the private sector.

According to the updated Arush Declaration, the main responsibility for preventing and combating corruption in the customs system should rest with the head of the Customs Administration and the executive management. It was also emphasized that the fight against corruption should be carried out at a high level and on a regular basis for a long time. [2]

Therefore, national and international law pays special attention to combating this problem, increasing the professional responsibility of civil servants and officials, the inevitability of punishment for corruption offenses, and creates a solid legal basis for criminal prosecution of such offenses.

However, corruption-related crimes are still being committed by government officials and law enforcement officials, and it is being transformed into other forms of corruption. So, we need to pay more attention to this issue. Clearly, corruption is a complex and multifaceted social phenomenon that is systematically organized and includes economic, legal, social, moral, psychological, and political factors.[3]

Therefore, the study of the causes and conditions that allow it to be based not only on legal mechanisms, but also on social, moral and psychological approaches - is becoming a requirement of our time.

It should be noted that in addition to increasing the effectiveness of operational and investigative measures to prevent and fight with corruption in customs authorities, there is a need for comprehensive and consistent research.

In this regard, it should be noted that in addressing the above issues, special attention is paid to research issues in the Law of the Republic of Uzbekistan "On Combating Corruption", adopted on January 3, 2017.

In particular, conducting research on anti-corruption issues, developing scientific methods and recommendations, their rational implementation, forecasting and scientific analysis of the effectiveness of forms and methods used in combating corruption, as well as government support for research in this area and incentives are guaranteed by this Law. [4]

In addition, in the State Program on Combating Corruption for 2019-2020, approved by the Decree of the President of the Republic of Uzbekistan dated May 27, 2019 No PF-5729 "On measures to further improve the anti-corruption system in the Republic of Uzbekistan" the attraction of grants for anti-corruption research is also provided for researchers of educational and research institutions.

The task to conduct social, scientific and other research on the state of corruption in the customs system, its scale, dynamics and trends, as well as the effectiveness of public policy in this area is set in chapter 5, paragraph 20 of the Action Plan of the State Customs Committee of the Republic of Uzbekistan dated August 8, 2019 "On raising the legal awareness and legal culture of the population and customs officers of the State Customs Committee, the formation of an intolerant attitude to corruption in the system".

Within the framework of practical innovative research, the causes of corruption offenses in the customs authorities will be thoroughly studied, scientifically analyzed; proposals and recommendations for the prevention of corruption will be developed.

In addition to economic factors, social, psychological and moral factors influence the occurrence and increase of corruption. Among them, we can pay special attention to factors related to the characteristics and conditions of service activities, behavior, character of employees, personal views on economic security, social thinking, as well as the current state of organizational and social control over service activities.

How important is it to take into account the socio-psychological aspects of corruption? To answer this question, it is important to analyze the cases of corruption in customs practice not only from a legal point of view, but also in a comprehensive way.

At the heart of the socio-psychological nature of corruption are immoral views and criminal acts that undermine the idea of an "honest society" in minds of mankind and undermine high moral values. Because the sole purpose of corruption is to satisfy the material interests of an official in any illegal way: through bribery or some other form of informal incentive.

There are many forms of corruption: bribery, robbery, favoritism, nepotism (for example, preference for relatives, acquaintances and friends rather than professional qualities in

employment), protectionism, lobbying (corruption is a manifestation of private interests over public interests), public resources and illegal distribution or redistribution of funds, misappropriation of state and public funds and property for personal gain, illegal privatization, provision of illegal services relying on acquaintances, etc.

Socio-psychological characteristics of a customs officer as a person play an important role in the abuse of official powers in pursuit of material interests and prevention of corruption. Such descriptions include negative moral qualities such as lust, greed, envy, careerism, impurity, repentance, and putting the interests associated with the pursuit of one's material goals above legitimacy. The presence of these qualities in a person means that he has a low level of non-corruption stagnation and tends to create corrupt situations by his own actions. From a psychological point of view, a person prone to committing corruption crimes is called a "corrupt" person, and in sociology his illegal actions are interpreted as a manifestation of deviant behavior, and in the nature of usual bribe-offender social defects can be found.

Psychological aspects of the phenomenon of corruption include:

- Psychology of corrupt behavior (bribe taker);
- Psychology of corrupt minds and worldviews, ie bribe-takers;
- Psychology of public opinion and attitudes towards corruption and its various manifestations;
- Socio-psychological factors, causes and conditions affecting corruption.[5]

The following factors may contribute to the above-mentioned defects in the personality of a customs officer as a civil servant:

- the employee's intention to use his / her official activities in the interests of selfish interests;
- the presence of employees who have achieved high economic well-being through illegal and criminal activities in the workforce;
- high economic security and a person's spiritual desire to live a luxurious life;
- not to feel remorse from the illegal acquisition of material wealth due to the weakness of spiritual and moral education or natural inclination;
- increased interest in expensive things and the habit of owning them;
- accustomed to the large expenses incurred for the material well-being of himself and his family, and desire to cover these expenses through bribery, misappropriation of state budget funds and other illegal income;
- dissatisfaction with the salary paid for the service, underestimation and miscalculation of expenses;
- not paying attention to savings or not knowing how to save, etc.

Ultimately, corruption undermines the values underlying the democratic political-administrative system, the harmony of state, society and human interests inherent in civil society, equality and freedom of citizens, transparency of political governance and public confidence in society.

Anti-corruption issues also play an important role in the personnel policy of the customs service. At the same time, great attention is paid to the moral qualities of candidates and current employees of the customs service, loyalty to their profession, quality and responsible performance of official duties, honesty of officials in the system, constant preventive measures to prevent corruption.

An analytical study of various factors related to the phenomenon of corruption revealed a number of conclusions:

- In our country, the fight against corruption in all spheres of governance, including the customs system, is being carried out on the basis of a comprehensive plan of targeted and concrete measures. However, corruption crimes, which cause great damage to the country's economic well-being, are still being committed.
- In order to effectively combat with corruption, it is necessary to know the nature of corruption. It is expedient not only to study corruption as an economic and legal category, but also to conduct a comprehensive interdisciplinary study on it.

The following proposals and recommendations for combating and preventing corruption in the customs service should be considered based on these findings:

It is necessary to comprehensively study the situation with the fight against corruption in the territorial departments of the State Customs Committee of the Republic of Uzbekistan. To do this, along with theoretical approaches, practical and experimental research have to be conducted, the results should be applied into the practice of customs authorities and its effectiveness should be monitored;

To pay special attention to the development of sociological and psychological scientific methods (questionnaires, trainings, test kits, analytical documents) on the prevention of corruption and crime, ethical skills related to the professional culture of the customs officer;

Along with the economic and legal measures taken in combatting against corruption, it is necessary to consider the individual-psychological and socio-psychological factors that contribute to corrupt behavior;

Formation of administrative-preventive mechanisms of combating corruption and taking into account psychological factors in their application in practice;

Developing clear socio-psychological and ethical standards in the formation of non-corrupt behavior among customs officers and increase the efficiency of this process;

To study the socio-psychological and moral phenomenon of corruption, as well as the formation of a system of non-corrupt culture and values among customs officials and participants in foreign economic activity;

Developing socio-psychological and ethical standards not only in the recruitment of personnel to the customs authorities, but also in diagnosing a person's propensity to corruption during his permanent service and, conversely, in determining the level of non-corrupt behavior and culture.

In order to carry out this practical research in a comprehensive manner, it is advisable to create automated programs of questionnaires, interviews, tests, experiments and indicators that determine the socio-psychological and professional-ethical aspects.

Based on the above conclusions, it should be noted that the following factors can prevent a customs officer of taking a bribe:

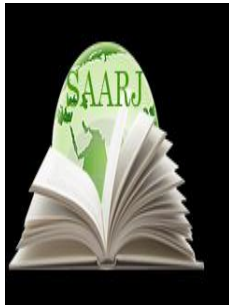
- High moral qualities and social responsibility of the customs officer, including personal intolerance of corruption;
- High and decent salary for a customs officer;
- Satisfaction with the benefits and social guarantees in the system (free medical care, free housing or affordable housing on a soft loan);
- Availability of a system of financial assistance and bonuses in addition to the basic salary;
- A sense of the inevitability of punishment for corruption, refraining from criminal prosecution and fear of punishment;
- The value of the position and profession, fear of losing a job and being fired;
- The fear that the customs officer will tarnish the reputation of himself, his colleagues and family members due to corruption.

The customs officer should have a high legal mind and legal culture.[6]

Moreover, the application of measures proposed in our analysis can not only increase the effectiveness of the anti-corruption strategy, but also help to combat it as firmly and systematically as possible.

REFERENCES:

1. Address of the President of the Republic of Uzbekistan Shavkat Mirziyoyev to the Oliy Majlis. 24.01.2021 // <https://president.uz/uz>
2. Arusha Declaration // http://www.customs.gov.kg/aru_dekl.pdf
3. Bogodukhova E.M, Gordienko V.G Psychological mechanisms of corruption behavior of the individual // Scientific-methodical electronic journal "Concept". - 2017. - T. 44. - P. 1–23
4. Law of the Republic of Uzbekistan "On Combating Corruption". No. ORQ-419, 3.01.2017
5. E. Kamnevav, V. Anenkova. Psychological aspects of the phenomenon of corruption. // Humanitarian sciences. Financial University Bulletin 2013, no. 4 (12). P.- 68.
6. The hidden economy. Study guide: team authored. - .: DBQ BI, 2020. 173-p.



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PATANJALI YOGA SUTRAS AND ADOPTION PATTERNS

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ABSTRACT

In many ways, the Yoga Sutras complement the Samkhya-notions of purusha and prakriti that underlie them. It shares certain vocabulary with Buddhism, with which it has a strong relationship. When compared to the Bhakti ritualism and Bhakti traditions that predominated at the time in India, Samkhya and Yoga may be considered distinct expressions of the same wide lineage of ascetic traditions. This is in contrast to the popular Vedic ritualism that predominated at the time. Most people know the Yoga Sutras as the text that introduced the concept of ashtanga, an eight-part practise culminating in samadhi, or the concentration of the mind on a meditational object. These practises include abstaining from certain foods, observing certain rules, practising yoga postures, controlling one's breath, and withdrawing one's senses (absorption). Purusha, the witness-conscious, is to be discerned as distinct from the cognitive apparatus (prakriti), and the defilements of prakriti are to be untangled. This collection of Patanjali's Yoga Sutras is made up of 195 (according to Vedas and Krishnamacharya) and 196 (according to Patanjali) aphorisms on yoga's theory and practise (according to other scholars including BKS Iyengar). Patanjali, an Indian sage who integrated and structured yoga knowledge from far earlier traditions, wrote the Yoga Sutras in the first century CE.

KEYWORDS: *Patanjali, Patanjali and Yoga, Patanjali and Sutras*

INTRODUCTION

The Yoga Sutras of Patanjali are revered in the modern Yoga tradition as a key book in the development of traditional Yoga philosophy. While many people believe the Yoga Sutras were appropriated, misappropriated, or both, David Gordon White argues that the text was lost for nearly 700 years between the 12th and 19th centuries before making a comeback around 1900

thanks to efforts by Swami Vivekananda and others, including members of the Theosophical Society. The 20th century saw it rise to classic status.

The authorship of the famous book on Sanskrit grammar known as Mahbhya, which is firmly dated to the second century BC, has been attributed to an author by the name of Patajali. As Louis Renou pointed out long ago, the two works are diametrically opposed in terms of subject matter and linguistic minutiae (such use of tenses and prepositions). Aside from Bhoja (the 11th century), no other document indicates that the writers were related.

In his study of Patajali's Ptajalayogastra, Philipp A. Maas determined that it was written around 400 CE, using synchronisms between Patajali's arguments and Vasubandhu's, as well as the history of the commentaries on it published in the first millennium CE, as well as the opinions of earlier Sanskrit commentators, manuscript colophons, and a review of the existing literature.

For the Ptajalayogastra, Woods made the date suggestion as early as 1914. Since then, historians of the history of Indian philosophical thought have generally agreed with Woods. In contrast, Edwin Bryant's translation of the Yoga Stras drew on the work of prominent commentators.



Figure 1 : Patañjali Statue (traditional form indicating kundalini or incarnation of Shesha)

Most academics date the book to the first or second century CE, although it has been dated as far back as many centuries before that, according to one expert. Consequently, Bryant came at the following conclusion: "However, a number of researchers have suggested that the Yoga Stras date from the fourth or fifth century CE. All of these justifications [for a later start date] are flawed."

Various dates have been ascribed to Yogasutra, spanning from 500 BCE to the 3rd century CE, with Michele Desmarais summarising the lack of evidence for any confidence about the dates. According to her, the book may have been produced at an earlier period because of the many hypotheses about when it was written, although academics generally accept the more recent dates.

"Eight limb yoga" (aga yoga) and action yoga, according to Feuerstein, are condensed in the Yoga Sutras (Kriya yoga). Sutras 1–27, chapter 3 except for sutra 54, and chapter 4 include the kriya yoga portion. In Chapter 2 Sutras 28–55, as well as Sutras 3 and 54 in Chapter 3, "eight limb yoga" may be found.

For example, according to Larson, there are many similarities between the ancient Samkhya, Yoga, and Abhidharma schools of thought, especially between the 2nd and 1st centuries CE. The Yoga Sutras of Patanjali may represent a synthesis of these three schools of thought. Its philosophical rationalism and its three epistemic techniques for obtaining trustworthy knowledge come from Hinduism's Samkhya school, which Yoga Sutras adopts. This "reflective discernment" (adhyavasaya) includes prakrti and purusa (dualism). According to Larson, the Yoga Sutras borrow the Buddhist concept of nirodhasamadhi from Abhidharma. Unlike Buddhism, which holds that there is no such thing as a "self" or "soul," Yoga, on the other hand, is physicalist and realist, like Samkhya. In addition to the yoga concepts found in writings dating back to the 1st century BCE, such as the Katha Upanishad, the Shvetashvatara Upanishad, and the Maitri Upanishad, Yoga Sutras incorporates the old ascetic traditions of seclusion, meditation, and introspection into its philosophy.

When it came time to write the Ptahjalayogastra, Patanjali drew on a variety of sources, including yoga from the Vedic and Jain traditions. Contributed his own explanation sections to the united work, which has been regarded the work of two individuals since 1100 CE. Ptahjalayogastra is the collective name for Patanjali's sutras and Vyasabhasya's work.

According to Bryant, the goal of yoga is to free oneself from suffering via discriminative insight. To achieve "discriminative discernment," one must "uncouple purua from any connection with prakti and from all engagement with the citta." Ultimately, Patanjali says that the essence of yoga-practice is "meditative techniques that culminate in attainment of a condition where awareness is oblivious of any other object, that is solely aware of its own nature as consciousness unmixed with any other object," according to Bryant.

If you believe in the Samkhya school, knowledge alone will get you to moksha, but Patanjali believes that knowledge coupled with personal experimentation, along with the Samkhya school's approach to knowledge, will get you there.

Avidya, or ignorance, is the root of the five kleshas, which are responsible for suffering and sasa, according to Patanjali's teachings. This website's first page: Liberation, like many other schools, focuses on eradicating ignorance via critical thinking, in-depth study, and self-reflection. In the Yoga system, the treatise on how to do this is known as the Yoga Stras. This website's first page: In the opinion of Yoga academics, samdhi is the condition in which ecstatic consciousness develops, and it is from here that a person begins to become aware of Purusa and their real self, or It goes on to say that if a person achieves this state of consciousness, they will always be aware; this is known as moksha, or liberation, in Hinduism. This website's first page:

Patanjali devotes Book 3 of his Yogasutra to yoga's soteriological elements. According to Patanjali, in order to achieve self-awareness, independence, and liberation, one must practise all eight limbs of yoga. It is referred to as "discerning principle" and mastery of citta and "self-knowledge" in verse III.4 to III.5 when speaking about the last three limbs of yoga, which he names samyama in verses III.4 to III.5. Yogasutras III.12 states that this discriminating principle enables one to develop sant (tranquilly) and uditā (reason) in one's mind and soul via intentness.

Eventually, one's capacity to distinguish between sabs (word), as well as the meaning and understanding they convey, would allow them to compassionately perceive the cries and utterances of all living things. This is called pratyaya (understanding). Having reached this condition, the yoga practitioner will have extraordinary abilities, intuition, and self-knowledge. They will also have more freedom and achieve kaivalya, their redemptive aim.

Epistemology

It is similar to the Smkhya school of Indian philosophy in that Patanjali's Yoga method uses three of the six Pramanas to acquire trustworthy knowledge. These were Pratyaka (perception), Anuma (inference), and Sabda (ptavacana, trustworthy sources' words/testimony). This school, along with the Samkhya school, believes that only the direct sensory experience of reality, inference, and the verbal testimony of the sages or shstras are acceptable methods of gaining knowledge or Praman, as Patanjali's philosophy does.

For example, unlike Advaita Vedanta, Yoga did not adhere to the three Pramanas of Upamaa, Arthpatti, or Anupalabdi ("non-perception, negative/cognitive evidence"), which are often found in Hinduism.

Some scholars have dubbed Patanjali's "personal, but basically passive, deity" or "personal god" in contrast to the Samkhya system, which is non-theistic/atheistic (Ishvara). Yoga school is referred to as "Samkya school with God" by Hindu intellectuals including the 8th-century Adi Sankara and many contemporary academics.

One may find the word Isvara in 11 different places in Patanjali's Yogasutras, from verses 23 to 29 as well as verses 1 and 2 of chapter 2. Hindu academics have discussed and remarked on who or what Isvara is ever since the publication of the Sutra? Commentaries on the Hindu scriptures have defined Isvara as anything from a "personal deity" to a "unique self." When it comes to yoga philosophy, Whicher says that although Patanjali's short lines may be understood both as religious and as nonreligious, the idea of Isvara in Patanjali's work serves as a "transformative catalyst or guide for helping the yogin on the road to spiritual liberation.". Isvara, the transcendental spirit, is unlike the yogin's purusa (real self), which is tethered to his material body and susceptible to the effects of karma and kleshas.

The verse 24, Patanjali describes Isvara (Sanskrit:) as "a unique Self/Spirit." *See also: *Note 3* As a result of this sutra, Isvara now has the characteristics of a unique Self/Spirit that is unaffected (aparamrsta) by one's obstacles/hardship (klesha), circumstances created by one's past or present actions (karma), and one's life's fruits (vipâka) as well as psychological disposition/intentions (ashaya).

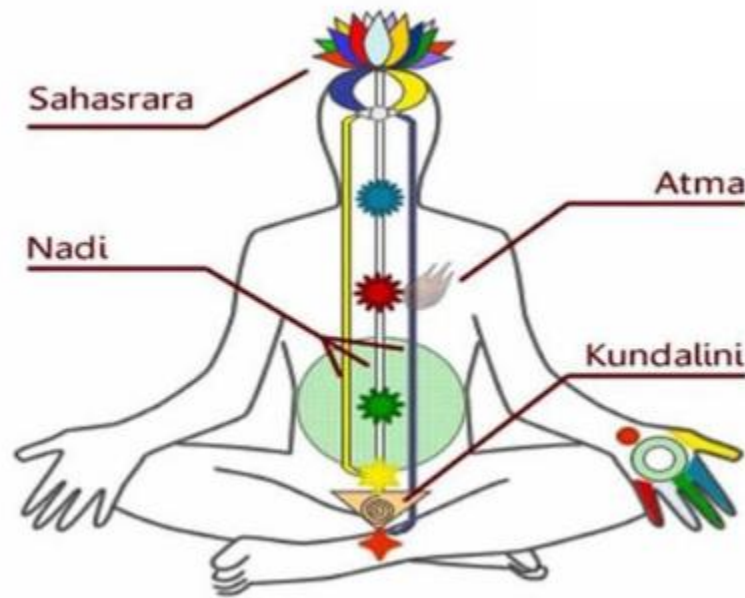


Figure 2 : Yoga Sutra of Patanjali

Historical and philosophical context

Samyama - the route to Kaivalya in the Yoga system – is the culmination of Dharana, Dhyana, and Samadhi. Yoga is a major topic of discussion (philosophy). The Yoga Sutras drew on a wide range of Indian intellectual traditions of the time to synthesise their ideas. Zimmer claims that Samkhya and Yoga are two of many philosophical systems that have their origins in India's pre-Aryan civilizations and customs. For those who don't know, For those keeping track (see footnote 5), In contrast to Bhakti and Vedic ritualism, which were also popular in ancient India, the traditional Hindu philosophies of Samkhya, Yoga, Vedanta, and the nontraditional Nastika systems of Jainism and Buddhism may all be viewed as reflecting one stream of spiritual activity. The Jnana marga, Bhakti marga, and Karma marga of the Bhagavad Gita correspond to the Vedanta-Sramana traditions, iconolatry, and Vedic rites, respectively.

Samkhya

According to the Yoga Sutras, Samkhya philosophy is used as a basis for Yoga, and Samkhya is the theory. There is a strong presence of Samkhya in the Sutras to the point that historian Surendranath Dasgupta refused to classify Patanjali's theory as such, instead naming it Patanjala Samkhya, in line with the Jain writer Haribhadra's commentary on Yoga, which referred to it as such. There are twenty-five tattvas or principles accepted by Patanjali's Yoga Sutras, one of which is Purusha, meaning Self or consciousness, the others being Prakriti (primal nature), Buddhi (intellect or will), Ahamkara (ego), Manas, five sensory capabilities, five action capabilities, and ten elements, according to the Samkhya school of philosophy. The Sadhana, the second section of the Sutras, also presents the Samkhya views on all observed action within the Sattva, Rajas, and Tamas Gunas (lethargy).

Sutra 1.23 - "Ivara pranidhnt v" is an example of how the Yoga Sutras deviate from early Samkhya in that it adds the principle of Isvara, or God, and this is taken as meaning that submission to God is one path to freedom.

"A separate Consciousness, unaffected by sufferings, deeds, fruitions or their residue," is how one definition of Isvara describes the concept. Yoga's ultimate aim is achieved via devotion to Isvara, symbolised by the esoteric word Om, as described in the sutras. There are many references to this sacred sound throughout Hinduism's Upanishads, beginning with the Chandogya and Brihadaranyaka Upanishads of ancient India and continuing through the Mandukya Upanishad of modern India.

While Samkhya believes that knowledge is the path to enlightenment, Patanjali's Yoga focuses on concentration and active effort as the way to enlightenment. As opposed to Samkhya's view, Yoga's goal is to liberate the person from the grips of matter, and it believes intellectual knowledge to be insufficient for this.

When Isvara was added to Patanjali's philosophy, the fundamental parallels between the two philosophies persisted. Max Müller noted that the two systems were referred to in common parlance as Samkhya with and Samkhya without the Lord.

One of Hinduism's most revered texts, the Bhagavad Gita, is said to be founded on the Samkhya-Yoga philosophy. Patanjali's Yoga Stras are a cornerstone of Hinduism's Yoga system of thought.

Buddhism

According to many scholars, Patanjali's Yoga Sutras and Buddhist scriptures have a complex connection. Karel Werner says in his article, "Without Buddhism, Patanjali's philosophy would not have existed. There is a lot in the Yoga Sutras' language that harkens back to Buddhist formulations from the Pali Canon, particularly the Sarvastivada Abhidharma and the Sautrantika school of Indian philosophy." Patanjali's Yoga sutras are more detailed and describe the real method of Yoga processes more precisely than the Buddhist explanation, according to him. Patanjali. Werner, on the other hand, claims "Despite the fact that he openly drew on the experiences he had previously acquired from different Yoga instructors of his day, the Buddha was the system's originator. Patanjali isn't a new movement's creator or leader; he's just a follower. ... The genius of Patanjali's accomplishment resides in the thoroughness and completeness with which all of the essential phases of Yoga practise and mental experiences are incorporated in his plan, and in their methodical presentation in a concise work." The Yogasutra's emphasis on "Self, Soul" and the presence of "no Self" differs from Buddhism's "no Self" precepts, according to Werner.

Jainism

The Yoga Sutras of Patanjali's five yamas, or restrictions, show an eerie similarity to Jainism's five main vows, suggesting Jainism's influence. Yoga also incorporates three other Jain teachings: the doctrine of "colours" in karma (lesya); the Telos of isolation (kevala in Jainism and Kaivalyam in Yoga); and the practise of nonviolence (ahimsa), though ahimsa first appeared in Hindu texts known as the Upanishads (the Chndogya Upaniad, dating to the 8th or 7th century BCE, has the earliest mention of the (a code of conduct). Violence against "all things" (sarvabhuta) is prohibited under Ahimsa, and those who follow it are considered to be liberated

from the cycle of rebirth and metempsychosis (CU 8.15.1). As one of the five fundamental qualities, Ahimsa is also mentioned.]

CONCLUSION

The Yoga Sutras of Patanjali are revered in the modern Yoga tradition as a key book in the development of traditional Yoga philosophy. However, David Gordon White has questioned the use and misuse of the Yoga Sutras, as well as their influence on later systematizations of yoga, arguing that the text was largely forgotten for nearly 700 years between the 12th and the 19th centuries before making a comeback in the late 19th century thanks to Swami Vivekananda and the Theosophical Society. The 20th century saw it rise to classic status. James Mallinson emphasised its importance. Prior to the 20th century, the mediaeval Indian yoga scene was dominated by other texts such as the Bhagavad Gita and the Yoga Vasistha, as well as literature on hatha yoga, tantric yoga, and Pashupata Shaivism rather than Patanjali's Yoga Sutras. These texts are attributed to Yajñavalkya and Hiranyagarbha. The Mahabharata's Mokadharma section has many references to yoga. Those who follow the Jaina religion do yoga according to their own set of scriptures, whereas Buddhists practise yoga according to pre-Patanjali sources. Between the ninth and sixteenth centuries, several important comments on the Yoga Sutras were written. There were few comments on Patanjali's Yoga theory after the twelfth century, when the school began to wane. Patanjali's Yoga theory had all but vanished by the fifteenth century. Few people had studied the Yoga Sutras, and it was seldom taught. As a result, the original manuscript was no longer copied. "miraculously restored" by Swami Vivekananda after being neglected for seven centuries, according to David Gordon White, the popularity of the Yoga Sutras is new. The Yoga Sutras first piqued Westerners' attention when they were rediscovered by a British Orientalist in the early 1800s. Swami Vivekananda, following Helena Blavatsky, president of the Theosophical Society, saw the practise of yoga according to the Yoga Sutras as a science and the "supreme meditative route to self-realization." This sparked widespread interest in the 19th century. According to White, "Big Yoga – the corporate yoga subculture" has made it a well-known book in the West.

REFERENCES

1. Surendranath Dasgupta (1992). A History of Indian Philosophy. Reprint: Motilal Banarsidass (Original: Cambridge University Press, 1922). pp. 230–238. ISBN 978-81-208-0412-8.
2. Tola, Dragonetti & Prithipaul 1987, p. xi.
3. James G. Lochtefeld (2002). The Illustrated Encyclopedia of Hinduism: N-Z. The Rosen Publishing Group. pp. 506–507. ISBN 978-0-8239-3180-4.
4. Renou, Louis (1940). "On the Identity of the Two Patañjalis". In Law, Narendra Nath (ed.). Louis de La Vallée Poussin Memorial Volume. pp. 368–373.
5. Radhakrishnan & Moore 1989, p. 453.
6. Maas, Philipp André; Patañjali; Hazel M. Hussong Fund (2006). Samādhipāda: das erste Kapitel des Pātañjalayogaśāstra zum ersten Mal kritisch ediert = The first chapter of the Pātañjalayogaśāstra for the first time critically edited. Aachen: Shaker. ISBN 978-3-8322-4987-8. OCLC 1049097407.

7. The Yoga system of Patañjali or the ancient Hindu doctrine of concentration of mind embracing the mnemonic rules, called Yoga-sūtras, of Patañjali the comment, called Yogabhāṣya ...: Transl. from the original Sanskrit by James Haughton Woods. Cambridge. 1914. OCLC 185290295.
8. Potter, Karl H; Agrawal, M. M; Bhattacharyya, Sibajiban; Philips, Stephen H (1970). The encyclopedia of Indian philosophies. Yoga: India's philosophy of meditation Vol. 12 Vol. 12. ISBN 978-81-208-3349-4. OCLC 988887600.
9. Baier, Karl; Maas, Philipp André; Preisendanz, Karin, eds. (2018). Yoga in transformation: historical and contemporary perspectives : with 55 figures. ISBN 978-3-8471-0862-7. OCLC 1081172387.
10. Bryant, Edwin F; Patañjali; Patañjali (2009). The Yoga sūtras of Patañjali: a new edition, translation, and commentary with insights from the traditional commentators. New York: North Point Press. OCLC 1151865824.
11. Feuerstein 1978, p. 108, Quote: "As I have shown in my own detailed examination of the Yoga-Sūtra, this great scripture could well be a composite of only two distinct Yoga lineages. On the one hand there is the Yoga of eight limbs or ashta-anga-yoga (written ashtāṅgayoga), and on the other, there is the Yoga of Action (kriyâ-yoga).".
12. The Yoga-darsana: The sutras of Patanjali with the Bhasya of Vyasa - Book 3 GN Jha (Translator); Harvard University Archives, pages 94-95
13. Gregor Maehle (2007), Ashtanga Yoga: Practice & Philosophy, ISBN 978-1577316060, pages 237-238
14. The Yoga-darsana: The sutras of Patanjali with the Bhasya of Vyasa - Book 3 GN Jha (Translator); Harvard University Archives, pages 108-126
15. The Yoga Philosophy TR Tatyā (Translator), with Bhojaraja commentary; Harvard University Archives, pages 108-109
16. John A. Grimes, A Concise Dictionary of Indian Philosophy: Sanskrit Terms Defined in English, State University of New York Press, ISBN 978-0791430675, page 238



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THE FIFTH GENERATION TECHNOLOGY FOR MOBILE COMMUNICATION

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ABSTRACT

The aim of this essay is a thorough examination of Fifth Generation mobile communication technology. Current technological effort is connected with Fifth Generation technology in mobile communication. Fifth Generation research involves developing the World Wide Web, the Dynamic Ad-hoc Wireless Networks, and Real Wireless Communications. Research has been done throughout the years. 802.11 wireless local area networks and 802.16 Wireless metropolitan area networks, ad-hoc wireless network people area networks, and Wireless digital communications networks are the most important technologies for Fifth Generation technologies. Fourth Generation technology will cover a variety of standards in a shared Third Generation similar environment with IEEE 802.xx integrated mobile wireless network from the outset. The primary input of this article are the key provisions of mobile communication technology of Fifth Generation. Mobile consumers have put greatest focus in Fifth Generation technology compared to others. Fifth Generation Technology represents mobile technology for the fifth generation. Fifth Generation technology is intended to make extremely high bandwidth utilization of mobile phones. The consumer never has the greatest technology of value as Fifth Generation. Fifth Generation technologies include all sorts of state-of-the-art features, making Fifth Generation technology the leader in the near future.

KEYWORDS: *Fifth Generation Mobile, Fifth Generation Technology, Architecture, Mobile Terminal, Wireless Networks.*

INTRODUCTION

Over the past several years, mobile and wireless networks have evolved significantly. Many mobile phones now include a Wi-Fi adapter as well. It may be expected that, in addition to their Third Generation, Second Generation, WLAN, and Bluetooth and so on, many mobile phones also include wax adapters. For both generations, we have expanded the study of integration with IP 2.5 Generation and the Third Generation Public Land Mobile Networks on the one hand and WLAN on the other. With respect to Fourth Generation, its goal is to integrate mobile phone network like GSM and Third Generation perfectly. Multi-mode consumer terminals are regarded to be Fourth Generation, although extra security measures and compatibility for specific wireless technologies continue to be a problem. However, integration across different wireless networks is still being done today in reality. Although multiple wireless networks from a single terminal are used, distinct wireless access techniques are not used for the same session. The anticipated OWA is intended to provide open baseband processing modules with open interface settings. The OWA is connected to future (Fourth Generation) mobile MAC/PHY layers. The Fifth Generation terminals have radio software and modulation techniques developed, and the Internet may download new error control systems. The improvement is seen as a focus on Fifth Generation mobile networks in consumer terminals. The Fifth Generation mobile terminals will concurrently have access to multiple wireless technologies. Special flows from various technologies should be integrated with the Fifth Generation mobile terminal. The network is trustworthy for user mobility management. The Fifth Generation terminal is the final option for a particular service by different mobile network access providers. The article offers the idea of a smart Internet telephone that mobile phones can prefer (see Fig. 1)[1].



Fig.1: What Is 5G Technology And How Must Businesses Prepare For It?

Challenges in Migration from Fourth Generation:

- With Fourth Generation, a single user terminal will have to be built to operate over multiple wireless networks and solve design challenges such as device size limitations, cost and power consumption. The radio technique can solve this issue.
- The unique characteristics and functions of each wireless system. The finest technology to select for a specific service at a certain place at a given time. This will be done by choosing the customer quality of service requirements according to the best possible fit.
- Reconfigurable, adaptable and lightweight protective methods should be developed.
- Integrating the existing non-IP and IP-based systems and delivering QoS guarantee for end-to-end services that involve various systems is a problem.
- It is challenging to collect, manage and aggregate the Consumers' account information from numerous service providers. In the same manner Consumers' billing is also a tough job.
- Software programs which will provide a new function to the customer but will start new problems.
- Spoofing involves false GPS signals being sent out, in which case the GPS receiver thinks that the signals comes from a satellite and computes the incorrect coordinates. Criminals may make advantage of such methods. Jamming happens when a transmitter putting out signals at the same frequency shifts a GPS signal.
- If a GPS receiver will connect with the main transmitter then the communication link between these two is not difficult to break and customer must utilize encrypted data.

Theoretical Framework:

- Fifth Generation Technology is a phrase for the next most important step in mobile communications standards beyond Fourth Generation standards used in various research papers and projects. Fifth Generation is presently not an official term used for any specific criteria. 3GPP version beyond Fourth Generation and LTE[2].

LITERATURE SURVEY

T. Janevski stated in the paper that with the 2.5 generation of mobile cellular networks, integration of mobile networks with the Internet has started. Today, internet traffic is globally dominant. For the development of future wireless networks, the need for higher data rates for data traffic and new IP-based services is essential. Even Third Generation with up to 2 Mbit/s could not provide data speeds used by Internet users utilizing fixed broadband or wired local area networks. In this situation, data rates were not provided. Wireless LAN was the solution to provide faster speeds in the wireless network, but was originally developed to extend the wired wireless LAN to the wireless domain. We propose a method for interoperability between the mobile cellular network and the WLAN in this post. This is a solution. Authentication, authorization, and accounts, i.e. AAA, for the integration of the two networks, cellular and WLAN, are carried out. For this goal, we have developed a Wi-Fi access controller and a Wi-Fi AAA gateway to provide gateway access control, charging and accounting capabilities for the Wi-Fi service. We have evaluated the current state of development of all network entities and

protocols required for the expansion of these components. The solution is an inexpensive and simple to use PLMN-WLAN Internetworking scenario[3].

J. McNair et al. stated in the paper that revolutionary Fourth Generation drivers include push-through seamless personal and end-station mobility towards ubiquitous wireless access and all-round computing. The creation of a vertical handoff protocol for users traveling between various kinds of networks is one of the major challenges for seamless mobility. Habits, policy metrics and radio link transfer processes historically used handoff detection policies cannot adapt or respond to changing user inputs and network accessibilities to dynamic handoff criteria. They cannot offer context-conscious services or provide interoperability for network operations. New methods are thus required to manage user mobility among different kinds of networks. This article provides a tutorial on design and vertical handoff performance issues in an envisioned fourth-generation multi-network system. Various Third Generation and beyond network topologies, such as wireless LANs, cellular, satellite and Mobile IPs are explored. In a diverse network context, the issue of vertical handoff is then explained. Finally, research efforts are being explored to solve remaining difficulties, including new methods for dynamic decision-making and algorithm identification and contextual transmission of radio connections[4].

W. Lu presented in the article that this article presents a mobile terminal open-label wireless architecture, which concentrates on an open baseband processing platform, which supports various existing and future wireless communication standards by multi-dimensional open baseband processing modules and baseband management systems. The article provides a multi-layered open architecture platform for system flexibility to optimize and minimize terminal power consumption so that wireless and mobile terminal communication systems are integrated and convergent next-generation. For full openness and simplicity, the OWA platform is fully compatible with computer architecture and interface rather than system architecture based on transmission[5].

M. R. Bhalla et al. stated in the article wireless communication is the distant transfer of information without requiring upgraded electric conductors or cables. The distance may be a few of meters as on TV or millions of kilometers for radio communications) (thousands or millions of kilometers for radio communications. The term is usually shortened to 'wireless' when the context is clear. It comprises various types of two-way, fixed, mobile and mobile radio, cellular telephones, PDAs, and wireless networking. In this essay, we will highlight the history and development of mobile technology in consecutive generations and their significance and benefits across the globe. Mobile wireless technologies have experienced the technical revolution and development of 4 to 5 generations over the last several decades. Mobile wireless research is currently focused on improving Fourth Generation technology and Fifth Generation technology deployment. Fifth Generation term is not presently used officially. Fifth Generation research is being conducted on the development of the WWW, the Adhoc Wireless Networks Dynamics and the WWW[6].

DISCUSSION

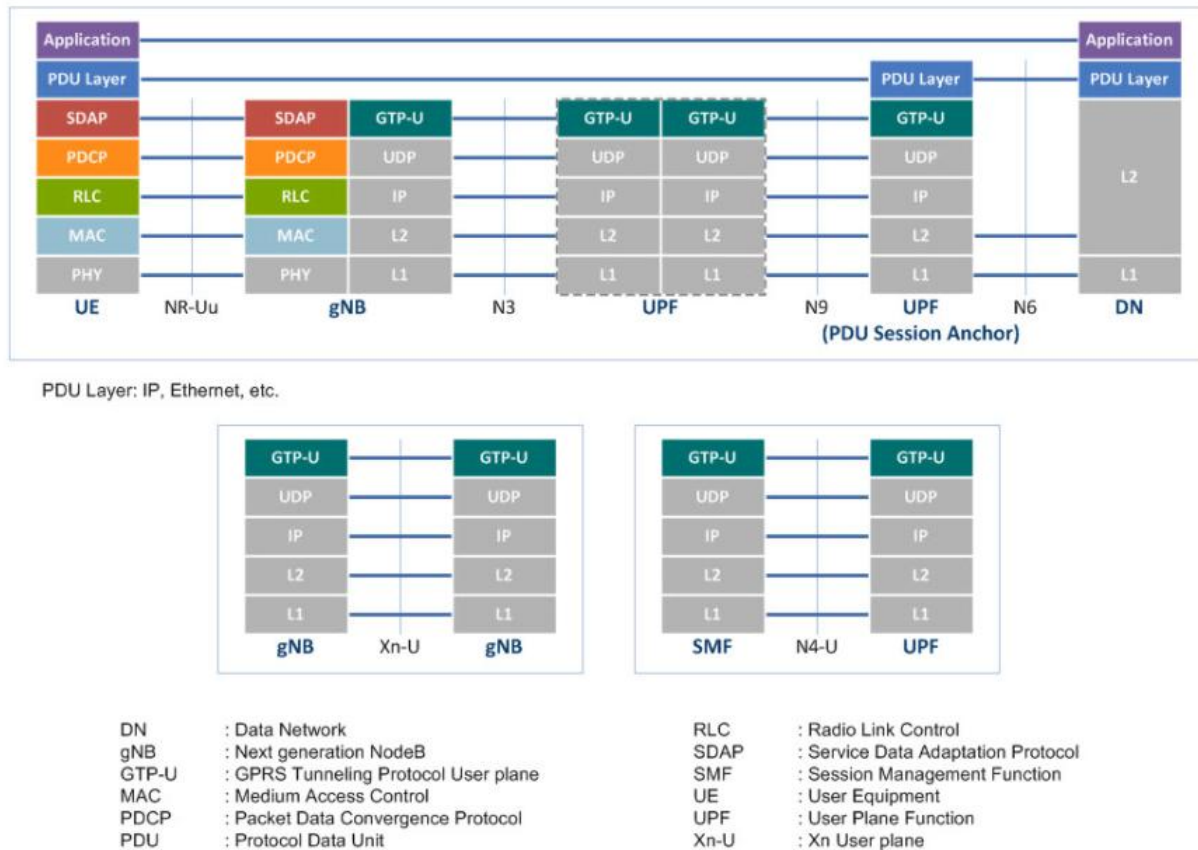


Fig. 2: Concept of Fifth Generation Technology explaining protocol stack for Fifth Generation.

Fig. 2 establishes the wireless technology and the layers for physical and media access control, i.e. OSI Layers 1 and OSI Layers 2. The Fifth Generation mobile networks are presumably based on open wireless architecture for these two tiers.

The network layer will be IP, since there is no competition at that level currently. The worldwide IPv4 has many problems including limited address space, and no significant QoS support per flow. These issues are addressed with IPv6, but are exchanged with a considerably bigger packet header. Mobility is still a problem. The Mobile IP standard is available on one side as are different choices for small mobility. The mobile IP is used for all mobile networks at Fifth Generation, each mobile terminal being FA (foreign agent) and keeping the Care Of Address mapping (CoA) for the current wireless network between its fixed IPv6 and CoA Address. However, multiple mobile or wireless networks may concurrently be linked to a cellphone. In this case, separate IP addresses will be kept on each radio interface while the IP addresses of the FA installed on the mobile phone will be each CoA. Fifth Generation phone makers will incorporate the fixed IPv6 on the mobile phone. The Fifth Generation mobile telephone features a multi-wireless virtual network environment. The network layer should be split into two sublayers of Fifth Generation mobile devices for this purpose i.e. the lower network layer (for each interface) and the higher network layer (for the mobile terminal) (for the mobile terminal).

This is because the Internet was originally created and the entire routing is reliant on the IP addresses which in every IP network worldwide should be distinct. The Upper-Level-Network (Fig. 2) intermediary program must maintain the Upper Network Address Translation (IPv6) into different Lower Network IP Addresses (IPv4 or IPv6), and vice.

Mobile and wireless networks vary in terms of transport layer from wired networks. In all TCP versions it is believed that lost segments are the consequence of network connectivity, but in the event of network wireless losses due of higher radio interface bit error. TCP modifications and adaptations for mobile and wireless networks are thus suggested, which broadcast the missing or impacted TCP segments exclusively through the wireless channel. Mobile terminals for Fifth Generation are suitable for downloading and installing transport layers. The versions of those mobiles (e.g. the TCP, RTP and so on or the New Transportation Protocol) that are targeted at a particular wireless technology installed at base stations should be accessible for the download. This is called the Open Protocol to Transport[7].

The last requirement from the Fifth Generation mobile terminal is that intelligent QoS management be given over a variety of networks with respect to the apps. Today, customers choose the wireless interface for their specific Internet service manually on mobile phones without utilizing QoS history in order to buy the finest wireless connection for a given service. Fifth Generation telephone provides the ability to evaluate service quality and store measurement information in mobile terminal information bases. The QoS parameters, such as delay, jitter, losses, bandwidth, dependability, are maintained in a Fifth Generation mobile phone data base to make the best wireless connection with the required QoS and personal cost constraints accessible through sophisticated algorithms that work in a mobile terminal. 4G will be able to offer a range of new services and models. For their interaction with Fourth Generation systems design, these services and models need to be further explored. By the time Fourth Generation is deployed, the process of IPv4 Address Extension should be completed. IPv6 support for Fourth Generation is thus needed to handle a large number of wireless devices. By increasing the IP number, IPv6 removes the need of Network Address translation. A wide variety of novel coding methods may be developed for Fourth Generation units and applications, which may assist with the deployment of the Fourth Generation network and services with available space and addressing bits in IPv6. The fourth generation seeks to fulfill PCC's goal - a vision that provides high data speeds in all wireless networks affordably. There must be minimal implementation complexity and an efficient negotiation mechanism between end-users and the wireless infrastructure in future wireless networks. For mobile wireless users, the Internet promotes the increase of data rates and speed access. This drives a development of the basic mobile IP network[8].

The Fifth Generation mobile phone design is being developed to respond to the QoS and price needs of upcoming applications such as wireless broadband access and MMS, video chat, mobile television, HDTV content, Digital Video Broadcasting (DVB), minimum voice and data services and other bandwidth services. Fifth Generation has the concept of delivering a sufficient RF, more bits/Hz and linking all heterogeneous wireless networks to provide the user with a smooth, consistent telecoms experience[9]. Packet Core Evolved is an IP based core network for LTE and other access technologies developed by the 3GPP (Telecom Standard). The aim of the EPC is to allow simpler access to various services, such as those offered by the IMS, across all IP core network topologies (IP Multimedia Subsystem). EPC is essentially a Mobility Management Entity (MME) and user datagram's agnostic access portal for routing. EPC will be a completely

new wireless operator architecture which will mimic the IP data communication world rather than the voice-centered wireless world. The IP network theory is based on flat IP. IP architecture is flat.

To this point, mobile networking for the circuit-changed voice has been developed. In order to aggregate, authenticate, control and steer conversations, wireless networks were hierarchically constructed. A BSC aggregates calls from multiple basic stations, allocates radio broadcasts, transfers from base stations to a more centralized mobile switching center. When the packet data networks were established the existing voice-centric architecture was overlaid, using the BSC to handle comparable mobility, the SGSN and GGSN were added for GSM/UMTS, and for CDMA, PDSN to route and manage the data and to connect to the Internet or correctly to the session. Due to the rapid growth in data traffic, this voice-centric architecture with too many network providers has grown noisy and difficult to manage. The flat network design eliminates the network's voice-centered structure. The independent and streamlined data architecture that removes many elements of the network chain may be used rather than overlaying a packet data core on a voice network. Both the BSC operations and the media gateway router are isolated. The base station interacts directly with a media gateway through WAN via the Third Generation Direct Tunnel Carrier Ethernet, MW, and DWDM etc. Certain duties of BSC/RNC, such as radio resource management, radio carrier control and resource dynamic distribution are performed on base stations, while features like paging messages distribution, security are handled in gateway routers by mobility managers. There are clear benefits to this approach. This will reduce Capex and Opex considerably, since there are little hopes and fewer network entities for the service provider. Data flows between endpoints faster by reducing the number of network hops, which substantially reduces network Latency to allow real-time applications like voice over IP, gaming and video-conferencing. WiMAX introduced flat IP designs, which will be flat by definition in future LTE networks[10].

CONCLUSION

We investigated Fifth Generation mobile communication technology in this research. The Fifth Generation technology is an open platform for various layers from the physical layer to the application. Presently, the present work is carried out in modules which provide one or more wireless technologies from one mobile Fifth Generation simultaneously the best operating system, with the lowest prices for a specified service. A new revolution in Fifth Generation technical development is scheduled to commence, because Fifth Generation technology will make it impossible to finish ordinary PCs and laptops that affect their market value. In the mobile communications industry, there are many advancements from First Generation, Second Generation, Third Generation, and Fourth Generation to Fifth Generation. The new Fifth Generation technology is put on the market at cheap costs, with high expectations, and excellent reliability. Fifth Generation mobile communications network technology will open up a new century. The Fifth Generation mobiles will have access to multiple wireless technologies at the same time, and various flows of different technologies may be combined between the terminals. For passionate mobile customers, Fifth Generation technology offers high-resolution options. Without any interruption, we may watch an HD TV channel on our mobile phones. A Tablet PC will be accessible on Fifth Generation mobile phones. There will be a lot of mobile technologies integrated.

REFERENCES

1. T. Janevski, "5G Mobile Phone Concept," 2009, doi: 10.1109/CCNC.2009.4784727.
2. A. Tudzarov and T. Janevski, "Design for 5G mobile network architecture," *Int. J. Commun. Networks Inf. Secur.*, 2011.
3. T. Janevski, "AAA system for PLMN-WLAN internetworking," *J. Commun. Networks*, 2005, doi: 10.1109/JCN.2005.6387866.
4. J. McNair and F. Zhu, "Vertical handoffs in fourth-generation multinet network environments," *IEEE Wirel. Commun.*, 2004, doi: 10.1109/MWC.2004.1308935.
5. W. Lu, "An open baseband processing architecture for future mobile terminal design," *IEEE Wirel. Commun.*, 2008, doi: 10.1109/MWC.2008.4492984.
6. M. R. Bhalla and A. V. Bhalla, "Generations of Mobile Wireless Technology: A Survey," *Int. J. Comput. Appl.*, 2010, doi: 10.5120/905-1282.
7. S. Singh and P. Singh, "Key Concepts and Network Architecture for 5G Mobile Technology," *Int. J. Sci. Res. Eng. Technol.*, 2012.
8. A. Gani, X. Li, L. Yang, O. Zakaria, and N. B. Anuar, "Multi-bandwidth data path design for 5G wireless mobile internets," *WSEAS Trans. Inf. Sci. Appl.*, 2009.
9. G. Kaur, P. Tomar, and P. Singh, *Internet of Things and Big Data Analytics Toward Next-Generation Intelligence*. 2018.
10. P. K. Singh *et al.*, "Broadcasting in Vehicular Networks : Issues and Approaches," *IEEE Intell. Transp. Syst. Mag.*, 2018.



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TAKING INTO ACCOUNT THE AGE CHARACTERISTICS OF STUDENTS IN LITERARY EDUCATION

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ABSTRACT

The adolescent is serious because he believes what he's saying is true. As a result, every teacher and methodologist must pay close attention to this characteristic of adolescents and patiently cultivate a reading culture in them. The text is the main source not only for the study of the artistic features of the work, but also for the use of expressive, literary commentary or creative reading, comprehensive, comparative, problem-solving, research, non-traditional methods of analysis. Every word in it is meant to thicken the message, including the tone and the burning feeling. To put it another way, the poet is tasked with bringing his mind to the level of wisdom.

KEYWORDS: *Comprehensive, Comparative, Adolescent*

INTRODUCTION

Without understanding the stages of development of literary conceptions in students, a teacher cannot obtain effective outcomes in the application of approaches in teaching. According to psychologists, students go through many stages of development, ranging from childhood (10-12 years) to adulthood (13-14 years) to adolescence (13-14 years) (15-17 years). Reading in a specific classroom is also good for the development of pupils' literary understanding.

Students are separated into groups based on their stage of adolescence. Because spiritual growth and personal development are not mutually exclusive. His inner growth is influenced not only by his age, but also by the social and family context in which he was raised, as well as his personality traits. It is commonly known that students in every class master literary education at varying degrees; some students have a greater ability to master literary education than others, while some have a slower development. However, whether or not students of the same age or in

the same class have this quality, they share something else. First and foremost, if we analyze such characteristics in the context of young students, a young teenager's unique attribute is that he considers himself to be an adult.

Even though this childhood trait remains in his conduct, he perceives himself as an adult and seeks to act like one. They were interested in art, particularly movies and fiction, during this time. They are anxious to read books about fantastical characters, heroes, and brave, caring, and kind-hearted people.

Without having a thorough understanding of the core of art, students in grades 5-7 begin to feel attractive. They find that reading helps them relax. A reader who has never seen the sea or the forest, for example, can desire to express in his own words the concept that the poet, the writer, describes the sea, the event, or the hero by reading a book.

Students in grades 5-7 interpret the author's words as a vivid speech, as though wandering in the bosom of nature, of being. They frequently pay attention to the actions of one or two protagonists who have a great influence on them when reading a work, neglecting the protagonists' features. They don't realize that the heroes' challenges and emotional experiences are mirrored in their gestures and statements. The picture of adults producing misery and cruelty in youngsters has a powerful impact on young teenagers.

Everything should be straightforward and quick for students in grades 5-7. Then they'll exhibit indicators of being irritated. The adolescent is serious because he believes what he's saying is true. As a result, every teacher and methodologist must pay close attention to this characteristic of adolescents and patiently cultivate a reading culture in them. Adolescents must be able to accept work aesthetically, think about it, remember what they have read and mastered, and constantly improve their ability to think rationally, which is to say, to teach them to think creatively.

The uniqueness of each work in terms of genre features, age, knowledge, and skills of students is required for literary-aesthetic analysis. For example, in lower classes, the riddle is only grasped when the meaning of the proverbs is interpreted through real-life instances, and if the subject, the similarity between events, is mastered by comparison. Because young children are fascinated by the flow of events and adventures, but adults are fascinated by the characters' spiritual realm.

In grades 5-6, education continues through the examination of job events. Because youngsters at this age understand white in white, black in black, good in good, and bad in concrete, but not the complex interior world of a person. They are fully aware of the lion's courage, the fox's cunning, the rabbit's timidity, and the dog's loyalty based on personal experience. The deeds and statements of the protagonists of fairy tales and parables reflect these animal instincts vividly. However, they are not described in isolation, but rather through contrasts with other heroes. This, in turn, aids in the detection of interpersonal difficulties. The work of Alisher Navoi "Arba'n" in particular plays a significant role in the didactics of readers.

"How did a dog locate a buddy for its owner?" by Shukur Sadullayev, and "Why does a donkey growl?" by Qudrat Hikmat. In this light, Anvar Abidjan's fairy tale "A very intriguing story" is exemplary.

The fascinating aspect of this type of work is how human characteristics and vices are imitated, rather than how animals, birds, and even inanimate objects speak about it. The defects of fear,

boastfulness, and boastfulness, as well as the merits of courage and devotion, are all mentioned in these stories.

In analyzing the following works, the teacher should give special attention to this element of the problem. The readers are guided from the deeds of the literary heroes to the character, from the description of events to the meaning, by such a deep study based on the events of the work. The volume of hadiths in the work "Arbain" is believed to be large, with forty hadiths presented. This material should be used with the younger generation.

As a result, in grades 8-9, the emphasis is placed on the personal appraisal of the work, as well as the objectivity of the independent viewpoints voiced, taking into consideration this characteristic in students. Reading skills are cultivated in this way using theoretical and literary principles. Although the situation in grades 8-9 is pedagogically identical, students differ in their personalities. In these classes, the uniqueness of each student's personality is reflected in the feedback, knowledge levels, and interest in things and events about the works he or she reads. As a result, personal relationships with students are divided, with emphasis on developing the cultural speech of individual students, taking into account their personal experiences.

High school students are more interested in the character logic of the protagonists, the causal connections between the past and the present, the contradictions between the past and the present. Because of their interest in the spirituality of the protagonists, students gain a certain understanding of the light and dark aspects of life. This is how they develop a love of beauty and elegance and a hatred of evil.

"The Scorpion from the Altar" by Abdulla Qadiri, "The Thief" by Abdulla Qahhor, "Humoyun and Akbar" by Pirmkul Kadyrov, "King Edip" by Sophocles (7th grade), "Navoi" by Oybek, "Mirzo Ulugbek" by M. Shaykhzoda Sharof Boshbekov's "Iron Woman", Chingiz Aytmatov's "Day of the Century" (8th grade), Yusuf Khos Khojib's "Kutadg'u Bilig", Khorezmi's "Love Letter" (9th grade), A. Navoi's "Farhod and Shirin", A. Analysis of Qadiri's "Last Days", M. Behbudi's "Padarkush", Hamzan's "Poisonous Life or Victims of Love", Cholpon's "Night and Day", O. Yakubov's "Ulugbek's Treasure" makes it very convenient for the teacher to achieve such an educational goal.

Working on a literary text to develop students' literary and aesthetic analytical skills while also providing them with academic knowledge improves the effectiveness of teaching. Because the subtlety of the language can only be appreciated and mastered when the author's notion is examined in light of the work's genre characteristics. The examination of poetic works, for example, as a literary type of lyricism, necessitates work based on its distinctive traits and purposes. Every word in it is meant to thicken the message, including the tone and the burning feeling. To put it another way, the poet is tasked with bringing his mind to the level of wisdom. The text is the main source not only for the study of the artistic features of the work, but also for the use of expressive, literary commentary or creative reading, comprehensive, comparative, problem-solving, research, non-traditional methods of analysis. In particular, in the upper grades, the study of the plot, composition, and the image of the protagonists is carried out on the basis of various types of analysis on the text, which increases the creative activity of students and expands the scope of independent thinking.

The development of such literary aesthetic analysis skills in students is critical to achieving a high level of success in the complex and serious mission of educating the younger generation as spiritually and ethically developed individuals.

Adolescence is a period of spiritual and physical growth. He creates a worldview, looks at each occurrence with confidence, awakens a sense of love, the level of approach to himself and others, the environment, art interest is stronger than in kids in grades 8-9, and regularity during this period. Students' attitudes toward art and literature as a model of beauty are strengthened during the early years of adolescence.

Throughout the literary course, adolescents' need to understand the surroundings and find their place in life is clear. High-quality works of art that assist students fulfill their ambitions and dreams are appealing to students of this age group. To sum up, it is vital to consider the activity of students, their degree of individual development, and their age in order to assure the efficiency of literary education on the road of human personality and spiritual growth. Today, in the educational process, it is an issue of enhancing students' independent creative activity, preparing them for independent information acquisition, and expanding their horizons. The process of school literary instruction should be designed to allow students to acquire knowledge consciously and to get to the heart of the issue they are studying.

LIST OF REFERENCES:

1. Dolimov S, Ubaydullaev H., Ahmedov K. Methods of teaching literature. T .: The Teacher, 1967.
2. Yuldashev K. Scientific and theoretical bases of teaching literature. T. 1996.
3. Tokhliyev B. Methods of teaching literature. T .: New Age Generation ", 2006.
4. Kadyrov V. Classical literature: problems and solutions of teaching. T .: Alisher Navoi National Library of Uzbekistan, 2009.
5. Q. Yuldashev, V. Kadyrov, B. Kasimov, J. Yuldashev. 7th grade literature textbook. T.2013.
6. Yuldashev K., Kadyrov V. Literary lessons - 7. Methodical manual for teachers. -T .: "Sharq", 2005.
7. www.school.edu.ru.
8. <http://www.ziynet.uz>.



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SOME SOCIO-PSYCHOLOGICAL FEATURES OF EDUCATION IN UZBEK FAMILIES

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ABSTRACT

The article examines the socio-psychological factors of family education, in particular, the process of raising children in the family and its psychological aspects, psychological issues of the educational impact on the child, psychological mechanisms and components of raising a harmonious personality in the family and their psychological aspects. The problems of family education in Uzbek families and the possibilities of their elimination are highlighted.

KEYWORDS: *Family, Family Upbringing, Social And Psychological Characteristics Of The Family, Upbringing In A Family Of A Harmonious Person, Problems Of Family Upbringing, Psychological Mechanisms Of Family Upbringing, The Main Social, Spiritual, Moral And Psychological Functions Of The Family.*

INTRODUCTION

If we look at the Chronicle of our independence, we will witness the rich practical work done in the social, economic, political and cultural spheres for a short 28 years in our country. The basis of these goals lies in improving the living conditions of people, citizens of our country, creating conditions and opportunities for their happy and prosperous living in families, educating the younger generation as healthy, spiritual and enlightened in all respects.

It is not surprising that today our country pays special attention to the issue of family, of course. Because the family, which is considered the main link of society, plays an important role in creating the bright future of our country.

The family is such a holy place, in which a person is formed that ensures the continuity of life, ethnic culture, traditions, moral and spiritual values are preserved, developed, the foundation of

economic and cultural life, which determines the development of society, is laid and strengthened.

If we briefly analyze the main social, spiritual, moral and psychological functions of the family, then all the emotional, psychological feelings that are formed in the child: kindness, endowment, responsiveness buds to himself and the surrounding nature are manifested in the family. In order for the family to carry out its duty to the extent that it is necessary, it will be necessary to assist it by carrying out appropriate educational and methodical armament, social, spiritual, events.

A spiritually mature family is the foundation of a spiritually high society. Family traditions, traditions, morals-the integration of spiritual values into the minds of children, the arming of each family member with professional skills is the basis of the upbringing of spiritual perfection.

Education can not remain within the framework of pure national criteria, even in any socio-economic conditions, without degrading the importance of national spiritual values, methods of National Education. The content and direction of education in all periods of the development of society is determined by the harmony of national and universal values. This theoretical rule is directly related to both social education and family education today.

Below we want to study and analyze the problems of raising children in the family, the mistakes made in upbringing, the violation of youth education and its prevention, and put forward our own scientific and vital conclusions that will respond to today's practice.

Serious changes are being made in the new socio-historical realities - family, family relations and Family Education, which are happening all over the world and especially in our country. It follows that the upbringing of children in the family in the spirit of independence, as a new-thinking person, taking into account the beginning of the family, is an important socio-pedagogical and socio-psychological necessity to review the content of family education again and further enrich it, to set its main directions and to identify goals and tasks, as well as ways

Due to this necessity, the issue of the use of national values in the upbringing of children in families in a moral and moral spirit plays a socio-political and cultural-educational role. Because the solution of these issues is rather complicated and contradictory, it requires an approach from the point of view of succession and historicity.

It is known that the current stage of the development of national independence reveals new criteria for the use of national values in family education. These criteria are expressed in such concepts as patriotism, national pride, national consciousness, national self-consciousness, national mentality, national upbringing, which ensure that the educational process is aimed at a specific style for the development of today.

When referring to the moral and moral upbringing of children in the family, it is necessary to reveal the peculiarity of national morality and upbringing.

In national morality and upbringing, the historical experiences of our ancestors, the lessons of life tested by periods, and the instructions to the ought are totals. Therefore, our national moral values have been passing from generation to generation for centuries.

Any moral virtue is an expression of the regulation of behavior in a person in this or that way, respect for a person means attention, affection, and it reflects the universal meaning. Already, since any person is a particle of Adam, then the essence of all mankind is embodied in it, and

therefore it belongs to all mankind. Accordingly, it is worthwhile for each parent to see the universal meaning and meaning in the upbringing of his child, in the upbringing of him as a harmonious person. The moral qualities of the child are dictated by a deep sense of responsibility in the upbringing of the children of parents who realize that the universal character becomes a universal value.

The spiritual and moral formation of a person in the family begins with the birth of a child, which includes the character of family relations, the pattern of parents, the level of general education in them, the level of general education, as well as how to organize a universal culture and family life. These factors constitute the content of the moral and moral upbringing of the child in the family, which includes a number of pedagogical and psychological characteristics. And taking these into account will help to know the essence, originality and significance of the use of national moral values in the upbringing of the child in a spiritual and moral spirit.

From our observations and sources it is known that a lot of valuable insights are put forward in the heritage of Eastern thinkers and Islamic teachings on the upbringing of children in the family in a spiritual and moral spirit.

If the idea that man is the greatest among all beings, that all things are created for him, constitutes the basis of Islamic spirituality, the foundation of Islamic education is to encourage people to be spiritually connected and to form noble qualities in them.

Islam is absorbed into the social life of the people, in particular, family relations, culture and national traditions, but this does not mean that the ancient, repeated culture of the Uzbek people, including family values, would not have existed without Islam. In the sources of Islamic spirituality, there is a system of views on Family, Family Relations and family education, it includes all aspects that are aimed at the formation, development and strengthening of the family. Although such views are put forward from the point of view of theology, they are also considered in accordance with the mind and daily marriage, since they are caused by the demand of people for their vital activities, lifestyles and social needs, finally family relations.

In Islam, the peculiarities of family education are indicated separately. These characteristics come from the requirements of Islam, which, in addition to the general idea of moral education of young people, serve to encourage the child to humanity and goodness, and have a universal meaning. Accordingly, today it is necessary for parents to break such a universal content of Islamic spirituality into the minds of children.

The fact that religious values serve as an important factor in the spiritual and moral upbringing of the family in the new historical conditions is explained by the fact that religious imaginations, the reason for the integration of rituals into the lifestyle of the nation, the vital activity of the people, the strong influence of religious consciousness on the human psyche. At present, it is the duty of parents to distinguish religious heresy with religious values in the process of family education and to prevent poisoning of the child's consciousness with religious superstitions.

The heritage of our great thinker ancestors is of great importance in the formation of a healthy lifestyle, a sense of respect for national and universal values in the hearts and minds of young people, and in the harmonious upbringing in all respects. After all, in the works of our scientists, who devoted their lives and potential to the realization of the true essence of life, a special place is given to issues related to the upbringing of a healthy generation.

In his works, eastern scientists paid attention to the problems of upbringing and education of children, leading him to enlightenment culture.

Great thinkers have pointed out that the upbringing of children is a high virtue that causes the human perfection of beautiful morality. In particular, the collection of Al-Adab Al-Mufrad hadiths by Imam Bukhari, Abu Lays was praised for the perfection of high human qualities in children in the works of "Tanbehul ghofili" by Samarkand.

The scholars of our country have emphasized that it is important that parents, who hope for the beautiful manners of their children in their works, regularly introduce them to the following aspects of the manners of treatment, which is the basis of husni behavior:

- pay attention to the fact that your child is sweet, gentle, capricious and humble in dealing with people;
- sharing the joy of people, grief, not betraying their property, calling for good and returning from evil are the qualities characteristic of the owners of husni behavior. Therefore, try to absorb these qualities to your child from childhood;
- know that it is also indecent to gossip to others during the treatment of your child with strangers, to ignore others, to show an attitude depending on his reputation, wealth or career;
- people of great age, who do not look at their eyes in circulation with their teachers, listen quietly to what they say, answer only questions, diligently carry out orders, also pay attention to CA children's hearts.

When talking about raising a child in the Uzbek family, it is important to remember the great thinkers of Central Asia, which left a rich legacy for the next generations. Their feedback has not lost its meaning even today.

Abu Ali Ibn Sina tried to explain the general foundations of Family Education. "If Aga makes the right use of the methods of family upbringing," wrote the scientist, "she will achieve happiness in her own life."

Ibn Sina said that regardless of the state of raising a child in the family, a person who considers it the main duty of the parents and eliminates his own shortcomings can educate others. Ibn Sina analyzed the factors that brought up the child, taught that the most correct of them – to be with the children and to talk separately, using positive examples, his self-esteem is unsatisfied. Ibn Sina gave kata importance to the expression of the father's role in tarbi. In his book "fasting" there is a chapter "The Father's attitude to children". In it, Ibn Sina says: "mothers are soft-hearted by their nature and, with their own manipulation, spoil the character of the child." According to Ibn Sina, the main educator in the family should be the father, he should be intimidated in time, sometimes give praise, sometimes reproach, sometimes encourage, sometimes punish the child in order to achieve the goal.

In the family there are wonderful thoughts of Alisher Navoi about the upbringing of a child. In his opinion, the most important thing in upbringing is to love children," to the child was a great poet, who said - from a small age it is necessary to give moral education, taking into account his age."

The well-known poet and pedagogue Abdulla Avlani also expressed wonderful thoughts about the upbringing of children in the family. As he wrote in his book “The native land and morality”, the health and happiness of the child depends primarily on his good upbringing, on the purity of his body, on the formation of religion, on the possession of good manners, on the warning of him from indecent behavior.

Thanks to Independence, new manifestations of family relations are being decided in our country. It has been leading to the destruction of old structures that have been in composition and anchored for many years. This requires the child to absorb into his mind a sense of inferiority, a spirit of ownership.

Such virtues as honesty, integrity, non-betrayal of others, philanthropy, generosity and generosity, austerity and extravagance, which are common in Uzbek families, were formed in the era of national and religious values, and as a result of family education, they passed from parents to their children and enriched their spiritual world.

Another of the important functions of the family is communication, the content of which is the interaction of family members, the provision of close communication between the mass media and family members, the perception of the surrounding nature, social environment.

In the following years, the mass media and the media have played a significant role in the comprehensive education of young people. Even when young people absorb what they see and hear, read, and draw appropriate conclusions, the family must act as intermediaries.

Effective organization of free time in the family is one of the main tasks of the family. Therefore, free time is one of the important social values of society. Active organization of leisure time in the family is an important means of ensuring family well-being, that is, reading, working, as well as organizing trips to museums, cinema, theater, concerts, historical monuments, shrines, etc.

It is also of particular importance to pay attention to beauty in family relationships and in marriage. If parents and adults in the family pay attention to beauty in their mutual relations, if there is harmony, sincerity, respect in family relations, moral qualities like above are found in the behavior of children brought up in the same family. So the aesthetic education in the family should begin with the correct attitude of parents and other older people towards each other.

Children observe the behavior, behavior of adults, how they talk with their neighbors, comrades. Therefore, it will be necessary to remember that it is absolutely a bad habit to boast before young children or gossip about others, which will have a negative impact on children.

If the father or mother of the child is rude, aggressive in relation to others, if he raises a grudge over trifle, he will break the anger of his own child, this situation will negatively affect the psyche of the child. In such conditions, there is no place for aesthetic education. In order to bring children to adulthood by making their aesthetic sense harmonious, the Katas themselves in the family should be people who fully adhere to the requirements of aesthetics.

In the family, the discipline is taught to teach children to order, freedom, to be careful of their own items and clothes.

It should be noted that the child carefully watches the clothes of the parents and adults, the feats. Therefore, parents should not be indifferent to this feature of children.

Some parents think that having less communication with their children will make them gain a reputation by carrying themselves narrowly. In their eyes, the less they meet with a fur child, the more reputation can be earned. This absolute misconception arises from the fact that the less the parents communicate with their child, the more alienation, indifference between them.

Some parents share a reputation with the child only through formality. Bunda they look for a furrow from the bristle, give the child a laziness, limit all his behavior, jerking and stroking to the olymas. It should not be forgotten that this does not lead to good.

Showing the child guardianship and guardianship by parents and other members of the family also does not give a good result. If parents or older members of the family are in a relationship with children as a partner, friend instead of such a relationship, self-assessment in children will give impetus to the formation of a sense of responsibility for the given task.

In order to improve the quality of educational influence on children in the family, the requirements imposed on the child by parents and senior members of the family and the unity of work with the word in the educational influence on them give a good result. The absence of such unity in the family negatively affects the behavior of the child. It should be noted that in a relationship with children and adolescents, ignoring their sympathy, age characteristics, psychology, the attitude to be made on the basis of insulting each other in families, bullying and oppression leads to the formation of such qualities as cowardice, nervousness, infidelity, cruelty, rudeness, anxiety in children. Such adjectives create an opportunity for the occurrence of a violation of upbringing in children and adolescents.

In conclusion, the family is the main educational institution that plays an important role in the upbringing of children as harmonious people in all respects.

REFERENCES:

1. Avloniy A. «Turkiy guliston yoxud axloq» T.: «O'qituvchi» 1992, 11-14 b.
2. Inomova O. «Farzand-nihol, ota-ona bog'bon» Toshkent, «O'qituvchi» 1994 y.
3. Uzoqov X., G'oziev E., Oripova L. «Oila axloqi va odobi». Toshkent; «O'qituvchi» 1995, 198 b.



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A REVIEW ON SEMANTIC WEB MINING

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ABSTRACT

Due to the enormous quantity of information in various forms, retrieving the most relevant papers from the web is challenging. The enormous quantity of data is tough for computers to comprehend, but it is simple for people to comprehend. The semantic web, often known as Network 3.0, is an online of data that allows competent computers to comprehend data on web pages. The Semantic Web is a technique for improving the precision of information retrieval systems. Online mining is the use of data mining methods to extract information from web data, such as web pages, connections between documents, and web site use records, among other things. Semantic web mining aims to bring the semantic web and web mining together. The primary goal is to use semantic web tools to convert unstructured data into machine comprehensible data so that machines can reply to human inquiries in less time and save tiresome effort, and to use web mining tools to automatically extract information buried in huge quantities of online data. The different Semantic-web methods and difficulties are the subject of this paper.

KEYWORDS: *Semantic Web Mining, Semantic Web Approaches, Semantic Web, Web 3.0, Web Mining.*

1. INTRODUCTION

Both the Semantic Web and Web Mining study fields build on the success of the World Wide Web. They work effectively together because they each handle a different aspect of a new problem presented by the current World Wide Web's (WWW) enormous success[1], [2]. The majority of data accessible on websites is unstructured, making it difficult for computers to comprehend, yet the volume of data is so large that it can only be handled effectively by machines. With Web information input, the World Wide Web has evolved into a new communication medium. This is reinforced by informational, cultural, social, and evidentiary values, to name a few. With the availability of different Search Engines such as Google, Yahoo, and others, people are increasingly turning to them to get information from Web sites. Existing search engines, on the other hand, are unable to differentiate between specific user requests. The semantic web tackles the first half of the problem by attempting to make data machine-understandable, while web mining tackles the second by automatically extracting valuable information from this data. Web mining necessitates the creative use of data mining and/or text mining methods, as well as unique approaches[3], [4]. Web data mining is one of the most difficult jobs in data mining. The goal of semantic web mining is to bring together the two fields of semantic web and web mining. Fig. 1 illustrates the layered structure of semantic web.

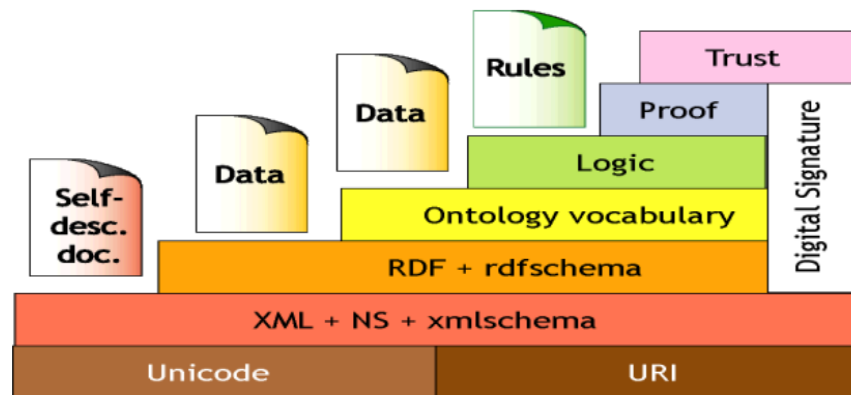


Fig. 1: Layer structure of semantic web[5].

1.1. Semantic Web:

Tim Berners-Lee, the creator of the World Wide Web, has a vision for the Semantic Web[6]. Semantics, in general, is concerned with the structure of sentences and what they really imply. When a user alters a sentence's pattern, the pattern changes, but the semantics stay the same. When a computer comprehends the semantics of a document, it does more than simply analyze the sequence of letters that make up that text; semantic web aids the machine in comprehending the meanings behind the web page. The present WWW contains a huge quantity of material that is frequently unorganized and comprehensible only by humans. The human brain, for example, employs logic:

- a. Ramesh is a father.
- b. A father is a parent.

As a result, Ramesh must be a parent, but machines are incapable of applying this reasoning. The Semantic Web attempts to solve this issue by giving machine-interpretable semantics, allowing

machines to better assist users. If a computer can recognize the meaning behind a web page, it may readily assist people in accessing knowledge rather than unstructured content, enabling knowledge to be handled automatically. A basic search engine cannot comprehend the connections between keywords, phrases, or parts of speech inside a search phrase, but a semantic search engine can, thanks to ontologies, understand the underlying meaning of the whole phrase. A detailed explanation of words and reasoning in a topic area is ontology. The usage of ontologies allows computers to provide meaningful results from semantic data. By making the message as plain as possible, a machine can comprehend or at the very least use it. A semantic search engine, for example, would be able to tell the difference between the following sentences, which are made up of the same keywords but have distinct meanings:

- a. By using java language semantic web mining.
- b. Semantic web mining by using java language.

The sentences in the example above are made up of the same keywords, but the subject connections have been inverted. Because the connections between the keywords or phrases are unknown in conventional online search, which is dependent on ranking algorithms, the engines would return similar or almost identical results, even if two totally distinct queries were asked. Additional issues with conventional online search occur when the terms are either too precise, resulting in few or no results, or too broad, resulting in irrelevant results.

The current web is about documents, while the semantic web is about objects on web pages, such as people, locations, organizations, and ideas.

2. DISCUSSION

2.1. Semantic Web Architecture:

For the Semantic Web, Berners-Lee proposed a layer structure. The Semantic Web is built in layers, one on top of the other, allowing for a more uniform development process[7].

2.1.1. Uniform Resource Identifier (URI):

The web's cornerstone is the URI, which binds the rest of the web together. The URI's goal is to clearly provide an identity that will be used to represent a resource in a consistent manner, identifying information representation structures such as classes, attributes, and people. It becomes easy to combine all data that relates to a particular resource since there is no ambiguity. A URI is just a description, not a location; it simply identifies something. For example, one individual's web page might be abcd.com, which can be used to identify that person. As a result, the object abcd is associated. A person may utilize his page, but it is only visible to other users. Users and software can understand precisely what they are being referred to since URIs are globally unique and each occurrence of the same identifier signifies the same thing.

2.1.2. Unicode:

Unicode is a character encoding system that allows all user languages to read and write on the web in a uniform format.

2.1.3. Extensible Markup Language (XML):

XML is a web-based data transmission and storage language. The purpose of XML is to transport and describe data, not to display it. User-defined tags may be found in XML documents. The structure of an XML document is described using an XML schema. In the semantic web, the XML namespace is used to prevent conflicting data or names. The purpose of the XML layer is to provide the fundamental syntax and structure of online data.

2.1.4. Resource Description Framework (RDF):

RDF is a format for storing and organizing data. RDF addresses the issue of data linkage. A resource is anything that has an identity, and URIs(Uniform Resource Identifiers) are used to identify it. The term "description" refers to a container that holds multiple assertions that describe the resource. To create and comprehend claims, you'll need a framework. The machine can analyze the query and come up with a response using RDF.

2.1.5. Resource Description Framework Schema (RDFS):

RDFs may be used to organize classes and attributes into generalization/specialization hierarchies. The purpose of RDF and RDFS is to give metadata to upper-layer technologies so that this information may be shared and reused across these technologies or between these technologies and other applications.

2.1.6. Web Ontology Language (OWL):

A precise explanation of words and reasoning in a topic area is known as ontology[8]. We may bring the semantic stuff using ontology. The web ontology language was created using description logics and web languages and may be used to define ontologies. OWL meets the semantic web's criteria for requiring little human input while still meeting software needs for a language with correct meaning. Ontologies are useful for clearly representing things and their relationships, which may be either direct or inverse.

2.1.7. Rules, Proof & Trust layer:

- *Proof Layer:*

The proof layer is used to validate that the findings generated by the agents can be trusted or to authenticate the agent's activity.

- *Rules Layer:*

The Rules Layer is intended to be used as a framework for developing new conclusions and expressing them for the deployment of the semantic web.

- *Trust Layer:*

The purpose of the trust layer is to offer a method for information providers and users to trust and be confident in each other.

2.2. Web Mining:

Online mining is the use of data mining methods to extract information from web data, such as web documents, hyperlinks between papers, and web site use records, among other things[9]. Thus, finding legitimate, previously unknown, and possibly valuable patterns in the enormous

quantity of online data, patterns that represent them in succinct form and manageable orders of magnitude, is a difficult task. Web mining, like other data mining applications, may benefit from data structure, but it can also be used on semi structured or unstructured data. Web mining aids the transition from human-understandable material to machine-understandable semantics in this way. Fig. 2 illustrates the categorization of web mining methods.

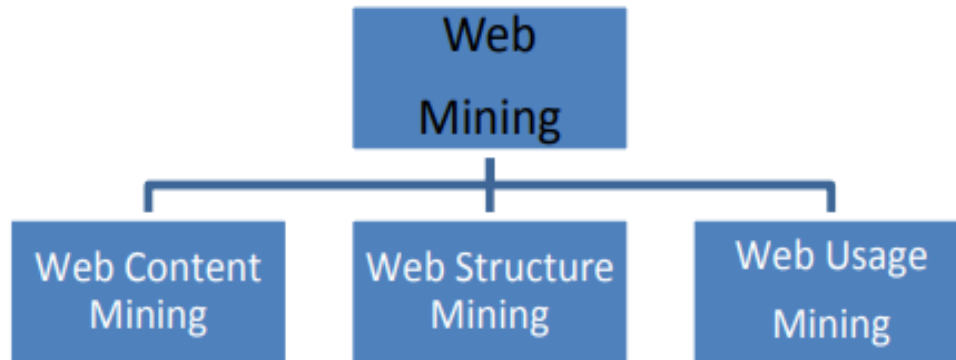


Fig. 2: Taxonomy of web mining[10].

2.2.1. Web Content Mining:

Web content mining is the technique of collecting information from the contents of Web pages by analyzing the content of web resources. It examines web page content as well as web searches. The study is mostly focused on text mining methods, although expansions to multimedia material are starting to appear. Textual, picture, audio, video, metadata, and hyperlinks are all examples of data kinds found in online content. Web content may be unstructured (plain text is often associated with unstructured data), semi-structured (HTML documents), or structured (XML documents) (extracted from databases into dynamic Web pages). Unstructured data is strongly linked with big data. Large datasets that are challenging to examine using conventional methods. As a result, NLP methods are used to retrieve information.

2.2.2. Web Structure Mining:

Online pages serve as nodes, while hyperlinks serve as edges linking related sites in a typical web graph. The technique of finding structural information from the web is known as web structure mining. We combine structure mining with the page rank algorithm to ensure that the material is relevant and of sufficient quality. Based on the kind of structural information utilized, this may be further split into two types.

Furthermore, a web page's content may be arranged in a tree-structured manner using the different HTML and XML elements on the page.

- *Hyperlink:*

A hyperlink is a structural element in web pages that connects one place to another, either inside the same page or on a separate page. An intra-document hyperlink leads to a different section of the same page, whereas an inter-document hyperlink connects two distinct pages.

- *Document Structure:*

According to the types of data to be mined, web mining may be classified into three categories. A broad variety of conventional data mining methods, including association rule discovery, clustering, classification, and sequence mining, are used and expanded in all three domains to reflect the unique structures of online resources and the unique issues presented in Web Mining.

2.2.3. Web Usage Mining:

Web usage mining is the use of data mining methods to find interesting usage patterns in web usage data or server logs in order to better understand and fulfill the requirements of web-based applications. It also analyzes user clicks from web server logs. The identity or origin of online users, as well as their browsing activity on a website, is captured by use data.

Directly addressing the issues connected with web log mining is a key aspect of the Web use mining method. It's all about detecting user surfing habits on the internet using information gleaned from web logs.

2.3. Semantic Web Approaches:

2.3.1. Ontology Approach:

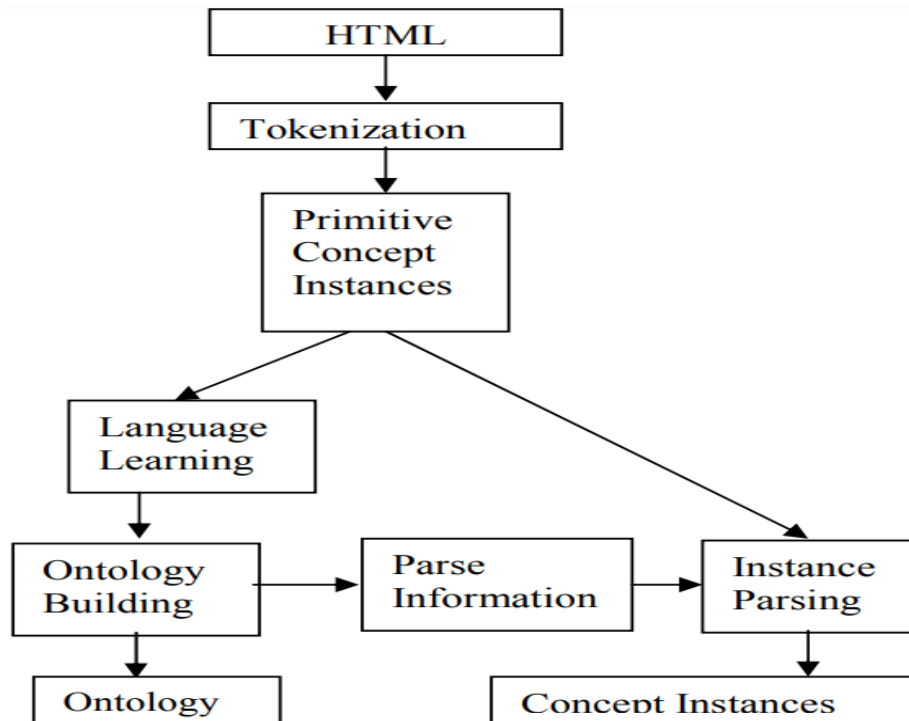


Fig. 3: Ontology learning process[11].

The semantic web's backbone is ontology. An ontology is a set of URIs having a meaning that is typically only obliquely explained. A formal ontology language is used to represent ontologies. Ontology is a collection of ideas and their interrelationships that are linked to a certain knowledge area. Ontology expertise is very helpful in defining the structure and scope of online content mining. Ontology is a collection of things, ideas, and other entities that exist in a given region, as well as the connections that exist between them. Getting an ontology from the internet is a difficult job. It is based on Web content mining techniques and blends machine learning techniques with approaches from areas such as information retrieval, using them to find and

make explicit the semantics in data. The methods generate interim findings that must be combined into a machine-readable format. Ontology learning process is illustrated in Fig. 3.

2.3.2. Semantic Based Web Mining:

Semantic-based web mining combines the semantic web with web mining, two rapidly evolving areas. It's also known as Semantic-Web Mining or Semantic Web-Mining. The semantic web attempts to solve this problem by making data intelligible to both machines and humans. Online mining, on the other hand, is concerned with automatically collecting valuable knowledge or information from vast amounts of data on web sites. Web pages are mined by the machine in semantic based web mining so that the machine can better comprehend the information on the web pages. It works by retrieving XML and RDF documents, as well as ontologies and metadata. Semantic web mining entails sifting through data sources and information pertaining to web-based information management systems. Web mining will lead to semantic web mining. The aim of semantic web mining is to make the web more accessible. Ontology, semantic web content, and web services are the three main categories of requirements for the semantic web.

2.4. Semantic Web Challenges:

2.4.1. Huge Quantity of Available Data:

Existing technology has not yet been able to predict all semantically duplicated words on the web, which includes vast amounts of data on billions of web pages.

2.4.2. Unclearness:

These are hypothetical terms like "young" or "tall." This is due to the ambiguity of user questions, the difficulty of matching queries to provider contents, and the difficulty of combining several knowledge bases with overlapping but carefully distinct ideas.

2.4.3. Term's Adaptability:

This is a set of exact ideas with varying values. A teacher, for example, could offer a set of test criteria that correlate to a number of different unique student abilities, each with a different likelihood.

2.4.4. Ontology Inconsistency:

These are logical inconsistencies that will inevitably emerge with the creation of big ontologies and the merging of ontologies from different sources.

3. CONCLUSION

We looked at two rapidly emerging research topics in this paper: web mining and semantic web. Semantic Web Mining, as a unified field, provides new methods to enhance both fields. By using the new semantic structures on the Web, semantic-based web mining may enhance the outcomes of web mining. Because of the availability of background information, the Semantic Web may make Web mining more simpler, and Web mining can also create new semantic structures in the Web. Many industries benefit from the study, including e-commerce, health care, privacy and security, search engines, knowledge management, and information retrieval.

REFERENCES

1. J. Sivakumar and K. S. Ravichandran, "A review on semantic-based web mining and its applications," *International Journal of Engineering and Technology*. 2013.
2. V. A. and A. A., "Semantic Web Mining using RDF Data," *Int. J. Comput. Appl.*, 2016, doi: 10.5120/ijca2016908022.
3. T. A. Al-asadi, A. J. Obaid, R. Hidayat, and A. A. Ramli, "A survey on web mining: Techniques and applications," *Int. J. Adv. Sci. Eng. Inf. Technol.*, 2017, doi: 10.18517/ijaseit.7.4.2803.
4. A. Gök, A. Waterworth, and P. Shapira, "Use of web mining in studying innovation," *Scientometrics*, 2015, doi: 10.1007/s11192-014-1434-0.
5. [5] M.-R. Koivunen and E. Miller, "W3C Semantic Web Activity." <https://www.w3.org/2001/12/semweb-fin/w3csw> (accessed Sep. 13, 2018).
6. A. Gangemi, V. Presutti, D. Reforgiato Recupero, A. G. Nuzzolese, F. Draicchio, and M. Mongiovì, "Semantic Web Machine Reading with FRED," *Semant. Web*, 2017, doi: 10.3233/SW-160240.
7. A. Harth, M. Janik, and S. Staab, "Semantic Web Architecture," in *Handbook of Semantic Web Technologies*, 2011.
8. L. Yu, "OWL: Web Ontology Language," in *A Developer's Guide to the Semantic Web*, 2014.
9. M. Spiliopoulou, B. Mobasher, O. Nasraoui, and O. Zaiane, "Guest editorial: Special issue on a decade of mining the Web," *Data Min. Knowl. Discov.*, 2012, doi: 10.1007/s10618-012-0257-y.
10. K. Griazev and S. Ramanauskaite, "Web mining taxonomy," 2018, doi: 10.1109/eStream.2018.8394124.
11. M. El Ghosh, H. Naja, H. Abdulrab, and M. Khalil, "Ontology learning process as a bottom-up strategy for building domain-specific ontology from legal texts," 2017, doi: 10.5220/0006188004730480.



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A STUDY OF GREEN CONCRETE MADE PARTLY FROM AGRICULTURAL WASTE LEFTOVERS

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ABSTRACT

The increasing use of concrete has resulted from the growing demand for building throughout the globe. Conventional concrete-making materials, on the other hand, are not completely environmentally friendly, prompting research into greener concrete alternatives. Extensive study has been done in the past to use agricultural waste materials such as those from palm oil, coconut, sugarcane, and the paddy industry in concrete, and the results show that such resources may be used in concrete. Reusing agricultural waste materials in concrete may decrease reliance on traditional concrete-making resources while also reducing environmental impact, waste conservation, and waste disposal from these industries. A review of the use of developing alternative agricultural waste materials in concrete, such as bamboo, maize, wheat, olive, sisal, seashells, and other materials, is conducted in this article with the goal of evaluating the advantages and drawbacks of utilizing these materials. This study examines the use of agricultural waste materials in concrete in various forms, including partial cement and aggregate substitution, as well as fiber reinforcing. The paper's primary conclusion is that, although the use of agricultural waste materials reduced certain concrete characteristics, effective treatment techniques and waste material selection would allow for the manufacture of concrete with better performance. The summary and discussion in this article should offer fresh

information and expertise on a wider range of agricultural waste materials that may be utilized to make greener and more sustainable concrete.

KEYWORDS: *Agricultural Waste, Concrete, Fiber Reinforcing, Green Concrete, Soil.*

INTRODUCTION

There is a rising need for greener concrete due to the increased use of concrete in the building sector throughout the globe. The negative environmental effect of concrete-making ingredients such as aggregates and cement is one of the main causes behind this. Excessive use of aggregates depletes these natural resources, and irresponsible quarrying and mining operations to extract these materials may result in environmental problems such as landscape destruction and ecosystem disturbance, as well as pollution of water, soil, and air. Furthermore, cement production is an energy-intensive process that, most significantly, results in greenhouse gas emissions[1]. The cement sector alone is thought to be responsible for around 1.8 Gt of CO₂ emissions each year, accounting for about 5–7% of total anthropogenic CO₂ emissions. According to a life cycle study, the manufacturing of 1 t of cement emits approximately 0.8 t of CO₂. Researchers have looked at the potential of using industrial by-products and waste materials in concrete in an effort to protect the environment via the development of green concrete. Industrial by-products have long been utilized in a variety of applications throughout the globe[2]. While the use of industrial by-products in concrete is well-established, the integration of waste material for concrete production, particularly waste from the agricultural sector, is still very much in the research stage. Agriculture waste is often burned or dumped, resulting in pollution and poisoning of the environment. Recognizing the potential for environmental conservation, research has been carried out throughout the years to re-use agricultural waste from the agriculture sector to make concrete. For example, waste from the palm oil industry, such as waste oil palm shell and palm oil fuel ash, waste from the coconut industry, such as waste coconut shell and coconut fibers, and waste from the paddy industry, such as waste rice husk, are among the most well-known agricultural wastes for concrete production[3]. These agricultural waste products were utilized in concrete production as aggregate, fiber reinforcement, and supplemental cementitious material (SCM).

Alternative agricultural waste materials for concrete, such as those from agriculture (bamboo, banana, maize, wheat, sisal, grass, etc.) and aquaculture farming (oyster, cockle, clam, and periwinkle, for example), have recently become popular. Agricultural farming wastes have often been used as a partial cement replacement material in concrete by researchers. This is due to the fact that plants obtain various minerals and silicates from the earth during their growth process; inorganic materials, particularly silicates, are found to be higher in annually grown plants than in long-lived trees, allowing plant residues to be a potential source of cement replacement material with pozzolanic reactivity[4]. Another frequent use of agricultural wastes is as fiber reinforcement in concrete composites. Natural fibers have the potential to be used since they are: i) less expensive, ii) need less industrialization, iii) environmentally benign, and, most significantly, iv) natural fibers are as strong as synthetic fibers. Furthermore, in an attempt to decrease reliance on traditional aggregates such as granite, gravel, and natural mining, some of these agricultural waste materials were used as partial aggregate replacements in concrete in an effort to protect the environment. As a result, the emphasis of this study will be on collecting and

analyzing past results obtained when agricultural waste residues (from agriculture and aquaculture farming) were used in concrete[5].

Understanding the typical behaviors of such waste elements in concrete, such as their advantages and downsides, may serve as a foundation for the creation of an environmentally friendly concrete that includes agricultural waste materials. Agriculture farming is a significant worldwide business since the majority of produced agricultural goods are used to feed people all over the globe[6]. China, India, the United States, Brazil, and Nigeria are among the world's top producers of agricultural goods such as cereals, vegetables, and fruits. However, there are many waste elements left behind after harvesting and consumption of agricultural goods, such as leaf, straw, stalk, and ash. The majority of these agricultural wastes are dumped in the environment, with little effort made to recycle them. Researchers have recently started to use these wastes as a partial substitute for traditional concrete-making ingredients and have discovered some intriguing results. While the use of farm wastes in concrete, such as those from the palm oil, coconut, sugarcane, and paddy industries, has long been recorded, this section examines new research on other agriculture leftovers, such as those from bamboo, wheat, olive, and other agricultural sectors.

Bamboo is the world's fastest-growing and highest-yielding natural resource and building material. Bamboo has been recognized as a potential option for building material by experts during the past two decades owing to its favorable mechanical characteristics, high flexibility, and cheap cost. Bamboo has been proven to be suitable for structural elements such as beams, columns, and slabs. Bamboo output is estimated to be about 20 million tons per year worldwide, mostly in Asia and Latin America, resulting in a large quantity of agricultural waste from the bamboo industry[7]. These agricultural wastes are often burnt in open landfills, polluting the environment. While bamboo is often used as reinforcement, the re-use of waste products such as bamboo leaf ash and fiber in concrete is gaining popularity in recent years. WSA's potential as an SCM in concrete was shown by a 25 percent improvement in mortar compressive strength when WSA was used at a 20 percent cement replacement level. On the other hand, it was discovered that when 8% WSA was applied, the compressive strength required 180 days to achieve the compressive strength of control concrete without WSA, which was ascribed to the delayed pozzolanic response. In the presence of up to 16 percent WSA, however, concrete's 28-day flexural strength was shown to be enhanced. Because concrete durability is so important, researchers also looked at the durability characteristics of concrete that utilized WSA as a partial cement substitute. When concrete was exposed to a sodium sulphate solution, WSA substitution up to 24 percent increased compressive strength, while WSA replacement up to 8 percent improved performance of concrete subjected to a magnesium sulphate solution. WSA-blended concrete had greater freeze-thaw resistance than control concrete, and increasing the WSA replacement amount from 5% to 15% improved the freeze-thaw resistance of the concrete.

Furthermore, as compared to control concrete without WSA, the resistance of WSA-blended concrete to alkali-silica reaction degradation was higher, and increasing WSA concentration to 15% resulted in better resistance to alkali-silica reaction. WSA's anti-alkali-silica degradation effects were shown to be stronger in concrete mixtures with a lower water-to-binder (w/b) ratio[8]. The pozzolanic reaction and filler effect of WSA, which refined the capillary pores within the cement matrix, were ascribed to the increased durability of concrete containing WSA against freeze-thaw and alkali-silica reaction. WSA may potentially be used as a partial

substitute for fine aggregate in concrete, according to the researchers. The workability of new concrete was decreased when WSA was utilized as a partial replacement by up to 10.9 percent owing to the greater fineness of WSA, which increased the water demand to wet the surface of the WSA particles. Furthermore, in the presence of WSA at a fine aggregate replacement level of 10.9 percent, the setting time of new concrete was extended by up to 92 percent. The use of up to 10.9 percent WSA increased the compressive, tensile, and flexural strengths of autoclaved concrete by up to 87 percent, 67 percent, and 71 percent, respectively, when combined with limestone fine aggregate. The compressive strength of WSA concrete (up to 6% fine aggregate replacement) was greater than that of control concrete after 28 days, despite the fact that the 7-day compressive strength was comparable. Based on the studied durability characteristics of WSA concrete, using WSA as a partial fine aggregate replacement of up to 6% resulted in outstanding concrete durability[9].

Due to the denser pore structure of the concrete system when the WSA filled the pores in the concrete system, the sulphate resistance, resistance to water penetration, and abrasion resistance were all improved when the WSA was applied. When concrete was exposed to heat cycling, the WSA concrete showed a smaller decrease in compressive strength than control concrete, indicating a superior reaction to thermal cycling, particularly when the WSA fine aggregate replacement level was raised to 15%. In the presence of WSA, fractures induced by thermal cycling appeared considerably later in the concrete, and the greater electrical resistivity of the WSA-blended concrete explained the concrete's improved resistance to raised temperature. The use of wheat straw as a concrete fiber reinforcement and the performance of wheat straw fiber were compared to hemp fiber[10].

DISCUSSION ON GREEN CONCRETE

When OWA was used as a partial cement substitute, the strength characteristics of concrete were generally decreased, according to numerous studies. The increase in capillary holes in the OWA-containing mortar was ascribed to this. The residual compressive strength of concrete with up to 22 percent OWA was enhanced at higher temperatures of up to 600 C when compared to concrete without OWA. This was bolstered by the fact that the OWA-blended concrete had a lower electrical charge, indicating less fractures and damage when exposed to high temperatures. The enhanced performance of concrete mixed with OWA at higher temperatures was due to the OWA's pozzolanic reaction and filler action, according to the authors. However, because of the lower vapor pressure generated up in the concrete, the existence of a larger number of pores in the OWA concrete may contribute to better fire resistant performance. When OWA was employed as a filler in self-compacting concrete instead of conventional filler, the compressive strength achieved by the former was slightly greater. Sisal fibers were shown to provide greater flexural strength as well as toughness and ductility to concrete, similar to typical fiber reinforced concretes. The composite showed strain hardening behavior and numerous fracture development under tensile when sisal fibres were employed at 10% volume fraction in cement composite. The performance of the concrete when exposed to impact force was also enhanced, such as impact energy, fracture resistance, and failure pattern, owing to the ductility and toughness given in concrete by the inclusion of sisal fibres. The impact energy and ultimate fracture resistance of concrete containing sisal fibres may be increased by up to 6 and 5 times, respectively, when compared to concrete without fibres, according to the results.

Despite the benefits of using sisal fibers, one of the main drawbacks of using this fiber in cement-based concrete is its durability. Untreated sisal fibres linked in cement matrix were shown to deteriorate and become more brittle over time as a result of alkaline attack and fibre mineralization, as described. As a consequence, the resultant cement composite would have problems with durability. The compressive and tensile strengths of the resultant cement composite were clearly reduced in the experiment carried out utilizing corroded sisal fibres that were subjected to different media. Recognizing this, researchers have tried to enhance the endurance of such fibers using two methods: i) coating the fibres before usage, and ii) using SCM to reduce the alkalinity of cement mortar. Thermal treatment and sodium carbonate (Na_2CO_3) treatment techniques were used on the sisal fibres, and the resultant sisal fibre reinforced concretes were shown to be more durable. The increased endurance of the thermally treated sisal fibres was attributed to better crystallinity, which guaranteed greater mechanical strength of the sisal fibres. When sisal fibres were soaked in Na_2CO_3 , calcium carbonate sediments filled in the pits and holes on the surface of the fibres, protecting the interior from alkaline assault during the cement hydration process, resulting in increased concrete durability. The fibre composite including pre-treated sisal fibre with silica fume slurry performed similarly to the control fibre composite having untreated sisal fibre in another study on sisal fibre treatment. While adding silica fume to the sisal fibre mortar increased its durability, using ground granulated blast furnace slag (GGBS) as a partial cement substitute did not decrease the composite's brittleness. Also, when silica fume was employed as a partial cement substitute, the drying shrinkage of sisal fibre mortar was reduced at later ages, while using GGBS resulted in a 9 percent increase in the drying shrinkage value. When met kaolin and calcined waste crushed clay brick were employed as partial cement replacement, there was a substantial increase in the flexural strength (approximately 4 times) and toughness (about 40 times) of sisal fibre composites exposed to hot-water immersion. When shown, the positive impact of cement replacement material on improving the durability of sisal fibre composites was mostly attributable to a decrease in fibre mineralization as the alkalinity in the cement matrix was decreased.

Due to evaporation of water and the formation of drying cracks at later ages, the compressive strength of DPF reinforced concrete that was air-cured was lower than that of water-cured concrete. In terms of the flexural characteristics of DPF reinforced concrete, it was found that the initial crack strength of the fibre reinforced concrete was lower than that of the control concrete, despite increased ductility. However, increasing the fiber content beyond 2% would have a negative impact on the initial crack strength and ductility of the resultant fibre reinforced concrete. Furthermore, it was discovered in the same study that a dry, hot climate had a negative impact on the flexural performance of DPF reinforced concrete, which was ascribed to fast evaporation of water, which resulted in the formation of voids and micro-cracks. When OS was combined with cement paste, there was no substantial reaction, thus the OS simply served as a filler. According to studies, the workability of the OS deteriorated by up to 30% when it was employed as a partial fine aggregate substitute. The increase in water adsorption in the presence of OS caused the slump to decrease, resulting in a more viscous concrete. The unevenly flat OS particle has a worse workability, and the mixing friction has increased. When the aggregate replacement level was raised to 50%, however, the slump worsened, which was ascribed to a lack of coherence between the cement paste and the OS, as described by. The air content of the concrete containing OS was observed to rise due to the porous nature and uneven grading of OS.

In terms of compressive strength, most studies observed a reduction in concrete's 28-d compressive strength as fine aggregate replacement levels with OS increased. However, the 28-d compressive strength of concrete with and without OS was found to be fairly comparable. Nonetheless, as the age of the concrete grew in the research, the strength growth of the OS concrete was lower, eventually culminating in a lower compressive strength of OS concrete compared to the control concrete beyond 56 days. The stress concentration in the weaker OS aggregate was blamed for the OS concrete's poorer strength development. Most agricultural waste materials, especially those from the agriculture industry, are used as SCM because they contain a significant quantity of silica after being burned at high temperatures, such as banana leaf ash, bamboo leaf ash, wheat straw ash, elephant grass ash, and corn cob ash. The high silica concentration in these ashes allows for pozzolanic reactivity, which is advantageous to concrete's later age strength development. Furthermore, by selecting the best burning temperature and grinding the farmed agriculture waste, a better grade pozzolanic material with a higher silica content is produced. The temperatures at which the fire was lit. In general, the use of these agricultural farming waste as SCM would decrease the workability of concrete owing to the porous nature and fineness of the SCM; the strength of the concrete at an early age would also be reduced, if not comparable to the control concrete, as shown in the summary in Table 8. However, owing to the pozzolanic reaction of these SCM, conversion of $\text{Ca}(\text{OH})_2$ to extra calcium silicate hydrate (CSH) may occur, and the resultant concrete's later-age compressive strength may surpass that of the control concrete. The enhanced durability characteristics found in earlier studies were also attributable to the pore refinement effect caused by the pozzolanic reaction of the agricultural farming waste as SCM. When aquaculture farming waste, such as seashells, was used as a partial cement replacement, however, there was little improvement because the majority of the ash was CaCO_3 , and unlike agriculture farming wastes, seashells do not have pozzolanic behavior. In contrast to using agriculture farming waste as a partial cement replacement, when used in powder form as fine ag Due to the fineness of the material, its usage often resulted in decreased workability as a consequence of increased water consumption.

On the other hand, when aquaculture farming waste, such as OS, was utilized as a partial fine aggregate replacement in aggregate form, the strength characteristics were reduced. This was ascribed to the waste aggregates' lower aggregate strength as well as their form. However, owing to the substantially varied nature of the OS employed in various studies, there are conflicting findings on the impact of durability behavior. Several agricultural wastes, such as corn cob, OS, and PS, were tested as coarse aggregate replacements, and the concrete characteristics were all decreased in the presence of these materials, mainly due to the lower intrinsic strength of the materials as aggregate. However, one of the main flaws is the durability of the fibers in the cement matrix, since the fibers may be vulnerable to alkali attack, which occurs during the cement hydration process and may cause increasing brittleness and deterioration over time. However, the long-term durability of natural fibers in concrete may be enhanced with suitable pre-treatments such as heat treatment and the use of SCM to partly substitute cement.

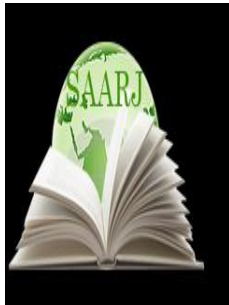
CONCLUSION AND IMPLICATION

In summary, this article outlined the possible use of a range of alternative agricultural wastes from both agriculture and aquaculture in concrete, including cement replacement, aggregate replacement, and fiber reinforcing. Although the use of agricultural waste materials may reduce certain concrete characteristics (such as workability and strength), based on the summarized

results in this study, the dose may be controlled to obtain acceptable concrete performance. Furthermore, these materials may be integrated into concrete for better mechanical and durability performance provided appropriate treatment (such as pre-treatment and burning) and material selection is carried out. As a result, the manufacturing of a more sustainable and green concrete may be accomplished, resulting in waste reduction and decreased negative environmental effect. This would result in more environmentally friendly building for the construction industry and a cleaner environment for society to live in.

REFERENCES

1. N. M. Al-Akhras, "Durability of wheat straw ash concrete to alkali-silica reaction," *Proc. Inst. Civ. Eng. Constr. Mater.*, 2013, doi: 10.1680/coma.11.00005.
2. N. M. Al-Akhras and M. Y. Abdulwahid, "Utilisation of olive waste ash in mortar mixes," *Struct. Concr.*, 2010, doi: 10.1680/stco.2010.11.4.221.
3. N. M. Al-Akhras and B. A. Abu-Alfoul, "Effect of wheat straw ash on mechanical properties of autoclaved mortar," *Cem. Concr. Res.*, 2002, doi: 10.1016/S0008-8846(02)00716-0.
4. N. M. Al-Akhras, K. M. Al-Akhras, and M. F. Attom, "Thermal cycling of wheat straw ash concrete," *Proc. Inst. Civ. Eng. Constr. Mater.*, 2008, doi: 10.1680/coma.2008.161.1.9.
5. G. Jungmeier, "The Biorefinery Fact Sheet," *Int. J. Life Cycle Assess.*, 2017.
6. E. Aprianti, P. Shafigh, S. Bahri, and J. N. Farahani, "Supplementary cementitious materials origin from agricultural wastes - A review," *Construction and Building Materials*. 2015, doi: 10.1016/j.conbuildmat.2014.10.010.
7. F. F. Ataie and K. A. Riding, "Thermochemical Pretreatments for Agricultural Residue Ash Production for Concrete," *J. Mater. Civ. Eng.*, 2013, doi: 10.1061/(asce)mt.1943-5533.0000721.
8. N. Benmansour, B. Agoudjil, A. Gherabli, A. Kareche, and A. Boudenne, "Thermal and mechanical performance of natural mortar reinforced with date palm fibers for use as insulating materials in building," *Energy Build.*, 2014, doi: 10.1016/j.enbuild.2014.05.032.
9. C. P. Woon, P. N. Shek, M. M. Tahir, and A. B. H. Kueh, "Compressive Strength of Ground Waste Seashells in Cement Mortars for Masonry and Plastering," *Appl. Mech. Mater.*, 2015, doi: 10.4028/www.scientific.net/amm.727-728.167.
10. P. Lertwattanakul, N. Makul, and C. Siripattaraprat, "Utilization of ground waste seashells in cement mortars for masonry and plastering," *J. Environ. Manage.*, 2012, doi: 10.1016/j.jenvman.2012.06.032.



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A STUDY REGARDING REVEALING ECHOCARDIOGRAPHIC AND ANTHROPOMETRIC CHANGES IN CHILDREN FROM BIRTH TO 3 YEARS OLD WITH CONGENITAL HEART DEFECTS

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ABSTRACT

This article in the literature explains the causes and complications of congenital heart disease in children, comparative diagnosis. This article presents information on the frequency and risk of congestive heart failure in the sympathetic nervous system in children. The most intensive development of a child is observed in the first year of his life. During this period, a significant increase in body weight and height is observed, and the functional activity of the central nervous system improves.

KEYWORDS: Heart, EXOKG Examination, Anthropometric Indicators.

INTRODUCTION

For every 1,000 live births in Uzbekistan, there are between 5.5 and 15.7 children with congenital heart defects. In 50% of cases, congenital heart defects cause disability among all congenital defects, and thus are among the problems of social significance [1,7].

The aim of our research is to compare anthropometric parameters and echocardiographic examinations in children with congenital heart disease. According to the European International Register of Birth Defects, congenital heart defects (CHDs) are the most common group of developmental anomalies in children and remain the leading cause of death in newborns [2,3,4]. Currently, there is a tendency to increase the number and weight of CHD [5,6]. Currently, there is a growing trend in the number and severity of registered CHD [6,10].

This concept has several drawbacks. First, it does not take into account the time of onset of the defect, and second, a number of anomalies of the intrathoracic vessels do not belong to CHD (e.g., permanent superior vena cava), which is important during surgery [1,8]. Third, diseases

such as cardiomyopathies and abnormalities of the cardiac conduction system ("Wolf-Parkinson-White phenomenon, long QT interval syndrome"), which lead to "structural abnormalities" and "functional disorders" [1,9], do not apply to CHD. Furthermore, the term CHD refers only to congenital defects of the thoracic regions of the great vessels (e.g., coarctation of the abdominal aorta). Although the concept of CHD is currently defined, it refers to anatomical deformity of the heart or large vessels developing in the uterus. 'can be rifled [2].

At present, CHD is the leading cause of death compared to other malformations in children and remains the leading cause of death [3]. In addition, a further increase in the prevalence of CHDs is expected. The main reason may be related to the improvement of diagnostic techniques associated with the improvement of the skills of ultrasound diagnostics specialists and the improvement of modern imaging techniques [6]. The most intensive development of a child is observed in the first year of his life. During this period, a significant increase in body weight and height is observed, and the functional activity of the central nervous system improves. Proper growth and weight gain are closely related to the development of functional abilities of organs and systems. Due to hemodynamic disturbances, TYuN has a direct negative impact on the development of the child. Some types of TYuN are associated with a sharp decline in quality of life, an increase in the number of chronic diseases [5], and the formation of delayed neuropsychic development (CPD). The authors also consider congenital defects of the heart to be a cessation of development at a certain stage of ontogeny, which corresponds to a particular stage of phylogeny. Within these theories, only atavistic heart defects (female and neutral) are compatible, and the whole group of male defects cannot be explained because none of the male components of congenital heart defects are compatible with normal embryonic or similar formation[6].

At present, CHD is the leading cause of death compared to other malformations in children and remains the leading cause of death [3]. The main reason may be related to the improvement of diagnostic techniques associated with the improvement of the skills of ultrasound diagnostics specialists and the improvement of modern imaging techniques [6]. Congenital defects are explained by the cessation of cardiac development at different stages of ontogeny; he interprets them as a return to one of the stages of phylogeny. The authors synthesize the previous two views, considering congenital heart defects as cessation of development at a certain stage of ontogeny, which corresponds to this or that stage of phylogeny. Dividing congenital heart defects and large vessels into males, females, and neutrals allows the patient's gender to be used as a diagnostic symptom. However, the male and female types of defects have a very large value of the coefficient of diagnostic value. For example, given the patient field data, the probability of diagnosis in a patent ductus arteriosus is 1.32 times higher. [6]

The study of the effects of external factors on the cardiovascular system is a current problem of applied medicine, which is confirmed by many modern studies aimed at studying the mechanisms of development of congenital heart defects, but the specificity of the types of response to external factors does not provide extensive confirmation of the findings obtained in clinical studies. As a result of our research, we divided patients into age groups and performed anthropometric changes and echocardiographic comparisons in children with congenital heart defects. Congenital heart defect - a permanent defect, deficiency and change in the anatomical structure of the heart; interferes with normal blood flow. Congenital and acquired heartworm are different. Congenital heart disease occurs as a result of malformation of the fetal heart and large

heart vessels during embryonic development. Poisoning of the mother's body in the early stages of pregnancy, suffering from certain diseases, biological effects of ionizing radiation, hereditary diseases, etc. k. causes. In infancy (up to 1 year of age), incomplete development of the cardiovascular system (e.g., incomplete opening of arterial pathways or oval foramen) is also considered a heart defect. The most common types of congenital heart defect are: abnormal pathways in various combinations between large and small circulatory circles, as well as the presence of narrowed or clogged areas in the major arteries of the heart (e.g., pulmonary artery and aorta) or misalignment of these vessels; mixed powders; defects in the number and structure of the heart chambers. Depending on the degree to which the arterial and venous blood is mixed, some congenital heart defects pass with cyanosis (blue powders), some without cyanosis (white powders). It depends on which direction the blood flows (in the direction of the shunt), the degree of pressure rise in the pulmonary artery, and the condition of the heart muscle through the improper holes that connect the large and small circulatory circuits. Symptoms of congenital heart disease include physical abnormalities, paleness or bruising, shortness of breath, changes in heart size and condition, heart murmurs, and more The aim of the study: To study the anthropometric parameters and comparative features of echocardiographic changes in the heart in children born with congenital heart disease (0-3 years).

Research material: The study was conducted at the Bukhara Regional Multidisciplinary Children's Hospital. It was conducted on the basis of bilateral agreements of Bukhara State Medical Institute. Children were divided into 3 groups: group of children aged 0-1 years ($n = 20$); The results of the examination of the group of children aged 1-2 years ($n = 20$) and the group of children aged 2-3 years ($n = 10$) were studied. The methodology of anthropometric study of children was used to conduct anthropometric measurements (Methodological recommendations on the morphometric features of the assessment of physical development of children and adolescents //N.H. Shomirzaev, S.A. Ten and I. Tukhtanazarova, 1998). Anthropometric research included height, body weight, body length, and chest circumference measurements. Echocardiographic examinations obtained the results of ultrasound anatomy of the heart. The study was conducted on a SONOACE R3-RUS device with linear (7.5 MHz) and convex (3.5 MHz) transducers. In this study, the linear dimensions of each part of the heart, the thickness and volume of the heart were studied using the formula of J. Brunn and co-authors (1981): $V = K \cdot [(L1 \cdot W1 \cdot T1) + (L2 \cdot W2 \cdot T2)]$, where V - gland volume index (cm^3), K - coefficient equal to 0.479; L , W , T - length, width and thickness of each piece of cloth. Mathematical processing was performed directly from the Excel 7.0 general data matrix using the capabilities of STTGRAPH 5.1, standard deviation indicators and representation error were detected. **Research results and discussion.** Studies have shown that in children from birth to 1 year of age, height ranges from 65.2 sm to 77.5 sm, with an average of 70.1 ± 0.9 sm, and in children from 1 to 2 years of age from 70.4 sm to 78.3 sm, on average 75.2 ± 0.4 sm, children aged 2 to 3 years were found to have an average height of 82.1 ± 0.2 sm from 76.0 sm to 87.4 sm.

In newborns to 1 year of age, body weight ranged from 3.4 kg to 7.2 kg, with an average of 4.1 ± 0.9 kg, and in children from 1 to 2 years of age ranged from 7.5 kg to 10.2 kg, with an average of 8.5 ± 0.6 kg, 2 to 3 years of age averaged 10.3 ± 0.4 to 9.0 kg to 12.1 kg.

TABLE № 1. INDICATORS OF PHYSICAL DEVELOPMENT OF CHILDREN FROM BIRTH TO 3 YEARS IN THE STUDY

№	Indicators	Children 0-3 years (n = 30)		
		Children 0-1 years old (n = 20)	1-2 year old children (n = 20)	2-3 year olds (n = 20)
1	Height, sm	70,1 ± 0,9	75,2 ± 0,4	82,1±0,2
2	Body weight, kg	4,1 ± 0,9 кг	8,5 ± 0,6	10±0,4
3	Chest circumference, sm	40,2± 0,6	43,4 ± 0,5	45,2± 0,8
4	Abdominal circumference, sm	39,0± 0,4	42,3± 0,5	45,4 ± 0,6

Note: * - reliability level $p \leq 0.05$ compared to the previous group

Echocardiographic parameters of the heart in children from birth to 3 years Right atrium from 8,1 mm to 10.2 mm in children from birth to 1 year, average - 9.15 ± 0.1 mm, pulmonary artery width in children of the same age from 9.2 mm to 11.0 mm, average $10.2 \pm 0.1.1$ to 2 years of age toright atrium8.5 mm 15.1 ± 0.1 mm on average 16.05 mm, pulmonary artery width 11.2 mm to 13.3 mm 12 in children of the same age 3 ± 0.3 mm. In children aged 2 to 3 years, the right atrium 10.1 from 16.2 mm to , average $18.2 \pm 0,3$ mm, and the pulmonary artery width averaged 13.2 ± 0.3 to 12.1 mm to 14.5 mm. reaches

TABLE №2. COMPARATIVE FEATURES OF ECHOCARDIOGRAPHIC PARAMETERS IN CHILDREN FROM BIRTH TO 3 YEARS

№	Indicators	Children 0-3 years (n = 75)		
		Children 0-1 years old (n = 25)	Children 1-2 years old (n = 25)	Children 2-3 years old (n = 25)
1	Right atrium , mm	$9,5 \pm 0,1$	$10,2 \pm 0,1$	$18,2 \pm 0,3$
2	Pulmonary artery width, mm	$10,2 \pm 0,1$	$12,3 \pm 0,3$	$13,2 \pm 0,3$

Note: * - reliability level $p \leq 0.05$ compared to the previous group

Anthropometric studies among children born with congenital heart defects from birth to 1 year of age showed that children born with interventricular septal defect had a height gain of 0.9 sm higher than children born with interventricular septal defect, and children weighed 0.63 kg more than children of the same age. detected. In children aged 1 to 2 years, children born with interventricular septal defect were found to have a height of 0.4 sm compared to children born with interventricular septal defect. Children of the same age had a body weight of 0.6 kg. Children born with interventricular septal defect in children aged 2 to 3 years were found to be 0.3 sm taller than children born with interventricular septal defect, and to have a body weight of 0.3 kg more than children of the same age..In children born with congenital heart disease from birth to 1 year of age, the circumference of the thoracic circumference was 0.6 sm higher than in children born with interventricular septal defect, and in children of the same age the abdominal circumference was 0.40 sm higher. Children born with congenital heart disease with congenital heart failure Children with congenital heart disease 0.5 cm higher than in newborns and 0.5 sm higher in children of the same age. Children born with congenital heart disease between the ages of 2 and 3 years , 8 sm, and in children of the same age, the abdominal circumference was found

to be 0.6 sm higher. Conclusions: According to the data obtained, children born with congenital heart disease from birth to 1 year, 1 to 2 years, 2 to 3 years with congenital heart failure, compared with children born with interventricular septal defect (height, body weight, chest circumference, abdominal circumference) was found to be high. Echocardiographic examination revealed that children born with congenital heart defects from 1 to 2 years of age, 1 to 2 years of age from 2 to 3 years of age, **children with congenital heart failure, children born with interventricular septal** defect (aortic width, pulmonary artery width) had lower body weight and height. found to be consistent with growth rates.

REFERENCES

1. AKHROROVNA, K. D. Medical Field Morphological Features of Human and Mammalian Spleen in Postnatal Ontogeny. JournalNX, 7(1), 252-256.
2. Ahrorovna, K. D. (2020). Effect of a genetically modified product on the morphological parameters of the rat's spleen and thymus. European Journal of Molecular and Clinical Medicine, 7(1), 3364-3370. Retrieved from www.scopus.com
3. Hoffman JI, Kaplan S. The incidence of congenital heart disease. J Am Coll Cardiol. 2002;39(12):1890-1900. doi: 10.1016/S0735-1097(02)01886-7.] .
4. Rao PS. Diagnosis and management of cyanotic congenital heart disease: part I. Indian J Pediatr. 2009;76(1):57-70. doi: 10.1007/s12098-009-0030-4.
5. Jenkins KJ, Correa A, Feinstein JA, et al. Noninherited risk factors and congenital cardiovascular defects: current knowledge: a scientific statement from the American Heart Association Council on Cardiovascular Disease in the Young: endorsed by the American Academy of Pediatrics. Circulation. 2007; 2016
6. Krasuski R.A., Bashore T.M. Congenital Heart Disease Epidemiology in the United States: Blindly Feeling for the Charging Elephant. Circulation, 2004; 2016
7. Mellion K, Uzark K, Cassidy A et al. Pediatric Cardiac Quality of Life Inventory Testing Study Consortium. Health-related quality of life out-comes in children and adolescents with congenital heart disease. Journal of Pediatrics, 2014
8. Mozaffarian D., Benjamin E.J., Go A.S. et al. Heart Disease and Stroke Statistics-2016 Update: A Report From the American Heart Association. Circulation, 2016
9. Бокерия Л.А., Меньшикова Л.И. Болезни и врожденные аномалии системы кровообращения.// Сердечно-сосудистая хирургия 2002.
10. Сулаймонов А. С. вабошқалар, Болалархирургияси, Т., 2000; Хайдаров Ғ. О., Эрматов Ш. Х., Ичкикасалликлар, Т., 2002



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PRAGMATIC, SEMANTIC, POLYSEMANTIC FEATURES OF WORDS WITH “TASTE” SEMANTICS

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ABSTRACT

The article studies the peculiarities of the lexeme «taste-» in English and its role in the speech act as well as their stylistic features. The article discusses the properties of pragmatics as a branch of semiotics and its expression in the utterances of the Uzbek language. The article deals with the classification of the mind and the object of language relations and the sensitivity of different parts of the tongue and oral cavity, the evaluative concepts related to taste receptors, the various semantic features of the words that make up the semantic field of “taste” are explained on the basis of English and Uzbek materials.

KEYWORDS: *Lexical-Semantic Field, Intensity, Taste, Syntagmatics, Paradigmatics, Polysemantic, Seme. Perception, Lexeme, Semantic Field, Semantics, Pragmatics, Syntax.*

INTRODUCTION

It has been noted in various works that pragma linguistics is the study of the linguistic system that is activated in a speech situation (context), the study of language in terms of its intended purpose, a science that studies language in terms of its intended purpose, theory describing speech acts, theory of conversion (oral speech) analysis, is the field of study of linguistic means of expressing interpersonal relationships.

Pragmatics is one of the most important branches of semiotics, a field of linguistics that studies the use of linguistic derivatives that emerge in the speech process. In other words, a contextual movement that expresses an opinion about the movement of pragmatics and represents a situation related to human activity is an area that studies relationships.

All types of speech are formed on the basis of the semantics and verb form of the leading verb that carries the basic information. Pragmatics, on the other hand, uses various elements of speech

- auxiliary tools used in speech – *I think, probably, of course, after all, both* deals with a deeper analysis of the nature of such tools.

In addition to its semantic meaning, the uttered sentence (thought) has its own pragmatic meaning, i.e. it also performs a pragmatic function. For example, the words "*I can do it*" to the person standing next to the cook mean "*I can make any dish delicious and sweet*" depending on the situation. This is its pragmatic meaning. There are cases when the semantic meaning of a sentence does not fully correspond to its functional-pragmatic meaning. For example, the saying, "Pick up collect sweet peppers!" It means *picking peppers with the usual taste*.

The Main Part

Analyzes of English dictionaries have shown that the lexeme "taste" has a polysemantic nature and can have different meanings, both when taken separately and as part of phrases and phraseological combinations. This makes it difficult to determine which of the meanings associated with the taste lexeme can be invariant or general. With this in mind, we found it necessary to analyze from a semantic point of view the units of "taste" and related morphological and syntactic structures listed in dictionaries.

It is important to study the semantic field "Taste-taste", its semantic subject groups, the spiritual relationship between them. Based on the archetype "Taste-taste", we divide the scale of the field into the following content groups (groups):

- 1) Qualitative qualities typical of simple taste: *tasty, sapidity, flavor, sweet, savor, delicious, relish, smark, bittersweet, sour, acid, four*;
- 2) Description of complex taste qualities: *bit, fondness, partiality, predilection, relish, sample, smack, touch, critique, delicacy, discernment, elegance, gestation, judgment, nicety, perception, predilection, refinement, sapidity, savor sensibility*;
- 3) Description of the identified complex types of taste: *bad taste, cheapness, crassness, crudeness, gaucherie, immodesty, impropriety, inelegance, showiness, tastelessness, vulgarity*;
- 4) qualify for an unexpressed differentially complex type of taste, for example: *acute (complex with taste-causing properties): untasty, unpleasure*;
- 5) Qualified taste of low intensity, delivered with additives: *tasteless, taste sensation. unsalted, unsalty. blah, bland, dull, lazy, mild*;
- 6) high-intensity sorting taste: *apathy, aversion, blandness, coarseness, disgust, disinclination, dullness, hate, hatred, idleness, indelicacy, indiscrimination, insipidity, laziness, lethargy, lot salty, brackish, briny, piquant, pungent, racy, saline, salted, spicy, tangy*.

It is the presence of the semantic "taste" that is the basis for the combination of the qualities that express and evaluate taste. The core of the field is the taste. Typically, researchers distinguish four main taste traits: sour, sweet, bitter and salty. The rest of the taste buds are grouped around them. Researchers have repeatedly pointed out that the nature of taste is expressed not by describing the objective structure of the senses, but by referring to the information carrier. Therefore, the basic meaning structure of taste qualities is as follows: «*Taste + N + [rating + intensity]*» where N is the standard, the size of the data carrier. For example, sour - "lemon - a red sour-fruited shrub with vinegar taste (juice)." For example; Sour - "lemon vinegar tastes as

sharp as juice." At the same time, "...each nation's idea of a particular taste is associated with different" reference objects. " Thus, the Uzbeks associate the bitter taste with pepper, and the British with the taste of orange peel or coffee grounds. The semantics of 'assessment' and 'intensity' can also be incorporated into the core of the lexical meaning and form its periphery to indicate the intensity of the manifestation of the taste trait and the speakers' sorting and evaluative attitude towards the trait. In the Taste field, enter the following attributes:

1) Adjectives meaning "N + [rating + int] taste". It consists of the following:

a) This value for quality is primary – *nordon, chuchuk, shirin, achchiq / sour, acid, sweet, bitter, tart*;

b) Relative adjectives in which the definition of a taste attribute is secondary – *sho'r, shuvoqli, temirli, asalli, asal hidli va boshqalar / salty, briny, metallic, honeyed, spicyetc.* Carrot, strawberry, vanilla, sugar, metallic, irony flavors, etc: new taste features can be observed in Uzbek with different semantic relative adjectives. Therefore, the taste field in Uzbek is an open system. In English, where word formation is mainly a method of conversion (similarity), we can talk about the openness of the field of taste determination (sugary, saccharine, strawberry, salt), in contrast to the language, which is dominated by normal groups.

2) Adjectives that have a taste of "N" and the reason is "A" – *taxir, nordon, achigan - rank, rancid, angry, rance, ranci*.

3) qualities that have a meaning that indicates the intensity of the manifestation of the taste. According to their semantic structure, they have the following form: a) "N taste + int> + [rating (-)]" – *shirin, shirali (sweet, juicy)*. In Uzbek, the intensity of a taste attribute can also be reduced. In this case, the units formed by reduplication form a lexicogrammatically whole: : *shira-sho'r (salty)*; The complex properties of the second component overlap: *shirin-shakar, achchiq-taxir (sweet-sugar, bitter-sour)*; complex adjectives with synonymous components: *nordon-achchiq, chuchmal-shirin (sour-bitter, sour-sweet)*. Excessive manifestation of a taste attribute is often unpleasant to taste, so the semantics of Uzbek adjectives include a negative evaluation semantics. There is no assessment in English.

4) Qualities that indicate complex taste characteristics. This section is represented by two groups. The first group combines adjectives meaning "N1 + N2 taste", where N1 is the first reference marker and N2 is the second reference marker: *sweet and sour ("taste of sugar and lemon"), bitter-salt ("taste of sour and salt"), bitter almonds ("sour and almond flavor")*. In English, these are *sour-sweet (sour-sweet)* and *bitter-sweet (bitter-sweet)* adjectives. The second group of adjectives means "having N + taste": *bog'lovchi, tortiq, ta'mi o'tkir, qamashtiruvchi/ astringent, tart, piquant, pungent, acerb*.

5) Attributes that represent a taste attribute, regardless of any data carrier, with values: a) «taste + rating (+)» – *mazali, ishtahali, suvli, shirin, mazali – flavourous, savoury, delicious, palatable, succulent, tasty, appetizing, sappy, juicy, fruity, dainty*; b) "tasty + rating (-)" – *bemaza / distasteful, unpalatable*; c) "tasteless [rating (-)]" – *ta'msiz, chuchuk/ asteless, insipid, flavourless, unflavoured*. These qualities can be generalized according to the closeness of meaning, so they are divided into "sweet", "sour", "bitter", "salty", "delicious", "tasteless", "tasteless". The same adjectives can be part of different sema groups, for example, salty (*salty /*

unsalted) is an antonym of the adjective and is included in the same group; on the other hand, it shows that it has no specific taste, in which case it can be included in the group of “*tasteless*”.

The adjectives in the Tart group are a combination of several semantic fields: «ta'm», «sezgi», «shakl» and «qisqarish xususiyati»/ «*Taste*», «*Touch*», «*Shape*» and «*Contraction Property*». Thus, the “taste” takes the adjectives, *qamashish*, *nordon/ acerb*, *acid*, *pungent*, *piquant* / located in the nearest center of the field. The Uzbek adjective tends to be the center of the “shortening feature” area, which is closer to the “taste” area than its English equivalent (crunchy, dazzling). Sharp adjectives are included in the field of “form” in the basic sense, but in the secondary sense they belong to the field of “taste”. In the Uzbek language, the main taste features are divided into *nordon*, *achchiq va sho'r* (*sour-sweet*, *bitter-sweet*, *sweet-salty*), which are associated with sweetness through a mixture of *sour*, *bitter* and *salty flavors*; also associated with *salty and bitter* (*achchiq-sho'r*, *sho'r-achchiq* - *bitter-salty*, *salty-bitter*); *shirin va sho'r* - *sweet* and *salty* are contrasted by the absence of a semantic component. Closer to the basic taste characteristics are the qualities that are synonymous with them (*sirka*, *shakar*, *asal*, *qiyom*, *shuvoq*, *qand*) / (acetic, sugar, honey, treacle, wormwood, sweet) They are qualities that indicate taste (acquired taste: *sour*, *sour*, *sour*, *dark* / acquired a taste sign “: *sour*, *sour*, *sour*, *rancid*”. 'mga shows different levels of specificity, as a result, these words are adjectives that indicate taste (*nordon*, *nordon*, *nordon*, *qoramti* / acquired a taste sign “: *sour*, *sour*, *sour*, *rancid*”). Then there are the basic qualities that indicate different levels of taste. Taste fields are semantically similar in English and Uzbek and differ only in quantity. There are «Nordon» va «achchiq» / “acidic” and “bitter” groups, which are central to the two similar languages. In the near periphery are placed synonyms of the main qualities and attributes meaning “acquired taste attribute”, which also act as synonyms of the dominant qualities. The long periphery also has adjectives that represent different levels of attribute in Uzbek. It should be noted that the isolation of the group of “salty” words, which differ from each other, is typical of the English language.

Probably the main taste marks for the English mentality are *shirin*, *achchiq va nordon hamda sho'r* sweet, bitter and sour and salty / sweet, bitter and sour, and salty / although it is an important taste sign, it is still associated with the main things it's not. In the Uzbek language, all taste signs have a complex relationship, but the center is still a “sweet” sign. The number of taste attributes varies with language, but this difference does not mean that some taste definitions are lacking in the languages being compared. Uzbek is a synthetic language, the degree of manifestation of different properties (*nordon*, *nordonroq*, *o'ta nordon*, *shirin*, *shirinroq*, *o'ta shirin*) / (*sour*, *sourer*, *very sour*, *sweet*, *sweetish*, *sweetest*) / has an advanced system of affixes that allows transmission. In English, the analytical constructions “form + quality” often correspond to them: slightly sweet (=shirinroq), extremely sweet (=shirin).

“Taste” lexemes can also be used as a variety of stylistic means in speech. For example, this lexeme can be used in speech by making metaphorical and metonymic models. For example, the metaphorical model of “Taste - pleasure (pleasure, spiritual pleasure)” reveals the human imagination as a space (object) with dimensions of depth and breadth.

CONCLUSION

In addition, the metaphorical model of “taste - meaning, logic” is widely used. *Logical taste* - refers to a person's positive feelings, while *avoiding taste* - refers to negative emotions such as

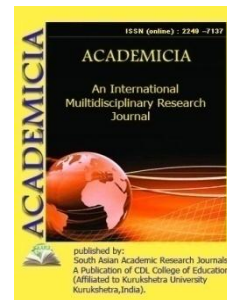
evil. For example: *Both Isomat's words and the applause of the many drinkers of tea made Mullah Berdiyor lose his taste.*

Along with metaphorical models, metonymic models of the type "taste - human" are also used. For example: *Look at the taste that escaped me these days!*

Lexemes with the semantic "taste" combine with lexemes belonging to different word groups and express their pragmatic meaning by expressing the connotative meanings that are related to it. When it is used in speech, its pragmatic features (connotative meaning) always appear as an accompaniment to it. Based on the above considerations, it can be said that "taste" is one of the most important perceptions of human beings. Serves as an object for instant research as one. An analysis of the pragmatic, semantic, and polysemantic features of words with the semantic "taste" in English and Uzbek shows that the role of English lexemes "taste" in information retrieval and There is a commonality between the stylistic features of the montage. In English and Uzbek, the adjectives and synonyms of the document, which represent the different spiritual properties and different levels of the words that make up the taste field, give additional results in a figurative sense in addition to their meaning.

REFERENCES:

1. A.Sobirov. Study of the lexical level of the Uzbek language on the basis of the principle of systems. - T. Ma'naviyat. 2004.
2. Sh.Iskandarova. Study of Uzbek lexicon as a content field (personal field). - filol. fanlaridok. Abstract – T.1999.
3. Kochkartoyev I. On lexical-semantic clusters of words // Scientific works of Tashkent State University. Exit 359.– Tashkent, 1969.
4. Yoqubov J.A. Semantic features of logic and linguistic expression of the modality category. Tashkent. Fan. 2005.
5. Language Of Uzbek Language. A.Madvaliev. Volume 5 State Scientific Publishing House "National Encyclopedia of Uzbekistan" Tashkent - 2004.
6. Akmajian A., Demers R., Former A., Harnish R. An Introduction to Language and Communication. The MIT Press-Cambridge. 1999.
7. Foley W.A. Trends in Linguistics. The Role of Theory in Language Description. Berlin, New York. 1993.
8. Hornby A.S. Oxford Advanced Learner * s dictionary. sixth edition / Edited by Sally Wehmeier. *Oxford University Press*, 2000. P. -1330-1331.
9. John Galsworthy. Apple Tree and other stories [Text]. J. Galsworthy. - M.: Izd-volit. nainostr.yaz, 1961.
10. Webster's third international dictionary of the English language. Könnemann.1993.P. -2343.
11. William Somerset Maugham. Cakes and Ale or the Skeleton in the Cupboard [Text]. W. S. Maugham. - M.: Manager, 2000.
12. Merzlyakova A.X. Semantic variation of prilagatelnyx in the field of Vkusa // Aktualnye problemy lingvistiki i metodiki prepodavaniya inostrannyx yazykov. Ijevsk, 2002 - S.98-116.Manaviyat.2004



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PLASTIC SOLID WASTE RECYCLING: A STATE-OF-THE-ART ASSESSMENT AND POTENTIAL APPLICATIONS

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ABSTRACT

Plastic solid waste (PSW) of polymers such as high density polyethylene (HDPE), low density polyethylene (LDPE), Nylon, and others) is posing new difficulties, which are significant research concerns in today's situation. Production of various goods made of various plastic materials has increased dramatically. This massive rise in plastic goods has resulted in increased trash production, posing new problems. Some studies have published findings in the area of PSW management using various recycling techniques. This article summarizes the numerous research projects undertaken by researchers in the area of recycling, as well as the progress made in the recovery and management of PSW using various methodologies (i.e. primary, secondary, tertiary, and quaternary) and various identification/separation approaches. This study also looks at how various reinforcements, such as sand, natural fiber, hemp fiber, metal powder, and others, affect the characteristics of virgin and recycled HDPE/LDPE/Nylon PSW.

KEYWORDS: *Plastic Waste, Plastic Trash, Polymers, Recycling, Solid Waste.*

INTRODUCTION

Plastic solid waste (PSW) recycling, recovery, and management is a problem in today's world. Many commodities are produced using plastics, and industries are becoming increasingly interested in the area of plastic production. Plastics have become an integral element of modern life, and worldwide plastic manufacturing has skyrocketed in the previous 50 years. Traditional plastics are very durable and do not breakdown easily in the environment[1]. Plastics will never

disintegrate and will stay on the landscape for many years. In typical environmental circumstances, polymer takes hundreds of years to decompose. Plastic trash is hazardous because its pigment includes many extremely poisonous trace elements. As a consequence, environmental contaminants emitted by synthetic plastics have been recognized as a major source of concern. PSW is manufactured on a large scale throughout the globe, with annual output exceeding 150 million tonnes. Every year, India consumes about 8 million tonnes of plastic goods, with this figure projected to increase to 12 million tonnes by 2012.

Plasticized PVC is widely used in the manufacture of pipes, window frames, floor coverings, roofing sheets, and cables, and as a result, it is often discarded. Packaging films, wrapping materials, shopping and trash bags, fluid containers, clothes, toys, home and industrial goods, and construction materials are among its many uses. Furthermore, a virgin plastic material can only be recycled 2 to 3 times since the strength of the plastic material decreases with each recycling owing to heat deterioration[2]. Solvents with hydrogen donor capabilities, in particular, have a role in the thermal breakdown of polymers, influencing hydrocarbon production and dispersion. It is worth noting that no accurate estimate of total plastic trash production exists; nevertheless, given that 70% of total plastic consumption is thrown as garbage, the nation generates about 5.6 million tons of plastic waste per year (TPA), or about 15342 tons per day (TPD) (CPCB). A study was performed to examine the demand for different kinds of plastic. PVC, PP, and HDPE all contribute more to the use of plastic, as can be seen in this bar graph. Plastic use is rapidly rising due to a variety of benefits like as flexibility, cheap cost, and excellent chemical stability[3]. Plastic trash from household waste is mostly made up of polyethylene and polypropylene. The more the consumption, the greater the demand for recycling to reduce the usage of raw materials. HDPE (high density polyethylene) LDPE (low density polyethylene) and nylon are the most common raw materials for plastic goods. Plastic makes up a large portion of municipal solid trash, and it is often made up of packaging debris as well as abandoned equipment and products. It cannot be dumped into the environment because of its nature. As new goods are launched on a regular basis, this figure is worsening. This may be very harmful to the ecology and the planet. Plastic trash is causing issues for the environment as well[4].

According to a research, greenhouse gases such as methane emissions produced by fossil fuels have the potential to cause global warming. The trash that is generated on a daily basis, on the other hand, has a far greater potential to release carbon dioxide as a greenhouse gas. It's worth noting that carbon dioxide has 21 times the global warming potential of methane. Plastic polymer use and manufacturing are determined by demand and availability. However, the use and manufacturing of different plastic polymers are not equal in India. In India, each individual consumes 9.7 kilogram of plastic[5]. The study produced by Tata Strategic on the use and production of different plastic wastes. This data plainly shows that there is a significant disparity between polymer demand and production. The use of fresh material to fill these voids is on the rise. Plastic product use can only be decreased to a limited degree, but new material usage may be minimized via recycling and management methods. Many studies on PSW recycling and recovery have been published[6]. In a study, the Delhi-based Central Pollution Control Board claimed that 90% of PSW is recyclable. Eighty percent of post-consumer plastic is disposed of in landfills, eight percent is burned, and seven percent is recycled. Because land filling of HDPE

has severe implications in terms of GHG (greenhouse gas) generation, PSW may be made acceptable for other uses by using various techniques.

Aside from the environmental problems associated with land filling, disposing of vast quantities of leftover fabric is a significant waste of resources and energy. The application domain of recycled plastic may be expanded by strengthening various particles. It may be used to create particle board because wood-based particle boards are formed by compressing different layers with urea formaldehyde-containing glue or resin, and this formaldehyde has the potential to cause a variety of illnesses, including cancer. HDPE, polypropylene (PP), polyvinyl chloride (PVC), wood flour, modified MMT, and glyceryl methacrylate are blended to make a wood plastic composite (GMA). As a result, recycled plastic may be utilized as a resin. Primary, secondary, tertiary, and quaternary recycling methods may all be used to recycle materials[7]. All kinds of polymers and metals may now be recycled thanks to technical advances in industry. Three techniques of plastic recycling have been proposed by certain researchers. The first step is to mechanically separate plastic trash for secondary usage. The second approach is divided into two parts: energy recovery via incineration and pyrolysis for use as fuels or polymer feedstock. The third technique involves bringing the polymer to the point of biodegradation, although this is extremely dependent on the kind and environmental circumstances. Following this, it can be stated that plastics play a significant role in municipal and industrial trash. This article focuses on the processing of various plastic-based products as well as their recycling techniques.

PSW is a significant contributor to the trash produced on a worldwide scale. Because of the increasing production and use of polymer materials, polymer disposal is becoming a worldwide problem[8]. The varying levels of waste production in many nations depending on their socioeconomic levels has become a significant problem for PSW disposal and management. Trash management is a complicated process that requires a variety of data from many sources, such as influencing variables in waste production, large-scale predictions, and trustworthy data. Each year, at least 93 million tonnes of trash are produced throughout Eastern and Central Asia[9]. The amount of trash generated per person per day varies from 0.29 to 2.1 kilograms, with an average of 1.1 kg/capita/day (OECD report 2010). The Organization for Economic Co-operation and Development (OECD) is a 34-country international economic organization that includes AFR (Africa), SAR (South Asia), MENA (Middle East and North Africa), ECA (Eastern and Central Asia), LAC (Latin America and the Caribbean), and EAP (East Asia and the Pacific Region). Solid waste management accounts for less than 5% of worldwide greenhouse gas emissions (GHG). International effort to reduce greenhouse gas (GHG) emissions is increasing in response to rising worries about the danger of climate change, and the solid waste management industry is anticipated to play a role[10].

DISCUSSION ON RECYCLING OF PLASTIC WASTE

PSW recycling is restricted to a certain number of cycles since the product loses some of its characteristics after recycling, such as strength and stability. After a certain amount of recycling, the only option for disposing of PSW is to land fill it. However, land filling pollutes the earth's surface. Land filling also results in carbon dioxide emissions. Plastic also leads to health problems such as skin corrosion/irritation, aspiration danger, severe eye damage/irritation, and so on. Because polymerization processes take a long time to complete, unreacted residual monomers are often discovered in polymeric materials, many of which are harmful to human health and the environment. As a result of the many polymers/plastic-based products available on

the market or as trash, Thermosetting long strands and thermoplastic short link materials are the two main types of plastic. Thermosetting plastic materials cannot be recycled again, while thermoplastic plastic materials may be recycled to some extent. The emphasis of this review is only on thermoplastic materials.

Low Density Polyethylene (LDPE), High Density Polyethylene (HDPE), Polypropylenes (PP), Polystyrene (PS), Polyethylene Terephthalate (PET), and Polyvinyl chloride are the six major families of plastics (PVC). Virgin plastics are readily accessible and produced using traditional methods, yet they are on the brink of replacing fossil fuels in terms of energy use. To begin with, plastics may be thought of as a kind of stored potential energy since the manufacturing of virgin plastics consumes 4% of global oil output, or 1.3 billion barrels per year. As a result, it is always a good idea to reuse and recycle plastic trash. This effort discusses and elaborates on some of the most well-known and widely utilized plastics. PVC is a versatile polymer that may be made into a broad range of short- and long-term goods. PVC usage accounts for 12 percent of overall demand among these main kinds of plastics. In 2013, the global PVC manufacturing capacity was estimated to be about 61 million tons. Plastic recycling is mostly determined by the kind of plastic. The kind of plastic is not guaranteed by trash collection. The problem of recycling compatibility must be addressed first. There may be a lot of plastics in a collection. To separate out different materials, segregation of plastic is required. Because of the various melting temperatures, combining one polymer with another may result in a decrease in the characteristics of recycled material. LIBS (laser induced breakdown spectroscopy) is a novel analytical method that uses pulsed laser sources. It's used to distinguish between different types of plastic trash. The study of the main constituent carbon and hydrogen contained in polymer matrices demonstrates the capabilities of this method.

For spectrum analysis and fingerprinting of different types of plastics, a laser-produced plasma emission is recorded. This method can identify a total of six plastic materials: Low Density Polyethylene (LDPE), High Density Polyethylene (HDPE), Polypropylenes (PP), Polystyrene (PS), Polyethylene Terephthalate (PET), and Polyvinyl chloride (PVC). Calibration is accomplished by shining a laser beam of a particular wavelength from a laser onto some previously recognized plastic waste material. For all PSW materials that need to be recognized, this process is followed. The key to successful recycling is accurate and efficient plastic identification and categorization. Because the value of recycled materials is determined by fraction purity, it is possible to make more precise decisions regarding separation technology based on the identification of the plastics. - Electrostatic separation is a phrase used to describe a large class of contemporary waste management technology that is widely used for separating granular mixes using electrostatic forces acting on particles with a typical size of about 5 mm. This is also known as free-fall. Triboelectric separation is extensively used for sorting and purifying granular materials derived from industrial plastic waste. In addition, there are two different kinds of triboelectric separation methods. One is a roll-type corona-electrostatic separator, which is used to separate plastic materials from metal components. When two materials are fed and spun at a certain speed in this triboelectric separator, the material within experiences two kinds of forces: particle/particle forces and particle/cylinder wall forces. When two materials rub against one other, charge appears on the particles of the materials. One receives a positive charge, while the other receives a negative charge. Then When a material

particle travels through a strong electrostatic field, forces operating between them cause separation.

When PVC is brushed with Teflon, for example, the latter gains a negative charge while the PVC gains a positive charge. Almost any plastic substance may be sorted out using this kind of separation method. However, the greatest separation of material with a particle size of 2-4 mm is limited by this method. Furthermore, it is a method for determining the chemical composition of a broad variety of materials, including metals, cements, oil, polymers, plastics, and the food sector. If excellent reference specimens are available, this method should provide very high accuracy. The time it takes to measure particles varies depending on the amount of components to be identified, and it may take anywhere from a second to 30 minutes. This method involves irradiating a sample with x-rays generated by a source. In most instances, x-ray tubes are utilized, although synchrotron or radioactive material may also be used. The under-inspection element will emit fluorescent X-ray radiation with distinct energies (corresponding to colors in optical light) that are unique to specific elements. A distinct color represents a different amount of energy. It is possible to identify the element by measuring the colors emitted by it. This is a qualitative study. The intensity of color may also be used to determine the quantity of an ingredient. By comparing the spectra of waste samples to those of various model polymers, FT-IR is utilized to identify different kinds of polymers and plastic materials. It's used to get an infrared spectrum of a solid, liquid, or gas's emission or absorption.

A FTIR spectrometer gathers high spectral resolution data across a broad spectral range at the same time. This gives it a big advantage over a dispersive spectrometer, which only measures intensity across a small range of wavelengths at a time. The structural changes as a function of strain are also investigated using FTIR spectroscopy. FTIR spectroscopy has previously been utilized to investigate structural changes as a function of strain. This technique is currently being utilized to analyze the structural changes that occur during polymer recycling. This method was used to separate PET, PVS, and PS, with extremely remarkable results in plastic separation, with 83 percent of the PET being recovered. Another polymer separation method used to detect various plastic polymers is froth flotation. Alter was the first to suggest that froth flotation might be used to recover plastics based on their critical surface tension. Some writers have discovered an issue with huge amounts of plastic garbage. Because of the hydrophobic characteristic of all plastic/polymer materials, froth flotation is difficult because air bubbles in the substance cause it to float. Flotation of material is caused by both hydrophobicity and gravitational force linked to mass. For the recovery of polymers in this experiment, wetting and foaming agents are required. As a wetting agent, calcium lignin sulfate is employed, as well as pine oil and MIBC (methyl isobutyl carbinol) as a foaming agent. When pine oil is employed as a foaming agent, PVC recovery improves, while MIBC findings favor PET recovery.

Overall, froth flotation has been identified as a significant and efficient separation technique in mineral processing engineering, as well as a helpful approach for separating mixed polymers. The material to be separated is first fed into the first tank, then mixed with hot water with the aid of an electro- magnetic feeder. The average residence duration in this tank will be determined by the time it takes for appropriate mixing and full particle contact with water prior to caustic/alkaline treatment. Another container is used for the alkaline treatment. Again, the mean residence time must be chosen for mixing. After that, the pulp will be formed and passed through a vibrating screen to be rinsed with cold water. The surfactants are present in a tank where the

wetted material and cold water are supplied for chemical treatment. The length of time spent in residence is determined by the kind of alkali and chemical employed in the conditioning process. The alkali liquid's pH should be kept steady. The temperature of the water used for alkali treatment is critical and has a significant impact. Because it is often impossible to achieve high temperatures owing to a lack of adequate water heating equipment. After that, samples from various product streams may be isolated and collected at predetermined time intervals for examination and product weight estimation. The plants used for this treatment take up a lot of room, and cleaning and washing the materials has become a time-consuming task. Even if it necessitates more room for the plant installation, washing plants should be built in such a manner that every component can be readily accessed and cleaned. A separation technique that can detect very tiny changes in physical characteristics is required to generate high purity material from complicated streams of post-consumer trash of grade similar to materials produced by post industrial waste. This technique may aid in the separation of usable plastic from trash with the least amount of residual material.

After manual sorting, this technique focuses on identifying main plastic included in a certain waste composition. MDS is a physical separation technique based on material density differences. This optical sensing method may be used, however due to the size of the plastic substance present, it is not always effective. Separation by density is another technique. Electronic trash may be separated using this method by adding a modifier to water, although it may contaminate recovered plastic. It's used to separate polypropylene (PP), low density polyethylene (LDPE), and high density polyethylene (HDPE) from one other, as well as contaminated materials including wood, rubber, and minor metals. Because MDS separates a complicated mixture into several distinct components in a single stage using the same liquid, it has the potential to be extremely inexpensive. The whole procedure is carried out while the mixture runs through a conduit, and the layers are separated in seconds. There are four stages to setting up MDS: (i) Wetting, (ii) Feeding, (iii) Separating, and (iv) Collecting are the four steps in the process. The MDS setup's components are immersed in the liquid surface. The liquid utilized in this procedure is magnetic in nature and circulates throughout the setup, moving from left to right under the effect of pressure differences before returning. To make the surface hydrophilic and remove heavy polymers, the materials are first wetted with hot water for a minute.

Wet particles are placed in a stainless steel box with 1mm holes. To prevent turbulence produced by air in the system, the air in the feeding box is first evacuated before the box is placed in position. When the box's lid is opened, the particles begin to rise and subsequently flow into the separation channel with the mainline; here, the density of the material plays an important role. Different kinds of materials are available in powder and granule form on the market. The material is fed into the barrel by gravity via the hopper. The heaters that surround the cylindrical barrel may be regulated manually using a variety of temperature ranges. The temperature range of a standard screw extruder is typically up to 275 degrees Celsius, which is sufficient to melt thermoplastic materials. As soon as the material enters the barrel, it begins to heat up. The material begins to move forward, towards the die, as the screw turns. The length of the barrel is crucial. Screw speed has a significant influence as well. The material will not melt correctly if the screw has a higher speed because the substance will lead at a quicker pace. If the screw speed is too slow, the material will be overheated and the wire will not properly form. The screw forces the material positively into the barrel and leads it to the die. Melting temperature is a key

characteristic that influences the flow properties of polymers. Multiple heating zones are possible. These heating zones progressively raise the material's temperature. The pressure exerted by the screw on the material may exceed 5000 psi (34 MPa). After then, the material reaches the breaker plate, causing back pressure. This is necessary for consistent material melting and mixing.

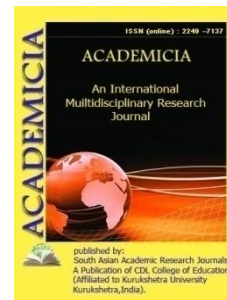
CONCLUSION AND IMPLICATION

This article discusses the many problems of PSW management, including material recycling. Reducing the usage of virgin materials and repurposing PSW will help to ensure the environment's and global warming's long-term viability. Landfilling, being the most convenient method of disposing of PSW, is growing worldwide problems while also raising space requirements. This article discusses different technologies, as well as separation methods, reinforced plastic material, and uses of reinforced PSW, in order to minimize land filling. The different separation/identification methods for PSW, such as froth flotation and MDS, are discussed in this article. Froth flotation is the most often used technique for separating large quantities of PSW in a single term. Contamination of collected trash due to lack of plastic separation may decrease the characteristics of the bi-product. Primary and secondary recycling techniques are widely utilized in Asian nations, however they have drawbacks in terms of losing different characteristics of PSW acquired as a by-product and using a lot of energy. Various researchers have attempted to produce goods with comparable characteristics to virgin material using a variety of different methods, such as tertiary, which involves chemical treatment of PSW in order to recover energy from the polymer, which is a petroleum product in the form of heat. Further, incineration is a recycling method in which PSW is utilized as fuel since it is a petroleum bi-product with little calorific value, resulting in natural resource sustainability. By reinforcing different fillers in polymer material to improve the characteristics, recycling of products using filler material is also becoming an interesting area.

REFERENCES

1. A. Aboulkas, K. El harfi, and A. El Bouadili, "Thermal degradation behaviors of polyethylene and polypropylene. Part I: Pyrolysis kinetics and mechanisms," *Energy Convers. Manag.*, 2010, doi: 10.1016/j.enconman.2009.12.017.
2. L. D. Bekele *et al.*, "Preparation and characterization of lemongrass fiber (*Cymbopogon* species) for reinforcing application in thermoplastic composites," *BioResources*, 2017, doi: 10.15376/biores.12.3.5664-5681.
3. R. Tuffi, S. D'Abramo, L. M. Cafiero, E. Trinca, and S. Vecchio Cipriotti, "Thermal behavior and pyrolytic degradation kinetics of polymeric mixtures from waste packaging plastics," *Express Polym. Lett.*, 2018, doi: 10.3144/expresspolymlett.2018.7.
4. L. Sorum, M. G. Gronli, and J. E. Hustad, "Pyrolysis characteristics and kinetics of municipal solid wastes," *Fuel*, 2001, doi: 10.1016/S0016-2361(00)00218-0.
5. M. E. Iñiguez, J. A. Conesa, and A. Soler, "Effect of marine ambient in the production of pollutants from the pyrolysis and combustion of a mixture of plastic materials," *Mar. Pollut. Bull.*, 2018, doi: 10.1016/j.marpolbul.2018.03.040.
6. S. Thumsorn, K. Yamada, Y. Wei Leong, and H. Hamada, "Effect of pellet size and

- compatibilization on thermal decomposition kinetic of recycled polyethylene terephthalate/recycled polypropylene blend,” *J. Appl. Polym. Sci.*, 2012, doi: 10.1002/app.35166.
7. A. C. Y. Wong and F. Lam, “Study of selected thermal characteristics of polypropylene/polyethylene binary blends using DSC and TGA,” *Polym. Test.*, 2002, doi: 10.1016/S0142-9418(01)00144-1.
 8. S. Melendi-Espina, R. Alvarez, M. A. Diez, and M. D. Casal, “Coal and plastic waste co-pyrolysis by thermal analysis-mass spectrometry,” *Fuel Process. Technol.*, 2015, doi: 10.1016/j.fuproc.2015.03.024.
 9. L. Zhou, Y. Wang, Q. Huang, and J. Cai, “Thermogravimetric characteristics and kinetic of plastic and biomass blends co-pyrolysis,” *Fuel Process. Technol.*, 2006, doi: 10.1016/j.fuproc.2006.07.002.
 10. L. Zhou, T. Luo, and Q. Huang, “Co-pyrolysis characteristics and kinetics of coal and plastic blends,” *Energy Convers. Manag.*, 2009, doi: 10.1016/j.enconman.2008.10.007.



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AN OVERVIEW ON PLANT MUTAGENESIS IN CROPS IMPROVEMENT

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ABSTRACT

The initial stage in plant breeding is to find appropriate genotypes with the required genes among existing kinds, or to develop one if none exist. Mutations are the primary cause of diversity in nature, and plant breeding would be impossible without them. In this context, the primary goal of mutation-based breeding is to create and enhance well-adapted plant types by altering one or two key characteristics to boost production or quality. In order to induce mutations in seed as well as other planting materials, both physical or chemical mutagenesis are employed. The first generation is then used to select for agronomic characteristics, with the majority of mutant lines being eliminated. The agronomic characteristics are verified in the second and third generations by phenotypic stability, with additional assessments taking place in future generations. Finally, only suitable mutant lines are chosen as a new variety or as a parent line for cross breeding. Rice is grown in Vietnam, Thailand, China, as well as the United States; durum wheat is grown in Italy and Bulgaria; barley is grown in Peru throughout Europe; soybeans are grown in Vietnam or China; wheat is grown in China; and leguminous food crops are grown in Pakistan & India. This article brings together data from across the globe on the effect of mutation breeding-derived crop varieties, highlighting the promise of mutation breeding

as a flexible and practical technique that can be used to any crop if the right goals and selection procedures are employed.

KEYWORDS: *Crop Improvement, Genetic, Mutation, Mutagenesis.*

1. INTRODUCTION

The mutation process results in mutant plants with novel and beneficial characteristics due to random genetic differences. In its most basic form, classical breeding entails the selective growth of plants with desired traits and the removal or "culling" of those with less desirable traits. Genetic diversity is widely recognized to be important in evolution and practical breeding. Natural variations do not reflect the original spectral range of de novo mutations. Rather, they are the consequence of genes recombining throughout populations, as well as their ongoing interaction with environmental variables. Green plants are necessary for human survival as food sources, clothing, as well as energy. To get non-poisonous or nutritious fruits, tubers, seeds, and other food items, ancient hunter-gatherers relied on their hunting abilities and plentiful natural flora, as emphasized in Larger and safer food sources were required as the human population grew, and large-scale production methods based on plant domestication were eventually created. Plant breeding is the process of creating new plant types for cultivation and human use[1].

The earliest technique of breeding was straightforward selection of desirable offspring, which relied on the occurrence of de novo mutations. After Gregor Johann Mendel established the principles of heredity in the 19th century, genetics became a key science of plant breeding. When the hybridization technique was established, however, plant breeding progressed much further. Its goal was to combine beneficial genes present in two or more distinct kinds to create pure-line offspring that were better in many ways to the parental types. Cross breeding (or recombinant breeding) is a popular technique in plant breeding that involves crossing various genotypes and then selecting traits. Later, in the late 1920s and early 1930s, Lewis John Stadler's work on inducing genetic changes via X-rays set the groundwork for mutant breeding, a new kind of plant breeding. Recombination of alleles on homologous pairs and their separate assortment during meiosis add to the diversity produced. All genetic differences in any creature, including plants, may be traced back to mutations. Natural selection uses the variety as a raw material, and it is also a driving factor in evolution. Because spontaneous mutations are uncommon and unpredictable in terms of incidence, they are challenging to utilize in plant breeding programs. In this manner, mutant variants with significant and minor phenotypic impacts emerge for a variety of characteristics. Mutation breeding is the process of creating and exploiting genetic diversity via chemical and physical mutagenesis in order to create new kinds. Along with recombinant breeding and transgenic breeding, it is currently a cornerstone of contemporary plant breeding. This technique, which is frequently complemented with germplasm obtained through induced mutation, has become the most popular for breeding plants via sexual reproduction, as Novak and Brunner point out[2].

Mutation breeding Mutagenesis is the process by which chemical, physical, or biological factors produce abrupt heritable changes in an organism's genetic information that are not caused through genetic segregation or genetic recombination. Three kinds of mutagenesis are used in mutation breeding. Induced mutagenesis, in which mutants arise as a result of ionizing radiation (gamma rays, X-rays, ion beams, etc.) or treatment with chemical mutagens; site-directed

mutagenesis, in which a mutation is created at a specific site in a DNA molecule; and insertion mutagenesis, in which mutations occur as a result of DNA insertions, either through genetic transformation as well as insertion of T Plant breeding requires genetic variety of beneficial characteristics for crop development, but numerous mutant alleles, as well as functional analysis of the targeted gene in many instances, are sources of genetic diversity for crop breeding. The method of finding individuals having a target mutation, which includes two main steps: mutant screening & mutant confirmation, is the most important part of mutation breeding. In contrast to the parent, mutant screening is a procedure that involves selecting individuals from a vast mutation population that satisfy particular selection criteria, such as early blooming and disease resistance. These choices, however, are often considered as putative mutant or false mutants[3].

The origins of plant modification have been claimed to date back to 300 BC, with accounts of mutant crops in China. See for a more in-depth analysis. Hugo de Vries discovered mutations as a method for generating variety in the late 1800s while working on the 'rediscovery' of Mendel's principles of heredity. this variation as heritable alterations caused by processes other than segregation and recombination. Figure 1 showing the process of mutagenesis. This phenomenon was characterized by him as rapid alterations in organisms that were hereditary and had rather significant impacts on the phenotypic appearance of the organism. subsequently created the word "mutation" and provided an integrated idea for the occurrence of abrupt, shock-like changes (leaps) in existing characteristics that result in the emergence of new species and diversity. After Stadler discovered the mutagenic activity of X-rays in maize, barley, and wheat, radiation-induced mutations as a method for creating new genetic diversity in plants progressed as a field[4].

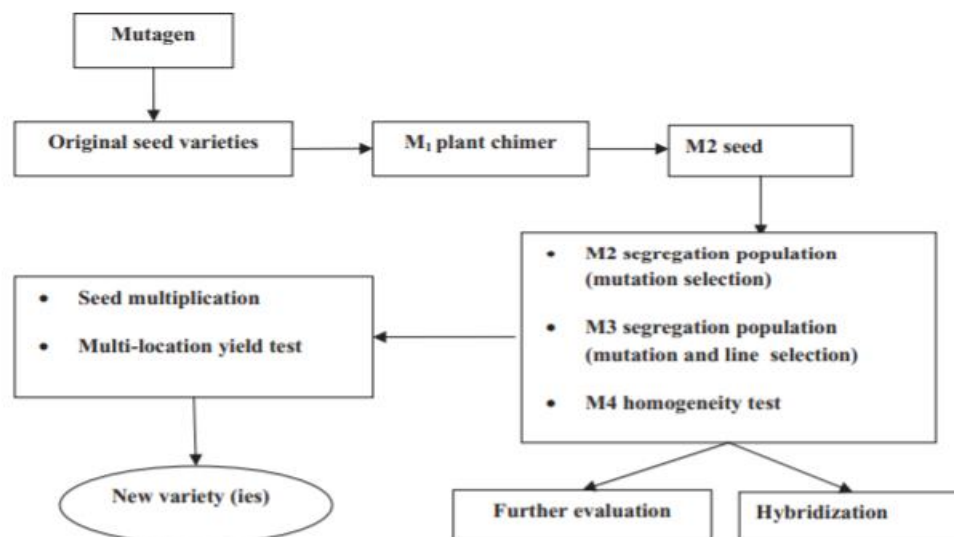


Figure 1: Illustrate the process of mutagenesis for crop Improvement.

1.1. Agents that cause mutations:

Mutagens are agents that cause artificial mutations. Chemical or physical mutagens are the two main categories in which they are classified. Planting materials are traditionally subjected to physical & chemical mutagenic agent to cause mutations in plants. All kinds of planting

materials, such as entire plants, typically seedlings, and in vitro cultivated cells, may be used for mutagenesis. Regardless, seed is the most frequently utilized plant item. Plant propagules including such bulbs, tubers, corms, as well as rhizomes, as well as the induction of mutants in leaves and roots plants, are becoming more efficient as scientists take advantage of totipotency (the capacity of an individual cells to divide as well as produce all the distinguishable cells in an organism to regenerate with whole crops) using single cells and other forms of in vitro propagation[5].

Vegetative cuttings, scions, or in vitro grown tissues such as leaves and stems explants, anthers, cell cultures, microspores, ovules, protoplasts, etc are used to induce mutations. Spikes, tassels, and other mutagenesis treatments are used to target gametes, which are typically found within inflorescences. Physical mutagens, on the other hand, cause large lesions such as chromosomal shortening or rearrangements, while chemical mutagens mostly cause point mutations. It's worth noting that the frequency or kinds of mutations are directly proportional to the mutagen's dose and pace of exposure or administration, not its nature. In the end, the selection of a mutagen will be influenced by a variety of variables, including the researcher's conditions, such as the mutagen's safety, simplicity of use, availability, efficacy in generating specific genetic changes, appropriate tissue, cost, and infrastructure[6].

Mutant cultivars' effects Induced mutation by different mutagens has helped to contemporary plant breeding by increasing genetic diversity. It has played a significant role in the creation of better plant types with traits such as high yield, early maturity, and lodging resistance, among others, all over the globe during the last five decades. The global effect of created and released variants in key crops. Several accomplishments in crop improvement via mutant breeding have resulted in two main outcomes: improved variations that can be grown commercially and novel genetic stocks with enhanced characteristics or greater trait combining capacity. Increased yield, improved nutritional quality, pest and disease resistance, early maturity, drought and salt tolerance, and so on are examples of these characteristics. Although the main goal of mutation breeding is to create new cultivars, the genetic stocks created may be utilized in a variety of ways in plant breeding, such as a donor parent in traditional breeding programs or as a parent in hybrid breeding programs. Apart from this, the goal of mutation research is to map genes, which is a completely distinct goal. Induced mutagenesis, a method for identifying a gene by knocking down its phenotypic expression, is a significant component of molecular genetics and genomics research today. The explanation of this method, however, is beyond the scope of this article[7].

- Direct use of a mutant line developed through physical and chemical mutagenesis, or Somaclonal variation.
- indirect use of a mutant line/lines used as a parental variety/varieties in interbreeding (cross between mutant lines or with a promotional variety/varieties)
- utilisation mutated gene allele (trait), such as the Calrose 76 sd1 allele (semi-dwarf 1 trait) in rice.
- use of mutant gene allele.

Incidence of mutant breeding in various nations Mutation breeding has been used on over 232 different crops and plant species, including wheat, rice, grapefruit, rapeseed, sunflower, cotton, and banana, among others. According to the Food and Agriculture Organization of the United

Nations (FAO)/International Atomic Energy Agency current database, mutant varieties with enhanced characteristics have been officially approved. Direct mutation was used to create more than 67 percent of the types. The induced mutant variants have agronomic & nutritional qualities that make these the market's most popular types. Some example of induced mutagenesis uses in plants for biotic stress resistance. Induced mutagenesis has also been used to create tolerant and resistant types to different abiotic stressors. Lodging resistance, acid sulphate soil tolerance in rice, salinity sensitivity in barley and sugarcane, and other traits are among them. Enhancement of crop productivity or various nutritional characteristics such as crude protein quality, amylose, phytate, protein content, and so on are also objectives of mutant breeding programs in diverse plants[8].

1.2. Mutants into Agriculture: A Effective Direct Application

1.2.1. Synthetic Biology's Potential

T-DNA insertion has direct use in the creation of novel genotypes, such as Golden rice, in addition to its use in functional genomics. To begin, the Golden rice was created by inserting T-DNA containing the genes phytoene synthase or lycopene cyclase and carotene desaturase in order to increase beta carotene synthesis, which is a precursor to vitamin A. With the development of functional genomic research, Golden rice 2 was created by inserting a T-DNA encoding phytoene synthase (from *Zea mays*) and carotene desaturase (from *Erwinia aurea*) into the rice genome. When compared to Golden rice, Golden rice 2 accumulates more carotenoids, making it a more promising source of vitamin A. While it's only been introduced in a few countries, including such Australia, New Zealand, Canada, as well as the United States, Golden Rice production may have a significant effect on reducing vitamin A deficiency. Other rice genotypes have been created via the insertion of T-DNA and have already been released in certain countries with a beneficial effect on agriculture, in addition to Golden rice.

2. LITERATURE REVIEW

Bhowmik et al. studied about CRISPR/Cas9 genetic modification is a game-changing technique that will help farmers create crops that will satisfy future demand. The lengthy life cycle of many agricultural species, as well as the fact that desirable genotypes often take many generations to acquire, make gene editing difficult to implement. Microspores are single-celled haploid cells that may grow into double-haploid seedlings and have been extensively utilized as a breeding technique to produce homozygous plants within a generation. They created an efficient haploid mutagenesis method using the CRISPR/Cas9 system and microspore technology to induce genetic changes in the wheat genome in this research. The usefulness and practicality of integrating microspore technology with CRISPR/Cas9-based gene editing for plant trait identification and enhancement are shown in this research[9].

Chikelu et al. studied about the options for producing more food by at least 70% over next four decades to keep up with a rapidly growing human population are bedevilled by erratic weather conditions, drained arable lands, decreasing water resources, and the significant environmental and health costs associated with increasing agrochemical use. Increasing productivity by using "smart" crop types that produce more with less inputs is a feasible alternative. However, genetic similarities among crop varieties—which make entire cropping systems vulnerable to the same stresses—combined with unvarying familial materials limit the possibilities for discovering novel alleles of genes as well as, thus, putting together new gene combinations to break yield

plateaus and improve resilience. Novel alleles are unmasked through induced mutation and used to create better crop types. The history, theoretical and practical concerns, and crop enhancement achievements of induced mutations are discussed, as well as how induced mutagenesis supports plant functional genomics. The contributions of cell and molecular biology methods to improving the efficiency of mutation induction, detection, and deployment are also discussed. In addition, the use of pre-breeding to facilitate the inclusion of mutants into crop development and the integration of phenomics into induced mutagenesis are recommended[10].

Liang et al. conducted research on Food security is a worldwide issue, and increased agricultural yields are needed to feed the world's increasing population. Mutagenesis is a useful technique for crop development that is not subject to the same regulatory constraints as genetically modified species. TILLING, that also combines traditional synthetic mutagenesis with high-throughput genomic sequence screening for genetic variations in desired genes to develop fresh mutant alleles for both genomic information and crop improvement, is a powerful way of creating novel mutant alleles for both genomic studies as well as crop improvement. TILLING is applicable to all genomes, whether small or big, diploid or even allohexaploid, and has a lot of promise for solving the fundamental problem of connecting sequence information to gene activity and modulating important characteristics in plant breeding. TILLING has been successfully used in a variety of crop species, and current TILLING progress is described here, with a focus on advancements in mutation detection technologies, TILLING application in gene functional research, and crop breeding. TILLING or Eco TILLING's potential for agricultural enhancement and functional genetics is also addressed. In addition, a small-scale forward approach including backcross and selling was used to unleash mutant traits that had been masked in M2 (or M3) plants[11].

3. DISCUSSION

The mutation process results in mutant crops with novel and beneficial characteristics due to random genetic differences. In its most basic form, classical breeding entails the selective growth of plants with desired traits and the removal or "culling" of others with less desirable traits. The initial stage in plant breeding is to find appropriate genotypes with the required genes among existing kinds, or to develop one if none exist. Mutation are the primary cause of diversity in nature, so plant breeding would be impossible without them. In this context, the primary goal of mutation-based breeding is to create and enhance well-adapted plant types by altering one or two key characteristics to boost production or quality. Furthermore, advances in cell and molecular biology are improving the efficacy and efficiency of mutation induction as well as the identification of new gene alleles. Physical and chemical mutagens are the most common types of mutagens used by researchers for plant mutagenesis. This chapter examines the technique of mutation induction, as well as the mutagens that are employed for this purpose and how they aid in crop improvement.

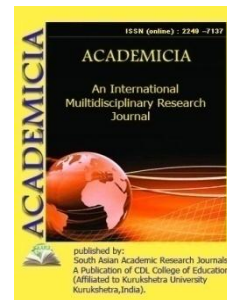
4. CONCLUSION

It will be a huge task to boost food production by at least 70% during the next several decades. There is a pressing need to end hunger among the world's growing population, which is becoming more concerning as a result of climate change, diminishing water supplies, dwindling arable land, and the severe health and environmental risks associated with the use of agrochemicals. Increased production of high-quality food with little input is seen to be an

intriguing possibility. On the other side, the limited diversity in plant crops, particularly staple crops, restricts the possibilities for discovering novel gene alleles. As a result, new plant crop variants with novel gene combinations & induced mutation are the best choice thus far. Induced mutation reveals a novel gene combination that produces a new breed with better characteristics to the parents. Furthermore, advances in cell biology are improving the efficacy or efficiency of mutations induction or the identification of new gene alleles. Physical and chemical mutagens are the most common types of mutagens used by researchers for plant mutagenesis. This chapter examines the technique of mutation induction, as well as the mutagens that are employed for this reason as well as how they aid in crop improvement.

REFERENCES

1. Y. Sun, J. Li, and L. Xia, "Precise genome modification via sequence-specific nucleases-mediated gene targeting for crop improvement," *Frontiers in Plant Science*. 2016, doi: 10.3389/fpls.2016.01928.
2. C. CHEN *et al.*, "An EMS mutant library for cucumber," *J. Integr. Agric.*, 2018, doi: 10.1016/S2095-3119(17)61765-9.
3. B. Hussain, S. J. Lucas, and H. Budak, "CRISPR/Cas9 in plants: at play in the genome and at work for crop improvement," *Briefings in functional genomics*. 2018, doi: 10.1093/bfpg/ely016.
4. Z. Tadele, "Mutagenesis and TILLING to Dissect Gene Function in Plants," *Curr. Genomics*, 2016, doi: 10.2174/1389202917666160520104158.
5. B. Trevaskis, "Developmental pathways are blueprints for designing successful crops," *Frontiers in Plant Science*. 2018, doi: 10.3389/fpls.2018.00745.
6. S. Penna and S. M. Jain, "Mutant resources and mutagenomics in crop plants," *Emirates Journal of Food and Agriculture*. 2017, doi: 10.9755/ejfa.2017.v29.i9.86.
7. Z. Shimatani *et al.*, "Targeted base editing in rice and tomato using a CRISPR-Cas9 cytidine deaminase fusion," *Nat. Biotechnol.*, 2017, doi: 10.1038/nbt.3833.
8. M. Abdelrahman, A. M. Al-Sadi, A. Pour-Aboughadareh, D. J. Burritt, and L. S. P. Tran, "Genome editing using CRISPR/Cas9-targeted mutagenesis: An opportunity for yield improvements of crop plants grown under environmental stresses," *Plant Physiology and Biochemistry*. 2018, doi: 10.1016/j.plaphy.2018.03.012.
9. P. Bhowmik *et al.*, "Targeted mutagenesis in wheat microspores using CRISPR/Cas9," *Sci. Rep.*, 2018, doi: 10.1038/s41598-018-24690-8.
10. C. Mba, "Induced mutations unleash the potentials of plant genetic resources for food and agriculture," *Agronomy*. 2013, doi: 10.3390/agronomy3010200.
11. L. Chen, L. Hao, M. A. J. Parry, A. L. Phillips, and Y. G. Hu, "Progress in TILLING as a tool for functional genomics and improvement of crops," *J. Integr. Plant Biol.*, 2014, doi: 10.1111/jipb.12192.



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MASTERING SKILLS OF INDEPENDENT STUDY AS THE BASIS OF PROFESSIONAL SELF-EDUCATION

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ABSTRACT

Currently, the goals, strategies, tasks and content of professional training of university students are undergoing significant changes: the formation of thinking focused on the construction of non-standard forms and models of real professional activity comes to the fore. From these positions, the following skills become important for the future specialist: orientation to project and mobility, independence in solving professional tasks – thus, we are talking about the acquisition of competence.

KEYWORDS: *Independent Study, Tasks, Self-Study, Learning Tools, Strategy, Systemization.*

INTRODUCTION

Modern requirements make it necessary to revise the usual learning strategy. The transition to learning tools is beginning to take place, encouraging students to develop internal motives for cognition, increase the level of theoretical understanding of their practical activities. The importance of fundamental knowledge increases, the course on individualization increases, the volume of independent work of students increases, the transition from educational activities under the guidance of a teacher to independent studies becomes important.

It should be remembered that there is a fundamental difference between the educational activity of students under the guidance of a teacher and its independent forms, which is not paid enough attention to. When a teacher leads students from a concept to reality, such a teaching method is valid only as a methodical technique. When it comes to the formation of a concept through independent work with educational materials and tools, the conditions of activity change decisively.

Thus, it is necessary to teach students how to logically analyze the sources of educational information, in particular, the analysis of information models in which the content of scientific concepts is fixed, which at the same time constitutes one of the most important tasks of training designed to prepare students for independent learning activities.

Modern requirements make it necessary to revise the usual learning strategy. The transition to learning tools is beginning to take place, encouraging students to develop internal motives for cognition, increase the level of theoretical understanding of their practical activities. The importance of fundamental knowledge increases, the course on individualization increases, the volume of independent work of students increases, the transition from educational activities under the guidance of a teacher to independent studies becomes important.

It should be remembered that there is a fundamental difference between the educational activity of students under the guidance of a teacher and its independent forms, which is not paid enough attention to. When a teacher leads students from a concept to reality, such a teaching method is valid only as a methodical technique. When it comes to the formation of a concept through independent work with educational materials and tools, the conditions of activity change decisively.

Thus, it is necessary to teach students how to logically analyze the sources of educational information, in particular, the analysis of information models in which the content of scientific concepts is fixed, which at the same time constitutes one of the most important tasks of training designed to prepare students for independent learning activities.

Independent work of a student (IW) is considered (L.I. Petrova, L.N. Kutergina)¹ as a means of teaching, providing: the formation of the necessary volume and level of knowledge, skills and abilities acquired by students during training, based on the set didactic goals and objectives of the discipline; mastering perfect ways of mental activity that ensure the productivity of cognition in the course of independent mastery of educational material; development of a psychological attitude to systematically replenish their knowledge and skills to navigate the flow of scientific and pedagogical information when solving new cognitive tasks; management of independent cognitive activity of students in the learning process. Didactics of higher education defined the concept of "*independent work of students*". It includes:²

- ♦ the presence of independent cognitive activity, the main motive of which is the independent mastery of new content;
- ♦ reliance on existing knowledge, skills, skills;
- ♦ systematic and systematic organization of independent work, taking into account the preparedness of students and their psychological characteristics;
- ♦ performing tasks (educational, research) under the guidance of a teacher or on the basis of methodological developments that contribute to the assimilation of various knowledge, the acquisition of skills, skills, experience of creative activity and the development of independence in behavior (I.A.Zimnaya, G.M. Kojaspirova, V.Ya. Kislenko, T.A. Kulikova, L.G. Niskanen, N.A.Starodubova, etc.)³.

Tasks of independent work:

Systematization and consolidation of the received theoretical knowledge and practical skills⁴;

- deepening and expanding theoretical knowledge;
- formation of skills to use regulatory, legal, reference documentation and special literature;
- development of cognitive abilities, student activity, creative initiative, independence, responsibility and organization;
- formation of independent thinking, abilities for self-development, self-improvement and self-realization;
- Formation of research skills.

It follows from the above that independent work is an integrative concept, which includes both the readiness of the student himself for independent activity, and the ability of the teacher to develop this activity among students. At the same time, the main thing is not the optimization of its individual types, but the development of students' activity, independence, desire to prove themselves (L.G. Niskanen)⁵.

Independent work in an educational institution can be organized individually with each student, with several students (for example, project teams) and a study group (lecture stream) as a whole.

Analysts of the Research Institute of Higher Education identify the main characteristics of independent work of students.

1. The focus of independent work on the profession. First of all, it is the formation of a steady interest in the chosen profession and methods of mastering its features, which depend on the following parameters: the relationship between teachers and students in the educational process, the level of complexity of tasks for independent work, the involvement of students in the formed activity of the future profession.

2. Professional orientation of independent work. The indisputability of this educational and substantive thesis from the point of view of knowledge, involvement in creative professional activity, effective personal interaction in the profession should not detract from the importance of knowledge of the general humanitarian culture of the relevant blocks of disciplines of the curriculum.

3. The rhythm of independent work of students. The intensification of the educational process involves the rhythmicity of independent work by reducing the routine work of the student in semesters. When forming the time volume of his subject, the teacher should take into account the total workload of students, and not the importance of only his discipline.

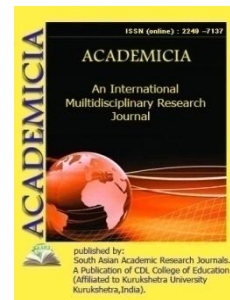
4. Individualization of independent work of students, which includes:

- increasing the proportion of intensive work with more prepared students;
- division of classes into mandatory and creative parts (for everyone trying to cope with more difficult and, most importantly, non-standard tasks, additional questions, educational and problem situations, etc.);
- regular consultations with students;
- Comprehensive and timely information about the thematic content of independent work, deadlines, auxiliary tools, forms, methods of control and evaluation of the final results.

- Depending on the course the student is studying, the specifics of the subject being studied tasks for independent work can be very diverse. It is important to strive to ensure that in junior courses independent work aims to expand and consolidate the knowledge and skills acquired by the student in the classroom.
- Independent work is an important factor in the theoretical and practical preparation of students for the upcoming activities, the formation of the necessary knowledge, skills, moral and mental qualities. In modern conditions, the degree of responsibility of the student has increased both for his educational activities and for the development of his horizons, knowledge, specific subject content and general content.
- Independent work as a form of training organization is possible and necessary to obtain any educational result. However, its types for obtaining different educational results will be different:
 - • to acquire knowledge: work with dictionaries and reference books; familiarization with regulatory documents; educational and research work; work with lecture notes; work with educational material (textbook, primary source, article, additional literature, including materials obtained via the Internet); taking notes of texts; answers to control questions; preparation of abstracts for presentation at a seminar, conference; preparation of abstracts, etc.;
 - • for the formation of skills and abilities: solving typical tasks and exercises; solving variable tasks and exercises; performing drawings, diagrams; performing calculation and graphic works; solving production situational (professional) tasks; designing and modeling of various types and components of professional activity; performing course and final qualifying works; experimental and design work; exercises on a PC and simulator, etc.
- When addressing the problem of the formation of independent work skills in the learning process, it seems necessary to solve a number of issues (issues related to activity in the process of independent work, the effectiveness of independent work, etc.).
- Whilst offering a number of models for self-learning the review authors conceptualized independent learning in terms of processes of self-regulation. These were organized around four or more phases for students to complete including: planning, self-monitoring, controlling the pace and direction of the work and evaluation. Evaluation included students' feelings of pleasure or otherwise. Self-motivation was also identified as necessary for successful independent learning. 'External' elements which supported independent learning included the development of a strong relationship between teachers and students, and the establishment of an 'enabling environment'. Research in the review described an 'enabling environment' as one which included an appropriate 'physical environment', a flexible approach to time that teachers gave students to work on specific tasks and a shared willingness to undertake independent learning on the part of students. Appropriate resources were also necessary and it was important that teachers were knowledgeable about the work being done. An essential element of independent learning identified in the review was positive relationships between teachers and students, based on trust. A mutual responsibility for learning, which drew in students' experiences in their family and local community, was also necessary. The skills which the review found to be necessary for successful engagement in independent learning are covered in the next section.

REFERENCES:

1. Yushko, G.N. Experience of using rating technology in higher education [Electronic resource] / G.N. Yushko. - Access mode : <http://www.oim.ru>, free.
2. Neprokina, I.V. Organization of research work of students at the university - as a pedagogical problem / I.V. Neprokina, D.S. Ryabova // Collection of the All-Russian scientific and practical conference "Socio-humanitarian and economic sciences. XXI century". - Magadan : IP Katsubina T.V., 2012. - pp. 208-210.
3. Niskanen, L.G. Independent work of students as a means of professional training of students / L.G. Niskanen // Vocational education: experience, problems, prospects.
4. Petrova, L.I. Methodological support of the Bologna process in higher education (pedagogical aspect) / L.I. Petrova, L.N. Kutergina.- Rostov n/A : Phoenix, 2008– - 649 s
5. Shchetinina, V.V. Organization of independent work of students in the conditions of a point-rating system for evaluating results / V.V. Shchetinina // Problems of university education. Competence-based approach in education : Collection of art. V All-Russian Scientific research. conf. (Togliatti, December 8-9, 2011). - Tolyatti : Publishing House of TSU, 2011. - pp. 73-77.
6. Pidkasisty, P.I. Organization of educational and cognitive activity of students / P.I. Pidkasisty. - M.: Pedagogical Society of Russia, 2005. - 144 p.
7. Pedagogy : studies. manual / V.V. Voronov [et al.] ; edited by P.I. Pidkasistogo. - M.: Pedagogical Society of Russia, 2002– - 640 p.
8. Петрова, Л.И. Методическое обеспечение Болонского процесса в вузе (педагогический аспект) / Л.И. Петрова, Л.Н. Кутергина.– Ростов н/Д : Феникс, 2008. – 649 с



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SCIENTIFIC BASIS OF CATALYST REGENERATION OF METHANE OXYCONDENSATION PROCESS

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ABSTRACT

In the study, the coking mechanism of the methane oxycondensation reaction catalyst was developed and the optimal conditions for catalyst regeneration were selected. Based on the results obtained, the process of catalyst regeneration of the methane oxycondensation reaction was modelled and the rate constant and activation energy of the coke formation process was evaluated based on experimental data.

KEYWORDS: *Catalyst, Coke, Regeneration, IR Spectrum, Thermogravimetry, The Velocity Constant, Activation Energy, Mathematical Modelling.*

INTRODUCTION

At a time when oil reserves are declining, natural gas is of great interest as an alternative fuel in petrochemical production. The current traditional method of converting natural gas to liquid fuels is multi-stage, going under high temperature and high pressure. At present, the only sensible way to process natural gas is by its oxycondensation reaction. This process is a one-step process that takes place at normal atmospheric pressure [1-6].

The main target products in the catalytic oxycondensation of methane are ethane and ethylene. Currently, 156 million tons of ethylene is produced worldwide, and the growth in demand for ethylene requires 5-6% per year. Ethylene is an important product of petroleum and gas chemistry and is used in the production of polyethylene, polyvinyl chloride, polystyrene, alkylbenzenes, ethylene oxide and others [7-10].

The efficiency of any petrochemical heterogeneous-catalytic process is primarily determined by the activity, selectivity and stability of the catalyst. Deterioration of the recorded characteristics

is observed during the use of the catalyst. The main reason for the deterioration of these parameters is the formation of coke on the active surface of the catalyst. As a result of coke loss, the catalytic properties of the catalyst are restored. A common method of restoring the catalytic properties of a catalyst is oxidative regeneration [11-16].

EXPERIMENTAL PART

The catalyst for the synthesis of C₂-hydrocarbons was prepared by two methods of precipitation and absorption. High-silicon zeolite, which was thermally and chemically treated with bentonite, was used in our laboratory as a binder [17-20]. Aqueous solutions of manganese acetate and sodium molybdate were used to prepare the catalyst by the precipitation method. The precipitate was filtered, dried at 130 °C, and baked in an oven at 800–1100 °C for 5 h. The required amount of zirconyl nitrate solution was then added to the resulting mass. The catalyst was then filtered, dried, and fired in the above sequence.

In the absorption method, the catalyst was prepared in the following two steps. In the first stage, a solution of manganese acetate was injected into the expanded clay heated to 550-600 °C. The mixture was then fired at 900 °C for 3 h at 150 °C until a homogeneous mass was obtained. In the second stage, an aqueous solution of sodium acetate, ammonium molybdate, was ingested. Subsequent drying and firing steps were continued as above.

The amorphous structures of the catalysts were determined by X-ray phase analysis, the porous structure was determined by the analysis of adsorption curves obtained by the method of thermodesorption of nitrogen, the surface area of the samples (S_{sol}) was determined by the BET method, the volume of micropores and mesopores was determined by BJH method.

The specific surface area of the catalyst was determined by the adsorption-desorption method of nitrogen at -77 °C Micro metrics Sorptometer Tristar 3000 using the BET method. Examination of the catalyst was performed by scanning electron microscopy (SEM) on an analytical auto emission wave electron microscope (ULTRA 55 Carlziss, Germany).

The spatial composition of the catalytic systems was tested on a Shimadzu XRD 7000 X-ray diffractometer.

The catalytic oxycondensation reaction of methane was carried out in a flow reactor under differential reactor conditions. The gaseous products of the reaction were analyzed chromatographically on the chromatograph "Gazochrome 3101" with a thermochemical detector connected to an additional thermostat under the following conditions: column thermostat temperature-100 °C, carrier gas (air) flow rate -35 ml/min, column length filled with activated carbon - 1m, inner diameter - 3 mm. Quantitative analysis was performed using the absolute grading method [21-23].

The catalytic activity of the catalysts was studied in a flow differential reactor, at normal atmospheric pressure, at 750–850 °C, and under a volume ratio of methane: oxygen = 1.5 ÷ 5: 1 [24-29].

The reactor is a quartz tube with an inside diameter of 8 mm and a length of 650 mm. Methane and pure oxygen with 99.9% purity were used for the reaction. The gases were mixed before entering the reactor. The contact gas coming out of the reactor was cooled in an aqueous refrigerator-separator.

This work aims to construct a mathematical model of oxidative regeneration. The kinetic model is the sum of the quantities that characterize the relationship between the reaction parameters of the rate of chemical change (pressure, temperature, reagent concentration, etc.) and the elementary stages, reactions, equations. This relationship is determined based on experimental data in the field of change of reaction parameters.

Manganese-based oxide catalysts prepared by the absorption method for the oxidative dimerization reaction of methane have high catalytic activity and efficiency, and the best results were obtained in the presence of the $(\text{Mn}_2\text{O}_3)_x \cdot (\text{Na}_2\text{MoO}_4)_y \cdot (\text{ZrO}_2)_z$ complex. Glide was used as a carrier. Methane conversion in the presence of catalysts obtained by the above methods was 56.8%, selectivity for target products was 62.3%, selectivity for ethylene was 65.8% and C_2 -hydrocarbon yield was 35.4%.

Regeneration of coking catalysts to restore their activity and selectivity is an important part of the technological process. Oxidative regeneration of coked catalysts is a potent exothermic process. Overheating of the catalyst can lead to a loss of irreversible catalytic activity: rounding of porous structures, crystallization and recrystallization, as well as leakage of active components. In this case, the maximum temperature of the catalyst is determined depending on its composition and structure. Coke formation follows the following scheme:

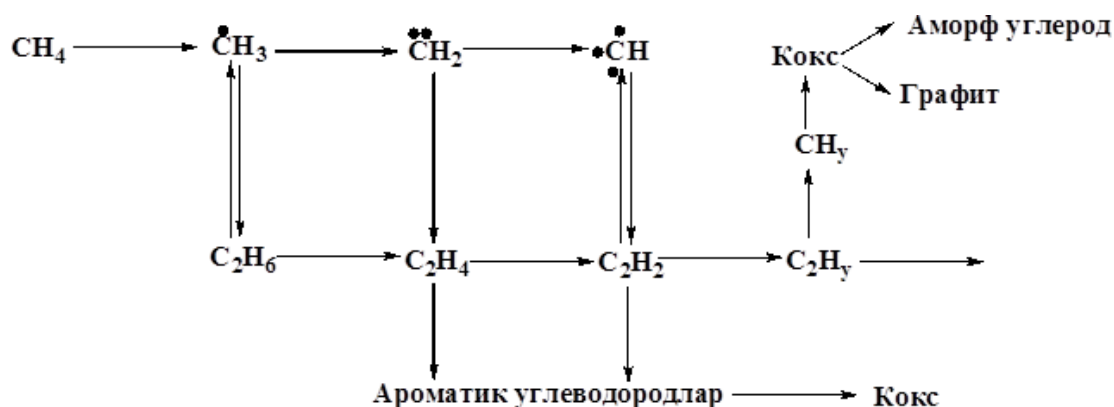


Figure 1. Scheme of coke formation during methane oxycondensation

RESULTS AND DISCUSSION

It is known that in the oxycondensation reaction of methane, the activity and productivity of the catalyst are reduced due to the formation of coke precipitate containing $\text{CH}_x (1 \geq x \geq 0)$. Oxidative regeneration was used to restore the activity of the catalyst. To determine the structure of the resulting coke (graphitized or amorphous), the experimental results were found to have an error $\pm 3\%$ when compared with the results obtained by the derivatographic analysis method (Fig. 2). The size of the catalyst pores and the specific surface area determine the susceptibility to coking, so the method of physical adsorption of nitrogen was used to determine the surface area of the catalyst, the size and volume of the pores.

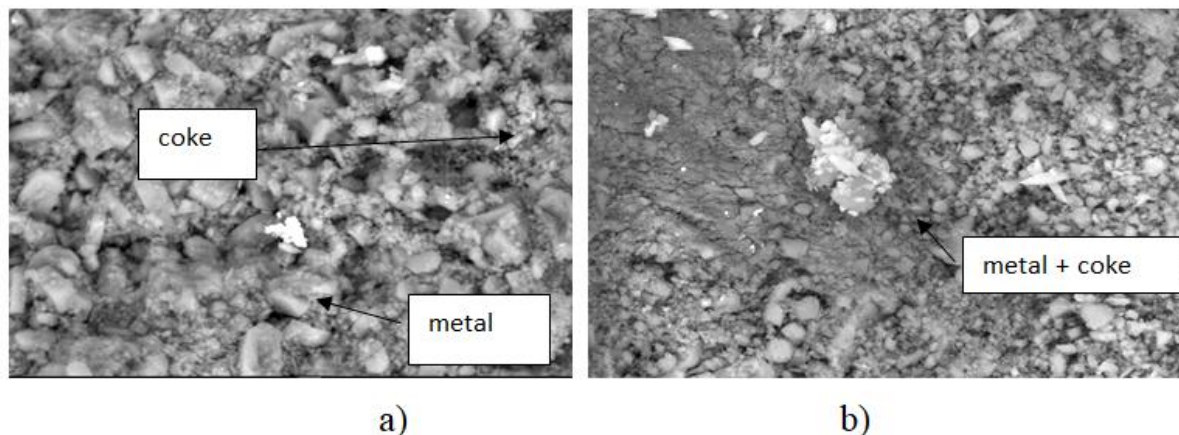
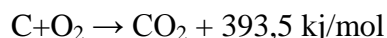


Figure 2. Coke catalyst micrograph (5000 magnification)

The larger the specific surface area of the catalyst, the higher its activity. The formation of coke on the active surface of the catalyst leads to a deterioration of the performance of the regime of catalytic processes. The laws of regeneration of the coking of catalyst particles were realized using a diffusion mathematical model. The amount of coke in the catalysts was determined by the difference between the masses before and after heating in the open air. To do this, the catalyst was heated in air at 110 °C and the mass was measured, then fired in an oven at 800 °C. After 1 h, its mass was measured again and the amount of coke was determined. Catalyst inactivation is reversible (coke sediment is formed) and irreversible (spatial change of the active component, sticking of the active centres of the catalyst under the influence of heat, decomposition, poisoning, etc.). In reactivation, the initial activity of the catalyst can be partially or completely restored. The following reactions can take place between coke and oxygen:



The approximate composition of the coke sediment corresponds to the CH_x formula as noted above. In this case, the combustion of coke $x=0\div 1$ is characterized by the following total reaction:



The coked catalyst sample was placed in a reactor and washed with an inert gas-argon (volumetric velocity of argon 500 h⁻¹) at 650 °C for 20 min. After that, gradually increasing the volume fraction of oxygen, the catalyst was chemically treated at 650 °C in a mixture of inert gas and oxygen. For 2.5 hours, the oxygen concentration in the regeneration mixture was increased to 25%. In this case, the chemical treatment was continued for 1.5 hours. The temperature was then raised to 750 °C for 3 h and chemically treated under an airflow rate of 500 h⁻¹. At the end of the catalyst regeneration cycle, the catalyst was washed at 750 °C in an argon atmosphere with a volumetric velocity of 500 h⁻¹ and cooled in an argon stream. The temperature range of oxidation treatment of catalysts was 200-1200 °C, the heating rate in the air was 10 °C/min. The

amount of coke released was studied in the range of 50–850 °C using a combination of thermogravimetry and differential thermal analysis methods. The absolute error in temperature measurement was ± 5 °C and in mass measurement $\pm 0.5\%$.

For IR spectroscopic examination, 10 g of coked catalyst was taken and 25 ml of chloroform was added. After 2 h, the resulting extract was placed on a plate and placed on an IK-Fure spectrophotometer after the chloroform had evaporated. Spectra were then recorded for 1 h at room temperature in the $600 \div 4,000 \text{ cm}^{-1}$ wavelength range. For quantitative analysis of inactivating components, their extract was prepared on a Soxhlet instrument: catalyst mass - 10 g, extragenic (acetone) volume - 40 ml, extraction time - 1 hour.

The number of extract components was analyzed by the gas-liquid chromatographic method: flame-ionization detector, carrier-gas (hydrogen) flow rate-1 ml/min; the Heating rate in the temperature range $40 \div 200$ °C 10 °C/ min; capillary column length 50 m, column diameter 0.32 mm, stationary phase-polyethene glycol (thickness $1.2 \mu\text{m}$). Determining the microstructure of the catalysts was carried out on a JEM-2010 instrument using irradiated electron microscopy. Coke formation was assessed according to DTA-TG data.

For laboratory regeneration of the methane oxycondensation reaction catalyst under laboratory conditions, experimental studies were carried out in a flow isothermal reactor by adding $0.3 \div 1.0$ g of catalyst to a reactor with a diameter of 3 mm. The $(\text{Na}_2\text{MoO}_4)_x \cdot (\text{Mn}_2\text{O}_3)_y \cdot (\text{ZrO}_2)_z$ catalyst was used in the experiments. As a result of the study, it was found that the specific surface area of the catalyst according to the BET method is $\sim 65 \text{ m}^2/\text{g}$. Experimental experiments on catalyst regeneration were carried out at $450\text{--}500$ °C under conditions of air consumption $10 \div 30 \text{ ml / min}$. The catalyst was heated in a nitrogen stream to the required temperature, then an airstream was connected. The catalyst ($0.3 \div 0.5$ mm fractions) was mixed with quartz to increase surface heat absorption. Changes in the concentration of oxygen leaving the $(\text{Na}_2\text{MoO}_4)_x \cdot (\text{Mn}_2\text{O}_3)_y \cdot (\text{ZrO}_2)_z$ catalyst regeneration reactor were detected by gas chromatography. Figure 3 shows the results of the change in the oxygen concentration leaving the $(\text{Na}_2\text{MoO}_4)_x \cdot (\text{Mn}_2\text{O}_3)_y \cdot (\text{ZrO}_2)_z$ catalyst regeneration reactor over time at different temperatures.

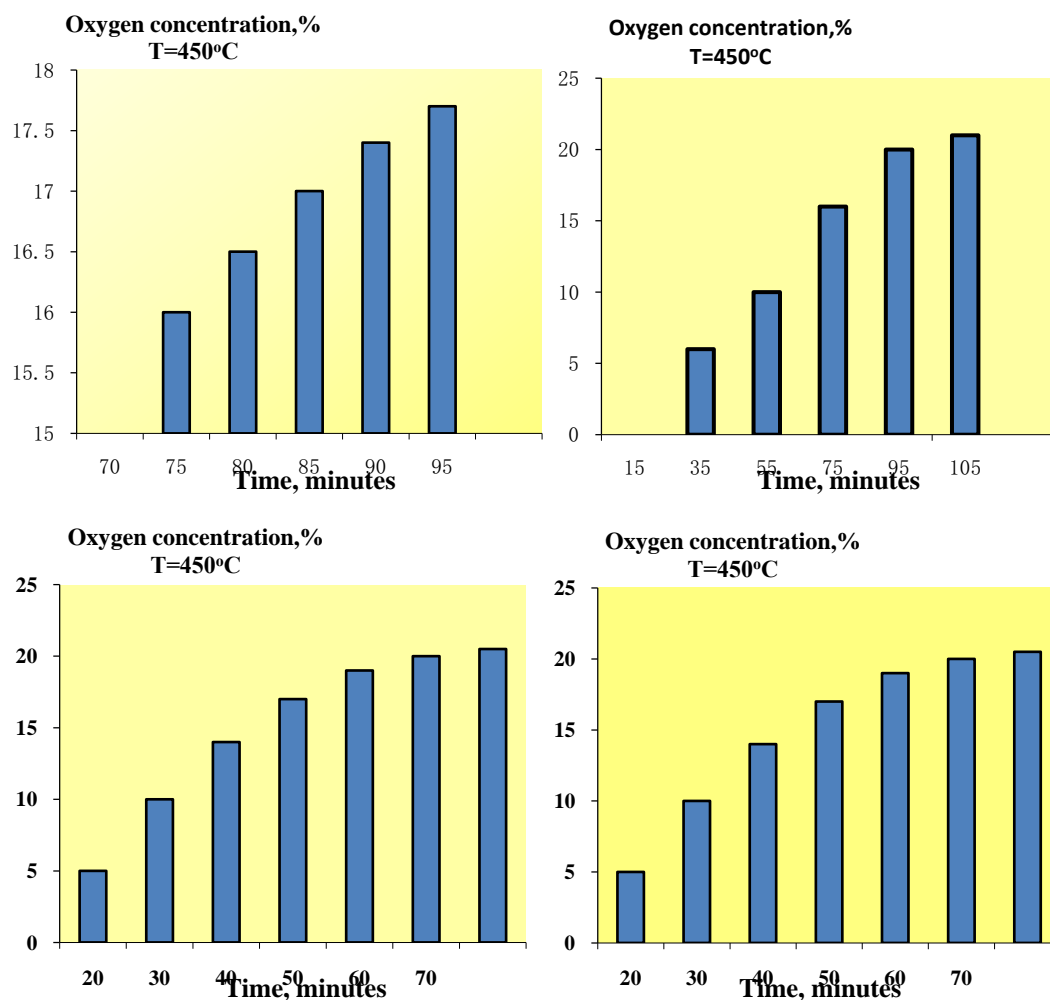


Figure 3. Graph of the change in the concentration of oxygen leaving the reactor over time at different temperatures

Using the formula $-\frac{1}{y} \ln\left(\frac{y_0}{y_1}\right) = k \cdot t + A$, it was studied that the experimental data of the oxygen concentration at the exit of the catalyst regeneration reactor containing $(\text{Na}_2\text{MoO}_4)_x \cdot (\text{Mn}_2\text{O}_3)_y \cdot (\text{ZrO}_2)_z$ depend on the regeneration time. The results obtained are shown in Figure 4 below.

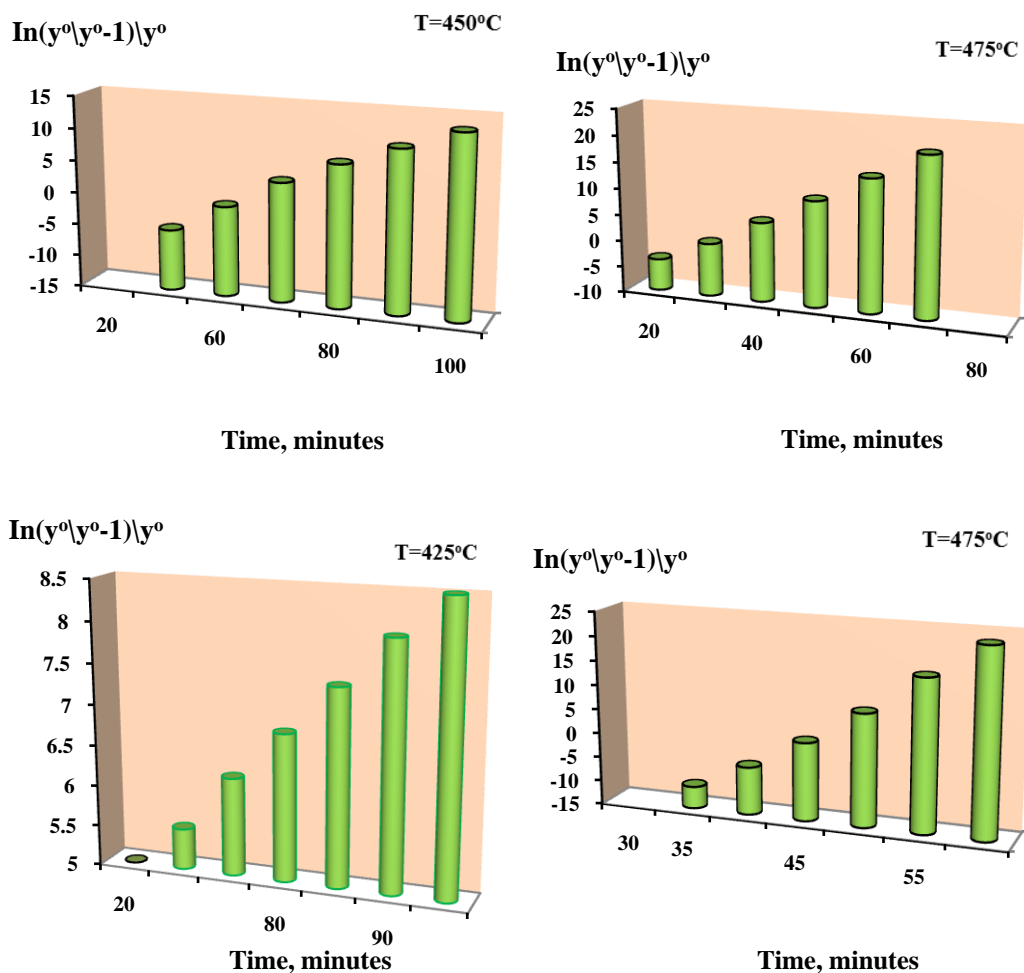


Figure 4. The dependence of the oxygen concentration leaving the reactor on the regeneration time

To determine the value of the reaction rate constant at different temperatures, the relationship between the concentration of carbon dioxide at the exit of the reactor and the regeneration time was linearly formed by the coordinates of the equation $-\frac{1}{y} \ln \left(\frac{y_0}{y_1} \right) = k \cdot t + A$. The results are shown in the figure below (Figure 5).

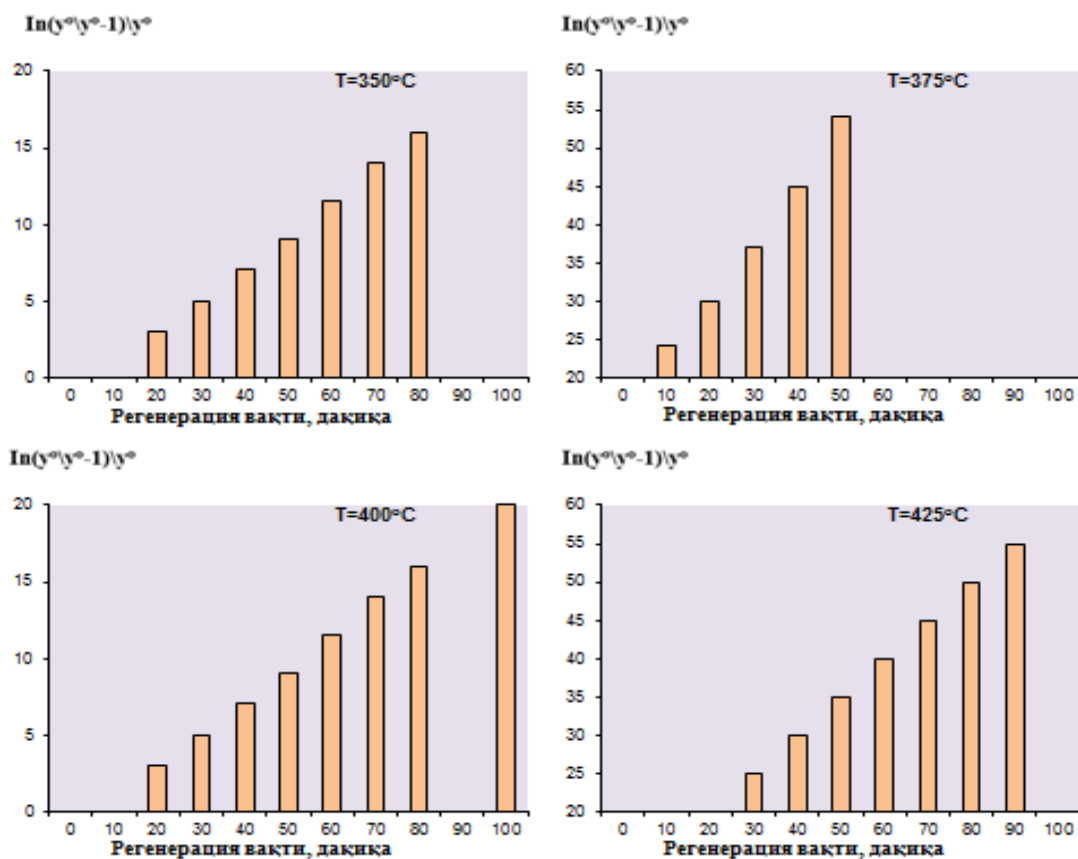


Figure 5. the relationship between the concentration of carbon dioxide at the exit of the reactor and the regeneration time

Based on the calculation of the rate constants of the oxidation reaction of coke in a catalyst containing $(\text{Na}_2\text{MoO}_4)_x \cdot (\text{Mn}_2\text{O}_3)_y \cdot (\text{ZrO}_2)_z$ at different temperatures, the activation energy of the complete oxidation reaction of coke was determined. For this, a correlation graph between $2 + \ln(k)$ and $1000/T$ was constructed and the activation energy was determined based on the value of the slope angle tangent. Based on the results obtained, it was proved that the activation energy of the coke combustion reaction is $75.8 \pm 5 \text{ kJ/mol}$.

Figure 6 below shows a micro photo of a coking catalyst containing $(\text{Na}_2\text{MoO}_4)_x \cdot (\text{Mn}_2\text{O}_3)_y \cdot (\text{ZrO}_2)_z$ after use at different time values at 800 °C. As can be seen from the figure, the volume of graphite aggregates accumulated in the catalyst sludge and their volume increase significantly with increasing operating time.

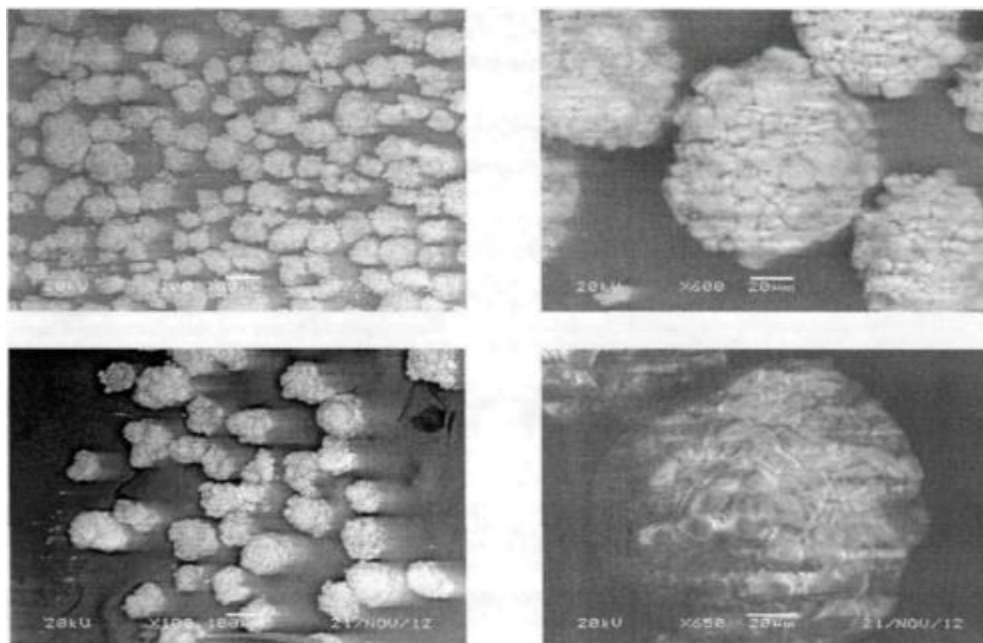


Figure 6. Micro photo image of catalyst surface after 240 hours (A), 480 hours (V), 720 hours (S), 960 hours (D) at 80 °C

The concentration of oxygen at the outlet of the reactor was determined chromatographically. The relationship between the oxygen concentration at the outlet of the reactor and the regeneration time was calculated according to the following formula:

$$-\frac{1}{y_0} \ln \left(\frac{y_0}{y_1} - 1 \right) = k \cdot t + A$$

To fully evaluate the rate and energy of the coke formation process, the reaction rate and activation energy were determined.

The velocity constant and activation energy were calculated based on the experimental data given in the following table:

TABLE 1. VELOCITY CONSTANT AND ACTIVATION ENERGY

Temperature, K	τ , sec	m_0 , r	m , r
973	900	1,0128	0,9138
1073	900	1,0390	0,8595

The process of coke formation is a 1-order reaction. The rate equation for a first-order reaction is:

$$\frac{dx}{d\tau} = k(a - x)$$

The calculation of the velocity constant is performed according to the following equation:

$$k = \frac{2,303}{\tau} \lg \frac{m_0}{m}$$

The activation energy was calculated according to the following equation:

$$\lg \frac{k_2}{k_1} = \frac{E_a}{2,303R} \left(\frac{T_2 - T_1}{T_2 \cdot T_1} \right)$$

Speed constant:

$$T_2 = 1073$$

$$k_2 = \frac{2,303}{900} \lg \frac{1,039}{0,8595} = 2,11 \cdot 10^{-4} c^{-1}$$

$$T = 873K$$

$$k_2 = \frac{2,303}{900} \lg \frac{1,0128}{0,9138} = 1,14 \cdot 10^{-4} c^{-1}$$

Activation energy:

$$\lg \frac{2,11 \cdot 10^{-4}}{1,14 \cdot 10^{-4}} = \frac{E_a}{2,303 \cdot 8,314} \cdot \frac{200}{936729}$$

$$\lg 1,851 = \frac{E_a}{2,303 \cdot 8,314} \cdot \frac{200}{936729}$$

$$0,267 = \frac{E_a}{2,303 \cdot 8,314} \cdot \frac{200}{936729}$$

$$E_a = \frac{0,267 \cdot 19,15 \cdot 936729}{200} = 23,95 \text{ кЖ/моль}$$

CONCLUSION

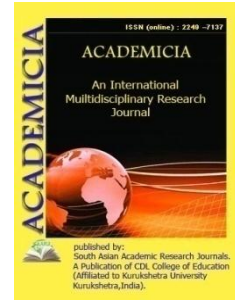
1. The coking mechanism of the methane oxycondensation reaction catalyst has been developed.
2. Optimal conditions for methane oxycondensation reaction catalyst regeneration were selected.
3. The process of regeneration of the methane oxycondensation reaction catalyst was modeled.
4. The rate constant and activation energy of the coke formation process were calculated on the basis of experimental data.

REFERENCES

1. Daneshpayeh M., Khodadadi A., Mostoufi N., Mortazavi Y., Sotudeh-Gharebagh R., Talebizadeh A. Kinetic modeling of oxidative coupling of methane over Mn/Na₂WO₄/SiO₂ catalyst.//Fuel Processing Technology. –2009. 90(3). № 5. –p.403-410.
2. Ji S., Xiao T., Li Sh., Chou L., Zhang B., Xu Ch., Hou R., York A.P.E., and Green M.L.H. Surface WO₄ tetrahedron: these sence of the oxidative coupling of methane over M–W–Mn/SiO₂ catalysts // Journal of Catalysis. 2003. Vol. 220. P. 47-56.

3. Tyunyaev A.A., Nipan G.D., Koltsova T.N., Loktev A.S., Ketsko V.A., Dedov A.G., Moiseev I.I. Polymorphic ODM catalysts Mn / W / Na (K, Rb, Cs) / SiO₂ // Journal of Inorganic Chemistry. - 2009. - T. 54. - No. 5. - S. 723-726.
4. Dedov A.G., Loktev A.S., Telpukhovskaya N.O., Parkhomenko K.V., Gerashchenko M.V., Moiseev I.I. Oxidative condensation of methane in the presence of lanthanum-cerium catalysts: the fundamental nature of the nonadditivity effect // Chemistry and technology of fuels and oils. -2010. -T.46.-№2. -S.43-46.
5. Makhlin V.A., Podlesnaya M.V., Dedov A.G., Loktev A.S., Telpukhovskaya N.O., Moiseev I.I. Oxidative dimerization of methane: kinetics, mathematical modeling and process optimization on La / Ce catalysts // Russian Chemical Journal. -2008. -T.52. -№5. -S.73-79.
6. Dedov A.G., Loktev A.S., Telpukhovskaya N.O., Parkhomenko K.V., Moiseev I.I. New catalysts for oxidative condensation of methane - mesoporous amorphous silicates of rare earth elements // Reports of the Academy of Sciences. 2008. -T.422. -№4. -S.498-500.
7. Н.И.Файзуллаев. Метанни каталитик оксиконденсатлаб этилен олиш.// Самарқанд, СамДУ, 2019. Монография. 108-бет.
8. Fayzullayev N.I., Tursunova N.S. Marganes saqlovchi katalizatorlarda metandan etilen olish // Химия и химическая технология. – 2018, №1, -С.24-28.
9. Fayzullayev N.I., N.S.Tursunova, H.M.Nasimov. Metanni katalitik dimerlash reaksiyasi yordamida etilen olish.// СамДУ, Илмий ахборотномаси. 2017-йил, 5-son (105), 130-136-бетлар.
10. Fayzullayev N.I., Sh.B. Raxmatov. Metanni katalitik oksikondensatlash.// СамДУ, Илмий ахборотномаси. 2018-йил, 3-son (109), 97-104-бетлар.
11. Lomonosov V.I., Gordienko Yu.A., Sinev M.Yu. Kinetic laws of oxidative condensation of methane in the presence of model catalysts // Kinetics and Catalysis. 2013. T. 54. No. 4. P. 474–486.
11. Davletshin A.R., Khamzin Yu.A., Shiriyazdanov R.R., Makhmutova O.N., Abdushev R.R., Kuzmenko M.Yu., Yakupov N.V., Telyashev E.G. Improvement of the process of regeneration of heterogeneous catalysts using supercritical technologies // World of oil products. 2016. No. 4. P. 33 - 36.
12. Bogdan V.I., Koklin A.E., Kazansky V.B. Regeneration of deactivated palladium catalysts for selective hydrogenation of acetylene with supercritical CO₂ // Supercritical fluids: theory and practice. 2006. T. 1.No. 2.P. 5 - 12.
13. Ostrovsky N.M. Kinetics of catalyst deactivation. - M.: Nauka, 2001. -- 209 p.
14. Khamzin Yu.A., Shiriyazdanov R.R., Davletshin A.R., Murzabekova A.B., Yakupov N.V., Shadrina A.E. Application of oxidative regeneration of zeolite-containing catalysts in the process of solid-acid alkylation of isobutane with olefins // Chemistry and technology of fuels and oils. 2018. No. 3. P. 23-26.
15. Khamzin Yu.A., Shiriyazdanov R.R., Davletshin A.R., Shadrina A.E. Alkylation of isobutane with olefins on zeolite-containing catalysts with in situ regeneration // Chemistry and technology of fuels and oils. 2018. No. 2. P. 18-21.

16. Klingmann R., Josl R., Traa Y., Glaser R., Weitkamp J. Hydrogenative Regeneration of a Pt/La-Y Zeolite Catalyst Deactivated in the isobutane/n-butene Alkylation // Applied Catalysis A: General. 2005. No. 281. P. 215-223.
17. Fayzullayev N.I., Mamadoliyev I.I. Yuqori kremniyli seolitning faollanish sharoitini maqbullashtirish// SamDU, Ilmiy axborotnomasi. 2019-yil, 3-son (115), 8-12-betlar.
18. Shukurov B.Sh., Raxmatov Sh.B., Fayzullayev N.I. Kaolindan yuqori kremniyli seolitlar olish. СамДУ илмий ахборотномаси. №5. 2018. 106-111-бетлар.
19. Н.И.Файзуллаев. C₁-C₄-alkanlarning katalitik sintezi.//СамДУ илмий ахборотномаси. 2018. №3. 135-141-betlar.
20. Fayzullaev N.I., Mukhamadiev N.K., Achilov D.Kh., Sarimsokova N.S. Nanocatalyst for the process of obtaining C2 hydrocarbons from natural gas // Third international conference of the CIS countries "Sol-gel synthesis and study of inorganic compounds, hybrid functional materials and dispersed systems" September 8-12, 2014 (Suzdal, Russia). - 2014. -- p. 164.
21. Faizullaev.NI Prospective methods of obtaining ethylene from natural gas of Uzbekistan "Chemistry and chemical technology". - 2014. - N 4. - Pages 18-26.
22. Faizullaev.NI Modeling and approval of methane ethylene synthesis reactor // SamSU Bulletin. -2016. -№ Pages 5.-147-153.
23. Fayzullayev.N.I. Catalytic Oxidation of Methane // International Journal of Chemical and Physical Science. – 2015. - V. 4. - N 2. – P. 49-54.
24. N.I.Fayzullaev, O.O.Fayzullaev, K.M.Muradov. Synthesis of ethylene from methane on piled catalysts//223h National Meeting, April 7-11, Orlando, F1.P.54.
25. Tsarev N.I., Tsarev V.I., Katrakov I.B. "Practical Gas Chromatography". Barnaul 2000.
26. Fayzullaev N.I., Kurbanov A.M., Turdiev M.F. Generalization of the results of the analysis and kinetic regularities of the global optimization of the oxidative condensation of methane // Bulletin AING, 2016, No. 4 (40). –S-35-39.
27. Fayzullayev N.I., Kurbanov A.M., Turdiev M., Saginayev A.T. Global optimization of oxidative condensation reaction of methane.// Scientific journal of the modern education & research institute. The Kingdom of Belgium. -2017. PP. 43-47.
28. Fayzullaev N.I.,Rakhmatov Sh.B. Kinetics and mechanism of the reaction of the catalytic oxycondensation reaction of methane.// Austrian Journal of Technical and Natural Sciences Scientific journal №5–6 2019 (May– June). PP 62-69.
29. Rakhmatov Sh.B., NI Faizullaev. Catalytic oxycondensation of methane. SamSU scientific bulletin. №3. Pages 97-104.
30. Fayzullayev N.I. Metandan etilen sintezi reaktorini modellashtirish va maqbullashtirish.// SamDU ilmiy axborotnomasi. -2016. -№ 5.-147-153 betlar.
31. Fayzullayev N.I., Sh.B. Raxmatov., U.M. Norqulov. Metanni katalitik oksikondensatlab etilen olish texnologiyasi.// СамДУ, Илмий ахборотномаси. 2018-yil, 5-son (109), 122-129-бетлар.



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KEY LIMITATIONS AND IMPROVEMENT FACTORS IN THE INDIAN SPORTS AT THE INTERNATIONAL GAMES AND OLYMPICS

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ABSTRACT

Thousands of competitors from across the globe compete in summer and winter sports contests at the contemporary Olympic Games, which are the premier international athletic events. More than 200 countries compete in the Olympic Games, which are regarded as the world's premier sporting event. Every four years, the Olympic Games alternate between the Summer and Winter editions, with the Winter Games taking place every other year. For us Indians and for our nation, India's Olympic performance sounds terrible. Approximately 1.2 billion people live in India, making it the world's second-largest country by population (or about 1/6 of the global population). It's the world's largest democracy. But why is India so far behind in the quest for Olympic Glory while having a population of over a billion people? Every self-respecting Indian is aware of India's underwhelming performance in the Olympics.

Keywords: *International Games and India, Indian Sportsmen and Performance, India in Olympics*

INTRODUCTION

India, a country of 1.3 billion people with a century of Olympic participation under its belt, has only won 28 medals. The USA, on the other side, has the most medals in its collection, with 2,522 to its name. This is obviously not the case of a country's population being exactly proportionate to the number of medals.

India has successfully sent a man into space, has been at the forefront of many scientific breakthroughs, and has compelled the rest of the world to recognise India's achievements in military and science & technology. If the Indian cricket team is regarded as one of the greatest in the world, why can't we apply the same level of commitment and ethics to other sports, including

the Olympic Games? The fact that we are the world's second-most populated and democratic nation really works against us in terms of bringing home a large number of Olympic gold.

Key Limitations in Sports

Cricket is given an excessive amount of attention.

As a nation, we're enamoured with just one sport: cricket. It's only at big events like the Olympics that non-olympic sports get some attention and support from the crowd. When football season ends, we have no idea who the best players in other sports are. They receive less attention, less sponsors, and fewer people hooting and cheering them on, and then we go about whining and insulting athletes when we don't win enough gold.

Infrastructure

Currently, we do not have enough infrastructure for athletes to train and practise, which would help them become more proficient and well-equipped to compete against world-class opponents. If our athletes had access to better facilities and could play all around the nation to remain in shape, that would have been ideal. The individuals in charge of sports federations are chosen because they are close friends of the governing party. However, despite their lack of knowledge of the activity or its requirements, they are selected to lead those who are dedicated to it. Even gold medallist Abhinav Bindra, from India, trained in Germany.

A scarcity of inspiration

Youth in India are discouraged from pursuing a profession in sports from an early age. Medical and engineering are major interests of our parents. And for girls, the situation is much more difficult due to the long list of disadvantages and obstacles they must overcome before their parents would allow them to play. In order to improve their job security, the majority of them had no choice but to stop playing sports. Similarly, India's preoccupation with cricket shows that we are great at chasing something that pays well.

Lack of resources and enough food

Athletes aren't given enough money to cover their basic expenses. Athletes don't have a steady stream of revenue, and the government offers little assistance during the early phases of their careers. It's been suggested that world-class athletes are more genetically and physically fit than the rest of us. Meanwhile, our athletes must depend on their own personal efforts to remain strong and healthy while receiving all the essential nutrients that are exclusive to athletes.

Ineffective management

Indian sports are plagued by administrative problems due to a lack of oversight. India's deficiency in this area may be attributed in part to the absence of former athletes on the administrative side of things. With each new budget, we have been able to improve the allocation of money to various areas of development while also growing our economy. However, despite the large number of young people interested in sports, only a small portion of government funding is dedicated to them. Enough with the IITs and IIMs; when are we going to see a sports-focused research institution?

Corruption in Politics

When it comes to sports, we as a country are rotten to the core. Corruption in sports favours wealthy candidates over less well-off ones, and this is why devoted and brilliant athletes from smaller cities are denied recognition. Politics has a significant impact on sports as well, which results in a dearth of genuine sports heroes in our country. Politicians make it a point to elevate only members of their own family, regardless of ability. Also, sports administration and management have simply become a new method of quickly filling pockets.

Improvements Required**Khelo Youth Games in India**

Under-17 school kids and under-21 college students compete yearly in India's national interdisciplinary grassroots games known as Khelo India Youth Games, which take place in January or February. An annual scholarship of 5 lakh will be awarded to the top 1000 students for a period of eight years in order to help them prepare for international sports competitions. The Indian government has taken a bold step with this programme.

A group effort

Sports cannot be heavily subsidised in developing countries like India. There are many industrialists and businessmen in India who are willing to take on the duties of encouraging these gifted sportsmen and putting up the required facilities. Instead of rewarding them with millions of rupees, we should concentrate on providing them with basic facilities so that they may grow into better athletes.

There is an excessive amount of criticism

There has been a lot of dissatisfaction with Indian athletes' past performances. This has a negative impact on their self-esteem. It's important to remember that even if you disagree with their views, please refrain from criticising them. Despite the fact that you have no idea about their backgrounds, training, government backing, or financial resources, they nevertheless made it to the Olympics to compete against others who had these advantages.

Impartial

Gender inequality in sports means that although we may have plenty of Dhonis, we struggle to find Mary Kom and Sania Nehwal. A man and a woman are as diametrically opposed as sports and women. It is a social taboo for females to participate in athletics since they are seen as fragile and their abilities are questioned. This has to end immediately. Special measures should be put in place to promote female involvement in sports.

There should be openness to the system

There should be greater openness in the way players and board members are chosen. The leader of a sports regulating organisation should be a former athlete. Sportsmen will benefit from this as well, since it will open up new employment possibilities. Players should only be evaluated based on how well they perform, not on any other criteria.

As part of its Let's Play for Revitalising Sports in India initiative, the National Institution for Transforming India (NITI Aayog) has set a goal of winning 50 Olympic medals at the 2024 Summer Olympics.

Increasing efficiency

Sports in India have grown phenomenally in the last several years, thanks to mega-events like the Commonwealth Games 2010, Hockey World Cup, and Cricket World Cup, and medal wins abroad. India took home six medals in total at the 2012 Summer Olympics in London, including two silver and four bronze. Sushil Kumar, Abhinav Bindra, Mary Kom, Saina Nehwal, and Sania Mirza's accomplishments have already put India on the map of world sports as superstars. Seeing women in the driver's seat with some significant achievements fills us with pride.

Indians today firmly believe in sports' ability to influence people. Indian sports are undergoing a transformation. No longer does cricket provide all of India's citizens with a sense of pride. They're now able to participate in many kinds of sports. The recent success of Indian athletes in international competitions has ushered in a new age of Indian sports. Some of India's old sports have seen a resurgence thanks to instructors who were previously world-class athletes themselves. Badminton has been revitalised thanks in large part to Gopichand and Padukone. Mahesh Bhupathi's camps in India are a wonderful way to get kids to get outside and have some fun.

The job of regulating and marketing Indian sports has passed to a variety of Indian sports organisations, who want to push the sport to new heights. The Indian Olympic Association and the Sports Authority of India, two sports governing bodies, are striving to raise the bar in Indian sports by implementing different talent development initiatives. There are many sports academies and institutions dedicated to the development of Indian athletes and sportspeople. In addition, a number of corporations are stepping in to help financially strapped games. Sports promotion businesses in India's 1.3 billion-person country get an annual prize.

Our nation is brimming with potential; all our children and youngsters need today is guidance and inspiration. India will win more medals in the future if the government focuses on helping struggling athletes by giving appropriate training to develop their skills and also by providing financial assistance, infrastructure and facilities. Furthermore, it's past time for us to shift our focus from cricket to other sports and begin praising them as well! Sports in India have gone a long way and seem to be going in the right path. Instead of focusing only on international competitions, we should promote domestic sports like the Indian Premier League and the Premier Badminton League, as well as football and kabaddi leagues. Even the Olympic games might benefit from such competitions.

A lone Indian athlete, Norman Pritchard, won two silver medals in athletics in the 1900 Olympic Games and became the first Asian country to earn an Olympic medal.

After sending a team to the very first Olympic Summer Games in 1920, the United States has continued to do so ever since. Since the 1964 Winter Olympics, India has also sent athletes to the summer games.

At the Summer Olympics, Indian competitors brought home 35 medals. A era of dominance occurred between 1928 and 1980, when the Indian Men's Field Hockey Team won eleven gold in twelve Olympics. From 1928 through 1956, the team won eight gold medals in all, including six in a row.

Post-independence

India scores the third goal in the 1948 Olympic final against Britain. Indian sports federations started sending delegations of more than 50 competitors in a variety of sports to the Summer Olympics in 1948, thanks to the IOA's expanded reach. A chef-de-mission led the group. India's field hockey team defeated Great Britain in the Olympics final to take home the gold medal. As an independent country, India has never won a gold medal prior to winning this one.

A team led by Prime Minister Jawaharlal Nehru won the gold medal in 1952 in Helsinki.

Wrestler K. D. Jadhav earned India's first individual gold medal in the 1952 Summer Olympics in London. By beating Pakistan in the 1956 Summer Olympics final, the Indian field hockey team won their sixth consecutive gold medal. The Indian team's run of six consecutive Olympic gold medals was a record at the time. Only the United States men's and women's basketball teams have broken this record since.

The Canadian hockey team finished second at the 1960 Summer Olympics after losing in the final. At the 1964 Summer Olympics, the squad regained their composure by winning the gold medal. However, in the next two Olympics, she only managed to take home bronze medals.

For the first time since the 1924 Summer Olympics, India left empty-handed in 1976.

At the 1980 Summer Olympics, the Indian hockey team set a new milestone by winning a record-tying 8th gold medal.

In the next three Summer Olympics, India had to go home empty-handed. Tennis player Leander Paes earned a bronze medal in the men's singles event at the 1996 Summer Olympics in Atlanta, breaking a 16-year medal drought and becoming the first solo medal winner since 1952. .



Figure 1 : Sushil Kumar the first Indian athlete to win multiple individual Olympic medals since independence

K. Malleswari, the reigning Women's 69 kg World Championship gold winner, finished third in the weightlifting competition at the 2000 Sydney Olympics. It was the first time an Indian woman had ever won an Olympic medal.

Rajyavardhan Singh Rathore won silver in the Men's double trap shooting event at the 2004 Summer Olympics in Athens.

Abhinav Bindra became the first Indian to win an individual gold medal at the Olympic Games when he won the Men's 10 metre air rifle event in the 2008 Beijing Olympics.

Vijender Singh won a bronze medal in the Middleweight division, becoming the first Indian boxer to win a medal in the sport. The three medals won by India in that year's Olympics were the most up to that point. After then, the record was beaten to become the third greatest ever.

The 83-member Indian delegation to the London Olympics in 2012 established a new record and brought home six medals, a new high for the nation.

Wrestler Sushil Kumar became the first Indian after independence to win two Olympic medals in wrestling (bronze in 2008 and silver in 2012). Women's singles bronze medalist Saina Nehwal gave India its first badminton Olympic medal. With her bronze medal in the Women's flyweight category, boxer Mary Kom became the first Indian woman to earn a boxing medal. This was India's best showing until 2020, when it was surpassed. Men's 10 m air rifle champion Gagan Narang finished third. Vijay Kumar won silver in the men's 25-meter rapid fire pistol competition, giving him three medals in total.



Figure 2 : Olympics Bronze medalist Mary Kom

A total of 118 competitors participated in the 2016 Summer Olympics, which was a record amount. In the Women's freestyle 58 kg division, Sakshi Malik earned her maiden Olympic gold as India's first female wrestler. It was a historic day for shuttler P. V Sindhu, who won a silver medal in the Olympics at the age of 25 and became the first Indian woman to do so.

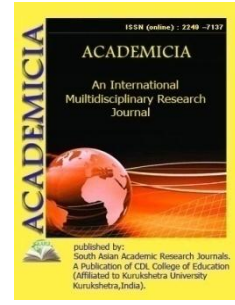
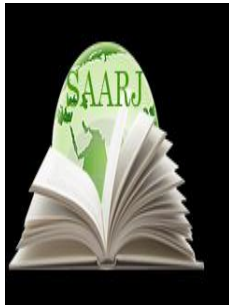
CONCLUSION

India sent a record number of 124 competitors to the Summer Olympics in 2020, which will be held in 2021. Saikhom Mirabai Chanu won a silver medal in the women's 49 kg weightlifting competition on the first day of the Olympics, making her the first Indian woman to do so. Sindhu went on to win the bronze medal match by a 3-0 score against China's He Bingjiao, becoming the first Indian woman to win two Olympic medals. Chopra became the second Indian to win a track & field individual gold with his victory in the Javelin throw (29). India took up the bronze medal in men's field hockey. After winning a gold medal in Moscow in 1972, this was the first medal I'd earned in 41 years. Ravi Kumar Dahiya and Bajrang Punia both took home medals in the men's wrestling tournament. Women's boxing saw Olympic newcomer Lovlina Borgohain take home the bronze medal. She was the second woman to win an Olympic medal in

her time in the history of the games. India's 7-medal haul is the most in the country's Olympic history.

REFERENCES

1. "India at the 1900 Paris Summer Games". Sports Reference. Archived from the original on 24 September 2016. 18 August 2016.
2. "India hockey all medals at Olympics list". 8 August 2021.
3. "Sir dorabji tata and the Olympics". 11 August 2021.
4. "India Olympics highs and lows;Olympics.com". 11 August 2021.
5. "India and Olympics;The Economictimes.com". 11 August 2021.
6. "History of Indian olympic association". 11 August 2021.
7. "Indian hockey won the first Olympic gold medal at hockey in 1928 Amsterdam". 11 August 2021.
8. "1928 Olympics: India's first step towards ascending hockey throne". The Hindu. 7 July 2012. Archived from the original on 27 January 2017. 19 August 2016.
9. "1932 Olympics games: India's dominance continues". The Hindu. 7 July 2012. Archived from the original on 5 February 2018. 19 August 2016.
10. "1936 Olympics: Hat-trick for India under Dhyan Chand". The Hindu. 8 July 2012. Archived from the original on 31 August 2017. 19 August 2016.
11. Rohan Puri (26 July 2016). "Olympics: Down the memory lane 1940–1956". The Times of India. 19 August 2016.
12. "1960 Olympics: Pakistan ends India's dominance". The Hindu. 12 July 2012. 19 August 2016.
13. "Gold winning hockey team of 1964 Tokyo Olympics felicitated". The Times of India. 26 November 2014. 9 August 2016.
14. "1972 Olympics: India's golden glory fades". The Hindu. 16 July 2012. Archived from the original on 22 June 2018. 19 August 2016.



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THE OVERVIEW OF THE LOAD DISTRIBUTION METHODS IN POWER SYSTEM

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ABSTRACT

There are different conventional load shedding approaches, such as under frequency control, but these have a slower response and are unreliable in correctly sharing load in the event of any disruptions or faults. This leads to a rise or decrease in loads, leading to a failure to satisfy the demand for electricity. The paper, titled Intelligent Load Shedding, focused on a more modern approach to load shedding. From the perspectives of architecture, engineering, implementation, and operation, a thorough comparison of traditional versus intelligent load shedding systems was conducted. It has been demonstrated that the intelligent process of load shedding overcomes all of the disadvantages of traditional approaches, is highly efficient, and requires very little maintenance.

KEYWORDS: *Traditional Load Shedding, Intelligent Load Shedding, Frequency Relay, Programmable Logic Controller, Power System Monitoring, Power System Simulation, Traditional Load Shedding, Intelligent Load Shedding, Frequency Relay, Programmable Logic Controller*

INTRODUCTION

Load shedding refers to a system in which electrical power demand is distributed across a number of power sources. Load shedding is utilized to lessen the pressure on the power source to the greatest extent possible when the energy demand exceeds what the power source can offer. A service provider sells electricity to a customer. Two conditions must be met in order for the expense to be negligible: the lowest cost of electricity and an uninterrupted supply of power. The

customer or operator will then arrange with the supplier to shed a minimal amount of the load on a voluntary basis on a defined timetable or on-demand basis[1]. To make the load shedding phase possible, the user side would acquire electricity from different secondary sources rather than the main supplier. On-site diesel generators, contracted or on-site photovoltaic, or another renewable energy source are examples of secondary sources. Consumers receive automatic load shedding during blackouts, whether the suppliers completely halt or restrict energy delivery for a shorter period of time. Brownouts occur when a supplier reduces voltage delivery during peak hours to maintain a balance between demand and supply. This results in automated load shedding for consumers.

Customers experience automated load shedding during brownouts when the supplier decreases the voltage distribution during peak hours to maintain a balance between demand and supply. The part of the load that can be taken away instantly in order to maintain appropriate operation of the necessary components is referred to as load shedding. Any disruption that results in a drop in generation, such as a fault, generation loss, switching problems, or lightning strikes, causes a reduction in load. There are two methods for controlling the transient and dynamic responses of a system whenever exposed to any kind of disturbance[2]. The first one is an excitation loop in which the reactive power and voltage level of the system is controlled and varied. Second one is a prime mover loop where the active power of the generator and frequency of the system is controlled and varied. Both these techniques are discussed below[3]. Excitation loop: There will be a dip in the reactive power if a fault occurs in the device. For the conversion of electrical energy into mechanical energy, reactive power is used and vice versa in the electro-mechanical domain.

The flux energy of the system is then decreased due to fault as soon as the fault is cleared. As soon as the fault is cleared, there is pressure on the rotating machine for proper balance between the generation and demand as well as maintain the level of magnetic energy. The reactive power that the system can produce determines the requirement for operating voltage and voltage regulation. When there are large disruptions, generators use their over-excitation capability to restore system stability and return to normal conditions[4]. Prime-Mover: In the event of a malfunction, prime mover type and turbine governor will have an impact on the machine's performance. Mechanical energy is provided to the generator in order for it to move past any fault or disturbance, and this energy varies depending on the type of turbine, such as gas, turbo, or hydro. This change in energy might cause a disturbance in the system's transient and steady states. More disruptions can also be caused by lightning strikes or network switching strikes [5].

A range of strategies for load shedding have been discussed on the following pages. One of the techniques is a breaker interlock arrangement. A breaker is linked to a group of load-breakers that have previously been designated to fly or is interlocked by remote signals. If a generator breaker or grid link is lost, signals are transmitted to the breakers to open them. Because the amount of load to be shredded has already been decided, this device can work with no additional processing in a short period of time[6]. In figure 1, the approach for load shedding via breaker interlock is shown as a line diagram. A signal will be transmitted to the interlocked load breakers as soon as the main circuit breaker opens, regardless of the time. Because no research was conducted prior to selecting the interlocked breaker, its opening and tripping will not be a function of the system's transient reaction, resulting in unwanted and unnecessary load shedding. The following are some disadvantages of this load-shedding technique:

1. The amount of material that has to be shredded is estimated using the worst-case scenario and is hard-wired. As a result, changing the load's priority is difficult.
2. Only single-stage load shedding is available.
3. Load shedding occurs on a regular basis..

The concept of sub frequency relay is another way used for load shedding. These relay any change in frequency or reduction in frequency rather than detecting any disturbances. After the first stage, the frequency is given time to recover while waiting for a predetermined amount of time to avoid any annoyance tripping. If the frequency continues to decay, an extra delay in time will be added, and time will be allowed to recover. The under frequency relay load shedding approach is presented, with a series of stages for connecting to various circuit breakers one by one until the frequency returns to its normal operating frequency. This method has a number of limitations, including a few frequency relays' slower response time, as well as extra or under load shedding, which creates further disruptions[7]. A flow chart depicts the architecture for load shedding. To determine the quantity of load that must be shed and the time it will take, a pre-calculation is performed. The selection of the load that must be rejected takes precedence. The decline in frequency will continue, and the next group in the priority hierarchy will shed. The process of shedding loads based on priority will continue until the specified stability value is reached [5].

There are different terms used in power system like load shedding, load sharing etc... So first we have to differentiate between load shedding and load sharing.

- Load shedding.
- It is process of cut-off the loads on the approximated area according to the load priority to reduce the increase demand greater than the supply.
- Load sharing
- Load sharing means generally equally share the load in power system. In power system load sharing of transformer is achieved with different techniques. It means in distributed power system if two transformer is connected. One transformer share the load in normal condition. If load demand is increasing and one transformer is connected not able to fulfill demand than another transformer is directly connected with main transformer in parallel and share the load. In power system it is called load sharing of transformer.

Main transformer is called power transformer and another transformer that are connected with the main transformer are called slave transformer in power system. For supplying a load in more than the rating of an existing transformer, two or more transformers may be connected in parallel with the existing (main) transformer. The transformers are connected in parallel when load on one of the transformers is more than its capacity. Due to the parallel operation of transformer reliability of power system is increase and damage to the various equipment in substation like transformers are reduces. To archive parallel operation of transformers some conditions are to be satisfied compulsory. Fig 1 shows the two transformers are connected parallel. There are total two buses in the system one is supply bus and another one is load bus. At the load bus, load is connected. E1 is primary side voltage and E2 is secondary side voltage. If a condition occurs and

load is suddenly increased, then second transformer is in parallel with the main transformer to supply the load demand.

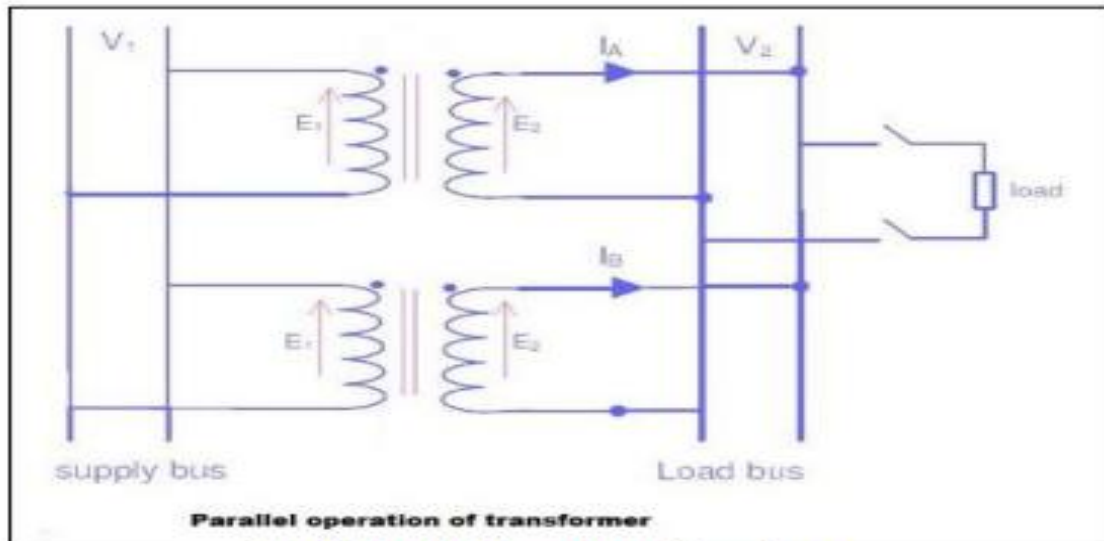


Fig. 1: Parallel Operation of Transformer.

II. NEED OF PARALLEL OPERATION OF TRANSFORMER

- If a large size means large rating of transformer is not available which can actually fulfill the total requirement of load, two or more small size transformers can be connected in parallel to increase the capacity.
- If installation place like substation is located far away, then transportation of smaller size of transformer is easier and may be economical. It will directly affect the cost
- If more than one the transformers run in parallel, is out due to fault of other parallel transformers is the system will share the load, hence power supply may not be interrupted
- If numbers of transformers run in parallel, we can shut down any one of them for maintenance purpose. Other parallel transformers in system will fulfill the load without total interruption of power.

III. CONDITIONS FOR PARALLEL OPERATION OF TRANSFORMER

When two or more transformers run in parallel, they must satisfy the following conditions for satisfactory performance

Voltage Ratio or Turns Ratio

If the transformer connected in parallel have voltage ratio different than this will not good condition for system. Due to the different voltage ratio induced emf generated at the secondary side will be different. Which cause circulating current flows in the loop which are formed by the secondary windings under no-load conditions. The value of this circulating current is much higher than no load current. So chances of damage the winding of transformer. Circulating current cause the losses and damage the insulation of the winding. So the voltage ratio should be proper manner to achieve better parallel operation of transformer. $V_1/V_2 = N_1/N_2$

Same Polarity

Polarity of all transformers that run in parallel, should be the same otherwise huge circulating current that flows in the transformer but no load will be fed from these transformers. Polarity of transformer means the direction of induced emf in secondary. If the directions of induced secondary emf in two transformers are opposite to each other when same input power is fed to both of the transformers, the transformers are said to be in opposite polarity. If the directions of induced secondary emf in two transformers are same when same input power is fed to the both of the transformers, the transformers are said to be in same polarity.

Same Phase Sequence

The voltage between two phases is called line voltages. In this case the phase sequence of line voltages of main transformer and auxiliary transformer which are connected parallel with main transformer must be identical for parallel operation in case of threephase transformers. If the phase sequence is not same, in every cycle each pair of phases will get short-circuited.

Same Impedance Ratio

We know the relation of current with impedance. Current is inversely proportional to the impedance. If we consider two transformers which has different per unit impedance. one transformer have less impedance will draw more current and which has more per unit impedance will draw less current. This leads unequal load sharing. This is not beneficial. Due to this condition, the transformers will not share the load according to their kVA ratings. In that case, it can be corrected by inserting proper amount of resistance or reactance or both in series with either primary or secondary circuits of the transformers where the impedance is below the value required to fulfil this condition.

LITERATURE REVIEW

FarrokhShokooh, J J Dai, ShervinShokooh, Jacques Tastet, Hugo Castro, TanujKhandelwal, and Gary Donner proposed a state-of-the-art load-shedding system that uses real-time data and is updated in the system's model. The technology has generated an optimal approach for shedding the required quantity, which is referred to as intelligent load sharing[2]. The programmable load shedding system (PLSS), which is a fundamental component of Hydro-protection Qu6bec's system and performs monitoring and control functions, has been described by authors Pierre C6te, Simon-Pierre C&e, and Marc Lacroix. Their job include keeping an eye on the frequency and voltage levels, as well as carrying out any necessary shedding if one of these is disrupted. However, if the spare components are unavailable, the cost and procedure of these have become hard chores [3]. Authors Dennis Michaelson, HishamMahmood, and Jin Jiang presented an energy management system based on a micro grid that provides energy through photovoltaic cells and battery storage. Experiments and simulations verified the technique, demonstrating the scenario's potential and viability [4]. Authors Ali Parizad, Hamid Khoshkhoo, ShahabDehghan, and RasoulMoradtalab discussed an isolated power network that is particularly vulnerable in terms of stability. A smart load shedding technique based on a smart load management system for proper functioning in islanded mode has been presented. The intelligent load sharing strategy is presented using a block diagram. The knowledge base of the system is fed by input and output databases from an offline simulation and study system. The knowledge base's outputs are complicated system responses like frequency variation. An automated monitoring system that

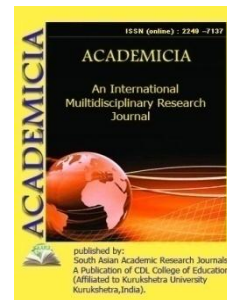
runs a professional knowledge base system in the background keeps track of all of the system's working conditions.

CONCLUSION

Load shedding is the only safeguard for the safety of a system induced by an overload after impact in industrial power systems. The mechanism is protected from collapse by using breaker interlocks, under-frequency relays, and several other PLC-based technologies. However, these are traditional load-sharing solutions, which have their own set of limits and drawbacks. Real-time configuration, pre-fault, and post-fault data unavailability are a few examples. As a result, an intelligent load shedding strategy was presented, which integrates system online data, system dependencies, online and offline simulation information, and a comparison analysis. This system is capable of executing load shedding in less than a hundred milliseconds from the moment a disruption occurs. In Indonesia, PT Newmont installed a functioning model of an intelligent load shedding system. Thirty-four megawatt steam turbines driven by generators and nine five megawatt diesel generator engines provide power to the power system. The eleven-kilovolt power plant distributes electricity via two 150-kV transmission lines. The entire system operates at a frequency of 50Hz, and the voltage is stepped down to 33kV before being sent out. The system employs the multistage frequency approach described in table 2. A comparison of intelligent load sharing and under frequency control is shown in table 3.

REFERENCES

1. T. Klingler, "Sharing the load," *J. Libr. Adm.*, 1999, doi: 10.1300/J111v26n03_06.
2. T. McCormack, E. Karaikovic, and R. W. Gaines, "The load sharing classification of spine fractures," *Spine (Phila. Pa. 1976)*, 1994, doi: 10.1097/00007632-199408000-00014.
3. M. N. Marwali, J. W. Jung, and A. Keyhani, "Control of distributed generation systems - Part II: Load sharing control," *IEEE Trans. Power Electron.*, 2004, doi: 10.1109/TPEL.2004.836634.
4. R. Majumder, "Modeling , Stability Analysis and Control of Microgrid .," *Control*, 2010.
5. H. Han, X. Hou, J. Yang, J. Wu, M. Su, and J. M. Guerrero, "Review of power sharing control strategies for islanding operation of AC microgrids," *IEEE Trans. Smart Grid*, 2016, doi: 10.1109/TSG.2015.2434849.
6. J. M. Guerrero, L. García de Vicuña, J. Matas, M. Castilla, and J. Miret, "Output impedance design of parallel-connected UPS inverters with wireless load-sharing control," *IEEE Trans. Ind. Electron.*, 2005, doi: 10.1109/TIE.2005.851634.
7. C. K. Sao and P. W. Lehn, "Control and power management of converter fed microgrids," *IEEE Trans. Power Syst.*, 2008, doi: 10.1109/TPWRS.2008.922232.



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THE ROLE OF HOLIDAYS IN THE DEVELOPMENT OF FOLK ART

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ABSTRACT

In human life, the holiday is a uniquely important and major event. The holiday also plays an important role in educating young people, as it embodies, preserves and develops the best traditions, customs and morals of the people. When we observe national holidays or world events celebrated in a country, we learn about the nationality and customs of that country. This is based on millennial experience in setting dates. For example, the time when the sun enters the zodiac sign is marked as the time of Navruz. Professor U. Karabaev in his book "Holidays of the Uzbek people" expressed the following opinion - "The peculiarity of the holiday is the participation of the general public. Hence, expressive and expressive means can be used and observed in all activities in the emergence of a piece of music. This expression is especially evident in public celebrations and performances.

KEYWORDS: *Embodies, Preserves, Uniquely, Especially*

INTRODUCTION

Art is a means of uniting people to beauty. Art is such a social that in any age its main goal is human education. Today, at a time when our country is entering the XXI century, striving for its great future, all our efforts in this direction are accompanied by a sense of faith, a deep understanding of our historical roots, including the history of our art and national music. It would be appropriate in all respects to talk about. Through music, dance and other arts, the goal is to educate people, give them spiritual pleasure, encourage them to do good, and to achieve this, the leader of the artistic team has to use a variety of expressive and influential means. Hence, expressive and expressive means can be used and observed in all activities in the emergence of a piece of music. This expression is especially evident in public celebrations and performances. In recent years, more precisely, after the independence of our country, we can feel the growing

interest in the organization of holidays. Public holidays are the highest form of cultural events and have been perfected with the development of human history. That is why the main part of this lesson focuses on the theme of holidays. Since the creation of mankind, holidays have become of special importance in its way of life. Human life cannot be imagined without holidays, traditions, ceremonies, customs. Holidays are the main means of showing the world the spiritual beauty of society, the way of life of the people, the living conditions. When we observe national holidays or world events celebrated in a country, we learn about the nationality and customs of that country. This means that the holiday is a mirror that demonstrates the most elegant and delicate qualities of life. The holiday is a living source of evidence of society's night, today, and tomorrow. The great scholar of the East, Mahmud Kashgari, said, "The holiday is a day of joy and happiness for the people." Abu Rayhan al-Biruni described the holidays as the "most important days" in life and divided them into the following types:

1. secular holidays;
2. religious holidays.

"Whoever celebrates Navruz will be happy until the next Navruz," said Omar Khayyam. Holidays also vary to some extent, depending on changes in society. New holidays are coming. But this does not change the joy of the holiday, the joy of the people. Man tries to forget the worries of his life during the holidays, to wear new clothes, to write dust with fun. When evaluating the holidays of the twentieth century, scientists in this field work on the basis of the concept of MM Bakhtin. "A holiday is an ideal life at a certain time," says II Mazaev. "Holiday is a unique social event that reflects the life of every citizen and society as a whole," - said D.M. Genkin, clarifying this point, writing: It's a unique antique that adorns. " Doctor of Philology, Professor U. Karabaev gave a detailed description of the features of Uzbek holidays in his book "Holidays of Uzbekistan" and in the book "Holidays of the Uzbek people" created as a revision of this book. Uzbek holidays are essentially no different from the holidays of other nations, they are also an expression of dreams, labor, struggle, traditions, a mirror of beauty, peace, solidarity, equality, continuation of life, an important part. In human life, the holiday is a uniquely important and major event. The holiday also plays an important role in educating young people, as it embodies, preserves and develops the best traditions, customs and morals of the people. History proves that the meaning and idea of holidays originated and changed and developed on the basis of people's thoughts, sorrows and dreams. Another feature of the holidays is that they are associated with a specific time, a special date. In people, the holiday mood appears when a predetermined time, date, day arrives. For example, after the cold days of winter, the warmth of the weather, the surrounding area is covered with blue clothes, the blossoming of giant trees - the arrival of spring brings joy and happiness to all people. Of course, everyone enjoys this change on their own. But because the beauty of nature and the joy of spring are common to all, people are also born to celebrate it together. A special time is set to meet this need. This is based on millennial experience in setting dates. For example, the time when the sun enters the zodiac sign is marked as the time of Navruz. Professor U. Karabaev in his book "Holidays of the Uzbek people" expressed the following opinion - "The peculiarity of the holiday is the participation of the general public. The celebration is primarily organized for the public and it is held with the direct participation of the people. During the holidays, everyone can show off their talents. People can observe the festive events as participants and express their reaction to the events that took place First; Another distinctive feature of the holidays is that they consist of a synthesis of

several (complex) events. Each holiday is organized on the basis of many events. The organization of the holiday is to express its theme, idea, direction through a special form, events and ceremonies. Usually every public (especially outdoor) celebration will have an opening ceremony. Then, somewhere - holiday exhibitions, contests; dor game in second place, wrestlers performances; in third place were performances by askiya and amateurs, puppet theater performances; in the fourth place - concerts of amateur art groups, folklore and ethnographic ensembles; fifth place sports competitions etc. will be organized. Traditions, ceremonies, theatrical concerts and performances, carnivals, performances, folk dances are the main components of the festivities. Public holidays are held on the basis of similar events.

"Bayram" is derived from the Turkish word, which means wedding, ceremony, celebration. There are different interpretations of the word holiday. The holiday is one of the most important parts of social local life, celebrating events that create joy and happiness. The peoples of Central Asia, including the Uzbek people, have many holidays that have been formed from ancient times and passed down from generation to generation. These holidays were formed in the most ancient times by the needs of the people, developed on the basis of social necessity and enriched with the experience of other nations. It is expedient to study the holidays of the Uzbek people in periods. For example:

- Forms of celebration that originated in primitive times (including hunting games, zoophagic (i.e. totem bear, wild goat, cow, which is the worship of horses, etc.) holidays, labor games, orgaist holidays, and other holidays).
- Ancient (pre-Islamic) holidays of the peoples of Central Asia;
- Uzbek holidays from the Middle Ages to the Revolution;
- Holidays of independence.

In recent years, the genre problems of public holidays have become more urgent. Some experts have difficulty in determining the genre of public holidays. As in theatrical art, public festivals also have their own genre types. This problem has been proved by the director, scientists DM Genkin, IG Sharoev, IM Tumanov, AD Silin, N. Vershkovsky, U. Karabaev in their researches. Based on their experience, public holidays can be divided into the following genres: theatrical concert; concert-meeting; public holiday; theatrical performance; festive movement in the streets, squares, stadiums and parks; decades of national art; art festivals; song festivals; dance festivals; carnivals; water festivals; open-air theater performances; street holidays; sports holidays; theatrical children's festivities are among them.

The origin of the holiday, the stages of its development is studied by the science of "Eortology". "Eortology" is derived from the Greek word for holiday. Specialists such as I.Snegiryov, I.Sakharov, F.Buslaev, A.Afanasev, E.Anichkov, K.Mardjanov, DMGenkin, IMTumanov played an important role in the emergence of this science and its scientific and theoretical study. . Oriental thinkers such as Mahmud Kashgari, Abu Rayhan Beruni, Firdausi, Farobi, Ibn Sino, Alisher Navoi, Babur, Agahi, Behbudi, Fitrat also expressed their views on the role of holidays in social life. .

It should be noted that the history of public holidays, especially the genesis of the history of holidays in Uzbekistan, its types have not been fully studied. History is such a science that the more we study deeply, the less we know for sure. In particular, the history of public holidays is

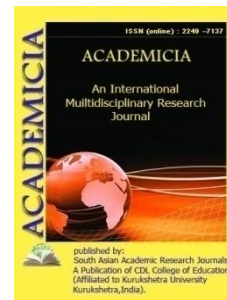
very little studied. One of the first in this field, Doctor of Philosophy, Professor UH Karabaev made a significant contribution to the development of the science of holidays in Uzbekistan. His books "Holidays of Uzbekistan", "Holidays of the Uzbek people" have a deep, scientific approach to this topic and try to fully cover the history of the holidays. Until recently, the history of the holidays was studied as a general art history (literature and theater). However, mass celebrations and performances have occupied a high place in every historical period as the main teaching of upbringing and enlightenment. If we take a brief look at the history of public holidays, we can begin with the holidays of ancient Greece and Rome, which were ideologically compositionally whole. Of course, even before the feasts of ancient Greece and Rome, feasts came into being and were formed in the period after the emergence of mankind. But these festivals were primitive in terms of their spiritual, intellectual level, expressive forms, and lacked compositional integrity. Founded in ancient Greece and Rome, elements of public holiday drama and directing emerged in folk festivals. In the ancient Greeks, the holiday was a kind of independent leisure and recreation, and even in a permanent way it became an integral, active type of activity. As we know, the games Delfe, Pythagoras, Nemeysk and Panfin were very popular. But the most popular of these games was the Olympics.

The Olympic Games are held every 4 years in the specially built city of Olympus. Although ancient Rome was a neighbor of Greece, the festivals were radically different in form and appearance. While the citizens of Athens took an active part in the Greek festivals, in the ancient Roman spectacles the participant was separated from the spectator. It was from this period that the word 'spectacle' became synonymous with the word 'holiday'. As a fierce class struggle took place during the Roman Empire, spectacles were staged to distract the population as the empire was ruled by force. In the performances of the ancient Roman Empire, stage technique, impressive means were much developed. The famous Colosseum, built in Rome in particular, still amazes people. The Colosseum is world-famous not only for its size, but also for its features such as a moving arena, the ability to turn an arena into a lake or forest through stage mechanisms. Especially in ancient Rome, the Triumph parades, dedicated to the victory over the enemy, were a peculiar theatrical military parade. In addition, spectacles such as gladiatorial fights, circus races, artists' competitions, naval battles, luperkali, "little triumph" - applause were popular. In the Middle Ages, the stratification of public holidays developed intensively. In particular, religious festivals flourished, elevating the power of the feudal state to the skies. At the same time, the humorous festivities in the city squares were the people's favorite holiday spectacles, gathering large crowds and showing their aspirations for the future and confidence in the future. was dedicated. Such an approach to public holidays has led to a change in the concept of 'holiday'. In the Middle Ages, the rest of the individual, not free at will, was governed by the church, the clergy. There were more than a hundred religious holidays during this period. Large churches, a church with enormous political power, also took the festivities into its own hands, demonstrating its superiority over the people and turning it into a weapon of its own propaganda. The wealth of the church provided a diverse variety of costumes during these festivities, creating a distinctive theatricality that helped bring the church ceremonies to the level of a public celebration.

REFERENCES:

1. Mirziyoev Sh.M. We will build our future together with our brave and noble people. –T .: Uzbekistan. 2017. B- 43., 53., 163.

2. Mirziyoev Sh.M. We will build a free and prosperous democratic state of Uzbekistan. –T .: Uzbekistan. 2016. B- 13
3. Karimov IA Uzbekistan's own path to independence and development. –T .: Uzbekistan. 1992.
4. Without historical memory, there is no future. –T .: Uzbekistan. 1998.
5. Karimov IA High spirituality is an invincible force. –T .: Spirituality. 2008. B- 19



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TO THE PROBLEMS OF SELF-ASSESSMENT OF CHILDREN WITH DISABILITIES THROUGH ADAPTIVE PHYSICAL EDUCATION AND SPORT

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ABSTRACT

In our country, effective measures are being taken to improve the health and physical activity of the nation. One of the means of personality upbringing is adaptive physical culture, which uses physical exercises, competitive and plays activities that are most suitable for children with disabilities. Taking into account the realities caused by the global problem - the fight against the pandemic, the President and the Government of the Republic of Uzbekistan are focusing all their attention on strengthening the physical and mental health of the population. The principle of the adequacy of pedagogical influences means the implementation of the laws of the educational and pedagogical process: the solution of correctional and developmental, compensatory, therapeutic and restorative problems.

KEYWORDS: *Adaptive Physical Education, Disabled, Quality Of Life, Adaptive Sports, People with Disabilities, Microsocioium, Psychological Factors*

INTRODUCTION

The article examines the psychological factors that contribute to attracting people with disabilities to adaptive physical culture and adaptive sports. Taking into account the realities caused by the global problem - the fight against the pandemic, the President and the Government of the Republic of Uzbekistan devote all their attention to strengthening the physical and mental health of the population. In this situation, the most vulnerable to the threat were people with poor health and disabled people. And the problem of rehabilitation of people with disabilities is becoming more urgent than ever.

Raising children with disabilities is a very complex process that depends on many different factors. To carry out this process, special tools and methods are required. One of the means of personality upbringing is adaptive physical culture, which uses physical exercises, competitive and plays activities that are most suitable for children with disabilities. It is important to effectively use the educational opportunities of adaptive physical culture classes, and for this you need to know the general orientation and motives of the child's personality: attitude to your flaw, fear of failure, achieving success, making new friends, increasing self-esteem and assessments of people around. [2. 448 p.]

The relevance of the research topic lies in the fact that this article studies the psychological factors that contribute to attracting people with disabilities to adaptive physical culture and adaptive sports. Taking into account the realities caused by the global problem - the fight against the pandemic, the President and the Government of the Republic of Uzbekistan are focusing all their attention on strengthening the physical and mental health of the population. In this situation, the most vulnerable to the threat turned out to be those with weakened health and the disabled. And as never before, the problem of rehabilitation of people with disabilities is becoming even more urgent.

The relevance of the research topic lies in the fact that this article studies the psychological factors that contribute to attracting people with disabilities to adaptive physical culture and adaptive sports. Taking into account the realities caused by the global problem - the fight against the pandemic, the President and the Government of the Republic of Uzbekistan are focusing all their attention on strengthening the physical and mental health of the population. In this situation, the most vulnerable to the threat turned out to be those with weakened health and the disabled. And as never before, the problem of rehabilitation of people with disabilities is becoming even more urgent.

In our country, effective measures are being taken to improve the health and physical activity of the nation. For example, a presidential decree No. UP-5924 of 24.01.2020 "On measures to further improve and popularize physical culture and sports in the Republic of Uzbekistan" was adopted, which states that in recent years, consistent measures have been taken to popularize physical culture in the republic. and sports, promoting a healthy lifestyle among the population, creating the necessary conditions for the physical rehabilitation of persons with disabilities and ensuring a worthy performance of the country in the international sports arena. [1].

Research on adaptive physical culture and adaptive sports is mainly aimed at the issues of physical rehabilitation of children with disabilities and, unfortunately, the psychological factors contributing to both physical rehabilitation and their personal development are still poorly understood.

Research methods and organization. Pedagogical observations of the educational and training process of children with disabilities were carried out at the sports base of athletes in the city of Dangara in the period from November 2020 to March 2021. Also, training plans, self-control diaries of the trainees were studied and consultations were held with their parents.

In the course of the pedagogical research, records were made, stating positive motivation to engage in adaptive physical culture and sports, mainly in those cases when children with DHO, in addition to the goals of physical development, set tasks to improve their personality. (APHC) was the formation of the sports culture of children with disabilities, their maximum adaptation to

an independent life, the formation of the need to get a decent education and subsequently work fruitfully in the chosen field, i.e. make their life as fulfilling as possible.

Sport for children with disabilities is also important because it is a means of communication, makes them forget about their problems; believe in yourself, in your strengths and capabilities; show leadership qualities. And this, in turn, gives them the opportunity to feel like ordinary children. For children with disabilities, regular physical exercises are doubly important, which train the heart, normalize the activity of all functional systems, and develop the necessary physical qualities.

The state should encourage all types of sports activities for people with disabilities. For the development of youth adaptive sports for people with disabilities, a systematic approach and the creation of favorable conditions for physical education are required. It is necessary to expand the range of rehabilitation effects on children with disabilities and provide complex methods of socio-pedagogical orientation, taking into account the individual capabilities of each child. [3, 17p.]

Research results and their analysis. The results of the pedagogical research data led us to the conclusion that it is necessary to conduct seminars and master classes with parents of children with disabilities who want to introduce the child to physical education and sports, explaining to them the sequence and gradualness of the use of such sports that do not require large material investments and specialized institutions. It should also be clarified that the organization and conduct of classes with children with disabilities should be carried out taking into account different principles and approaches.

For example, the principle of a differentiated and individual approach in adaptive physical education assumes the unification of those engaged in relatively homogeneous groups (by age, diseases, indicators of physical development). An individual approach means taking into account the characteristics inherent in one child. Taking into account the principle of compensatory orientation of pedagogical influences provides for the reimbursement of underdeveloped or lost functions due to the restructuring or increased use of preserved functions and the formation of new possibilities. The principle of the adequacy of pedagogical influences means the implementation of the laws of the educational and pedagogical process: the solution of correctional and developmental, compensatory, therapeutic and restorative problems. [4]

When choosing the means, methods, teaching methods, the real possibilities, interests and needs of the student must be taken into account. The principle of the optimality of the pedagogical influence, the reasonably balanced values of the psychophysical load, the expedient stimulation of adaptation processes that enhance the strength and nature of external stimuli. Physical activity should correspond to the optimal reactions of the body.

Taking into account the principle of variability of pedagogical influence implies a variety of not only physical exercises, but also the conditions for their implementation, methods of regulation, emotional state, impact on sensory sensations, speech, fine motor skills and intellect.

The main form of organized classes in all types of adaptive physical culture, as well as in the entire system of physical education, is the lesson form. Depending on the objectives of the program content, classes should be divided into:

- Educational activities - for the formation of special knowledge, teaching a variety of motor skills,
- Classes of correctional and developmental orientation - for the development and correction of physical qualities and coordination abilities,
- Health improving classes - for posture correction, flat feet, prevention of somatic diseases, strengthening of the cardiovascular and respiratory systems,
- Lessons of a therapeutic orientation - for the treatment, restoration and compensation of lost or impaired functions in chronic diseases, injuries, etc.
- Lessons of a recreational orientation - for organized leisure, recreation, play activities.

CONCLUSIONS

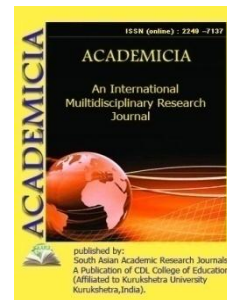
The intensification of work with disabled children in the field of physical culture and sports, undoubtedly, contributes to the humanization of society itself, a change in its attitude towards people with disabilities, and thus has great social significance.

In the field of physical rehabilitation of disabled people, there is still an underestimation of the fact that physical education and sports are much more important for a person with disabilities than for people who are well-off in this respect. Active physical culture and sports activities, participation in sports competitions are a form of so urgently needed communication, restore mental balance, relieve the feeling of isolation, return a sense of confidence and self-respect, and give an opportunity to return to an active life.

The main task still remains to involve as many people with disabilities in intensive sports as possible in order to use physical education and sports as one of the most important means for their adaptation and integration into society, since these activities create mental attitudes that are extremely necessary for successful reunification of a disabled person with society and participation in useful work. The use of physical culture and sports means is effective, and in some cases the only method of physical rehabilitation and social adaptation.

LIST OF USED LITERATURE

1. Presidential Decree No. PD-5924 dated 01.24.2020 "On measures to further improve and popularize physical culture and sports in the Republic of Uzbekistan"
2. Theory and organization of adaptive physical culture [Text]: textbook. In 2 volumes. V.2: Content and methods of adaptive physical culture and characteristics of its main types / Ed. prof. S.P. Evseeva. - M.: Soviet sport, 2005 ..
3. Rubtsova NO To the problem of the formation of the infrastructure of the system of physical culture and sports for the disabled // Theor. i prakt. phys.c-ry. 1998. No. 1. P. 16–18.
4. Comprehensive rehabilitation of disabled people, Textbook for students. higher. study. Institutions / Zozulya, E.G. Svistunova - M.: Publishing Center "Academy", 2005. - 304 p.



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PLANT-BASED NUTRITION'S SIGNIFICANCE IN CANCER PREVENTION

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ABSTRACT

Plants-based nutrition has been proven to protect against 15 of the world's largest leading causes of mortality, including several cancers, and may have potential as a disease-modifying tool for better management or treatment of these diseases. The effects of plant-based diet on breast, prostate, colorectal, or gastrointestinal cancers have been the most thoroughly researched, with the most published supporting data to far. Diets rich in whole foods including plant-based proteins have been proven to protect against these malignancies, as well as other cancers other chronic diseases. Nutritional treatments in the prevention of different malignancies outperform presently available medical therapies, or should be utilized more often as a supplement to first-line medical treatment. Despite the fact that the effects of nutrition are becoming increasingly well-known, as well as the importance of food and lifestyle variables in health and illness is receiving greater attention and focus, the advantages and drawbacks are still underappreciated.

KEYWORDS: *Vegan nutrition, Plant-Based Diet, Cancer, Nutritional Therapy.*

1. INTRODUCTION

The leading causes of death in the United States and many other developed nations are avoidable. Our food, in particular, continues to be the leading cause of mortality and disability in the United States. A significant decrease in mortality and age-adjusted incidence of several malignancies prevalent in Western culture has been seen among populations eating mainly plant-based diets. Breast, prostate, colon, pancreatic, ovary, and uterine endometrial cancers are among these malignancies. However, as the Westernized food and lifestyle expand throughout the globe, this tendency is diminishing. Red or processed meats are implicated as significant carcinogens in reports from the International Agency for Research on Cancer, the World Health Organization's cancer agency. Other dietary factors, such as a high fiber intake, fruits, and vegetables, on the other hand, have been shown to protect against cancer. While the significance of plant-based foods including fruits, vegetables, nuts, seeds, and legumes as nutritional sources is well acknowledged, using diet to prevent and treat illness is still rare. Despite the fact that numerous observational and experimental research studies have shown a significant preventive role of plant-based diets against the rate of cancer as well as many other disease states, including the 15 leading causes of death in the Western world, this remains the case.

A recent comprehensive meta-analysis found that a vegetarian diet has a substantial protective impact against overall cancer incidence (-8 percent), whereas a vegan diet had a considerable decreased risk of total cancer incidence (-15 percent)[1]. Surgery, radiation, and chemotherapy are some of the current cancer treatment methods. Not only do these cancer therapies cost a lot of money for health-care systems, but they also cost a lot of money for individuals. As a result, dietary interventions should be utilized as a preventative measure and may be a cost-effective and safe complement to conventional medical therapies. This study examines the evidence on the impact of diet on cancer incidence and development, with a particular emphasis on the effects of reducing or eliminating animal protein, as well as noteworthy bioactive chemicals in plant foods that provide cancer protection. Though plant-based nutrition has been demonstrated to help prevent and increase survival in a variety of cancers, our study will concentrate mostly on breast, prostate, colorectal, and gastrointestinal (GI) cancers, since these are the classes with the most data to far. Before we get to the end, we'll talk about "other" cancers briefly[2].

Vegan diet & cancer, vegetarian diet as well as cancer, plant-based nutrition as well as cancer, vegetarian diet or breast cancer, vegan diet or prostate cancer, vegan diet and GI cancer were all used in a PubMed search. Cross-referencing publications and finding relevant resources from the Physicians Committee for Responsible Medicine nutrition guide for doctors were part of the secondary search approach. Systematic reviews and meta-analyses, as well as original research using a variety of methods including longitudinal prospective studies, randomized controlled trials, including case series, were used as sources.

1.1 Breast cancer and plant-based nutrition:

Breast cancer is the most prevalent cancer among American women, second only to skin cancer. Every year, an estimated 250,000 women or 460 men are diagnosed with the disease (plus 2,500 instances in males), with 40,000 women and 460 men dying as a result. In order to increase survival, imaging and early detection are often stressed. Early diagnosis and screening, on the other hand, does not protect breast cancer; it merely detects a disease that is already there. Furthermore, current imaging is insufficient to identify cancer in its earliest stages, thus what the

medical profession refers to as "early detection" is, sadly, "late detection." A breast cancer tumor, for example, must be approximately 2 billion cells (30 doublings) in size to be detected by a mammography. The primary element that affects doubling time, and therefore when someone is diagnosed with cancer, may vary from 25 to over a thousand days. This implies that a person may be diagnosed at any point between the ages of 2 and 100, and the main determinant of where they fall on the timeline may be based on what they consume[3].

According to post-mortem studies, up to 39% of women in their 40s have already had breast cancers that are too tiny to be detected by mammography. Breast cancers may also develop in pregnancy as a result of a mother's nutrition. As a result, waiting until a diagnosis to begin eating and living a healthy lifestyle may be too late. Typically, someone is deemed "healthy" if scans or diagnostic screening tests reveal no pathologies or abnormalities, and they don't exhibit any clinical signs of a disease condition. Can someone really be deemed "healthy" if they had been carrying a cancer for decades that was just too tiny to be discovered or cause major clinical signs? Because there is so much more going on at a cellular level inside the human body than scans can ever reveal, it may be more advantageous to consider living in a continuous state of prevention or therapy than awaiting until a disease has advanced to the point of exhibiting outward symptoms. As a result, maybe we should live as if we already had the beginnings of illness in our bodies, since a disease-prevention diet and lifestyle may also be a cure for occult diseases that we can't see[4].

The American Institute for Cancer Research (AICR) issued ten cancer preventive guidelines in 2014. Dietary consumption of mainly whole plant foods (vegetables, fruits, whole grains, legumes) reduces the incidence of many malignancies and other disease states, according to the findings. In a 2013 study of approximately 30,000 post-menopausal women with no history of breast cancer over the course of seven years, it was discovered that following just three of the ten AICR recommendations (maintaining a normal body weight, limiting alcohol, and eating mostly plant-based) resulted in a 62 percent lower risk of breast cancer. Furthermore, the pace at which consuming a plant-based diet may alter an individual's physiology is astounding. In vitro tests of the effects of a healthy diet (plant-based) and lifestyle (daily walking) on tumor cell proliferation and apoptosis were conducted in 2006. Researchers discovered that participants' blood samples were able to inhibit cancer development and destroy 20 percent to 30 percent more malignant cells after just two weeks of healthy living than blood samples obtained before the diet/lifestyle modification. Lower levels of insulin-like growth factor 1 (IGF-1) owing to reduced animal protein consumption were shown to be responsible for the cancer-suppressive impact. IGF-1 is a hormone that promotes cell proliferation, and the more IGF-1 in the bloodstream, the greater the chance of developing cancer. As a result, it is believed that decreasing animal consumption would lower IGF-1 levels and enhance our bodies' natural cancer defences. Ngo and colleagues discovered that after 11 days of decreasing animal protein intake, circulating IGF-1 levels fell by 20%, but levels of the cancer-protecting IGF-1 binding protein rose by 50%. Only individuals who eat a completely plant-based (vegan) diet get cancer prevention due to lower amounts of growth hormone and higher levels of binding protein. Because all animal proteins promote the synthesis of IGF-1, regardless of whether they come from muscle, eggs, or dairy, vegetarians who ingest eggs or dairy do not have the same protective impact[5].

1.2 Breast cancer through heterocyclic amines:

Heterocyclic alkali metals, in addition to IGF-1, are another chemical present in animal products that adds to cancer risk (HCAs). Animal products cooked in different ways at high temperatures have been discovered to contain cancer-causing chemicals since an initial article in 1939. HCAs are “chemicals present when muscle in meat, including beef, pig, fish, and chicken, is cooked using high-temperature methods,” according to the National Cancer Institute. HCAs are produced when high temperatures stimulate chemical interactions between elements of muscle tissue, chemicals that aren't found in plants, thus cooked vegetable burgers/products don't contain any. The longer meat is cooked, the more HCAs are generated, and the findings indicate that well-done meat is linked to an increased risk of breast, colon, oesophagus, pancreatic, prostate, and stomach cancers. This isn't to say that shorter cooking time doesn't generate HCAs; even roasting chicken for 15 minutes at 350 degrees produces significant quantities of HCAs, which cause DNA damage and therefore an elevated risk of cancer.

Several studies, notably the Staten Island Breast Cancer Study Project as well as the Iowa Women's Health Study, have shown a link between consuming more cooked meats and an increased risk of breast cancer in women. Women who ate more grilled, barbecued, or smoked meat throughout their lifetime had a 47 percent higher risk of cancer, according to the Long Island research, while women who ate their meat "well-done" had a 5-fold higher risk of cancer, according to the Iowa study. Studies have also shown a connection between fried meat intake and the quantity of DNA damage in the breast tissue. The most common HCA in cooked beef, 2-amino-1-methyl-6-phenylimidazo pyridine (PhIP), has strong estrogen-like actions and may contribute to cell development nearly as much as endogenous estrogen, which would be the hormone that feeds most human breast cancer tumors. Researchers examined levels of PhIP in subject's breast milk after initial in vitro experiments to establish whether HCAs really find their way into women's breast ducts from their diet, and quantities were found in doses known to be carcinogenic[6].

1.3 Plant-based diets may help prevent breast cancer:

Unfortunately, even after being diagnosed with breast cancer, most women do not make the required dietary and lifestyle adjustments to fight the illness and extend their lives, including eating more whole plant foods.

Fiber, vegetables, and flaxseeds are all helpful. According to studies, women who consume 6 g or more of soluble fiber per day (equal to a cup of black beans) had a 62 percent lower risk of breast cancer than those who consume less than 4 g. Notably, the benefits seem to be stronger for the more difficult-to-treat estrogen receptor negative (ER-) cancers, with premenopausal women who ate a lot of fiber having an 85 percent lower risk. Hundreds of research, including particular pattern and large prospective studies, have shown similar results, with the conclusion being that the more plant-based a person's diet is, the better. According to the findings, every 20 g of fiber eaten per day reduces the risk of breast cancer by around 15%; however, others speculate that the benefits may only be seen after a baseline of 20 g per day is reached. Given that one cup of split peas contains 16 g, 20 g may not seem like much, but the average American woman consumes less than 15 g per day, with vegetarians consuming slightly more at 20 g, healthy vegan diets 37 g, vegans 46 g, and whole-food plant-based diets suggested as therapeutic interventions for many chronic diseases averaging about 60 g. These findings show that people in the United States and other Westernized nations are deficient in fiber, and that increasing fiber consumption through whole foods (rather than supplements) may help improve health[7].

Cooked meat consumption was related to a 47 percent higher risk of breast cancer in the Staten Island women's research, while those who also had a poor diet of fruits and vegetables had a 74 percent increased risk. Increased fruit and vegetable consumption is linked to improved general health and lifestyle behaviours, as well as the presence of numerous bioactive chemicals in fruits and vegetables that protect against cancer. Cruciferous vegetables like broccoli, for example, increase the activity of detoxification enzymes in the liver. Consumption of broccoli and brussels sprouts has been found to enhance caffeine clearance, and the same has been shown to occur with carcinogens. When non-smokers were fed pan-fried beef along with 3 cups of broccoli and brussels sprouts for two weeks and the amounts of HCAs in urine samples were measured, liver clearance was enhanced. Despite eating the same quantity of carcinogens, substantially less was found in the urine of the subjects, supporting the hypothesis that cruciferous vegetables have a detoxifying capacity. It was also shown that liver function improved for up to two weeks after the intake of vegetables was stopped. The safest approach is to choose a vegetarian burger that contains no HCAs in the first place[8].

Lignans have been found to directly inhibit the development and proliferation of breast cancer cells in both in vitro and interventional trials. The risk of breast cancer was shown to be substantially decreased in a 2010 National Cancer Institute-funded research of 45 people with high breast cancer risk who were given 2 tablespoons of ground flaxseed per day. Needle biopsies taken after the yearlong study revealed fewer precancerous changes than before, and 80 percent had lower levels of Ki-67, a biomarker for increased cell proliferation, implying that breast cancer risk can be significantly reduced by simply adding a few tablespoons of ground flaxseeds to one's daily diet. When it comes to women who have already been diagnosed with breast cancer, those who have higher serum lignan levels and eat more dietary lignans have a better chance of surviving. This discovery may be due to an increase in the protein endostatin, which has a role in depriving tumors of blood flow in the breasts of women who eat more lignans, according to the researchers[9].

1.4 Prostate cancer or plant-based nutrition:

In 2018, it is expected that new instances of prostate cancer will be identified, with 609,64 men dying from the illness. Furthermore, according to autopsy studies, about half of men over the age of 80 die of prostate cancer without realizing it. A variety of dietary components have been linked to an increased risk of prostate cancer, and the relevant food sources, like with breast cancer, are of animal origin. This is especially true with milk and eggs when it comes to prostate cancer.

1.5 Prostate cancer and dairy:

Humans are the only species that consumes milk after weaning, much alone drinks the milk of another species, despite the fact that dairy products are often marketed as "natural." Milk and other dairy products are also advertised as being "good" for the body, despite the fact that every animal-derived food product includes significant amounts of sex steroid hormones, particularly dairy since milk is obtained from nursing female cows. Hormone levels in so-called "organic" cows are high enough to affect hormone-related problems such as acne, reproductive dysfunction, early puberty, and increased twin rates. The impacts of growth hormones, in addition to sex steroid hormone, are of special importance when it comes to cancer. When you consider that cow milk is designed to help a calf acquire a few hundred pounds in a few months,

it's easy to see how a lifetime of human exposure to those growth hormones might lead to cancer, especially hormone-sensitive cancers.

1.6 Colorectal cancer or plant-based nutrition:

CRC is the third most frequent cancer in males and the second most prevalent cancer in women in the world, with more than half of all cases occurring in industrialized nations. Obesity and diet have been proven to have a significant effect in reducing the risk of colon cancer. Fortunately, food is a changeable element, and a shift from a disease-promoting to a disease-protecting pattern may be achieved. While specific meals have been linked to an increased or decreased risk of colon cancer, the overall pattern of food consumption may have the biggest impact on disease progression. Numerous studies have indicated that diets rich in unprocessed plant foods including fruits, vegetables, and whole grains protect against colon cancer, while diets rich in meat and saturated fat increase the risk. As a result, vegan and vegetarian diets have been linked to a lower risk of CRC. Vegetarian diets were linked with a reduced overall incidence of CRC compared to non-vegetarians in the Adventist Health trials, which tracked a large prospective cohort of almost 80,000 individuals. Plant-based diets may have a preventive impact in part because they exclude meat, which includes hazardous elements such as saturated fats and carcinogens produced during the cooking or processing of animals. Incorporating many beneficial plant components, such as fiber and micronutrients, into plant-based diets may provide further protection[10].

1.7 Other cancers and plant-based nutrition:

Plant-based diet also has been proven to protect against a variety of different malignancies, both GI and non-GI. According to a systematic review and meta-analysis, people who eat a healthy diet rich in fruits and vegetables had a two-fold lower risk of stomach cancer than those who consume a Western diet rich in meat, fats, and carbohydrates. Processed or red meat consumption has been linked to an increased risk of stomach cancer, which may be mediated in part by the food preservative nitrites found in processed meats. Plant-based nitrates, on the other hand, are not linked to an increased risk of stomach cancer. Similarly, eating more red meat or animal fats raises the risk of pancreatic cancer, whereas eating more fruits, vegetables, and whole grains seems to decrease the risk. A high consumption of fruits and vegetables was also shown to be protective against cervical intraepithelial neoplasia in a review of dietary cervical cancer prevention methods. Higher vitamin, mineral, or antioxidant levels in the blood were linked to a lower risk of high-grade cervical intraepithelial neoplasia. A Western diet heavy in animal's products and refined carbohydrates has been linked to an increased risk of endometrial cancer, while a diet rich in plant foods seems to be beneficial.

2. DISCUSSION

Plant-based nourishment has been proven to protect against 15 of the world's top causes of death, including several cancers, and may have potential as a disease-modifying tool for better management and treatment of these diseases. The effect of plant-based diet on breast, prostate, colorectal, or gastrointestinal cancers have been the most thoroughly researched, with the most published supporting data to far. Diets rich in whole foods including plant-based proteins have been proven to protect against these malignancies, as well as other cancers and chronic diseases. Plant-based nutrition has been proven to protect against 15 of the world's top causes of death, including several cancers, and may have potential as a disease-modifying tool for better

diagnoses and prevention of these diseases. The effects of plant-based diet on breast, colorectal, prostate, and gastrointestinal malignancies have been the most thoroughly researched, with the most published supporting data to far. Diets rich in whole foods including plant-based proteins have been proven to protect against these malignancies, as well as other cancers and chronic diseases.

3. CONCLUSION

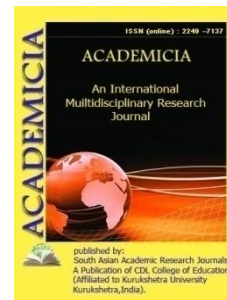
Diet is one of the leading causes of early mortality and disability in industrialized nations, and it also contributes to the high prevalence of malignancies in Western societies. Because of the significant impact of food on cancer incidence and development, as well as the high cost burden imposed by existing treatment regimens, prevention via a mostly plant-based diet seems to be an appealing method of fighting the issue. Though there are still some misconceptions about vegan diets, especially when it comes to iron and B12, The Academy of Nutrition and Dietetics' stated stance on plant-based diets states that "appropriately planned vegetarian, including vegan, diets are healthful, nutrient dense, or may provide medical benefits for the preventative measures and treatment of certain diseases including ischemic heart disease." As a result, worries regarding vegan diets' nutritional insufficiency are unfounded when diets are properly designed.

Adoption of a plant-based diet, as discussed in this article, offers significant protection against a variety of malignancies while posing practically no risk of undesirable side effects. A well-planned plant-based diet is a simple and cost-effective strategy that may be used alone to prevent illness or in conjunction with conventional therapy to treat disease that has already developed. A plant-based diet has also been proven to protect against other Western chronic illnesses such as diabetes, heart disease, and obesity, in addition to cancer prevention. The present lack of nutrition education and understanding among doctors remains a barrier to more broad diet modification prescription for cancer prevention, and it should be addressed beginning early in medical school. With current cancer treatment regimens being unsustainable, a focus on prevention, particularly via food and lifestyle modifications, represents a significant paradigm shift with the potential to significantly reduce disease burden.

REFERENCES

1. M. Madigan, "The role of plant-based nutrition in preventing heart disease," *University of Toronto Medical Journal*. 2017.
2. I. Matic, A. Guidi, M. Kenzo, M. Mattei, and A. Galgani, "Investigation of medicinal plants traditionally used as dietary supplements: A review on *Moringa oleifera* Vegetarian dietary habits in African people," *J. Public Health Africa*, 2018.
3. T. T. Mosby, M. Cosgrove, S. Sarkardei, K. L. Platt, and B. Kaina, "Nutrition in adult and childhood cancer: Role of carcinogens and anti-carcinogens," *Anticancer Research*. 2012.
4. R. Kala, H. N. Shah, S. L. Martin, and T. O. Tollefsbol, "Epigenetic-based combinatorial resveratrol and pterostilbene alters DNA damage response by affecting SIRT1 and DNMT enzyme expression, including SIRT1-dependent γ -H2AX and telomerase regulation in triple-negative breast cancer," *BMC Cancer*, 2015, doi: 10.1186/s12885-015-1693-z.
5. Z. Szabó *et al.*, "Plant-based diets: A review," *Orv. Hetil.*, 2016, doi: 10.1556/650.2016.30594.

6. R. Chan, K. Lok, and J. Woo, "Prostate cancer and vegetable consumption," *Molecular Nutrition and Food Research*. 2009, doi: 10.1002/mnfr.200800113.
7. Z. Szabó *et al.*, "A növényi alapú étrendről," *Orvosi Hetilap*. 2016, doi: 10.1556/650.2016.30594.
8. J. M. Chan, P. H. Gann, and E. L. Giovannucci, "Role of diet in prostate cancer development and progression," *Journal of Clinical Oncology*. 2005, doi: 10.1200/JCO.2005.03.1492.
9. I. Matic, A. Guidi, M. Kenzo, M. Mattei, and A. Galgani, "Investigation of medicinal adietaryplantsreviewtraditionallysupplements:On moringausedoleiferaas," *J. Public Health Africa*, 2018, doi: 10.4081/jphia.2018.841.
10. O. D. Rangel-Huerta and A. Gil, "Nutrimetabolomics: An update on analytical approaches to investigate the role of plant-based foods and their bioactive compounds in non-communicable chronic diseases," *International Journal of Molecular Sciences*. 2016, doi: 10.3390/ijms17122072.



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ORIGINS AND DEVELOPMENT OF A SCIENTIFIC DISCIPLINE: PHYSIOLOGICAL PHYTOPATHOLOGY

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ABSTRACT

*The life cycle of the pathogenic oomycete *Phytophthora infestans*, which causes late blight in potatoes and was responsible for catastrophic famines in the 1840s, was explained by German scientist Anton de Bary (1831-1888) in 1860. DE BARY (1861) founded the scientific field of physiological plant pathology in a book on the subject released 150 years ago. With reference to Charles Darwin's (1809-1882) theory of descent with modification by natural selection, we outline the life and scientific accomplishments of Anton de Bary, who created the words "symbiosis" and "parasitism." De Bary's discovery of the cause of wheat stem rust disease, which is caused by infections with the fungus *Puccinia graminis*, is then discussed. We conclude that "nothing in phytopathology makes sense except in the light of Darwinian evolution" since continuous pathogen-host plant co-evolution is widely established in nature. Finally, we discuss the importance of fundamental plant science research in terms of practical applications such as agricultural production maintenance and improvement, as well as food quality.*

KEYWORDS: *Evolution, Physiological, Phytopathology, Scientific, Theory.*

1. INTRODUCTION

The American Phytopathological Society released the inaugural issue of a journal that is being published today a century ago. Erwin F. Smith, a renowned botanist and microbiologist, was requested to write a tribute on the opening page of this new magazine. To the surprise of some of his North American colleagues, a German biologist was honored in *Phytopathology* Volume 1 (No. 1), with the following words: "Of all the personalities contributing to the advancement of

plant pathology from its crude beginnings to the present time, none has been more interesting than De Bary's, none more productive of important results." De Bary paved the way for all that has come after in plant pathology, and we must always remember him with the respect that a great master deserves." Anton de Bary was described as an outstanding biologist in Erwin F. Smith's later biography as "gifted with intellect and the instincts of a careful experimental scientist, one who refused to accept or promote any truth as fact unless proven by rigorous technical methods." Anton de Bary was one of many notable 19th-century scientists who continue to live "in the shadow" of Charles Darwin, the renowned British naturalist. This is owing to the fact that he researched "lower creatures" such as plasmodial slime molds, fungi, and plants to a great degree. Only one of de Bary's many works has allusions to "higher creatures" (vertebrates) or humans.

Furthermore, it is seldom recognized that it was Anton de Bary who coined the words "symbiosis" and "parasitism" in relation to plants and Darwin's natural selection principle. A little-known monograph on potato late blight was published one hundred and fifty years ago, launching the scientific field of experimental plant pathology. The accomplishments of Anton de Bary are discussed in this article. After that, pathogenic fungi and bacteria are addressed in relation to the genesis and development of experimental plant pathology. Finally, we use Darwin's *Origin of Species* to explain theoretical and applied elements of these worldwide research objectives[1].

Anton de Bary (Figure 1) was born in Frankfurt-Main, Germany, on January 26, 1831. He studied medicine at the Universities of Heidelberg, Marburg, and Berlin from 1849 to 1853, earning his doctorate with an unpublished dissertation on a botanical topic. De *plantarum generationes exuali*, the title of this 1853 book, reveals the young physician's main interest: plants and related sessile creatures. At the same time, a 22-year-old junior scientist published his first book, despite the fact that he was already an experienced plant and fungus collector. summarized current knowledge on the smut fungi and the diseases that they cause in plants, with regard to cereals and other crop species, in his *Researches on the smut fungi and the diseases that they cause in plants, with regard to cereals and other crop species*, and proposed that the true causes of these devastating plant diseases could only be elucidated in the future through proper experiments. De Bary joined the University of Tuebingen as a lecturer (Privatdozent) for botany in 1854. The expert for fungi and plants was appointed professor of botany at the University of Freiburg am Breisgau just a year later. The scientist released his landmark book on potato blight at the Botanical Institute in Freiburg i. Br., which subsequently became one of Germany's major center for plant research. The renowned physicist left Freiburg after twelve years of hard labor to take a more appealing post at the University of Halle, where he remained from 1867 until 1872. De Bary served as the first rector of the newly formed University of Strassburg, where he spent his last and most productive years. The biologist died of a tumor infection on the 19th of January 1888 at Strassburg[2].

Anton de Bary began his work as a field naturalist in the surrounding countryside, collecting plants and fungus. Despite his official training as a surgeon, his desire to study plants, fungi, and other "lower creatures" such as myxomycetes eclipsed his interest in medicine. He pioneered advanced laboratory methods for studying the life cycles of plant parasites, myxomycetes, and other "primitive" living organisms. Anton de Bary was a botanist, plant physiologist, myxomycetologist, and phytopathologist as a result of his studies. Furthermore, the laboratory

scientist became one of the founding fathers of modern bacteriology with the publishing of his Lectures on Bacteria[3].

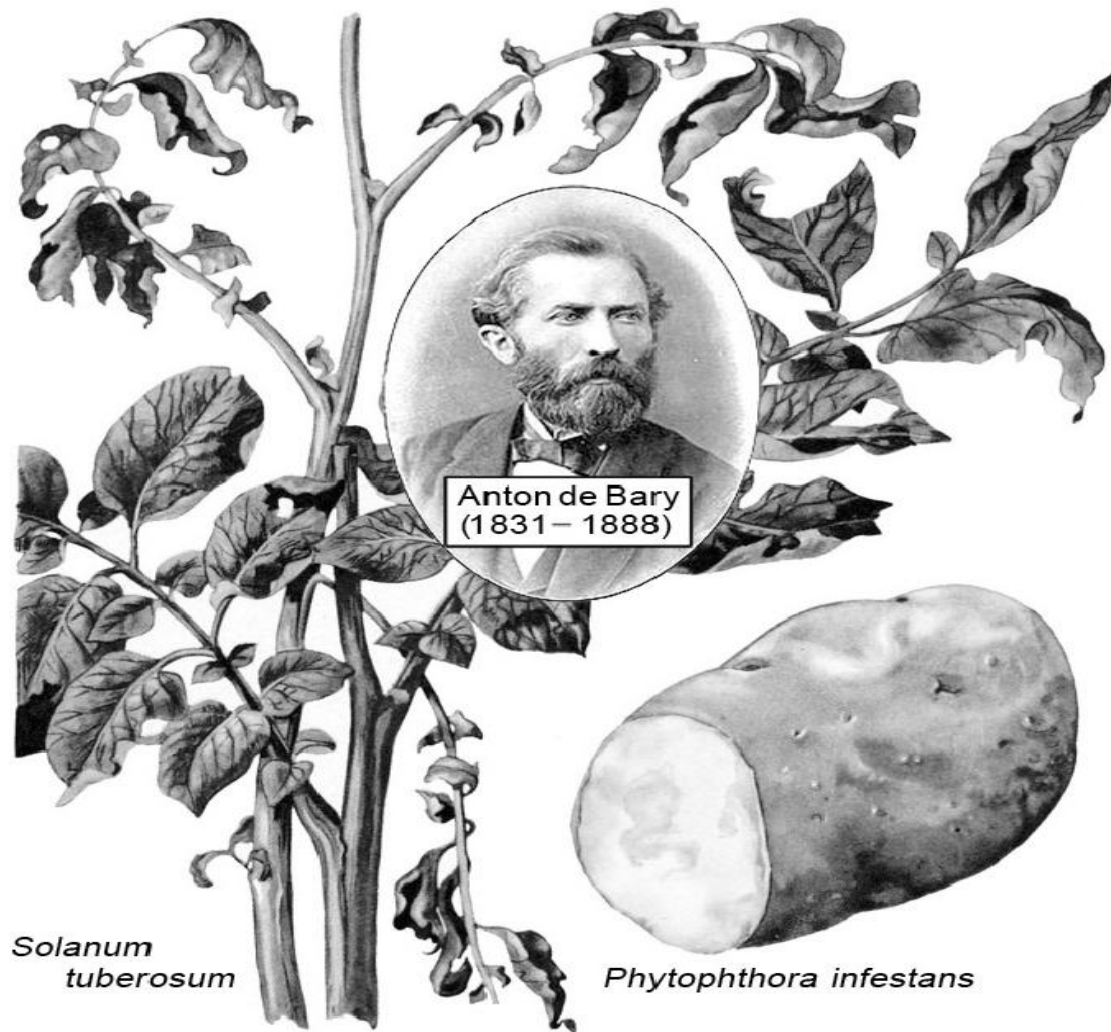


Figure 1: Photograph of the founding father of experimental plant pathology and his research object, potato plants (*Solanum tuberosum*), infected by the oomycete *Phytophthora infestans*. The name “infectious plant destroyer” for this pathogenic fungus was coined by Anton de Bary in 1876[4].

2. REVIEW OF LITERATURE

D. Andrivon in his study discloses about the genesis of the first European populations of the potato late blight disease *Phytophthora infestans* is discussed using historical and scientific data. It demonstrates that the existing hypotheses of a direct introduction of the fungus into Europe and North America from a Mexican or Andean origin and diversification center are suspect. A three-step process involving (i) migration from central Mexico to South America several centuries ago; (ii) migration from South America to the United States in 1841–1842, and (iii) migration to Europe from either South America, the United States, or both in 1843–1844, is in good agreement with both historical records and the genetics and structure of current populations[5].

Winslow R Briggs in his study discloses that from amateur taxonomy of Minnesota wildflowers to discovery of the phototropin family of blue-light receptors, he took a winding route. He also cites those who influenced his decision to pursue a profession in plant taxonomy, plant development, and ultimately plant photobiology (and out of music). He highlights the numerous detours that a research career may take, including those that lead to dead ends. He also highlights the cyclical character of his career, which has seen him go back and forth between the Atlantic and Pacific seas (with occasional excursions to Freiburg, Germany) and between red-light and blue-light receptors. He discusses his long-standing connection with California's Henry W. Coe State Park during a brief interlude. Finally, he describes how he traced an unexpected route from plant blue-light receptors to a blue-light receptor needed for a bacterial animal pathogen's maximum virulence[6].

G Drews in his study focuses on experimental method and idea, based on Darwin's theory of evolution, were the beginning principles for a phylogenetic taxonomy that could not be realized till now. Experimentally, he defined many species and subspecies, as well as their delimitation. De Bary also accurately described the whole process of fungus infecting plants. Based on his experiments, the words parasitism, symbiosis, heterospory, and heteroecy were created or redefined. His many research on algae, lichens, ferns, and higher plants contributed to the current state of knowledge. De Bary was a highly contemporary instructor who encouraged self-reliance, observation skills, self-control, and a critical assessment of one's own findings and conclusions rather than being dictatorial. He was well-known globally, and many scientists from across the globe came to see his state-of-the-art laboratory[7].

3. DISCUSSION

3.1 Potato blight and the origin of physiological phytopathology:

Fungus-like parasites (oomycetes), such as the potato blight disease *Phytophthora infestans*, and their infection tactics are detailed in a recent paper titled "Genome evolution in plant pathogens" (DODDS, 2010). However, the author of this well-known overview of potato blight studies failed to note that the field of physiological plant pathology was founded 150 years before his article was published. The life cycle of *P. infestans* was discovered at that time. This finding, which was described in a landmark publication titled *The presently spreading potato illness, its cause, and prevention*, was published in November 1861. A research based on plant physiology principles (Figure 2). The author established the field of experimental phytopathology, or the scientific study of plant diseases, with this paper.

Anton de Bary, a German botanist, detailed how the vegetative body (mycelium) of *P. infestans* spreads through the leaf tissue of infected potato (*Solanum tuberosum*) plants in February 1861. (Figure 1). De Bary documented the symptomatic course of the plant disease 'late blight' versus the developmental phases of *P. infestans* in a series of clever studies. De Bary concluded that the oomycete is the causative agent of the potato plant disease based on these investigations, which showed a good connection between the life cycle of *P. infestans* and phases of plant disease development[8].

Anton de Bary presented experimental proof that potato tubers are infected by the fungus through the brown, blighted leaves and detailed the disease's progress in the field in this monograph (Figure 2), which was largely based on his own study. DE BARY (1861) produced precise cross sections through the leaves of infected potato plants, demonstrating the vegetative

structure (mycelium) moving through the intercellular gaps of its host organism (Figure 3 A). He also kept track of the conidiophores' growth as they emerged from the pores of the stomata (Figure 3 B) and the germination of isolated *P. infestans* spores (Figure 3 C). The author concluded that "The disease of the leaves, stems, and fruits is caused by a pathogenic fungus, *P. infestans*, and the disease of the tubers occurs via infection from the leaves" based on these and other observations made according to the principles of experimental plant physiology, a scientific discipline founded in Germany in the 1850s by Julius Sachs. Furthermore, the expert stated that "it would never be feasible to drive the parasite *P. infestans* to extinction... nevertheless, a careful selection of uninfected tubers for agriculture will be sufficient to avoid large-scale outbreaks of this catastrophic plant disease." At the conclusion of the book, he advised farmers on how to avoid another catastrophic potato blight outbreak, such as the one that ravaged Ireland from 1845 to 1848, resulting in crop losses and famine[9].

3.2 Is there really a thing as spontaneous creation of lesser organisms:

De Bary refuted the concept of spontaneous generation with his empirical evidence for the "fungal hypothesis," which says that *P. infestans* is the causative organism of potato blight. Many scientists thought that "lower" or "primitive" species, such as *P. infestans*, might arise from dead material under current environmental circumstances in 1861. Experimental data showed that the oomycete grows exclusively from its own spores and never emerges from scratch, according to the doyen of phytopathology. The notion in "generation without parents," which had never been backed by unambiguous evidence, vanished permanently from the scientific literature with the publishing of these evidence-based findings, which corroborated the similar "microbe-experiments" of Louis Pasteur. As a result, the birth of plant pathology 150 years ago resulted in the collapse of a doctrine that had sparked unending discussion among naturalists and philosophers. DARWIN disregarded the "spontaneous generation argument" in his book *On the Origin of Species* because, in his opinion, the evidence for this idea had always been poor and contentious[10].

3.3 Wheat stem rust: Infection experiments and their consequences:

The brownish uredia and uredospores of the stem rust, which is caused by the fungus *Puccinia graminis* (Figure 4 A-C). Based on de Bary's seminal work of 1865 and subsequent studies, the complex life cycle, with alternation of generations on different host plants, has been elucidated in detail. Due to the elegant studies of DE BARY we know that the common barberry (*Berberis vulgaris*), as well as a grass species, is required for the stem-, black- or cereal rust (*Puccinia graminis*) to complete its life cycle. During the spring and early summer, stem rust infections on wheat and other cereal species (Figure 4 A, B) produce dikaryoticurediniospores. These propagules, which are produced within the uredinia, are distributed by the wind to nearby conspecifics. Here they germinate on the stems or leaves and then infect their new host plant through the stomata. This asexual summer circle, which spreads the infection over wide areas, is indicated in Figure 4 C as a circle. At the end of the growing season, the cereal rust produces dikaryotic teliospores, which, during the next spring, develop into basidiospores. These propagules can not infect cereal plants. However, they are carried by the wind to a second host plant, barberry (*Berberis vulgaris*) and related species. There, the basidiospores infect young leaves via the penetration of the epidermal cells. The resulting infection structures (pycnia or spermagonia), which represent the sexual stage of the life cycle, form, after fertilisation, so-called aecia. These structures produce aeciospores, which are carried by the wind to cereal

plants. After infection, the aeciospores develop into uredinia, and thus the next life cycle of the pathogenic fungus *P. graminis* begins (Figure 4 C). The elucidation of this “sophisticated” (i.e., evolved) life cycle of a plant pathogen, that still causes severe problems in Africa today. These insights were based on careful infection experiments and the use of different host plants and spore. One practical consequence rapidly emerged from this elegant work: the systematic removal of barberry plants close to crop fields. It should be noted that Anton de Bary’s research was based on the principles of experimental plant physiology (see the sub-titles of the monographs, a scientific discipline that was still in its infancy when the botanist-mycologist carried out his seminal work[11].

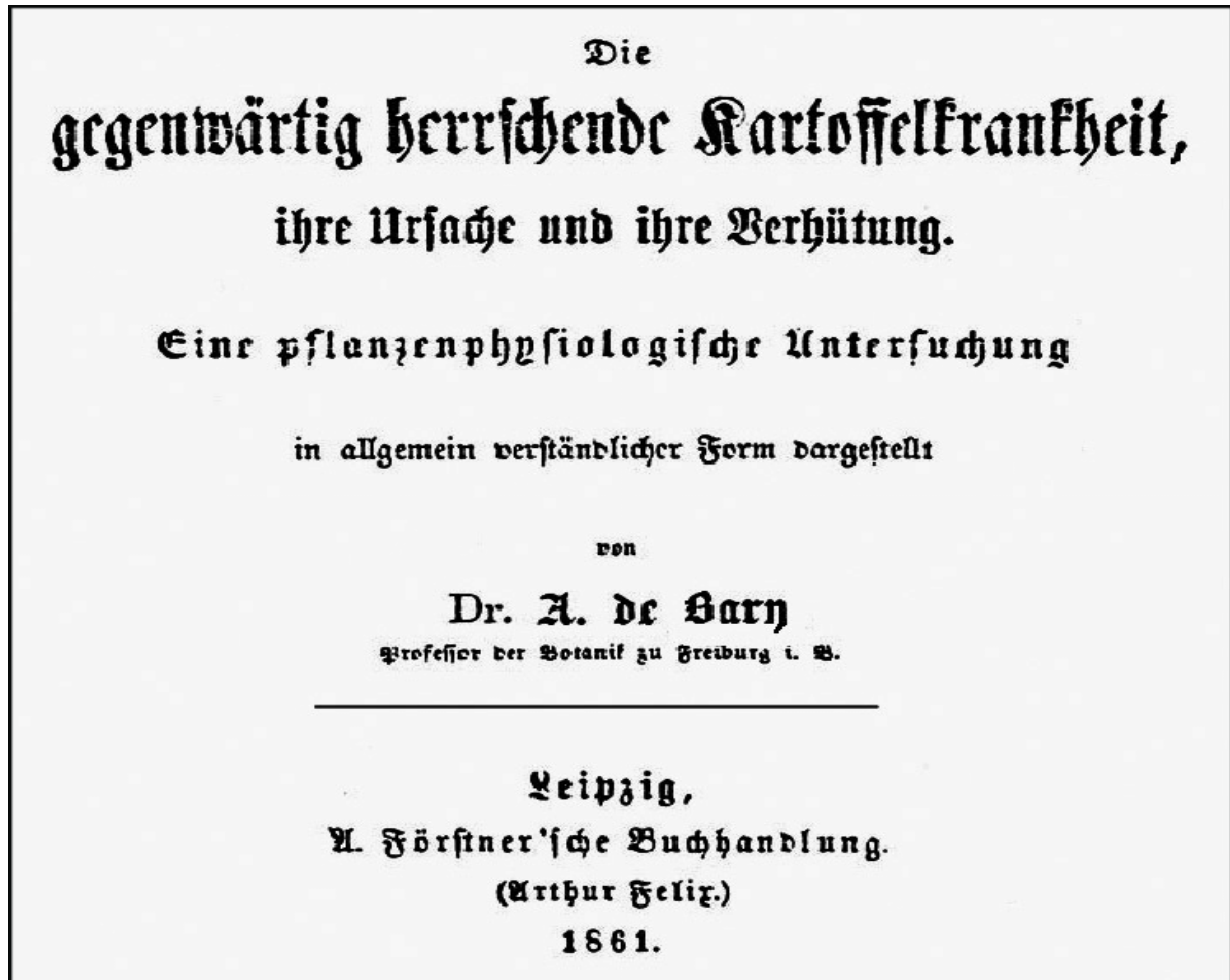


Figure2: Title page of Anton de Bary’s monograph on the potato late blight. This book also contains recommendations how to prevent the spread of this devastating plant disease[12].

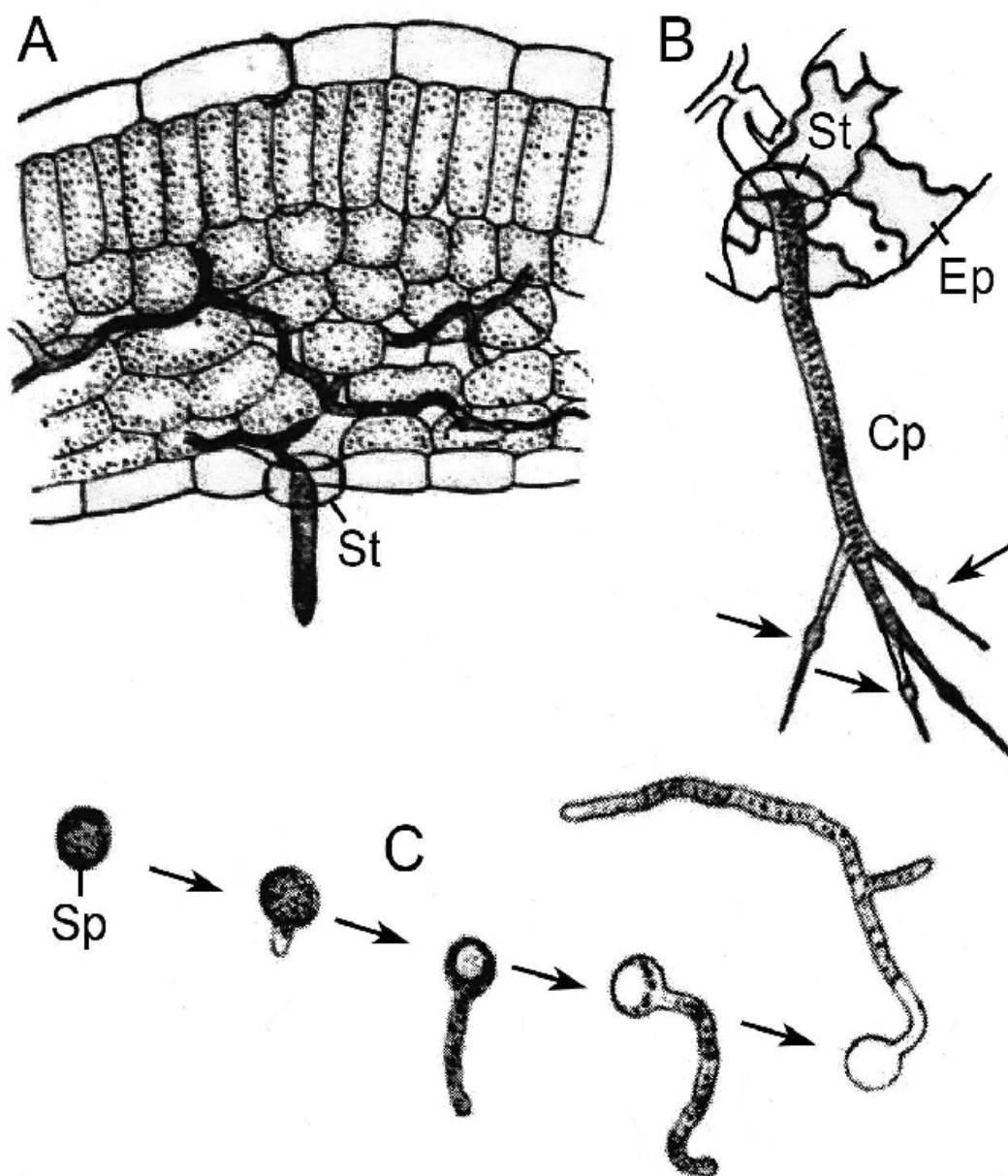


Figure 3: The discovery of the life cycle of the late blight oomycete *Phytophthora infestans* by Anton de Bary. The mycelium of *P. infestans* in a leaf of a potato (*Solanum tuberosum*) plant (A), spore germination in liquid culture (C), and a conidiophore (with spore-containing conidia, arrows) that emerges from a stomatum on the underside of a leaf (B). Cp = conidiophore, Ep = epidermis, Sp = spore, St = stomatum[13].

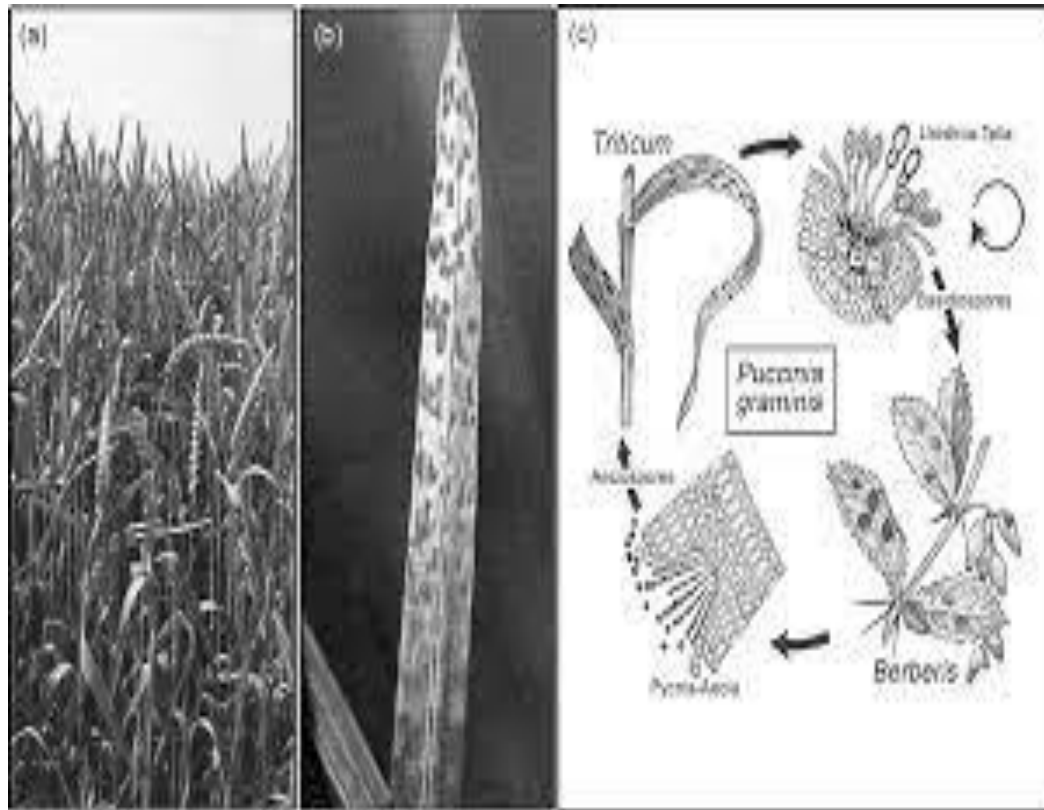


Figure 4: Healthy wheat (*Triticumaestivum*) plants in the fi eld (A) and a dying wheat leaf (B) that is infected by the pathogenic fungus *Puccinia graminis*, which causes this plant disease (stem- or cereal rust). Diagram of the life cycle of *P. graminis* via uredinia-telia (C). These propagules spread asexually on the infected *Triticum* plants (circle), release basidiospores that infect barberry (*Berberis vulgaris*) plants, where they reproduce sexually via pycnia-aecia, and fi nally re-infect wheat plants via aeciospores. Anton de Bary, who elucidated this grass (*Triticum*) host 1- alternate (*Berberis*) host 2- cycle, recommended removing barberry plants in the vicinity of wheat fi elds to prevent the spread of the cereal rust[14].

4. CONCLUSION

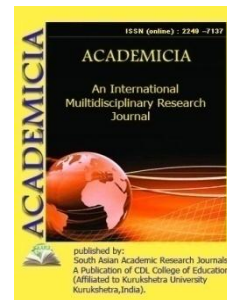
Anton de Bary (Figure 1), a German scientist, was one of the first to apply experimental botany techniques to investigate the causes of illnesses in important crop species like potato and wheat. He explained the life cycles of pathogenic fungus based on thorough studies, came to the conclusion that these eukaryotic microorganisms are the causal agents of disease development, and so became the founding father of experimental plant pathology. With the publishing of a monograph on potato blight 150 years ago, this scientific field was born (Figure 2). DE BARY (1878) pointed out in his renowned book on plant symbioses and diseases that only a Darwinian viewpoint produces relevant results - in other words, "Nothing in plant pathology makes sense unless in the light of Darwinian (adaptive) evolution." The study of Anton de Bary on potato blight and wheat stem rust demonstrates the practical importance of fundamental research in maintaining steady agricultural yields and food quality. His discoveries on the mechanism of infection and spread of plant diseases in the field led to the development of strategies to avoid

future outbreaks. Furthermore, it was clearly stated that harmful microorganisms such as Phytophthora or Puccinia would never be fully eradicated since living creatures will constantly find methods to adapt to changing environmental circumstances via fast microevolutionary processes. This traditional “Darwinian” perspective on phytopathology was accurate. We now understand that dynamic plant-microbe co-evolutionary processes take place. As a result, new diseases have emerged, such as the modified stem rust strain Puccinia graminis race 1, which was recently identified. Ug99, which has a catastrophic effect on African wheat output, cannot be eradicated. In areas of the world where food production is constantly challenged by plant illnesses, insect catastrophes, droughts, and civil conflicts, these pests will continue to inflict catastrophic crop losses.

REFERENCES

1. D. Andrivon, “The origin of Phytophthora infestans populations present in Europe in the 1840s: A critical review of historical and scientific evidence,” *Plant Pathology*. 1996, doi: 10.1046/j.1365-3059.1996.d01-196.x.
2. W. R. Briggs, “A wandering pathway in plant biology: From wildflowers to phototropins to bacterial virulence,” *Annu. Rev. Plant Biol.*, 2010, doi: 10.1146/annurev-arplant-042809-112326.
3. K. Bryson and N. J. Msindai, *On the origin of species: By means of natural selection, or the preservation of favoured races in the struggle for life*. 2017.
4. B. Balfour, “Professor Heinrich Anton De Bary,” *Trans. Bot. Soc. Edinburgh*, 1889, doi: 10.1080/03746608909468358.
5. P. Skelsey, W. A. H. Rossing, G. J. T. Kessel, and W. Van Der Werf, “Invasion of Phytophthora infestans at the landscape level: How do spatial scale and weather modulate the consequences of spatial heterogeneity in host resistance?,” *Phytopathology*, 2010, doi: 10.1094/PHYTO-06-09-0148.
6. R. P. Singh *et al.*, “Will Stem Rust Destroy the World’s Wheat Crop?,” *Advances in Agronomy*. 2008, doi: 10.1016/S0065-2113(08)00205-8.
7. M. J. Löhr, “Handbuch der physiologischen Botanik, in Verbindung mit H. de Bary, Th. Irmish, N. Pringsheim und J. Sachs herausgegeben von W. Hofmeister. 4ter Band. Handbuch der Experimental-Physiologie der Pflanzen. Untersuchungen über die allgemeinen Lebensbedingungen und die Functionen ihrer Organe, von Professor Dr. Julius Sachs. Mit 30 in den Text eingedruckten Holzschnitten. Leipzig, im Verlage von Wilhelm Engelmann. 1865,” *Arch. Pharm. (Weinheim)*., 1866, doi: 10.1002/ardp.18661760181.
8. L. M. Bartoshuk *et al.*, “Food cravings in pregnancy: Preliminary evidence for a role in excess gestational weight gain,” *Appetite*, 2016.
9. R. L. Orbach, “Research vital to economic growth,” *Science*. 2011, doi: 10.1126/science.1204760.
10. C. Matta, “Spontaneous Generation and Disease Causation: Anton de Bary’s Experiments with Phytophthora infestans and Late Blight of Potato,” *J. Hist. Biol.*, 2010, doi: 10.1007/s10739-009-9220-1.

11. U. Kutschera and Z. Y. Wang, "Brassinosteroid action in flowering plants: A Darwinian perspective," *Journal of Experimental Botany*. 2012, doi: 10.1093/jxb/ers065.
12. U. Kutschera and K. J. Niklas, "Evolutionary plant physiology: Charles Darwin's forgotten synthesis," *Naturwissenschaften*. 2009, doi: 10.1007/s00114-009-0604-z.
13. U. Kutschera and K. J. Niklas, "Endosymbiosis, cell evolution, and speciation," *Theory Biosci.*, 2005, doi: 10.1016/j.thbio.2005.04.001.
14. [14] C. Darwin, "The Origin of Species, by Means of Natural Selection, or the Preservation of Favored Races in the Struggle for Life," *The Crayon*, 1860, doi: 10.2307/25528056.



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THE USE OF MODERN EDUCATIONAL TECHNOLOGIES IN THE ORGANIZATION OF PHYSICAL EDUCATION IS A GUARANTEE TO INCREASE THE EFFECTIVENESS OF EDUCATION

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ABSTRACT

During the writing of this article, I looked at a lot of physical activity, as well as the organization of physical education classes, the attitude to this science, their study, to get acquainted with its peculiarities. In this article, I have tried to shed light on what we need to focus on in order to develop physical education teachers through professional competencies. They are short and limited in size, rich in content, and written in prose.

KEYWORDS: *In Physical Education, Sports, Muscle, Training, Success, Sports Facilities, Tourism, Games. Subject Matter, Physical, Standards, Accomplished, Educator, Experienced, Inclusive Teaching, Develop Skills.*

INTRODUCTION

It envisages the development of a system of targeted training that will meet the needs of society and the state in qualified and competitive personnel in our country. The education system should increase the opportunities, importance and prestige of knowledge in meeting the diverse educational needs of man and society, as well as focus on the general, cultural, professional and scientific training of specialists, ensuring the fundamentality of the knowledge they acquire. Education is considered a key factor of socio-economic development, a very important value and the main investment of society, its priority and driving force, it is able to think independently, creatively, acquire new knowledge, socio-professional activity. Higher education is not only a scientific institution in the formation of personality, but also a cultural, educational, scientific, methodological, spiritual and educational center of the country. During the years of independence, significant structural, organizational and substantive changes have taken place in the education system of Uzbekistan. Especially in the field of education, the introduction of

modern, innovative pedagogical technologies, increasing the effectiveness of teaching is a topical issue today.

Modern development of physical culture of youth based on national values requires a new approach to the promotion of physical culture, physical education, health, physical maturity, physical development, health promotion, healthy lifestyle. The task of physical education is to develop health, physical qualities, prepare the younger generation for mental and physical labor, and protect the Motherland. This idea has always been reflected in the spirituality of our ancestors. In particular, it is reflected in a number of epics, such as "Alpomish", "Gorogly". Man's physical maturity is glorified and valued in all aspects of historical development. The concept of physical culture is seen as part of folk culture. Physical culture is the accumulation of material and spiritual wealth accumulated in human society and used for human perfection.

Physical culture is a set of achievements in the creation and rational use of special tools, methods and conditions for the purposeful realization of the physical maturity of members of society.

Physical culture plays a role in the development of society:

1. Establishment of reasonable norms (norms) of human activity.
2. Provides services for the collection (informatization) of cultural information on physical education and its transmission from generation to generation.
3. Formation of interpersonal communication.
4. (Aesthetic) service of the person who meets the requirements of movement aesthetics.
5. (Biological) service related to meeting a person's natural need for constant movement and ensuring his physical condition to the extent necessary for daily life.

The starting point of physical culture is conditionally created through "preschool and school physical culture". By this we mean that physical culture is a compulsory subject in secondary schools and other pre-school educational institutions. This, in turn, lays the foundation for general physical education, the full development of physical abilities, the formation of a solid health base. This ensures that the foundation of the level of physical potential required for a comprehensively developed person is laid.

The physical culture of the school serves as the main basis for the formation of the ground for physical education in the student. Therefore, the organization of physical culture education on the basis of modern educational technologies plays an important role in increasing the effectiveness of education.

The introduction of educational technologies in the process of physical education involves not only the continuous improvement of pedagogical skills of teachers, preparation for the implementation of the educational process at a high theoretical and methodological level, the formation of skills to use advanced methods., shapes and tools. However, observations show that it is still difficult to understand the role of teachers in the formation of a single concept of 'pedagogical technology' and its place in the teaching system, the learning process and the integrity of each specific lesson.

It should be noted that in today's rapidly developing world, professors and teachers of educational institutions have great tasks. In this regard, on June 5, 2018, the President of the

Republic of Uzbekistan Sh.M. Mirziyoyev's resolution "On additional measures to improve the quality of education in higher education institutions and ensure their active participation in the ongoing comprehensive reforms in the country" brought the education system to a new level.

Of course, this document is an important step in training. This was the basis for creating adequate conditions for the development of the higher education system. The introduction of innovative pedagogical and information technologies in the education system is one of the most pressing issues today. Therefore, it is important to introduce modern methods, tools and technologies of teaching physical education in the education system. The following are the teaching methods and technologies used in the education system.

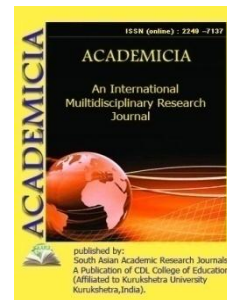
Basic pedagogical methods and technologies

- 1 Traditional education (class-lesson form, monologue, one-sided scheme of communication).
- 2 Interactive methods.
- 3 Non-traditional methods.
- 4 Educational technologies.
- 5 Educational technologies in the field of education.
- 6 Pedagogical methods based on the ethical and personal direction of the pedagogical process.
- 7 Problem-based learning;
- 8 Pedagogical methods based on the effective management and organization of the educational process.
- 9 Didactic lessons and reconstruction of materials based on pedagogical methods.
- 10 Pedagogical methods in educational disciplines.
- 11 The author's pedagogical methods are "The best teacher of the year".
- 12 Alternative methods.
- 13 Nature-friendly methods.

REFERENCES:

1. "On Additional Measures to Improve the Quality of Education in Higher Education Institutions and Ensure Their Active Participation in the Comprehensive Reforms in the Country" of the President of the Republic of Uzbekistan dated June 5, 2018 Resolution No. PQ-3775.
2. Resolution of the President of the Republic of Uzbekistan dated April 20, 2017 "On measures to further develop higher education."
3. National training program. 463- I - my son, 29.08.1997 y.
4. Abdullaev A., Xonkeldiev Sh.X. Theory and methods of physical education. Textbook. T-2005. 168 p. Publishing and printing department of UzSWLU, 2005
5. Muslimov N.A., Usmonboeva M.X., Sayfurov D.M., To'raev A.B. Innovative educational technologies. Tashkent: 2015. - 208 pages.

6. Tojiev M., Khurramov A. Modern teaching methods used in the organization of the educational process on the basis of pedagogical technology. Methodical recommendation. T.: "Science and Technology", 2014,
7. Xatamov Z.N. Sports and Action Games (Sports History) textbook. Kokand 2021. Fergana Publishing House
8. Xatamov Z.N. Sports and moving games (handball). Kokand 2021. Fergana Publishing House
9. Xatamov Z.N. Textbook "Sports competitions and refereeing." Kokand 2021. Fergana Publishing House.



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TECHNIQUES OF USING FOLK PROVERBS IN THE CULTIVATION OF ORAL SPEECH OF PRIMARY SCHOOL STUDENTS

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ABSTRACT

This article about the function of a language is not only transferring messages, but first and foremost is the transmission of what we report. There is a «space of meanings» fixed in the language knowledge about the world, about the national characteristics of a particular community speaking this language. Language picture of the world is formed as the set of knowledge about the world, reflected in vocabulary, grammar, phraseology.

KEYWORDS: *National Character and Culture, Analysis Of Essence, Content And Structure, Language Awareness Product*

INTRODUCTION

The article focuses on the role of proverbs as the source of folk wisdom, means of expressing national character and culture specificity; and also peculiarities of their use at foreign language classes. In the research paper proverbs are presented as the language awareness product, which reflects people's historical life experience, traditions and culture; the analysis of essence, content and structure of proverbs has been done, characterizing their expressiveness and brevity, which enable to reveal specifics of people mentality, their mind and identity. Special attention is paid to the use of proverbs at foreign language classes for improvement of learners' inter- cultural and socio cultural knowledge; familiarizing them with the culture of the studied language; development of students' foreign language communicative skills and habits, that are important for their intercultural communication with native speakers of the studied foreign language. Examples of language and speech activities on the use of proverbs, directed to the enhancement of learners' communicative skills in different aspects of the language, the role of proverbs in the development of students' oral and written foreign language communication are given in the article.

The function of a language is not only transferring messages, but first and foremost is the transmission of what we report. There is a «space of meanings» fixed in the language knowledge about the world, about the national characteristics of a particular community speaking this language. Language picture of the world is formed as the set of knowledge about the world, reflected in vocabulary, grammar, phraseology.

National character is the elusive phenomenon of ethnicity. Culture, history, living conditions and activities of any nation form a certain psychological features, peculiar to this nation (ethnic group), perceived as one of its characteristics. These psychological traits relate to certain phenomena. For example, the degree of conscious regulation of emotions and feelings of each nation is different: some people are more reserved others more emotional and direct in expressing their feelings and moods.

What is national character? Does it exist? Is it possible to generalize typical features in the scale of the whole, when people are different? It takes all sorts to make a world, says the English proverb. Should we believe that nation is those people from different varieties with their own individual features? The definition of the concept «national character» is very complex and contradictory. We consider the views of various authors regarding the concept of «national character».

S.M. Harutyunyan defines the national character as a kind of national flavor of feelings and emotions, ways of thinking and actions under the influence of conditions of material life, the peculiarities of historical development of this nation and that is manifested in the specificity of their national culture. N. Dzhangildin defines the national character as a combination of specific psychological features, that is the characteristic of the particular socio-ethnic community in the specific economic cultural and environmental conditions of its development.

For the revealing peculiarities of the national character of people of the country of the target language, particular interest and relevance represent proverbs, as they are the product of linguistic awareness of people, transmitted from generation to generation. Proverbs reflect the rich historical experience of people, ideas associated with work, lifestyle and culture of people. Correct and appropriate use of proverbs gives speech a unique originality and special expressiveness. As noted by M. Sholokhov: «...in none of the forms of language folk creativity people's mind is described with such a power, its national history, social structure, everyday life, worldview are reflected so clearly as in proverbs».

According to this scheme, proverbs are characterized by their conciseness and brevity, have their roots back centuries, reflect a true phenomenon and are the source of folk wisdom.

Such expressive means as an exact rhyme, ordinary form and brevity are peculiar to proverbs that made them memorable and necessary in speech. In such sayings people expressed a special characteristic of their people mindset, identity, spirit and character, a way of judgment, moral beliefs. The main purpose of proverbs is to give a national assessment of the phenomena of reality, expressing their worldview. Having studied proverbs and sayings of people it's much easier to understand the mindset and character of the nation that is an important component of intercultural communication.

Proverbs as a whole cover a large part of the human experience. Due to the generalized nature of the structure of proverbs, they can be used at different stages of learning a foreign language,

which in its turn will contribute to the development of foreign language communicative competence of students through the expansion of socio-cultural knowledge, enriching students' vocabulary.

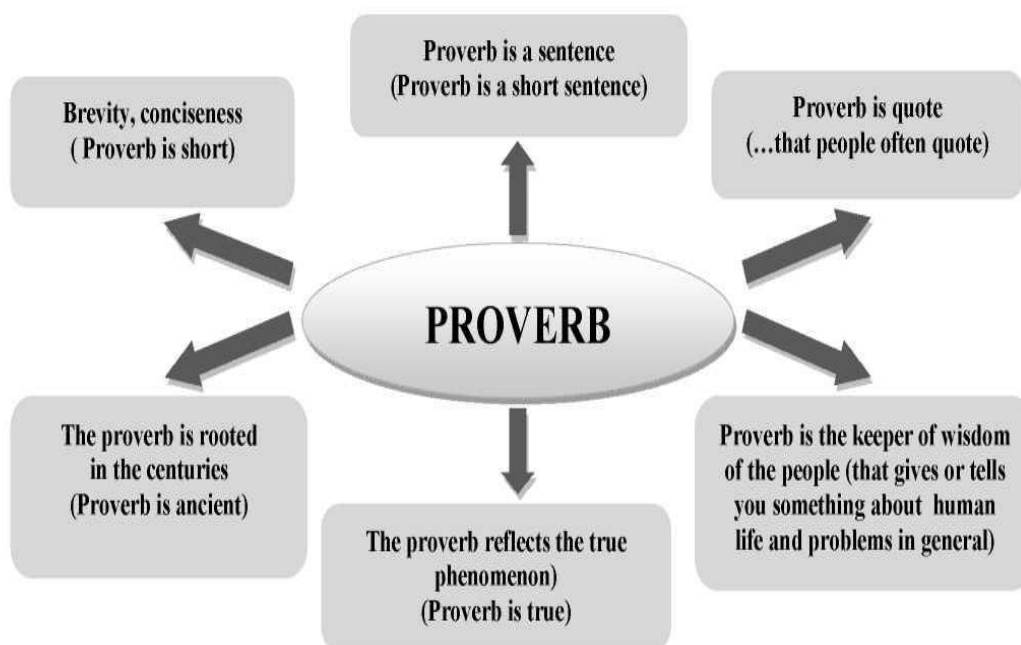


Figure 1. The conceptual content of the term «proverb» by M. I. Dubrovin

Proverbs can be used in the process of learning different aspects of a foreign language. Let's consider using proverbs as a means of improving phonetic skills of the students. Students are offered proverbs and sayings for practicing difficult English sounds that are absent in the native language of pupils, that can be used as a phonetic training to improve auditory-phonetic and rhythmical-international skills. For instance, proverbs *Where is a will there is a way*, *When the cat is away, the mice will play*, *We do not know what is good until we have lost it* are used for practicing mouth-labial sound;

Wealth is nothing without health, *Birds of feather flock together*, and *He was born with a silver spoon in his mouth* for testing the interdental sounds. Difficult sounds are pronounced first in isolation, then in words where this sound occurs in phrases and sentences. Both choral and individual work is conducted. Regular use of the proverbs in English language, selected according to phonetic principle gives a positive result in training and improvement of phonetic skills of students.

Moreover, proverbs contribute to the development of communicative skills of students that are necessary for intercultural communication with native speakers of the studied foreign language and learning their culture. Thanks to proverbs, students become familiar with spiritual heritage, national character of representatives of the foreign culture, their way of thinking and expressing thoughts. Proverbs are a source of development of human values in a broad sense, as students become acquainted with the national values and characteristics of another culture, feels themselves as a part of the intercultural space, at the same time they preserve their own national identity. Systematic and purposeful use of proverbs in foreign language classroom greatly

enhances the quality of teaching and learning process and promotes the formation of foreign language communicative competence of students.

REFERENCE

1. 1. Komensky, Y.A. (1939). Velikaiadidaktika [Great didactics]. Moscow: Hosudarstvennoeuchebno-pedahohicheskoeizdanie [in Russian].
2. Ushinsky, K.D. (1948). Sborniksochinenii [Collected works].(Vol. 2). Moscow: Izdatelstvo APN RSFSR [in Russian].
3. Sayanaya, N. N. (2010). Poslovitsy kak sposob konnotatsii (naprimererusskoho, anhliiskoho i frantsuzskohoyazykov) [Proverbs as a way of connotation (on the example of Russian, English and French languages)]. Proceedings from Problems of Psychology, Philology and Intercultural Communication: XI nauchno-prakticheskaiakonferentsiiaprepodavatelei, studentov, aspirantov i molodykh uchennykh – XI scientific-practical. Conf. prep, students, asp. and young scientists.(pp. 136–141). Taganrog: Izdatelstvo TIU i E [in Russian].
4. Belaya, E.N. (2011). Teoriia i praktika mezhekulturnoi kommunikatsii [Theory and practice of intercultural communication]. Moscow: Forum [in Russian].
5. Erofeev, N.A. (1982). Tumannyi Albion. Anhliia i anhlichanehlazamiruskikh 1825–1853 [Foggy Albion]. Anhliia i anhlichanehlazamiruskikh [England and the British through the eyes of the Russians 1825–1853]. Moscow: Nauka [in Russian].



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ENVIRONMENTAL AND ECONOMIC IMPLICATIONS OF PAPER RECYCLING

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ABSTRACT

The method of paper recycling and bleaching has been investigated in the current article. The collecting of waste paper and cardboard is economically and ecologically inevitable due to geographical and temporal dispersion and the necessity to develop suitable methods, particularly in urban regions. The collection of waste paper in industrialized nations is managed in such a manner that waste paper is prevented from entering the waste cycle from the start. However, in third-world countries, despite having sufficient technical knowledge, the process does not work well for a variety of reasons, including a lack of regulatory organizations, a lack of sense of responsibility among professionals in the field of recycling, and public ignorance, and it is necessary to pay attention to proper waste paper collection. Due to the presence of valuable materials in municipal solid waste, which is sometimes referred to as "dirty gold," the municipality must spend a lot of money to collect them (75 to 80 percent), and often this waste can be recovered and buried in the ground by using proper and technical planning based on accurate and reliable data. Economic variables, the most significant of which are inflation, environmental issues, consumer patterns, raw resources, technology, and products are the most important elements influencing paper recycling, according to the findings of this research. Separating waste paper from the source is also the best method to collect it for recycling.

KEYWORDS: *Environment, Fossil Fuel, Recycling Paper, Renewable Energy, Waste Paper.*

1. INTRODUCTION

The effect of energy consumption in manufacturing is a major problem in paper recycling. Processing waste paper for paper and board production necessitates the use of energy generated from fossil fuels like oil and coal[1]. Waste paper processing, unlike the manufacture of virgin fiber based chemical pulp, does not provide a thermal surplus, therefore thermal energy must be supplied to dry the paper web[2]. However, if waste paper could be recovered for energy, the demand for fossil fuels would be decreased, which would have a positive influence on the carbon dioxide balance and greenhouse effect. Furthermore, pulp manufacturing from virgin fibers necessitates the use of round wood, which emits air-polluting chemicals, as does waste paper collecting. Consumers and politicians have turned to the forest sector as an easy target for their environmental goals. This has prompted calls for reforms in the industrial forest production system in nations like as Germany, Sweden, and the United States[3].

The Scandinavian forest sector is concerned that European Union or individual country political choices would impose a set usage rate for waste paper in paper and board manufacturing. If the environmental effects of alternative applications are not thoroughly examined, such choices may result in sub-optimal waste paper usage. Energy recovery and landfill are two important alternatives to recycling for paper manufacturing[4]. When Western Europe is split into two areas, a basic sketch of fiber flow connections may be seen. Though greater recycling is widely considered to be desirable and essential, the advantages of paper recycling have not been thoroughly studied. In a number of nations, waste management policy is defined by a hierarchy of choices, with waste reduction, reuse, and recycling all being preferred over energy recovery. This, in turn, is thought to be better than landfill[5]. Any evaluation of recycling, on the other hand, should compare the effects, costs, and advantages of recycling to those of other waste disposal alternatives. This is the primary goal of the article. The manufacturing procedures are described using an engineering methodology. However, both economic and environmental factors are taken into account. Under different assumptions, the Model produces optimum fiber flows. In 2011, the United States recycled 66.8% of their paper use. More paper is collected for recycling than plastic, metal, and glass combined, and every ton of paper recycled saves more than 3.3 cubic yards of landfill space. Because 87 percent of us have access to curbside or drop-off recycling for paper, it's a material we're accustomed to recycling[6]. Furthermore, in 2011, 76 percent of paper mills utilized some recovered material, indicating that the paper you toss away is making its way into a variety of new goods. The process of converting old paper into new paper may seem to be complicated, but it is really very simple.

You could even attempt recreating this technique with anything from old wrapping paper to junk mail if you're feeling adventurous. Paper recycling, on the other hand, enables us to conserve both energy and materials on a large scale. According to the EPA, recycling one ton of paper saves 17 trees, 7,000 gallons of water, and 463 gallons of gasoline. Continue reading to learn more about how the process works and how to recycle paper properly. Because it has previously been recycled many times, newspaper is a lower quality paper, while printer paper is a better grade paper[7]. The length of the fibers in a piece of paper determines its grade, which shortens with each trip through the recycling process. According to the EPA, after five to seven recycling cycles, the fibers become too short to produce new paper and must be combined with fresh fibers. Have you ever heard of paper having "seven generations"? This term refers to the number of times paper fibers may be recycled before becoming too short.

According to the EPA, there are five main paper grading classifications. While these phrases are primarily helpful to paper mills seeking to process certain types of paper, you may hear them from time to time and need to know how to differentiate between them[8]. Now that you know how paper is turned into new paper, you need to know how you may recycle correctly as a consumer. For example, you may sometimes come upon a kind of paper that you don't know what to deal with. Understanding some fundamental paper terminology – such as those for various types of paper and different types of recycling – may help you put the correct items in the right bin in such circumstances. You may still have questions regarding paper recycling after you know what kinds of paper recycling are accessible to you and which types of paper are recyclable[9]. Here are a few often misunderstood things. Have you ever wondered whether shredded paper might be recycled? Yes, but there may be certain limitations in your area regarding the size of the shredded pieces and how the paper is contained.

For further information, contact your local recycling program. Equipment at paper mills that recycle recovered paper, believe it or not, is intended to remove staples and paper clips, so you don't have to remove them before recycling. However, removing paper clips so that they may be reused is generally in your best interest. The Model takes into account the environmental impact of all important activities and transportation; for example, the carbon dioxide balance is computed in the system. As a result, the Model not only calculates industry-related fiber cycles, but also the function of forestry and forest products in the climatologically significant carbon dioxide circulation. The environmental impacts of the many activities in the overall system are also calculated using the same approach as in certain life cycle assessments. An environmental load index value is assigned to each emission and usage of nonrenewable resources such as oil and coal (ELU-index). The ELU-index is based on the EPS-system, which stands for Environmental Priority Strategies in Product Design.

The concept is based on people's willingness to pay to prevent the negative effects of certain pollutants. We track all manufacturing processes and emissions rather than focusing on just paper and board manufacture, which is the standard approach for life cycle analysis. Scandinavia (Finland, Norway, and Sweden) and Continental Western Europe (the United Kingdom) are the two areas that make up Western Europe. Scandinavia is often referred to as the other region's "lumberyard." Each area has its own production resources as well as a market for paper and energy. The goods are either supplied to the local market or to the international market. Paper is recycled for paper and board manufacture and/or recovered for energy usage after it has served its purpose. Waste paper is collected, sorted, baled, and sent to paper mills in either area for the manufacture of recycled pulp if it can be recycled[10].

2. DISCUSSION

The waste paper is expected to follow the usual waste-handling system if it is recovered for energy consumption. It then takes the place of oil or coal. The gathered paper is eventually sent to Scandinavia or the rest of Western Europe. The price of fossil fuel and round wood determines the value of waste paper. The more waste paper is recovered for energy purposes, the greater the price of oil. In the Model, waste paper that is not repurposed has no economic value and has a negative environmental value. As a result, all waste paper is recovered in the Model. It is expected that there is sufficient capacity for de-ink and energy generation. Newsprint, SC paper, LWC, office paper (wood-free), coated paper (wood-free), tissue, white lined chipboard, return fiber chipboard, wrapping paper, white liner, Kraft-liner, and fluting are among the twelve paper

grades produced by the Model. For each product, recipes indicate the amount of fiber, filler, and calories required. In order to maintain the desired quality of the goods, the Model selects between virgin and recycled fibers. There are five distinct flush and market pulps provided.

Non-integrated paper mills in other areas of Western Europe get dried pulp in sheets from Scandinavian manufacturers. For each pulp quality, the amount of pulp wood short and long fibers and energy required is given. Paper is made using the leftover energy from pulp manufacturing. Back-pressure power or condensation power plants that burn coal, oil, wood, or waste paper may generate electricity. Hydroelectric power facilities, on the other hand, are the primary source of energy in the Nordic nations. The Forestry section of the Model explains how the forest absorbs CO₂. Energy is used and expenses are incurred as a result of timber harvesting and transportation. The energy required in fertilizer production is also taken into account. The pulp mill module explains how to make pulp from wood as a raw material. Electricity, thermal energy, and chemicals are used in addition to wood. The pulp mill's extra energy may be put to good use in the paper mill. Back-pressure steam turbines and condensing turbines may both generate electricity. Waste paper pulp is made from recovered paper in the de-inking mill module. The model estimates the costs of using low-quality waste paper.

Other than that, the calculations are identical to those for the pulp mill. The fiber composition of each particular product is used to determine both the yield of the process that generates recycled pulp and the energy value in waste paper. The impact of filler is also taken into account. The composition of the paper affects the efficiency of the recycled pulp mill and the thermal energy recovered from burning it. The Model's paper mill module explains how paper is made from virgin pulp and waste paper pulp. In addition, several kinds of energy and fillers are used. Emissions to the atmosphere and water are measured and recorded. Different quantities of recovered paper from various goods may be used to make the paper products. Incorrect combinations, however, are prohibited by the Model's restrictions. When creating wood-free characteristics, for example, wood-containing paper is not utilized. In the model, waste paper collection necessitates the use of energy in the form of diesel fuel, electricity, and other resources with variable costs. Standard environmental emissions are taken into account. The amount of resources required varies based on the product and the location. The energy and financial resources required to gather paper are increasing. The resources required to gather the final 30% of consumption, for example, are three to six times greater than those required to collect the first 30%, depending on quality. It's believed that there's enough industrial capability to recycle waste paper into fibers or electricity. This means that, even if it is a possibility, the recovered waste paper does not end up in a landfill since it has economic worth for both paper and energy generation. Energy is required for all activities, including transportation. All of the energy in the model is produced in an energy plant, which also calculates environmental emissions.

Energy may be bought, however certain types of energy, such as all diesel-fueled transportation, cannot be replaced. On the other hand, electricity and heat may be produced using both fossil fuels (oil or coal) and the burning of fiber products. Energy may be created from both water and fossil fuels in Scandinavia, while electricity generated from fossil fuels is required throughout the rest of Western Europe. Emissions, of course, are impacted. Prices, efficiency, manufacturing costs, and transportation costs are among the model's input data. Each paper quality's fiber supply and energy requirements are given. The amount of wood and energy required, as well as the environmental emissions generated during the manufacturing process, are given for each kind

of pulp. The Swedish Pulp and Paper Research Institute and the MoDo Company databases are among the data sources. Data from Germany is considered to be representative of the situation throughout Western Europe. An overview of the literature on the environmental implications of using waste paper in Sweden.

The report includes useful information on sludge, chemical usage, transportation, energy consumption, and emissions to the air and water. It's worth noting that although the statistics for Sweden is regarded trustworthy, the data for the rest of Western Europe might be better. For the year 1990, comprehensive data on the production and trade of Western European forest products was gathered. This was the year in which the most recent data for the nations examined was available. We pushed the model to preserve trees in Scandinavia by recycling fibers in the following two instances. It maximizes the utilization of waste paper for energy recovery and recycling, given the constraints. We minimize the cost of production for the forest industry in the first scenario, and we minimize the burden on the environment in the second situation, as assessed by the ELU-index. In 1990, Western Europe, excluding Scandinavia, had a utilization rate of 53%. The rate is unlikely to drop in the future; on the opposite, it is likely to rise. The model is permitted to utilize a range for the Western European utilization rate while determining the optimum solution. It's difficult to define the top range end of the utilization rate given the economic, technological, and practical constraints.

As a result, we've estimated that this ceiling is 20 percentage units higher than the current level, or 73 percent. When economic optimization is applied, the utilization rate for Western Europe, excluding Scandinavia, reaches the maximum of 73 percent. When environmental optimization is performed, the utilization rate is reduced to the lowest possible level, which is 53%. In this case, an economic optimization is done, i.e. the forest industry's marginal income is optimized. Because of the 'forced' utilization rates in the Scandinavian forest pulp and paper sector, the model is free to utilize recycled fibers in whichever manufacturing processes generate the most money. In the remainder of Western Europe, the forest sector finds a solution with a utilization rate of 53 to 73 percent. The economic answer is found at the top limit, as previously stated. When the entire use of recycled fibers in Scandinavian paper and board manufacturing varies, the total environmental effect for Western Europe as a change in the ELU-index. It also shows the variation in load depending on whether energy in Scandinavia is generated by hydropower or fossil fuels.

If energy is generated from fossil fuels, and the percentage of de-inked pulp used rises from 5 to 60%, the environmental burden reduces at first, then increases. The curve is rather flat, with a minimum utilization rate of about 30%. Initially, de-inked pulp replaces thermal mechanical pulp, but this potential fades with time. A pulp mill generates excess energy, which is utilized to dry the paper web. This energy excess must now be replaced by fossil-fuel-based energy. This implies that the minimal level is determined by the current pulp production structure in Scandinavia, i.e. the balance between chemical and thermomechanical pulp production. If the energy is hydroelectric, the disadvantage of recycling is much higher. The result of a higher utilization rate in this instance is a continual rise in oil consumption.

Another example is the compulsory use of waste paper in the production of newspaper and office paper. A comparison between hydroelectric power and fossil energy is performed as previously stated. If a condensing turbine power plant is utilized, this equates to about 20 GJ of heat energy per ton. If utilized for energy recovery after consumption, 11.5 GJ of heat per ton will be

generated. As a result, when TMP is utilized, the overall energy savings for the whole system is about 7 GJ of heat per ton. The thermo-mechanical pulping process no longer transforms electricity into heat energy, which is required in the paper-making process, when paper is recycled as fibers. The cheapest accessible alternative, fossil (oil) energy, compensates for this energy loss. In addition to being a nonrenewable resource, burning oil for energy generates emissions, the most significant of which is carbon dioxide. If, on the other hand, the energy used to make newsprint comes from fossil fuels, a higher utilization rate is good for the environment. This is because the energy needed to create TMP in this instance is generated from fossil fuels in inefficient condensing power plants (40 percent). When electricity is not required, like when waste paper is utilized, it is more cost-effective to generate heat directly from fossil fuel. The de-inking process (2 G J/ton) and the paper mill (5.1 G J/ton) both need thermal energy.

As a result, instead of receiving 6 GJ of thermal energy, 7.1 GJ of heat per ton must be added. The usage of electric energy, on the other hand, is just 5.2 GJ/ton, which is 5.3 GJ/ton less than when TMP is used. Discrepancies in wood and waste paper transit contribute just a little amount to the ELU-index differences. The index does, however, show a slight rise in environmental effect, owing to higher emissions. In this final example, the ELU-index is used to make an environmental optimization. Given the 'forced' utilization rates in the Scandinavian forest pulp and paper sector, the model is free to utilize recycled fibers in whichever manufacturing processes reduce environmental impact. The model may, as in the previous instance, provide a solution for the forest sector in the remainder of Western Europe with a utilization rate of 53 to 73 percent. The environmental answer for the remainder of Western Europe is located at the lower limit, as previously indicated. When the entire use of recycled fibers in Scandinavian paper and board manufacturing varies, the total environmental effect for Western Europe as a change in the ELU-index. It is believed that, at least on the margin, the altered usage of power in Scandinavia is based on fossil fuel. Given a utilization rate of 53% in the rest of Europe, the figure indicates that a 'forced' utilization rate of about 30% in Scandinavia is environmentally advantageous. However, from 5% to the lowest threshold, the slope is rather flat.

The curve for the environmental effect has the same form as the curve for oil consumption. Oil usage has reduced by approximately 4 million m³ when compared to the preceding scenario. This is because the utilization rate in the remainder of Western Europe has dropped from 73 to 53 percent, resulting in an increase in thermos mechanical pulp output and excess energy that may be utilized to dry the paper web. Comparing the outcomes of economic and environmental improvements is also fascinating. An economic optimization was carried out, with the usage rate for the remainder of Western Europe being the same as when an environmental optimization was carried out, i.e. 53%. The changes between the two optimizations are extremely minor. The market solution gets very near to an ecologically beneficial option for a fixed use of virgin fibers throughout the remainder of Western Europe, and with the current factor prices and levies.

3. CONCLUSION

In a number of nations, waste management policy is defined by a hierarchy of choices, with waste reduction, reuse, and recycling all being preferred to energy recovery, which is then preferred to disposal. The problems are complicated, and the science for evaluating them, life cycle analysis (LCA), is still in its early stages. There has been little research on the advantages of paper recycling. Alternatives were investigated using the LCA concept and a systems analysis methodology at the same time. When compared to conventional life cycle analysis, this method

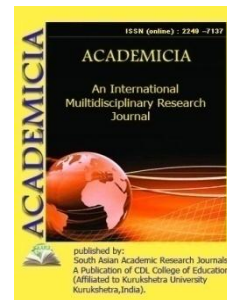
has the benefit of looking at the whole system. While a modification is made in one component of the system, such as a requirement on the utilization rate when manufacturing newspaper, the implications for fossil fuel use in other areas of the system are measured and considered.

The findings highlight the significance of a systems analysis approach and the need to consider all long-term implications. Different fiber grades are required for different products. It is in humanity's best interests to reduce carbon dioxide levels in the atmosphere in order to prevent global warming. Maximum energy recovery from waste paper would only have a little impact on Western Europe's carbon dioxide balance (a few percent of total fossil fuel consumption in Western Europe). Increased manufacture of wood-based pulp or the use of waste paper as fuel are two examples of developments that contribute to the substitution of fossil fuels and, as a result, a reduction in anthropogenic carbon dioxide emissions. Another option is to increase the land area covered by planting trees that absorb carbon dioxide. The amount of paper and paper products in household trash, coupled with the shortage of disposal capacity, is a significant issue in many countries and a driving factor for regulation. These reasons combine to create a compelling case for waste paper collecting, particularly in Western Europe's highly populated nations. The issue of whether the collected paper is recycled as a raw material for paper or for other uses is a complex one.

REFERENCES:

1. S. Byström and L. Lönnstedt, "Waste paper usage and fiber flow in Western Europe," *Resour. Conserv. Recycl.*, 1995, doi: 10.1016/0921-3449(95)00027-G.
2. R. Grace, R. K. Turner, and I. Walter, "Secondary materials and international trade," *J. Environ. Econ. Manage.*, 1978, doi: 10.1016/0095-0696(78)90025-6.
3. R. Grace, R. Kerry Turner, and I. Walter, "Secondary materials and international trade: Reply," *J. Environ. Econ. Manage.*, 1979, doi: 10.1016/0095-0696(79)90004-4.
4. A. K. Duraiappah, Z. Xin, and P. J. H. Van Beukering, "Issues in production, recycling and international trade: Analysing the Chinese plastic sector using an optimal life cycle (OLC) model," *Environ. Dev. Econ.*, 2002, doi: 10.1017/s1355770x02000049.
5. A. Terazono *et al.*, "Current status and research on E-waste issues in Asia," *J. Mater. Cycles Waste Manag.*, 2006, doi: 10.1007/s10163-005-0147-0.
6. H. Buchner, D. Laner, H. Rechberger, and J. Fellner, "Potential recycling constraints due to future supply and demand of wrought and cast Al scrap—A closed system perspective on Austria," *Resour. Conserv. Recycl.*, 2017, doi: 10.1016/j.resconrec.2017.01.014.
7. A. Kolk and L. Curran, "Contesting a Place in the Sun: On Ideologies in Foreign Markets and Liabilities of Origin," *J. Bus. Ethics*, 2017, doi: 10.1007/s10551-015-2897-5.
8. R. Kahhat and E. Williams, "Materials flow analysis of e-waste: Domestic flows and exports of used computers from the United States," *Resour. Conserv. Recycl.*, 2012, doi: 10.1016/j.resconrec.2012.07.008.
9. W. Hartanto, "Penegakan Hukum Terhadap Kejahatan Narkotika dan Obat-Obat Terlarang dalam Era Perdagangan Bebas Internasional yang Berdampak pada Keamanan dan Kedaulatan Negara," *J. Legis. Indones.*, 2017.

- 10.** A. Terazono, A. Yoshida, J. Yang, Y. Moriguchi, and S. Sakai, “Material cycles in Asia: especially the recycling loop between Japan and China,” *J. Mater. Cycles Waste Manag.*, 2004, doi: 10.1007/s10163-004-0115-0.



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AN OVERVIEW OF THE WORLDWIDE PROBLEM OF ANTIBIOTIC RESISTANCE: A REVIEW

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ABSTRACT

Antibiotics, which have previously revolutionized medical research, are now under jeopardy due to the emergence of multidrug resistance among dangerous microorganisms. The abuse of antimicrobial medicines, as well as the unavailability of newer treatments owing to stringent regulatory restrictions and decreased commercial incentives, has been blamed for the antimicrobial resistance problem. Emergent bacteria, resistance mechanisms, and antimicrobial drugs must all be studied in order to slow the rate of resistance. Health-care environments, as well as the environment and agricultural sectors, need multidisciplinary approaches. Probiotics, antibodies, and vaccinations are examples of progressive alternative treatments that have showed encouraging outcomes in studies, suggesting that they may be used as preventative or supplementary therapy in the future.

KEYWORDS: *Antibiotics, Antimicrobial Resistance, Alternative Therapies, Evolution, Multidrug Resistance.*

1. INTRODUCTION

Antibiotic resistance is a long-standing concern, and the "resistome" is a dynamic and growing issue. Overpopulation, increasing worldwide movement, increased use of antibiotics in clinics and livestock production, selection pressure, inadequate sanitation, wildlife dispersal, and a poor sewage disposal system are all factors that contribute to the global resistome. Antibiotic therapy is one of the most used methods of infection control in contemporary medicine. Many antibiotics were developed during the "golden era" of antibiotics, which lasted from the 1930s through the 1960s. Unfortunately, due to researchers' inability to keep up with the speed of antibiotic discovery in the face of developing resistance bacteria, this period came to an end. Predisposing factors for the development of antibiotic resistance include a persistent inability to create or find new antibiotics, as well as indiscriminate antibiotic usage.

Antimicrobial resistance (AMR) is a significant worldwide hazard to human, animal, and environmental health that is gaining traction. The development, spread, and persistence of multidrug-resistant (MDR) bacteria, often known as "superbugs," is to blame. MDR bacteria may be found in the animal, human, and environment triangles or niches, and these diseases are all interconnected. Excessive use of antibiotics in animals (food, pets, aquatic), antibiotics sold over-the-counter, increased international travel, poor sanitation/hygiene, and release of nonmetabolized antibiotics or their residues into the environment through manure/feces are all possible causes of "the global resistome" or AMR. These variables lead to the development of MDR bacterial illnesses in the population due to genetic selection pressure.

The worldwide use of antimicrobials in cattle has recently shown hotspots of antibiotic usage across continents, which will have economic and public health implications in the coming years. Antibiotics are widely used in food animals such as cattle, poultry, and pigs, and it is predicted that by 2030, their usage would have increased by 67 percent in the world's most populous nations. The effectiveness of an antimicrobial agent is harmed by the potential for tolerance or resistance to develop from the first time it is used. Antimicrobial agents used to treat bacterial, viral, fungal, and parasitic illnesses fall under this category. Several physiological and pharmacological processes may be at play as this resistance develops. It's important not to exaggerate the complexity of all the processes involved in the development and spread of resistance. Furthermore, a critical issue is the absence of basic data on these particular topics, which has resulted in a lack of major accomplishments in managing resistance development. Various institutions and organizations across the world have acknowledged this significant worldwide public health issue. Numerous suggestions and resolutions have been presented, as well as several reports, but little progress has been achieved so far. Antibiotic resistance is, unfortunately, a never-ending problem[1].

Antibiotics were discovered at a pivotal point in human history, revolutionizing medicine and saving many lives. Unfortunately, these "magic bullets" have been accompanied by diseases that have developed resistance to them. Medical professionals are now expressing grave worry about a return to the pre-antibiotic era. Fortunately, over 20,000 putative resistance genes (r genes) have been discovered after analyzing the available bacterial genomes; nevertheless, functional resistance determinants in different microorganisms are much fewer in number. Antibiotic resistance to various antimicrobial drugs was initially identified in intestinal bacteria, such as *Salmonella*, *Shigella*, and *Escherichia coli*, in the late 1950s and early 1960s. These resistant strains caused massive clinical, economic, and human-life losses, mostly in poor countries. In the

industrialized world, however, it was seen as a minor health issue limited to intestinal bacteria. This myth was dispelled in the 1970s when it was discovered that *Neisseria gonorrhoeae* and *Haemophilus influenzae* are both ampicillin resistant, with *Haemophilus* also resistant to tetracycline and chloramphenicol. Antimicrobial resistance has increased as a result of increased usage, especially in poorer countries where these medicines were readily available without a prescription.

Inadequate hygienic conditions aided resistance propagation, and insufficient health-care funding restricted access to new and effective antibiotics. Antibiotic resistance has been designated a "global public health issue" by a number of influential organizations, including the Centers for Disease Control and Prevention (CDC), the Infectious Diseases Society of America, the World Economic Forum, and the World Health Organization (WHO). The World Health Assembly has asked WHO to develop a worldwide action plan to address the issue of antibiotic resistance. The recent release of a book titled "The growing danger of antimicrobial resistance alternatives for action" has added to the issue's value. People in the United Kingdom voted for a £10 million government-sponsored award (the Longitude Prize challenge) to develop new antibiotic resistance-fighting methods. By 2015, President Barack Obama has instructed the National Security Council to develop a comprehensive national action plan to combat antibiotic resistance, based on the recommendations of the US President's Council of Advisors on Science and Technology.

Antibiotic resistance does not seem to be decreasing globally, but it may be shifting in the wrong direction. Antibiotic resistance has a complex etiology, and its effects are seen all across the world. Several efforts have been made to define the various elements of antibiotic resistance, as well as potential remedies to address this worldwide problem. However, a well-coordinated effort is missing, especially at the governmental level across the globe. 16 Antibiotics have played a pivotal part in social and medical evolution, and they are now required in all health-care systems. Without efficient antibiotic treatment to prevent bacterial infections, contemporary medicine's successes, such as organ transplantation, cancer treatments, preterm baby care, and a multitude of sophisticated major operations, would not have been feasible. If comprehensive global action plans are not implemented soon, we may face grave consequences in terms of social, medical, and economic possibilities. We attempt to depict the global scale, main etiologies, and effects, as well as highlight important regions that need immediate attention[2].

1.1 The Emergence of Antibiotic Resistance:

Microorganisms have evolved rigorous methods to evade the deadly effects of antimicrobial compounds as a result of Darwinian selection. The majority of antibiotics are generated naturally by microorganisms such as saprophytic bacteria or environmental fungus, but some are modified synthetic antibiotics and a few are entirely synthetic, such as fluoroquinolones and sulphonamides. Various species have developed defensive mechanisms against them, including changes in the target location, drug entrance or distribution blockage, and enzyme synthesis that may destroy antimicrobials. As a result, antibiotic resistance may simply represent Darwinian competition from natural antimicrobial components generated from microbes. 29,30 The results of a functional meta-genomic study of soil microorganisms showed a wide range of genetic factors linked to antibiotic resistance. Although little is known about this feature in human infections, enzyme synthesis (-lactamases) is an unusual example of a naturally occurring resistance mechanism that has an effect on human health. Although few results suggested a more

complex relationship, it is thought that different antimicrobial compounds generated by saprophytic bacteria inhibit the development of other species present in that environment, providing a reciprocal advantage in such environments. The concentration of antimicrobial compounds in the soil seems to be considerably lower, and may not be able to prevent the development of adjacent bacteria, according to the researchers. Second, evidence suggests that antimicrobials at sublethal concentrations have a substantial influence on microbial physiology and evolution, and that they may function as efficient signaling molecules that drive host or microbial gene expression. Another significant question is why just a few saprophytic bacteria generate carbapenems, a kind of broad-spectrum antibiotic. Several genes involved in carbapenem production may be involved in biofilm development and quorum sensing. These results raise additional questions about the drugs' unintended consequences. Resistance does not just develop against natural antimicrobials; it also develops against synthetic antimicrobials[3].

2. REVIEW OF LITERATURE

J. Davies in his study talks about many of the routes that are responsible for the release of resistance-driving substances into the environment are monitored and controlled by environmental authorities (e.g., antimicrobials, metals, and biocides). As a result, environmental regulators should play a key role in the creation of global and national antimicrobial resistance (AMR) action plans. The absence of environmental-focused mitigation measures in current AMR action plans is considered to be a result of our lack of basic knowledge of many of the major problems. Here, we'll look at the issue of AMR in the environment through the eyes of an environmental regulator, using the Environment Agency (England's regulator) as an example to draw worldwide similarities. The issues that are important to environmental regulators are outlined in order to answer the following questions: What are the AMR's drivers and pathways? What are the implications for environmental regulators' regular job, powers, and responsibilities? What are the information gaps that prevent environmental protection from AMR from being delivered? We provide a series of thought experiments that demonstrate how various mitigation methods may work. We conclude that: (1) AMR Action Plans do not cover all potentially relevant AMR routes and drivers in the environment; and (2) AMR Action Plans are inadequate in part due to a lack of research to guide policy, which must be addressed[4].

T. P. Van Boeckel et al. in his study discloses that antimicrobials are important medicines whose effectiveness is jeopardized by antimicrobial resistance's development and dissemination. Antibiotics are given to food animals for a broad range of nontherapeutic reasons, including growth enhancement. Concerns about the development of resistance and its dissemination to humans as a result of nontherapeutic antimicrobial usage have resulted in a slew of contradictory behaviors and viewpoints. Based on the "precautionary principle," substantial evidence supports the elimination of nontherapeutic antimicrobials (NTAs) in Europe. Even yet, solid scientific proof of the benefits and drawbacks of NTAs is not apparent to all stakeholders. Antibiotic resistance in microorganisms linked with animals fed NTAs and their food products has been found in significant amounts. This resistance spreads to other animals and people both directly and indirectly via touch, the food chain, water, air, and manured and sludge-fertilized soils, among other things. Modern genetic methods are helping to unravel the ecological effect of NTAs, but modeling efforts are hampered by a lack of crucial information on microbial and antibiotic doses at each step of the transmission chain. Nonetheless, the increasing body of data documenting the transmission of resistant bacteria from animals to humans, including that

resulting from the use of NTAs, recommends discontinuing NTA usage in order to decrease the growing environmental burden of resistance genes[5].

N. Zisko et al. in his study discloses about the antibiotic therapy of serious illnesses and the execution of medical and surgical operations under the protection of antibiotics are two main ways that contemporary medicine saves lives. However, we have not kept up with microorganisms' capacity to evolve resistance to antibiotics developed during the golden period of antibiotic discovery, from the 1930s through the 1960s. That period is referred to as "golden" because achievement appeared regular at the time; it is referred to as a "era" since it came to an end. When corporate scientists tried to develop fundamentally novel medicines with action against resistant infections instead of creating variations of existing treatments, they mostly failed. Industry shifted its attention to medicines that prevent or ameliorate noninfectious illnesses after a series of expensive failures to find new antibiotics that would be destined for short-term usage even if they gained regulatory clearance. As individuals in richer areas run out of effective antibiotics, they are forced to share them with those in poorer areas who couldn't buy them in the first place[6].

3. DISCUSSION

3.1 The Global Economic Scenario of Antibiotic Resistance:

Estimating the precise economic effect of antibiotic-resistant bacterial diseases remains a major worldwide problem. In this case, determining the illness distribution linked to antibiotic resistance is critical. Antibiotic resistance is a significant financial burden for the whole globe. Antibiotic-resistant pathogen-associated hospital-acquired infections (HAIs) kill 99,000 people per year in the United States alone. About 50,000 Americans died in 2006 as a result of two prevalent HAIs, pneumonia and sepsis, costing the US economy \$8 billion. Antibiotic-resistant bacterial infections need at least 13 days in the hospital, resulting in an extra 8 million hospital days per year. There have been reports of costs of up to \$29,000 per patient treated for an antibiotic-resistant bacteria illness. In all, economic losses of approximately \$20 billion have been reported in the United States, with yearly productivity losses of roughly \$35 billion owing to antibiotic resistance in health-care systems.

According to the experts at the Research and Development Corporation, a non-profit worldwide organization based in the United States, a worst-case scenario may emerge in the near future in which the globe is left without any effective antimicrobial agents to treat bacterial illnesses. In this scenario, the worldwide economic burden would be about \$120 trillion (\$3 trillion annually), which is almost equivalent to the current annual US health-care expenditure. In general, the global population would be severely impacted: by 2050, about 444 million people will have died from diseases, and birthrates would be quickly declining. These losses are catastrophic, but owing to data limitations, such as the inclusion of general conditions and illnesses vulnerable to antibiotic resistance, these numbers only provide a partial picture of the economic consequences of antibiotic resistance. The use of antibiotics in animals and the food sector is another important aspect of AMR that was overlooked in the study. It is a key player in the rising AMR, and it may result in its own anticipated economic losses. In many poor nations, the use of antimicrobials as growth promoters is also a common occurrence. This technique has been prohibited in the European Union since 2006.

Current cost estimates for antibiotic resistance are restricted in scope and do not take into account the wider societal benefit of antibiotics. These are predisposing variables that lead to error in estimating the true economic cost that the globe is bearing as a result of this problem. Prospective research should use macroeconomic techniques that include all of the consequences of growing antibiotic resistance, including the decrease in efficacy of different medicines in contemporary medicine, to obtain an accurate estimate of the economic implications produced. The precise assessment of the global economic cost of antibiotic resistance may not be completely determined until these problems are addressed[7].

3.2 Causes of Antibiotic Resistance:

Many variables are now at play in the complex genesis of antibiotic resistance. These include insufficient regulations and usage imprecision's, a lack of awareness in best practices that leads to unnecessary or inept antibiotic use, the use of antibiotics as a growth promoter rather than to control infection in poultry and livestock, and online marketing that made the unrestricted availability of low-grade antibiotics very accessible. Overuse of antibiotics is the primary driver of resistance development, as Sir Alexander Fleming predicted when he said that "the public would want the medicine and then will begin an age... of abuses." Antibiotics kill susceptible germs, but they leave resistant pathogens alone, which multiply and flourish as a result of natural selection. Despite the fact that misuse of antibiotics is highly prohibited, over prescription persists throughout the world. In 30 percent to 50 percent of instances, treatment reasons, agent selection, and antibiotic medication duration are all incorrect, according to many studies. Antibiotics are utilized as a growth enhancer in cattle all over the world. Approximately 80% of antibiotics are marketed in the United States only for use as growth supplements and illness control in animals, according to estimates. In another research, a worldwide map of 228 nations was created to show antibiotic use in cattle; the overall antibiotic consumption was estimated to be 63,151 tons in 2010. Van Boeckel et al. also predicted a 67 percent increase in antibiotic use by 2030, almost doubling in the fast growing and densely populated nations of Brazil, Russia, India, China, and South Africa[8].

3.3 Drivers of antibiotic Resistance:

Understanding the different causes of antibiotic resistance is now the most important step in dealing with this worldwide problem. Antibiotic resistance selection in health care systems, the environment, and agriculture/livestock is a natural process (Figure 1). Sanitation settings, infection control standards, water hygiene systems, medication quality, diagnostics and treatments, and travel or movement restrictions are all significant variables that may contribute to antibiotic resistance. In addition to mutations in different genes on the microorganism's chromosome, the interchange of genetic material across organisms plays an important part in antibiotic resistance dissemination. Plasmid transmission is the most common way for antimicrobial resistance genes to be transferred to a host cell. Antibiotics may affect this process by promoting the transfer of resistance components, as well as exerting a selective strain on resistance development. The demonstration of resistance transmission dynamics has raised awareness and knowledge of how resistant infections spread from one person to the next. The feco-oral route is the most significant mode of transmission at the community level, particularly for resistant Enterobacteriaceae infections, which are typically transmitted owing to sanitation failure. CA-MRSA, which is typically spread owing to extended hospital stays or unsanitary hospital environments, is also an excellent example of understanding the transmission dynamics

of resistance at the human–human level. For resistant *N. gonorrhoeae*, sexual intercourse is also a means of transmission[9].

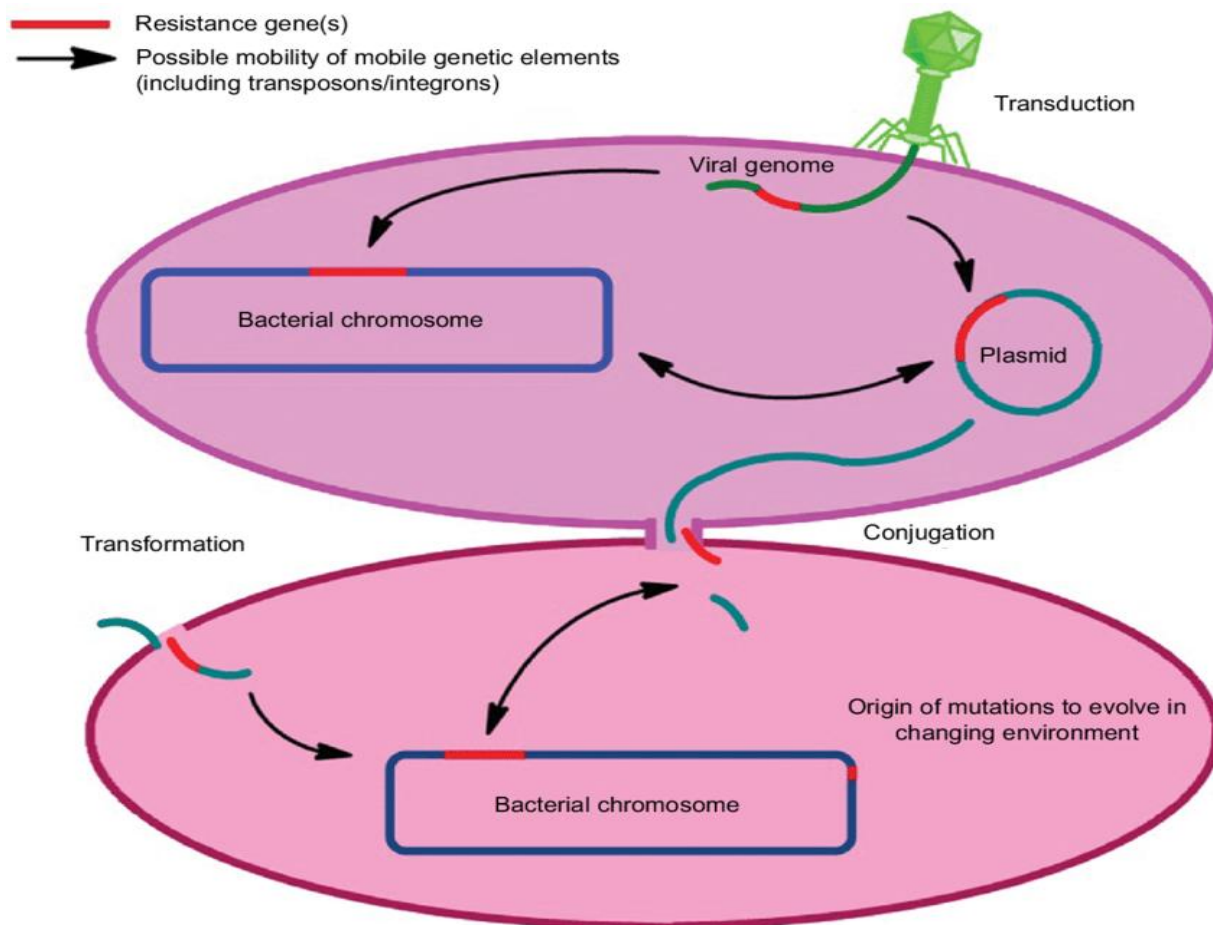


Figure 1: Drivers of antibiotic resistance transmission[10].

3.4 Therapeutic Strategy:

Despite clinical evidence that methods based on small molecule monotherapy are ineffective in resistance situations, infection control has long been a major concern of the evolutionary race. The evaluation of different candidates for infection control throughout the development phase indicates that the emphasis of research would be on new antibiotic discovery and identification. Unfortunately, biotherapeutics such as antibiotics, new combination therapies, and drug delivery methods are still lagging behind the development of novel small molecules, which are often extensions of existing medication classes. Globally, systemic monotherapy approaches are ineffective because resistance has surpassed medication development. Instead of fighting bacterial development, control efforts may be better served by exploring resistance mechanisms based on genetic inspiration, such as furanones used by red sea algae to disrupt resistant bacteria's quorum sensing.

Though biologics are still in their infancy in terms of bacterial infection management, their potential to fight MDR cannot be ignored. Small compounds will always play an important part in infection control; nevertheless, the hunt for a viable therapeutic candidate based on biological

inspiration may be pursued more logistically. Various drug development tools are necessary to address biologics' shortcomings, such as controlled delivery options, partial in vitro stability, insufficient high-throughput, advanced screening tools, inefficient pharmacokinetics, and comparatively unknown pharmacodynamics, but they are not as radical as those available for small molecule development. Between biologics combinations, compounds based on biological inspiration, and medication delivery technologies, a huge potential exists by accident. As a result, a paradigm shift similar to that seen in cancer and complicated viruses might be used to eliminate vulnerable bacteria, manage antibiotic resistance, and protect the host microbiota. A mix of traditional antibiotics, new adjuvants, and feasible restricted delivery methods may be used to create this kind of strategy. Advanced bioinformatics to identify optimal combination delivery and novel targets may offer significant advantages, as opposed to many costly development methods that often fail in trials[11].

Nanotechnology is becoming more widely used in medicine, therefore it is not surprising to find these technologies being used to combat the threat of antibiotic resistance. Nanoparticles may be used in a variety of ways to treat infections therapeutically. They may be combined with currently available antimicrobials to improve their physiochemical action against drug-resistant bacteria. Second, colloidal zinc, silver, copper, and titanium may be employed as antibacterial agents in and of themselves. Antibiotics' main targets are the inhibition or disruption of bacterial cell walls, proteins, and nucleic acids production, but nanoparticles have been found to impact the respiratory system, resulting in the formation of reactive oxygen species, which eventually leads to bacterial mortality. Nanoparticles also target the bacterial cell wall, thus silver nanoparticles, for example, may be used with medicines to increase their antibacterial activity via synergy.

Antimicrobial peptides (AMPs) are new antimicrobial agents that may be found in animals, microbes, and plants. They have a wide range of activity and are particularly effective against bacteria, fungus, and protozoans. The amphipathic structure of AMPs allows them to interact with bacteria' cell walls and cellular membranes. Although antimicrobial action is typically due to disruption to cellular membranes, AMPs may also target other proteins, DNA, RNA, and regulatory enzymes, and therefore seem to be a potential alternative to traditional antibiotics. However, as soon as AMPs are used in clinical practice, resistance to these compounds is expected; therefore, it is critical to investigate the molecular mechanisms of their action and gain a better understanding of resistance to these compounds in order to plan rationally for the use of AMPs as an alternative to antibiotics[3].

4. CONCLUSION

We should strive to get a better understanding of the scope of the AMR problem. In order to manage AMR, it is critical to gather comprehensive and reliable data. The current concern about this problem stems from a lack of knowledge. At this point, it is impossible to forecast the future situation with certainty, although the management of AMR seems to be extremely challenging due to the shortage of new antibiotics. To address this problem, multifaceted methods should be used. Medical students, doctors, and pharmacists must get ongoing and updated training.

Regulations should be put in place, with antibiotic usage being closely monitored as part of the policy. For the development of novel screening and diagnostic instruments, a worldwide and multidisciplinary approach must be considered. The issue's ecological and environmental

components should not be overlooked; all aspects of "one health" should be included in the control strategy. Alternative methods, particularly in poor nations, may be beneficial. The current level of worldwide attention shows that AMR is no longer an unnoticed problem. Although this focus is insufficient in and of itself to fight AMR, a worldwide code of behavior including all available methods for combating AMR may eradicate the disease in the future. Antibiotic alternatives such as probiotics and lytic bacteriophages may assist to reduce the worldwide burden of AMR. Antibiotics, infection management, vaccination, encouraging healthy food supply practices, and control of person-to-person transmission via screening, treatment, awareness, and education may all help to keep AMR from spreading and spreading. Tracking, bio-surveillance, and response and preventive measures for AMR and MDR pathogens at the national, regional, and global levels may assist to manage the "global resistome."

REFERENCES

1. A. C. Singer, H. Shaw, V. Rhodes, and A. Hart, "Review of antimicrobial resistance in the environment and its relevance to environmental regulators," *Frontiers in Microbiology*. 2016, doi: 10.3389/fmicb.2016.01728.
2. B. M. Marshall and S. B. Levy, "Food animals and antimicrobials: Impacts on human health," *Clinical Microbiology Reviews*. 2011, doi: 10.1128/CMR.00002-11.
3. C. Nathan and O. Cars, "Antibiotic Resistance — Problems, Progress, and Prospects," *N. Engl. J. Med.*, 2014, doi: 10.1056/nejmp1408040.
4. J. Davies, "Origins and evolution of antibiotic resistance.," *Microbiología (Madrid, Spain)*. 1996, doi: 10.1128/mmbr.00016-10.
5. T. P. Van Boeckel *et al.*, "Global trends in antimicrobial use in food animals," *Proc. Natl. Acad. Sci. U. S. A.*, 2015, doi: 10.1073/pnas.1503141112.
6. N. Zisko *et al.*, "Meso level influences on long term condition self-management: stakeholder accounts of commonalities and differences across six European countries," *PLoS One*, 2015, doi: 10.1186/s12889-015-1957-1.
7. G. M. Rossolini, F. Arena, P. Pecile, and S. Pollini, "Update on the antibiotic resistance crisis," *Current Opinion in Pharmacology*. 2014, doi: 10.1016/j.coph.2014.09.006.
8. C. A. Michael, D. Dominey-Howes, and M. Labbate, "The antimicrobial resistance crisis: Causes, consequences, and management," *Frontiers in Public Health*. 2014, doi: 10.3389/fpubh.2014.00145.
9. B. Spellberg, A. Srinivasan, and H. F. Chambers, "New societal approaches to empowering antibiotic stewardship," *JAMA - Journal of the American Medical Association*. 2016, doi: 10.1001/jama.2016.1346.
10. S. J. Hoffman *et al.*, "Strategies for achieving global collective action on antimicrobial resistance," *Bull. World Health Organ.*, 2015, doi: 10.2471/blt.15.153171.
11. C. Nathan, "Antibiotics at the crossroads," *Nature*. 2004, doi: 10.1038/431899a.



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PHARMACEUTICAL SUPPLY MEASURES IN UZBEKISTAN IN THE EARLY YEARS OF INDEPENDENCE

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ABSTRACT

This article details the beginning of the reforms in the pharmaceutical industry in Uzbekistan in the post-independence period, the initial work done to meet the needs of the population, and their results. This, in turn, is important when studying the history of pharmacy in the country.

KEYWORDS: *Uzbekistan, "Pharmacy" Production Association Pharmaceuticals, Academy Of Sciences Of The Republic Of Uzbekistan, Medicines, "Uzkimyofarm", "Uzbiofarm", Committee On Pharmacology, "Uzpharmsanoat".*

INTRODUCTION

In 1991, the population's demand for pharmaceuticals was met by only 34%. The following year, the situation worsened, to 10-12 percent. In the first period of independence, Uzbekistan spent 661 million soums on the purchase of medicines and medical supplies from abroad. soums and 144.4 mln. U.S. dollars were allocated. However, it was not possible to meet the demand of the population for pharmaceutical products with these funds¹.

It is no exaggeration to say that the pharmaceutical industry in Uzbekistan was re-established during the years of independence. Because before independence, almost all medicines and medical supplies were imported, and only two percent of the products in the domestic pharmaceutical market were made in local enterprises. There are only two enterprises in the pharmaceutical system, namely, Uzkimyofarm and Uzbiofarm, which mainly produce 20 types of pharmaceutical products².

In order to meet the demand of the population for pharmaceutical products, the Government of Uzbekistan has made some organizational and structural changes. On March 6, 1992, in accordance with the Decree of the Cabinet of Ministers of the Republic of Uzbekistan No. 74-F, Committees on Pharmacology and Pharmacopoeia were established under the Ministry of Health

of the Republic of Uzbekistan³. The Chairman of the Pharmacology Committee is Doctor of Medical Sciences, Professor O.M. Najmitdinov, Chairman of the Pharmacopoeia Committee, Academician of the Academy of Agricultural Sciences of the Republic of Uzbekistan, Corresponding Member of the Academy of Sciences of the Republic of Uzbekistan S.I. Iskandarov was appointed⁴. The composition of both committees and the regulations of special expert commissions were also approved. A laboratory for quality control of medicines has been established under the General Department of Science and Training of the Ministry of Health of the Republic of Uzbekistan. Its director is Doctor of Pharmaceutical Sciences A.N. Yunuskhodjaev has been appointed. The activities of the committee were focused on the production of medical equipment.

Decrees of the First President of the Republic of Uzbekistan "On the establishment of the State Joint-Stock Concern of the Pharmaceutical Industry of Uzbekistan ("Uzpharmsanoat") in 1993, № 916-PF of July 14, 1994" On regulation of drug sales in the Republic ", Ministers of the Republic of Uzbekistan Resolution of the Cabinet of Ministers of the Republic of Uzbekistan № 344 of July 24, 1992 "On the illegal export of food, medicine and some consumer goods from the Republic of Uzbekistan", January 8, 1993 "On additional measures to provide the population with medicines" Resolutions № 404 of August 6, 1994 "On urgent measures to improve the supply and distribution of medicines and medical devices in the Republic" played an important role in the legal regulation of activities in this area⁵. With the publication of these documents, the industry became one of the main directions of the economy. In order to implement the program of integrated development of the pharmaceutical industry of the republic, the state joint-stock concern "Uzpharmsanoat" was established⁶.

In 1993, 14 republican, regional and municipal production associations functioned within the Pharmacy Production Association. ordered. Effective January 11, 1993, free sale prices were introduced for all medicines, except for 60 types of essential medicines⁷.

Pharmacies varied depending on the form of ownership. In a survey of pharmacy communities, the Tashkent City Pharmaceutical Production Association said that 4 of them wanted to switch to foreign currency, 12 to commercial, 32 to lease, and 45 to collective ownership⁸.

Hospital pharmacies that supply treatment and prevention facilities with medicines and other medical supplies have not been privatized. The existing system of drug supply in these institutions has been preserved. In order to improve the supply of medicines to the population and treatment and prevention facilities, centralized management and control over the activities of pharmacies, the State Joint-Stock Company "Dori-Darmon" was established on the basis of the Republican Association of Pharmaceutical Production. The state joint-stock association "Dori-Darmon" included regional state joint-stock associations, private, public and joint-stock pharmacies⁹. The association's trade plan has improved somewhat in a market economy. For example, in 1994, the association's sales amounted to 44.6 million. soums. The association's net profit this year is 10 million. Soums¹⁰. In 1995, the Dori-Darmon Association imported medicines worth 2,040.9 million soums¹¹.

In accordance with the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 181 of May 25, 1995, the "Main Department for Quality Control of Medicines and Medical Equipment" was established. He is responsible for the quality control of drugs and diagnostics, medical equipment and products, centralized management of the activities of organizations

engaged in the examination, standardization, certification and registration of drugs. At the same time, the General Directorate reviewed the system of regular analysis of the situation in the drug market, research on new drugs and their registration. The main department includes: Committees on Pharmacology and Pharmacopoeia, the Committee on New Medical Techniques, the State Center for Quality Control and Standardization of Medicines, the Bureau for Registration of Medicines and Medical Devices. In 1996, the products of the local pharmaceutical industry in Uzbekistan met the needs of the population in medicines by only 5-6%, and the rest of the medicines had to be imported. For example, in 1995, 353 types of medicines and 86 types of chemical reagents were imported to the Republic on a loan of 51 million US dollars from the European Union¹².

Founded on the basis of a private pharmacy in Tashkent, Farmed has a strong position among private pharmaceutical companies in Uzbekistan. Over the course of a year, the firm has partnered with more than 40 major pharmaceutical companies in 20 countries around the world. The company has also opened a network of pharmacies in Tashkent and a number of regions of the country¹³. The company has set up an information and methodological center to conduct marketing research of the pharmaceutical market.

The ongoing reforms in the pharmaceutical sector of the Republic of Uzbekistan necessitated a scientifically based approach to the analysis of the pharmaceutical market to ensure a balance between supply and demand for drugs.

In conclusion, these measures played an important role in providing the population of Uzbekistan with medicines in the difficult social situation in the first years of independence and in recent years have served as an important foundation for the formation of the pharmaceutical industry.

List of sources and publications used:

1. Axmedov J.J. Factors influencing the investment attractiveness of the pharmaceutical industry in Uzbekistan // Scientific electronic journal "Economy and Innovative Technologies". 2016 – № 6, November-December.
2. Do'smurotov M. Further expansion of localization of pharmaceutical products // Xalq so'zi, July 27, 2016.
3. Chemistry and pharmacy. - 1992, - №2. B. 49.
4. Nazirov Z.N., Ziyaev Z.R., Muhamedov R.A. The role of the Pharmaceutical Society of Uzbekistan in improving the quality of medicines. // Chemistry and pharmacy. 1992, №2. B. - 8.
5. Rajabov MT, Xonxo'jaev O.X., Tukhtaeva AM, Burxonxo'jaeva X.V. Problems of denationalization of pharmacies // Chemistry and pharmacy. – 1994.– №1-2. P. 4.
6. Soipova D.T., Toshmuhamedov E.R., Nasritdinova M.A. Development of the pharmaceutical market of the Republic of Uzbekistan // Chemistry and pharmaceuticals, 1996. - №2. P. 41.
7. National Archive of Scientific and Technical Medical Documents of Uzbekistan, M-372-fund, list 1, case 166, page 285.
8. NASTMDU, M-372- fund, list 1, case 374, page 77.
9. NASTMDU, M-372- fund, list 1, case 314, page 55.

10. NASTMDU, M-372- fund, list 1, case 84, page 57.

11. NASTMDU, M-372- fund, list 1, case 85, page 83.



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CONFLICTS OF THE PROCESS OF THE INDUSTRIAL STAFF TRAINING IN THE SOVIET PERIOD

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ABSTRACT

One of the main factors determining the development of society and the state is the issue of personnel. One of the factors that have a strong impact on the establishment and development of all sectors is the staff. This article analyzes the organization of personnel training in Uzbekistan during the Soviet period, in particular, qualified personnel, and the contradictions in this process.

KEYWORDS: Tashkent, Samarkand, Uzbekistan, Soviet, Central Asia, Skilled workers, technicians, FZU, FZO, "Hujum" movement, Tashselmash.

INTRODUCTION

In the early years of Soviet rule, the training of industrial personnel was one of the most problematic tasks. As a result of the growing number of industrial enterprises related to agriculture and development of natural resources in Uzbekistan, they have faced difficulties in staffing. There was a shortage of indigenous peoples, especially among the cadres. This paved the way for the influx of industrial personnel from Russia to Central Asian industrial enterprises. Among the engineering and technical intelligentsia, only 1 percent were indigenous¹.

There were not enough educational institutions to train skilled workers, technical staff. FZU (школа фабрично-заводского ученичества- a professional technical school) began to be organized to train qualified workers.

Skilled workers were organized in two directions: FZU and vocational schools. While FZUs trained workers for almost all areas of industry, vocational schools trained staff for an industrial trust or enterprise.

In 1923, there were 11 vocational schools in Turkestan, where 865 students studied. This year, 1,379 students took part in 19 vocational courses in the country. 827 people studied in technical schools².

In 1926, 738 students studied in 10 factory schools and 176 people studied in 3 vocational schools in Uzbekistan³. In 1925-1926, 1 million 230 thousand rubles will be allocated in Uzbekistan for vocational education⁴. However, the material and technical base of this type of educational institution is weak and the classrooms are not well equipped. They lacked teaching staff.

The largest FZU in Central Asia was established in Tashkent, and in the first academic year, 300 students were admitted to this educational institution⁵.

FZUs operated mainly under large industrial enterprises. Training of working complexes was organized in large industrial enterprises. For example, in Tashkent at the mechanical plant of the General Cotton Committee in 1928-1929, 500 people were trained in special training courses⁶. In addition, 20 clubs were opened at the Tashselmash plant, which employed 254 workers. 225 people took part in educational circles at the "Qizil Tong" sewing factory⁷.

Attempts were made to train specialized industrial personnel in factory schools (фабрично-заводского обучения – ФЗО (FZO)). For example, 289 people were trained at the FZO school under the Fergana silk factory, and 661 people at the FZO of the Samarkand cotton industry⁸. In the Fergana Valley, FZOs have been established to train personnel mainly for the cotton, silk and textile industries. Also, in December 1929, a 6-month FZO school was opened at the Bukhara Silk Spinning Factory. In Bukhara and Andijan, working universities for 120 people were established, with socio-economic, technical and other departments. Such universities were opened in Tashkent for 320 people, in Kokand for 200 people, in Kashkadarya and Surkhandarya regions for 40 people. In 1928-1929, a course was organized at the Tashselmash plant to train and improve the skills of workers, and 500 workers were involved in the course. In 1931, 925 workers were trained in such courses. Only 30 percent of them were Uzbek workers. In 1931, 20 technical circles were organized at the plant, which were attended by 25 workers.

Due to the "Hujum" movement among women, the share of women has increased, and some work has been done on their training. Women worked mainly in the garment, weaving, food, and silk industries.

The school for women seamstresses was opened in 1926 in Tashkent. From 1928 to 1929, the school had 47 students, 57% of whom were Uzbek women⁹.

In general, the share of women in FZUs has also increased. For example, in 1928, women accounted for 28 percent of FZUs, while in 1932 it was 32 percent¹⁰.

Industrial enterprises grew. In 1932, 54.7% of the total number of workers in Uzbekistan worked in large enterprises. In 1927-1928, the figure was 19.8 percent.

The technical modernization of industrial enterprises required a constant increase in the skills of workers. Accordingly, various circles and courses on technical education in factories and plants were multiplied. In 1932, a total of 642 clubs operated in the factories of Uzbekistan, employing 20.9 thousand people.

In 1933, 47 highly skilled workers worked at the Tashselmash plant. By 1934, their number had risen to 112. From 1934 to 1936, the Tashkent Textile Combine trained 874 skilled workers¹¹.

In 1937, 562 students were planned to be educated in industrial technical schools, but in practice 442 students were educated, and the plan was fulfilled by 78.7%¹². 955 students were educated in FZU schools instead of 1050 students. In 1937, 11,109 people were to graduate from industrial colleges, while in practice, 4,131 people graduated by the end of their studies¹³. Also, in 1938, the average annual contingent was fulfilled by 63.8%, the admission plan by 85%, the graduate plan by 43.9%¹⁴.

In 1938, an inspection of the educational process and educational work at the Textile College and the Cotton Training Complex revealed a number of shortcomings. These include non-implementation of the curriculum, low quality of admission, inefficiency of public political and educational work.

The Crafts Union of Uzbekistan has organized schools and courses to staff its enterprises. In 1937 it was planned to train 700 workers in such courses according to the plan, and in practice 302, instead of the planned 841 workers in 1938, 596 workers were trained.

Some work has been done in the regions in this regard. For example, in 1939, 23 women were educated in technical schools of the Bukhara regional trade union, and in 1940, 172 women were educated.

One of the most serious problems in the industry was the shortage of highly educated engineers and technicians. In 1921, a total of 232 specialists were registered in the Turkestan industry, of which only 94 had higher education¹⁵.

In the early years of Soviet rule, Uzbek industrial enterprises were staffed mainly by higher education institutions in the Central regions. Engineers and technicians trained by Moscow State University, Leningrad State University, Moscow Polytechnic Institute, Kharkiv Polygraphic Institute were sent to work in Central Asian industrial enterprises.

With the opening of Turkestan State University in 1920, it became possible to train partly engineering and technical intellectuals. In 1922, 436 students studied at the Department of Mechanics, Civil Engineering, Hydraulic Engineering and Mining of the Technical Faculty of the University¹⁶.

In 1929, the Central Asian Cotton-Irrigation Polytechnic Institute was established on the basis of the Faculty of Engineering, Melioration and Agriculture of the Central Asian State University. In the same years, the Central Asian Silk Institute was established. From 1931 to 1932 the Institute of Railway Engineers, the Institute of Textiles was opened. In 1934, the Central Asian Industrial Institute was established. These institutes have trained engineers and technicians not only in Uzbekistan but in all Central Asian republics.

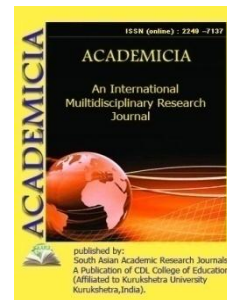
In 1933, 69 technical colleges and 30 working universities were opened in Uzbekistan, as well as working universities in Tashkent and Samarkand.

In 1929, a total of 2,418 specialists worked in the Central Asian republics, of which 197 were engineers and technicians with higher education. The number of engineers in Uzbekistan was almost four times less than in the Central regions.

In summary, Soviet-era documents state that the training plan was overfulfilled, and in practice trust managers and plant directors did not pay enough attention to staff training. Due to staff shortages, the trust administration states were not fully staffed.

REFERENCES:

1. Beylin A.E., Kadri spetsialistov SSSR i formirovaniye rost., M., Politizdat, 1935, Page 102.
2. Golovanov A.A., Internatsionalnoye sotrudnichestvo narodov SSSR v razvitii legkoy promishlennosti Uzbekistana. (1929 - 1937). Diss. kand. ist. nauk. T., 1981, P. 92.
3. Mamatkulov K. M. Development of industrial development of Samarkand region for the years of the Soviet power. (1917-1941gg). T., 1977, 26 pages.
4. Mo'minov N.M., Sovetlarning O'zbekistonni sanoatlashtirish uchun kurashi. (1928 - 1932). T., 1959, P. 76.
5. National Archive of Uzbekistan (NAU), Fund F – 89, List 1, case 487, page 71.
6. NAU, Fund P – 1624, List 10, case 130, page 3.
7. NAU, Fund P – 1624, List 10, case 130, page 6.
8. Pravda Vostoka, January 5, 1926.
9. Sadikov S., Visshaya shkola kuznitsa podgotovki kadrov. T., 1973, Page 84.
10. Sovet O'zbekistoni ishchilar sinfi tarixi, T., Fan, 1974, P 69.
11. Teteneva L. G., Borba rabochego klassa Uzbekistana za vipolneniye vtorogo pyatiletnego plana v promishlennosti. (1933-1937). Aftoref... diss...kand...ist...nauk. T., 1959, P. 14.
12. Uzbekistanskaya pravda. 1929, December 13.
13. Yuldashev X., Iz razvitiya sotsialisticheskoy promishlennosti, T, Gosizdat UzSSR, 1962, P. 112.



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AN EVALUATION OF THE STATE OF ELECTRONIC TRASH RECYCLING METHODS

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ABSTRACT

As the usage of electrical and electronic devices grows, so does the amount of electronic trash produced (e-waste). It is the quickest. The world's increasing garbage stream Printed circuit boards are an integral component of almost all electrical and electronic devices. Improper disposal of these electronic trash may put human health and the environment at risk. On the contrary, the effective management of this trash requires a well-thought-out plan for waste awareness, collection, recycling, and reuse. These days, the effective trash recycling has long been seen as a major problem for any community. Circuit boards (PCBs) (PCBs). Many electronic businesses rely on precious heavy metals and hazardous halogenated organic compounds, which are abundant in these rocks. In this case, the makeup of various PCBs, as well as their hazardous consequences, are addressed in this article. There are a variety of recycling methods in use today. The most significant metals from e-metallic waste's fractions are shown. Metals may be recovered from e-waste once it has been processed. Physical separation through pyrometallurgical, hydrometallurgical, or biohydrometallurgical methods is also addressed, as well as biohydrometallurgical separation.

KEYWORDS: End-Of-Life (EOL), Electronic Waste (E-Waste), Infrastructure, Materials Recovery, Recycling.

1. INTRODUCTION

The increasing reliance on electrical and electronic devices in our everyday lives, as well as their end-of-life waste, has created a new environmental and health issue. Reusing and properly recycling this trash, on the other hand, conserves natural resources and prevents water and air pollution[1]. WEEE (waste electrical and electronic equipment) refers to electrical and electronic equipment, including all of its components, that has ceased functioning or has function problems. Cell phones, videocassette recorders, scanners, faxes, printers, tablets, DVD players, microwaves, x-ray machines, and certain scientific equipment are among the electrical and electronic trash. Large amounts of this trash are produced as a result of constant technological innovation and replacement, particularly in the case of computers and mobile phones[2].

Electronic trash (e-waste) produced across the globe in 2016 was approximately 44.7 million tons, and this is expected to rise to 52.2 million tons in 2021, at a pace of 3 to 4% each year. In 2005, the United Nations University estimated that 8.3–9.1 million tons of e-waste were produced throughout European nations. According to a variety of estimates, total electrical and electronic waste would increase at a rate of 2.5 to 2.7 percent per year, reaching approximately 12.3 million tons by 2020. Every year, a growing number of electric and electronic gadgets are withdrawn from the market in most nations[3]. E-waste generated from outdated laptops is expected to rise by 200–400% in South Africa and China by 2020, while e-waste generated from abandoned TVs and refrigerators would be twice or three times as much in China and India. It has been claimed that the quantity of solid e-waste has risen to alarming new heights, posing a significant threat to human health across the globe. Given that a mobile phone has a lifespan of around a year and a computer has a lifespan of 2–5 years, roughly 100 million mobile phones and 17 million computers are projected to be abandoned globally each year owing to faulty or obsolete technology[4].

Egypt is the biggest market in both the Middle East and Africa at the moment. In 2014, about 370,000 tons were produced, and the country's share will continue to increase. South Africa comes in second on the continent with 350,000 tons produced, followed by Nigeria with 220,000 tons produced in the same year. According to the United Nations Environment Program (UNEP), the rise in generation rates in Egypt is due to a 15% increase in home consumption, a 95% increase in computer users, a 74.5 percent increase in television sales, and a 13.5% increase in mobile phone subscribers. In Egypt, the fastest increasing component of the municipal solid waste (MSW) stream is mobile phones (subscribers > 90 million in 2015).

It expands at three times the rate of typical municipal trash (UNDP Egypt 2015, 2016). Electric and electronic equipment, according to reports, contain over 1000 distinct chemicals, including hazardous heavy metals and organics, which may cause severe environmental contamination issues if discarded improperly[5]. WEEE (waste electrical and electronic equipment) recycling is a crucial topic for waste management and the recovery of valuable materials. In terms of materials and components, WEEE is heterogeneous and complicated. Developing a cost-effective and environmentally friendly recycling system necessitates identifying and quantifying valuable materials and hazardous substances in order to comprehend the physical characteristics of waste and improve metal recovery in order to conserve natural resources and provide an environmentally sustainable waste management solution[6].

In virtually all electric and electronic equipment, printed circuit boards (PCBs) constitute the most essential component (EEE). Copper, precious metals (PMs), and other valuable metals abound on these boards. Because of the inclusion of chlorinated/brominated flame retardants and inorganic chemicals, waste printed circuit boards (WPCBs) have drawn public attention due to their ecologically hazardous components. WPCBs are improperly disposed of, resulting in hazardous chemicals being released into the environment as well as the loss of numerous precious metals. Copper (20%) and gold (250 g/t) are considerably more abundant in printed circuit boards than in copper or gold ore, i.e. 20–40-fold and 25–250-fold, respectively[7].

For treating electrical and electronic wastes and recovering their metal contents, different treatment methods based on physical, pyro metallurgical, bio metallurgical, and hydrometallurgical processes are available. The potential dangers and economic possibilities of e-waste are outlined in this study. A summary of WPCB components is provided, as well as their harmful impacts on humans and the environment[8]. The physical and chemical metallurgical methods for recovering metals from e-waste are addressed. The information is discussed and contrasted to Egypt's existing e-waste control initiatives. The future prospects and difficulties that Egypt has in terms of effective e-waste recycling are also addressed. Printed circuit boards are made up of a wide range of materials, some of which include a variety of hazardous chemicals that, if not properly handled, may pollute the environment and endanger human health[9].

There are over 1000 hazardous chemicals linked to e-waste, with the following being the most frequently reported: Toxic metals (such as barium (Ba), beryllium (Be), cadmium (Cd), cobalt (Co), chromium (Cr), lead (Pb), lithium (Li), lanthanum (La), mercury (Hg), manganese (Mn), molybdenum (Mo), and hexavalent chromium (Cr(VI)) as well as persistent organic pollutants (POPs) such as bromine. The detrimental hazardous consequences of certain metals found in electronic waste on human health[10]. Mechanical processing, which comprises three main steps: dismantling, upgrading, and refining, is typically the first stage in the WPCB recycling process. Dismantling is critical for all types of electronic trash, with the goal of isolating dangerous or valuable components for further treatment. To separate the materials and components into various categories (i.e., plastics, steel, aluminum, copper, printed circuit boards), the dismantling process is done manually using basic equipment like as hammers, tongs, screwdrivers, and conveyors. Following the dismantling process, WPCBs are exposed to a physical process that includes shredding the boards into tiny pieces using a crusher and grinder, followed by magnetic, eddy current, and density separation methods to separate the metallic and non-metallic fractions. Finally, a refining process is used, which includes hydrometallurgical, pyro metallurgical, electrometallurgical, bio metallurgical, and combinations of these processes. In the United States, landfills and incineration are the most common methods of disposal for this trash. The demand for landfills is growing, which is putting a strain on our ecosystem.

Diverted waste treatment techniques are also sought due to a lack of disposal capacity and increasing concern about environmental quality. To keep end-of-life (EOL) electronics out of landfills and incinerators, new waste management solutions are required. However, while developing an effective diversion plan, there are many things to consider. This approach must be founded on the program's long-term economic viability, technological feasibility, and a reasonable degree of societal support. EOL electronic goods should be recycled and reused as part of the plan. The types of processes that can be used and the quantity of trash that can be

treated. Transportation, collection, recovery, and resale facilities are all included. The quantity of trash in the waste stream, the recycling technologies available, government restrictions, and the economics of EOL products are all factors that influence the recycling infrastructure.

2. DISCUSSION

We begin at the point when CEDs first become waste (either through obsolescence or through operational failure) and work our way through the collection, treatment, and final disposition of recycled electronic waste to gain a better understanding of the current processes and infrastructure available for electronic recycling in the United States. This overview covers important actors at each stage and gives a complete picture of the infrastructure for electronic trash recycling. Consumers believe that these CEDs are valuable. This logic is incorrect. The residual value of obsolete electrical equipment is constantly decreasing as electronic technologies advance. With the passing of time, both the resale value of components and the resale value of machines decrease quickly. For example, the value of a computer with technology older than two generations approaches zero.

Furthermore, it is more difficult to recycle older equipment than it is to recycle modern technology. In general, older equipment includes a greater range of materials, such as various polymers, as well as a greater quantity of dangerous elements, such as lead. As a result, it is preferable to discard outdated computer equipment as soon as it seems to be obsolete. Consumers must have both access to and awareness about recycling programs in order to effectively recycle electronics. This basically implies that customers must know where to turn when their technological gadgets become outdated or unusable. Several cities have tested collecting systems that are now accessible to the general public. As a consequence, electronic recycling initiatives are becoming increasingly prevalent. Curbside collection is the collection of e-waste on a regular basis, similar to how ordinary municipal trash is collected, or upon request. The operation expenses of e-waste collection may be significantly reduced if it coexists with an existing curbside trash collection service. This is the most practical collecting method for residents.

Operating expenses, on the other hand, may be greater than for other collecting methods. There's also the risk of theft of gadgets left out for recycling, as well as the abandonment of trash that isn't e-waste. A special drop-off event is a one- or two-day event organized over the weekend to encourage residents to participate. The number of devices gathered in this option is determined on the amount of customer engagement and the weather conditions during the special event time. When specialists from the repair sector collaborate with the program, a special drop-off event is regarded to be an excellent recycling program since these experts can pick out the most valuable goods for resale, repair, and reuse. A year-round collection event is what a permanent collection option is. E-waste may be collected at the municipal solid trash collection facility, resulting in little expenses. Although this kind of collection program has been proven to be the most cost-effective, it is not appropriate for every town size. This collecting method requires that the amount of collected devices be verified on a regular basis, and that the devices be delivered to a recycler after specified quantities have been gathered. Consumers may bring old electronic equipment to a shop when they buy new electronic equipment under the point-of-purchase collection model, and merchants act as the collecting agency.

Depending on the retailer's choice, this collection option may be implemented as a permanent or one-time drop-off event. For this technique of collecting to be effective, the retailer's active involvement is required. Geographic location, accessibility and comfort for customers, and population dispersion may all be factors in determining a suitable collecting site. Electronic equipment retail shops or big public parking lots may be utilized as collecting sites for special drop-off events. The transportation element of electronic recycling is also significant. Transportation is supplied by the local government, a private recycler, or a third party with curbside pickup. Residents are responsible for transportation to the collection location in permanent collection, and the recycler is responsible for transporting the collected e-waste to the processing facility. Consumers must bring their e-waste to the collection location in the case of a special drop-off event. The transportation to the recycling processing facility is subsequently handled by the local government or the recycler.

The salvaged and recycled materials market is the third market. Examining and testing for reuse are time-consuming and labor-intensive activities, notwithstanding their simplicity. A plug-and-play test is performed to determine whether or not equipment is functioning. Dismantling equipment that fails the plug-and-play test for component resale and reuse is an option. Individual component recovery from e-waste is more difficult than a simple plug-and-play test that can be used to evaluate an entire system. Employees in charge of component recovery must understand (1) how to dismantle the system, (2) which components are valuable, and (3) which components, such as a hard drive, need extra caution in their handling. To optimize economic value, the disassembly process begins with the more valuable high-end components and ends with the less valuable low-end ones. Hazardous contaminants are also removed throughout the demanufacturing process. Because ink is a hazardous chemical, printer ink cartridges must be removed before the printer may be recycled. Due to the difficulties of removing the laminated layer from the metal, laminated metals are also removed and discarded. The sequence in which the manufacturing processes are performed is critical to output efficiency.

Even though they are destroyed, data from special drop-off event collecting systems has shown that more than half of the computers are in excellent operating order. These used computers may readily be sold on secondary markets since there is still a need for them. In 1997, the TV repair business in the United States had a market value of approximately US\$ 17 billion and employed 588,000 people. The computer repair business, on the other hand, is expanding. Because a computer is a combination of current electronic technology, this sector depends on high-tech, qualified personnel. As a result, this sector is divided into two segments: companies that repair computer displays and companies that repair computers themselves.

Those in the computer repair business have the opportunity to collaborate with recyclers. If the collected equipment has any market value, some electronic equipment that has been collected for recycling may be repaired and resold by the repair business. However, even if the unit is still functional, there is no market for it if it is old and outdated, such as 286 CPUs. Overseas is the biggest market for gadgets gathered in the United States.

More than half of the e-waste collected for recycling in the western United States is projected to be shipped to other nations such as China, India, and Pakistan, where recycling prices are far lower than in the United States. However, due to ongoing registration in many of these nations, the situation is still in flux. Because the glass recovered is utilized as a raw material for new CRTs, glass-to-glass recycling is considered a closed loop recycling process. CRTs are collected

and transported to a recycler, where the whole glass is crushed into cullet without the panel and funnel glass being separated. The cullet is sent to CRT producers to be used in the production of new CRTs. The composition of CRT glass varies based on the manufacturer and the time it was manufactured, particularly for panel glass.

One of the reasons why glass producers are hesitant to accept recycled CRT glass is because of this. Glass manufacturers are adamant about avoiding mixing various kinds of glass. Due to the difficulties in establishing the precise composition of recycled glass, using used CRT glass poses considerable risk to the glass production business. The danger of employing glass with an unknown composition is that a little amount of the incorrect composition may contaminate a whole glass furnace's contents, causing changes in glass characteristics. The glass furnace may need to be shut down for 3–4 days to rectify an erroneous glass composition. The glass-to-glass technique has many advantages. First, recycled cullet may be used to substitute virgin materials at a similar or lower cost, and it can enhance the furnace's efficiency, reducing the amount of energy used to make CRT glass. In addition, since recycled glass already has a high purity, this method may enhance the quality of the output glass and decrease emissions from the glass-making process.

Cullet has a greater value to a main CRT glass producer than it does to a lead smelter, which is another glass recycling technique. In addition, as compared to glass-to-lead, the glass-to-glass method lowers regulatory burden by treating CRTs as universal waste rather than hazardous waste, as defined by the Resource Conservation and Recovery Act. Another factor is high-definition television (HDTV). The market for new televisions in the United States is virtually saturated (more than 99 percent), but the arrival of HDTV in the near future, as well as customer preference for flat panel displays, may hasten the obsolescence and replacement of traditional CRT television sets. To deal with these developments, regulation and research will be required to improve glass-to-glass recycling and the development of new uses for old CRT glass. One unique aspect of CRT recycling is that there is a low-cost option: foreign recycling, which costs around a tenth of what domestic alternatives do. Labor costs, variations in work methods, appropriate waste disposal techniques, and environmental effect are all variables that influence cost. Another incentive for exporting CRTs is the low transportation cost: empty containers must return to their home nations after unloading the products in the United States.

Adding value to these containers by filling them with CRTs and other old devices is a good idea. Although this option is applicable to other electronic trash, CRTs are the most important item since CRT recycling facilities are situated on the east coast and exporting is often from the west coast of the United States. Plastics are widely apparent in electrical and electronic devices, such as telephones, TVs, and personal computers. Many plastic components, however, are concealed from view and form the infrastructure that connects and supports contemporary life. Plastics are essential materials for use in electronics because of their unique electrical insulating characteristics, as well as their strength, stress resistance, flexibility, and durability. Because thermo sets cannot be remelted and molded into new items, they are usually shredded when recycled. Circuit wire boards, electrical switch housings, electrical motor components, electrical breakers, and other electronic components utilize thermosets. Plastics, behind metals, offer the most potential for electrical product salvage. Electronic goods are typically made of 'engineering thermoplastics,' which have a high intrinsic value. Engineering thermoplastics sell for dollars per pound when pelletized, compared to pennies per pound for bottle and container-grade plastics.

3. CONCLUSION

When e-waste is collected, it contains a wealth of useful materials. As a result, appropriate disposal procedures should be implemented to ensure that it does not harm the environment or provide a health risk to humans. WPCB recycling has traditionally relied on physical and chemical techniques. Physical recycling techniques such as magnetic separation or density separations are easy, convenient, ecologically friendly, and energy efficient. They are thought to be more cost-effective in terms of recycling and separating metallic components than non-metallic ones. Brominated fire retardants are converted to monomers via chemical recycling techniques, which remove the metals that remain in the residue. Many studies are being conducted on chemical recycling methods, with an emphasis on the metallic portions.

Despite lacking most of the necessary components to carry out an e-waste system, Egypt remains a viable market for e-waste recycling. Egypt has many organizational and technological challenges. Examples include a lack of recycling methods, a lack of cost recovery for e-waste services, a lack of strong laws, a lack of civic awareness, and a scarcity of suitable disposal locations. Existing recycling efforts in Egypt are still in their infancy and do not meet international environmental requirements. A poll regarding e-waste management activities is included in this assessment. It must be considered that, if the present pace of e-waste production in Egypt continues, there will be a massive hoard and the amount of discarded trash will significantly grow, as well as the noxious impact on people and the environment. To deal with this threat, the community and the government must work together. Everyone must accept responsibility, and the e-waste recycling system must be modernized with the participation and assistance of all sectors. Rigid regulations influencing e-waste management behavior should be examined.

REFERENCES:

1. S. Ottewell, "Processing packaging plastics," *Chem. Eng.*, 1990.
2. J. chun Lee, H. T. Song, and J. M. Yoo, "Present status of the recycling of waste electrical and electronic equipment in Korea," *Resources, Conservation and Recycling*. 2007, doi: 10.1016/j.resconrec.2007.01.010.
3. L. Zhang and Z. Xu, "A review of current progress of recycling technologies for metals from waste electrical and electronic equipment," *Journal of Cleaner Production*. 2016, doi: 10.1016/j.jclepro.2016.04.004.
4. E. Alvarez-de-los-Mozos and A. Renteria, "Collaborative Robots in e-waste Management," *Procedia Manuf.*, 2017, doi: 10.1016/j.promfg.2017.07.133.
5. D. Beverungen, R. Knackstedt, and O. Müller, "Developing Service Oriented Architectures for Product-Service Systems -- A Conceptual Approach and its Application for the Recycling of Electronic Equipment," *WIRTSCHAFTSINFORMATIK*, 2008.
6. R. Wang and Z. Xu, "Recycling of non-metallic fractions from waste electrical and electronic equipment (WEEE): A review," *Waste Management*. 2014, doi: 10.1016/j.wasman.2014.03.004.
7. S. N. M. Menikpura, A. Santo, and Y. Hotta, "Assessing the climate co-benefits from Waste Electrical and Electronic Equipment (WEEE) recycling in Japan," *J. Clean. Prod.*, 2014, doi:

10.1016/j.jclepro.2014.03.040.

8. P. Chancerel and S. Rotter, "Recycling-oriented characterization of small waste electrical and electronic equipment," *Waste Manag.*, 2009, doi: 10.1016/j.wasman.2009.04.003.
9. C. P. Cheng and T. C. Chang, "The development and prospects of the waste electrical and electronic equipment recycling system in Taiwan," *J. Mater. Cycles Waste Manag.*, 2018, doi: 10.1007/s10163-017-0612-6.
10. S. Zhang, Y. Ding, B. Liu, D. Pan, C. chi Chang, and A. A. Volinsky, "Challenges in legislation, recycling system and technical system of waste electrical and electronic equipment in China," *Waste Manag.*, 2015, doi: 10.1016/j.wasman.2015.05.015.



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A BRIEF STUDY ON ONION

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ABSTRACT

The onion (Allium cepa L.) is an important vegetable that has a high production, domestic, and international commerce. It is historically used as a food component in the Mediterranean diet. In the everyday diet, it is eaten raw, cooked, or processed into various onion products. When onions are added to certain meals, they produce a high concentration of bioactive chemicals that may have health benefits. One of the most widely researched advantages is its impact on cardiovascular disease, which includes hypocholesterolemic, hypolipidemic, anti-hypertensive, antithrombotic, and hypoglycemic actions. Onion consumption has also been shown to have antiproliferative effects in many cancer cell lines, to be involved in bone metabolism and behavior as a potential antidepressant agent, and to stimulate the growth of specific microorganisms in the colon (Bifidobacteria and Lactobacilli) with a general beneficial effect on health. Furthermore, the use of onion as an antibacterial, antioxidant, anti-inflammatory, and asthma-protective substance has been documented in folk medicine.

KEYWORDS: Antibacterial, Cancer, Onion, Phytochemicals, Vegetable.

1. INTRODUCTION

Since ancient times, the onion (*Allium cepa* L.) has been regarded as a culinary and medicinal plant. It is the second most commonly grown vegetable bulb crop after tomato, and it is a vegetable bulb crop that is familiar to most cultures and eaten globally. It's a low-latitude horticulture crop with a short growing season. Due to its highly appreciated flavor, fragrance, and distinctive taste, as well as the therapeutic qualities of its flavor components, it is often referred to as "Queen of the Kitchen." Throughout the year, onions are used in curries, as spices, in salads, as a condiment, or cooked with other vegetables, such as boiled or baked. It's also utilized in a variety of processed foods, including as pickles, powder, paste, and flakes, and it has therapeutic properties[1]–[4]. The depiction of Onion is shown in Figure 1.



Figure 1: Illustrates the vegetable Onion[5].

It is typically eaten raw, but since fresh onion losses in storage have been estimated to be in the range of 20–30%, processed goods are the most practical option. As a result, the international market for onion is increasingly focusing on dehydrated products such as flakes, rings, granules, kibbles, powder, and frozen or canned onions, as well as onion in vinegar, brine, or as essential oil, despite the fact that its commercial products are less abundant than garlic's. Dehydrated foods have a significant economic value, not only because of their culinary applications, but also because of their medical qualities as nutraceuticals, since they contain greater quantities of beneficial chemicals than fresh foods.

1.1 Historical Aspects:

Humans have been eating onions since the Neolithic period, and they are still eaten all throughout the globe. There have always been individuals who enjoyed the usage of onions and utilized them in large amounts throughout this long time, but there have also been others who rejected and despised them. Onions have been grown for at least 5000 years in at least 175 nations across the world. The spherical bulb was considered as a symbol of the cosmos by ancient Egyptians. The name comes from the Latin word *unus*, which means "one," and the onion was brought to Britain by the Romans, from whence it may have spread to the Americas. The earliest written record of the onion is from 2600–2100 BC and comes from the Sumerians. We learn that leek had a significant part in the kingdom of Ancient Egypt in the Papyrus Ebers, which is based on ancient Egyptian texts and expertise[6]–[9].

a. Botany:

The genus *Allium* is extremely vast, with numerous wild edible species (only a tiny percentage is commercially grown), and it is widely spread across temperate zones in the northern hemisphere. The primary source of origin is thought to be Central Asia, with the Mediterranean areas serving as a secondary source. There are about 780 species in the genus *Allium*, with a wide range of physical characteristics. Onion's chromosomal number is 16 (2n).

1.2 Chemical Structure of Prominent Phytochemicals:

a. Saponin:

Saponins are a kind of amphipathic glycoside having foaming properties. One or more hydrophilic glycoside moieties are coupled with a lipophilic triterpene derivative in their structure. Polycyclic (C27) aglycones (C30) are linked to one or more sugar side chains, and the aglycone is either steroidal or triterpene. Figure 2 illustrates the chemical structure of Saponin.

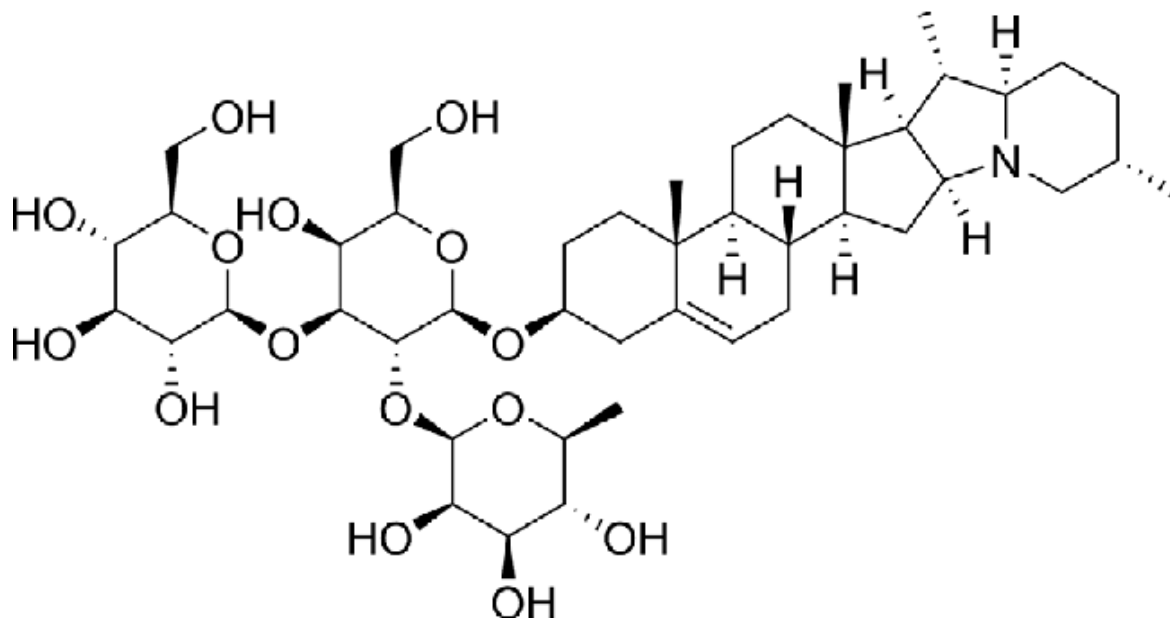


Figure 2: Illustrates the chemical structure of Saponin[10]

b. Quercetin:

Quercetin has five hydroxyl groups, which govern its biological activity and the number of derivatives it may produce. Glycosides and ethers are the two main types of quercetin derivatives found in onions. Only trace amounts of sulfate and prenyl substituents are detected.

c. Anthocyanin:

Organic molecules called anthocyanins are present in the epidermal layer of plant cells. They have a complicated structure that includes an aromatic three-ring molecular region with one or more sugar molecules attached. Anthocyanin is made up of a flavyliumcation (2-phenylbenzopyrylium) that connects hydroxyl (–OH) and/or methoxyl (–OCH₃) to one or more sugars. The sugar-free anthocyanidinaglycones and the anthocyanin glycosides are split into the anthocyanins, which are mainly 3 glucosides of the anthocyanidins.

1.3 Properties and Biological Role of Onion Phytochemicals:

a. Properties:

Several studies have shown that alliums' biological and medicinal activities are mostly attributable to their high concentration of organosulfur compounds. The primary sulfur-containing constituents in whole onions and garlic are S alk(en)yl-L-cysteine sulfoxides (ACSOs), such as alliin, and -glutamylcysteines, which, in addition to serving as storage peptides, are biosynthetic intermediates for corresponding ACSOs; from these, and through different metabolic pathways in each vegetable, volatiles such as allicin, and lipid- Onions get their distinctive odor and taste from these chemicals, as well as the majority of their biological characteristics.

b. Biological Roles:

Onions not only provide taste to a dish, but they also contain phytochemicals that are good for your health. Onions include phytochemicals, which are natural substances that have the ability to improve human health and protect against a range of illnesses, including cancer. Antimicrobial, antiallergenic, anti-inflammatory, and antithrombotic properties are all found in organo sulfur compounds. In addition, flavonols found in onions, such as quercetin and kaempferol, have antiviral, antibacterial, anti-inflammatory, and anticancer properties, as well as heart and brain protection.

1.4 Antioxidant Activity:

Flavonoids have long been known to have anti-oxidant effects. It is onion flavonoids' most well-studied and documented action, which protects cells and tissues against reactive oxygen species (ROS). ROS produce free radicals, which cause exogenous damage to cells in many organs. Flavonoids, such as quercetin and kaempferol, have also been shown in vitro to stabilize free electrons produced by ROS. The hydroxyl configuration of flavonoids' B ring plays an important role in scavenging ROS by contributing hydrogen and an electron to hydroxyl and peroxy, stabilizing them. The flavonoid heterocycle causes a reaction between a free 3-OH and the aromatic rings, resulting in antioxidant activity. Furthermore, studies show that the quantity, location, frequency, and amount of sugar residues all have a role in antioxidant action.

1.5 Antibacterial Activity:

Flavonoids have been shown in many studies to have potent antibacterial effects. Their antibacterial inhibitory effect obstructs the formation of microbial enzymes, adhesins, transport proteins, and other proteins.

Quercetin is a flavonoid that has been researched extensively for its ability to suppress bacterial growth. It has showed tremendous promise in totally inhibiting the development of *Staphylococcus aureus*. Kaempferol has been proven in studies to be an inhibitor of *Helicobacter pylori*. Onion and garlic extracts have been shown to have bactericidal effects against *Streptococcus mutans*, *Streptococcus sobrinus*, *Porphyromonas gingivalis*, and *Prevotella intermedia* (Gram-positive bacteria), which are the bacteria that cause dental cavities and adult periodontitis, respectively. Onion, on the other hand, is ineffective against Gram-negative bacteria. Aside from organosulfur compounds, some quercetin oxidation products found

in onions have been shown to have antibacterial action against *H. pylori* and MRSA (multidrug resistant *S. aureus*).

1.6 Antiviral Activity:

Flavonoids have long been recognized to be effective against viruses, according to studies. Flavonoids have been shown by several scientists to have antiviral action, meaning they can suppress or destroy viruses. The blocking and destruction of viral protein and nucleic acids is the method for limiting viral proliferation.

1.7 Anticancer Activity:

Onion phytochemicals are important in the prevention of a variety of carcinogenic actions. Flavonoids have been shown in many studies to have a beneficial effect in cancer risk reduction. Flavonoids use a variety of mechanisms to prevent cancer, including cell cycle arrest, tyrosine kinase inhibition, p53 protein control, heat shock protein inhibition, and inhibiting Ras protein production (a class of cellular protein). Onion intake, according to Kumar and Pandey, lowers the risk of cancer in many organs, including the prostate, stomach, breast, and lungs. In a human phase I study, quercetin was evaluated as a tyrosine kinase inhibitory drug. Ovarian cancer, lung cancer, leukemia, bladder cancer, prostate cancer, breast cancer, and pancreatic cancer have all been linked to kaempferol.

1.8 Anti-inflammatory Activity:

Inflammation is a complicated biological reaction. Pathogen infection, chemical irritation, and damage to cells and tissues are all known to trigger it. Many animal models have been used to demonstrate the function of flavonoids in the prevention of inflammation, and quercetin and kaempferol have been shown to be effective anti-inflammatory drugs. In vitro, quercetin has been shown to block various isotypes of immunoglobulins such as IgM, IgG, and IgA, all of which are mitogen triggered.

1.9 Hepatoprotective Activity:

The term "hepatoprotective" simply refers to the ability to protect the liver from harm. The flavonoid's property in this respect has been well investigated. Quercetin supplementation has been found to protect mice's liver cells against iron excess hepatic damage. Hepatoprotective properties of anthocyanin have also been discovered. The anthocyanin cyanidin-3-O-glucoside (C3G) has been discovered to enhance hepatic Gclc expression for protein kinase A activation by raising cAMP levels, which aids in phosphorylation of the element binding protein for improved Gclc transcription.

1.10 Antihypertensive Effect:

A study of hypertension in rats found that quercetin and its methylated metabolite isorhamnetin, found in onions, can lower blood pressure and prevent angiotensin-II-induced endothelial dysfunction by inhibiting the overexpression of p47phox, a membrane NADPH oxidase regulatory subunit. The increased superoxide production resulted in a high nitric oxide level. Other studies in hypertensive rats using ethanolic extracts of onion and garlic found that oral administration of extracts on a normal salt diet or during a high salt diet had no effect on blood pressure.

1.11 Antiplatelet or Antithrombotic Effect:

In vitro, onion suppresses platelet aggregation, and many platelet inhibitors have been extracted and identified. According to studies on onion's antithrombotic properties, its aqueous extracts prevent the production of thromboxane, a powerful inducer of platelet aggregation. The antiplatelet action of onions is thought to be a characteristic of organosulfur compounds, according to many epidemiologic research. Antithrombotic action has been discovered in a family of -sulfinyl-disulfides (cepaenes) present in onion extracts.

2. DISCUSSION

The onion (*Allium cepa*) is a Central Asian native and one of the world's oldest cultivated plants, having been grown for almost 4000 years. Onions and other members of the genus *Allium* have long been used for a variety of functions, including food preparation and flavoring. The significance of onion stems from the flavor it gives to other meals as a result of its composition. When onions are added to certain meals, they produce a high concentration of bioactive chemicals that may have health benefits. One of the most widely researched advantages is its impact on cardiovascular disease, which includes hypocholesterolemic, hypolipidemic, anti-hypertensive, antithrombotic, and hypoglycemic actions. The significance of phytochemicals in the treatment of a variety of human diseases distinguishes the onion as a valuable commodity in the culinary and pharmaceutical industries. The creation of top cultivars with high phytochemical content is crucial for onions' future in the food sector.

3. CONCLUSION

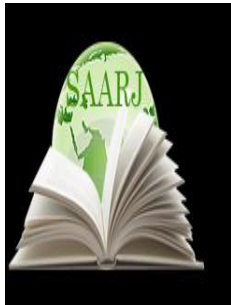
The onion is one of the most often used vegetables for improving the flavor and taste of a broad range of dishes throughout the globe. Aside from that, onion plays a significant function in salads when eaten raw because of the health advantages of direct phytochemical consumption in the raw form. The significance of phytochemicals in the treatment of a variety of human diseases distinguishes the onion as a valuable commodity in the culinary and pharmaceutical industries. The creation of top cultivars with high phytochemical content is crucial for onions' future in the food sector. More study is needed at every step of production, from the farmer's field to the processing facility, and appropriate methods must be created to maintain the beneficial phytochemicals for human health.

By establishing a quality-based technique for processing raw onions, phytochemicals in onions may be maintained. There is a dearth of scientific data on the effects of postharvest processing techniques on the phytochemicals found in onions. More study is also required on the effect of preharvest techniques on phytochemical development, which has yet to be fully investigated.

REFERENCES:

1. A. Melnikovas, "Towards an explicit research methodology: Adapting research onion model for futures studies," *J. Futur. Stud.*, 2018, doi: 10.6531/JFS.201812_23(2).0003.
2. UK Essays, "Research Onion - Explanation of the Concept," *Essays*, 2017.
3. K. Sharma, N. Mahato, and Y. R. Lee, "Systematic study on active compounds as antibacterial and antibiofilm agent in aging onions," *J. Food Drug Anal.*, 2018, doi: 10.1016/j.jfda.2017.06.009.

4. H. Ouyang, K. Hou, W. Peng, Z. Liu, and H. Deng, "Antioxidant and xanthine oxidase inhibitory activities of total polyphenols from onion," *Saudi J. Biol. Sci.*, 2018, doi: 10.1016/j.sjbs.2017.08.005.
5. "the-health-benefits-of-onions-main-image-700-350-8425535." <https://www.bbcgoodfood.com/howto/guide/ingredient-focus-onions> (accessed Aug. 01, 2021).
6. E. Y. Ko, S. H. Nile, K. Sharma, G. H. Li, and S. W. Park, "Effect of different exposed lights on quercetin and quercetin glucoside content in onion (*Allium cepa* L.)," *Saudi J. Biol. Sci.*, 2015, doi: 10.1016/j.sjbs.2014.11.012.
7. J. Mitra, S. L. Shrivastava, and P. S. Rao, "Onion dehydration: A review," *Journal of Food Science and Technology*. 2012, doi: 10.1007/s13197-011-0369-1.
8. K. Sharma *et al.*, "Temperature-dependent studies on the total phenolics, flavonoids, antioxidant activities, and sugar content in six onion varieties," *J. Food Drug Anal.*, 2015, doi: 10.1016/j.jfda.2014.10.005.
9. I. Mehta, "Origin and History of Onions," *IOSR J. Humanit. Soc. Sci. (IOSR-JHSS)*, 2017.
10. "Chemical-structure-of-saponin." https://www.researchgate.net/figure/Chemical-structure-of-saponin_fig1_319703260 (accessed Aug. 01, 2021).



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THE EMERGENCE OF THE LIBERATION MOVEMENT IN KASHKADARYA

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ABSTRACT

The article describes the rise of the anti-Soviet movement in the Kashkadarya oasis to the level of a national liberation struggle. An analysis of the data also shows the courageous leaders who led the struggle as the ideological leader of the volunteers during the uprising, who took an active part in the uprising and led the special rebel groups against the Red Army.

KEYWORDS: "Korboshi", "Mullah", Soviet Power, Red Army, Abstract, Revkom, GPU (BSB), RSFSR, Squadron, Revolution, Amin, Platoon, Division, Penitentiary, Defense, "Consultation".

INTRODUCTION

The Soviets, who occupied the main part of Turkestan, focused on the conquest of the Bukhara Khanate. In November 1919, the Central Committee of the Russian Communist (b) Party, the Central Executive Committee of the All-Union, and the Turkestan Affairs Commission of the Council of People's Commissars of the RSFSR set out to carry out a "people's revolution" in the Bukhara Khanate. The commission included VV Kuybishev, MV Frunze, Sh.Z. Eliava, Ya.E. Rudzutak from Komfirka and Soviet leaders.

The Turkic Commission was given the historic task of "turning Turkestan into a model republic in the Soviet East, of fraternal support for the liberation struggle of the oppressed peoples of Bukhara and Khiva against the Emir and Khan, as well as the British imperialists seeking to colonize the country." [1].

The Bukhara Khanate, according to Soviet dictators, was the backbone of the anti-revolutionary movement in Central Asia at that time. For this reason, the Tukkomissiya focused primarily on Bukhara. The Soviets were terrified of British intervention at the time.

The negotiations of the Turkic Commission with Amir Sayyid Alimkhan on January 7 and March 30, 1920 showed that the khanate and the Soviets could not establish close relations. The

Amir was well aware of the Soviets' original goal of occupying all of Turkestan, which was delayed by Bukhara and Khiva due to the fact that the khanates were favored by Britain, Turkey, and Iran.

Amir Alimkhan's goal was to increase the army and strengthen the defense. The news that Khiva had fallen into the hands of the Soviets made him think hard and hasten to take emergency measures. Now Bukhara was the only khanate that had not been occupied by the Soviets, and the only throne that had not been occupied by him. Over the next three years (1917–1920), the ranks of the army were steadily increased, and the number of rifles purchased from the British reached tens of thousands. The calculation made on July 12, 1920, shows that the Emir had 13,220 cavalry and 12,000 infantry. In the principalities of the khanate, such as Karshi, Shakhrisabz, Kitab, Chorjoi, Termez, Sherabad, Dushanbe, 70,000 volunteers were assigned to military operations. Arming volunteers was a difficult task. Although Amir Alimkhan hoped for foreign help in this regard, he could not believe that the promises would be fulfilled.

The Turkestan delegation of the All-Union Central Executive Committee of the Soviets and the Council of People's Commissars of the RSFSR met in Tashkent to consider the conquest of Bukhara, and Petrograd was very upset by the prolonged occupation. In a telegram to VI Lenin on August 1, 1920, M. Frunze attributed the reason for the delay to the fact that the internal revolutionary situation in Bukhara was being slowed down "due to political instability and factors." Although the telegrams say that "the people are dissatisfied with the regime of the Emir," the public in Bukhara is full of red phrases such as the political disenfranchisement of M. Frunze, the low level of revolutionary consciousness. The Soviet intended to destroy the Bukhara Khanate under the banner of an "internal revolutionary explosion[2]."

The commander of the Turkestan Front, M. Frunze, wrote on July 30, 1920: The Revolutionary Council of our Front has decided to resolve the issue in the near future.

The commander had made a plan to invade the khanate. Three or four days before the attack on the capital Bukhara, on August 28, 1920, a surprise attack was planned on Kitab, Shakhrisabz and Karshi, which were strongholds. This military policy was intended to distract the emir from the defense of the capital.

The Revolutionary Committee intensified its propaganda in many parts of the khanate, turning over dissidents and secretly arming them. The young people of Bukhara allied with the Soviet and began to actively assist them in this work. The Amir's danger was from them.

No matter how much the young people of Bukhara urged them to start an armed uprising, the Shura allegedly rejected their speeches and planned to gain time, to gather strength to occupy the main bases of the emirate. Preparations after Kolesov's defeat in March 1918 thus ended in late August 1920. It is impossible to say that Amir Sayyid Alimkhan was not aware of these actions. He expected the threat of the Soviet attack from Samarkand to the Kashka oasis, Kitab, Shakhrisabz and Karshi. For this reason, the defense forces will be strengthened in the Black Wood Pass, the number of snipers and soldiers will be increased.

In the villages, there are rumors that "if we overthrow the Emir, his lands, treasures, property, all the land and wealth of the rich and officials will be given to the poor, landless, land tax, tribute tax, all taxes will be completely banned" [1,2].

On August 28, 1920, the 1st Turkestan Cavalry Division launched an attack on the Takhta Karacha Pass. After the capture of Kitab and Shahrisabz by the Soviet cavalry division, Yakkabog, Chirakchi and Karshi were captured one after another.

When the regional center Karshi was captured by the Reds, the entire military force was thrown into Bukhara. The Soviet Union focused on the overthrow of Amir Sayyid Alimkhan and the capture of the khanate's capital.

The conquest of the Qashqa oasis, the economic and military base of the khanate, dashed the trust and hopes of Amir Sayyid Alimkhan. After that, in spite of the unprecedented preparations for the defense of Bukhara, Amir Sayid Alimkhan held a secret meeting with a few of his relatives and accepted the offer to leave Bukhara.

September 2 was a dark morning in Bukhara. By order of M. Frunze, the planes ruthlessly bombed the ancient city, the Emir's residence Ark, mosques and madrasas, bazaars - crowded places. On September 2, 1920, Bukhara, the last khanate capital in Turkestan, fell to the Soviets. The Soviets were thus able to take control of the territories of the three khanates.

One or two days before the attack on Bukhara, Amir Sayyid Alimkhan and his relatives, the most loyal, the most reliable people, officials, and soldiers were stationed in Karshi, in the summer residence of the mayor of the city Togaybek in Haramsaray. Although Karshi was occupied by the Reds two or three days ago, its control was not established, and the main military forces were involved in the invasion of Bukhara. The temporary situation did not allow the emir, who had fled Bukhara, to stay in Karshi for a few days. Many famous rich people, dodhos and karavulbegs from places like Kitab, Shahrisabz, Yakkabog, Chirakchi, Dehkanbod remain unaware. They were given the command of the Emir[3].

The last meeting of Amir Sayyid Alimkhan in Karshi was attended by beys, commanders, rich people, priests, eshans and mullahs, who were loyal to the throne, and only those who were considered the most necessary.

In early September 1920, at a meeting held immediately after the fall of Bukhara to the Soviets, Amir Sayyid Alimkhan expressed his confidence in victory and his far-sightedness.

Epifanov, the head of the investigation department of the Main Political Department, wrote about the "counter-revolutionary organization": "Citizens: 1. Mulla Navruz Pulatov. 2. Erka amin Dustmurodov. 3. Maxmaraimbek Abdusattorov. 4. Abdurasulqulbek Abdusattorov. 5. Mullo Tojiddin Salimov. 6. Khojanazar Inotullaev. 7. Khoja Abdulaziz Mullo Bokihojaev. 8. A Review of the Criminal Activity of Mullo Nemat Shodmonov "provides valuable insights into the history of the period from the escape of Amir Sayyid Alimkhan to the spring of 1926. [3]

The General Political Directorate (GPU) has been following in the footsteps of the "counter-revolutionary organization" since the establishment of the Soviet regime in Kashkadarya. In the 20s and 21s, when the Soviets were still relatively small, it was impossible to take drastic measures against the enemies of the revolution. For this reason, there were temporary concessions to certain aspects of the amir's regime, to the beys and officials. The BSB, as a detective, a murderer, a punitive body, did not ignore even small resistance movements [4].

The loyal revelations of the emirate were threatened by a growing revolution in the East. The current of revolution turned all its intensity towards the oppressors and washed away the old

beliefs. Mirza Navruz Pulatov, Erka Amin Dustmurodov, Muhammad Rahim Abdusattorov, Abdurasulkulbek Abdusattorov, Mullo Tojiddin Salimov, Khojanazar Inotullaev, Khoji Abdulaziz Mullo Bokihojaev and Mullo Nemat Shogimov (now Mullo Nemat Shogmonov) and the Karshi Agoligi Nuriddinkhoja (shot for his counter-revolutionary activities) to form a "counter-revolutionary organization" in Karshi. The number of members of the "counter-revolutionary organization" has reached 70. This organization has set itself the task of ending the revolutionary movement of the "Young Bukhara". When the Emir fell from the throne in Bukhara, the organization set the sole goal of overthrowing the Soviet government and launched a campaign to bring back the Emir who had fled to Afghanistan.

After the fall of the Emirate in Bukhara, the Emir fled to Karshi, a city now known as Behbudi. Amir was warmly welcomed by members of the Counter-Revolutionary Organization. With the help of the Emir, the Europeans living in Karshi at that time were forced to exterminate on the basis of national liberation. As a result, about 800 Europeans were killed, and neither women nor children were left out of the bloody revenge.

In connection with the arrival of the Red Army in the city of Karshi, the "Counter-Revolutionary Organization" is constantly propagandizing an armed uprising among the population. The armed uprising was supposed to take place against the Soviet government and the Red Army. The "counter-revolutionary organization" uses the factor of the population to achieve its goal [4].

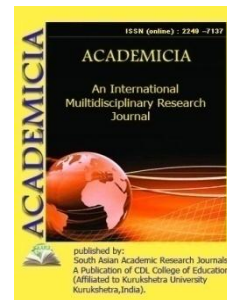
The above-named people are at the forefront of the struggle as the ideological leader of the volunteers during the uprising, actively participating in the uprising, and even fighting the Red Army by leading separate rebel groups.

The first action of the rebels, led by Muhammad Rahimbek and Khojanazar Inotullaev, was to demolish the Karshi railway station. Railway goods are looted, workers and railway workers are arrested, beaten and shot [5].

The study of the history of the establishment of the Soviet dictatorship in Uzbekistan in the 1920s makes an invaluable contribution to the practical understanding of the value of such sacred concepts as the independence of the Motherland, the freedom of the people.

LIST OF USED LITERATURE:

1. Ishanov A.I. Buxarskaya narodnaya sovetskaya respublika. T., «Uzbekistan», 1969, 159-bet.
2. Zaxarov S.M. Ocherki istorii Kashkadarinskoy i Surxandarinskoy oblastey Uzbekistana, 42-bet.
3. Melkumov Y.A. Turkestansi. M., Voenizdat, 1960, 18-19-betlar.
4. Ravshanov P. Qo'lg'a tushgan qasoskorlar. – Toshkent, "Fan", 2014, 300 bet.
5. Ravshanova G. Qashqadaryo: XX asr boshlari tarixi. – Toshkent, "Yangi asr avlodi". 2016, 280 bet.



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BIOLOGICAL AND ECOLOGICAL CHARACTERISTICS OF MAIN PESTS OF LEGAL CROPS

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ABSTRACT

*This article provides information on the role of physical and physiological properties of grains and cereals, the effects of microorganisms and pests, as well as storage regimes. The body length of the beetle is 2.5-3.5 mm. The whiskers of male beetles are comb-shaped, with 8-10 joints with long growths, and the whiskers of females are rosary. The presence of a moldy and pungent odor on the grain mass indicates the development of storage fungi. The main role here belongs to the fungus *Penicillium*. The initial stage of development of microorganisms is insignificant from the outside. this condition can be clearly determined by observing the dynamics of the microflora of the grain mass, because at this time there are still no signs of spoilage in the grain.*

KEYWORDS: *Lentils, Entomology, Rosary, Penicillium, Ball Beetle.*

INTRODUCTION

In addition to microorganisms, there are visible and invisible living organisms in the grain mass that are called pests. the main pests settle on the grain before and after harvest, and then begin to live in the same conditions as the grain.

Pests include more than a million different insects in the insect class. The science that studies insects is called entomology. Of these, only one describes the beetle's habitat, survival and control measures.

Chinese grain beetle (*Callosobruchus chinensis* L.). Damage. the Chinese grain beetle, like the bean beetle, harms beans, peas, and cowpeas, lentils. Spread. Afghanistan, India, Indonesia, the Far East, Southern, Central and Eastern Europe, Central and South Africa, Mauritius, Bermuda, the West Indies and Hawaii.

Definition The body of the beetle is short oval; reddish-brown, with black and light spots of short feathers streaked along the wings. The base of the front of the back is wider than the tip. The next leg has teeth on the inside. The body length of the beetle is 2.5-3.5 mm. The whiskers of male beetles are comb-shaped, with 8-10 joints with long growths, and the whiskers of females are rosary. These signs make it easier to identify males and females. the larvae and fungi are very similar to the larvae and fungi of the bean beetle.

Living life. This beetle, like the bean beetle, infects the grains of plants that fall on it in the fields and in the barns after harvest. Elsewhere, it spreads mainly with grains. lays its eggs on the surface of beans in the fields and on grain or grain bags in warehouses, while the female beetle lays an average of 60 eggs. Eggs develop on average 8 days, larvae 17 days and fungi 7 days. under different conditions, the full development of this pest takes 18-60 days. Several larvae can mature in a single grain of bean. This pest gives several joints per year. It develops without hibernation when the temperature is high enough.

Control measures. Measures will be taken to control the bean beetle. *Callosobruchus quadrimacutatus* F. Damage. This beetle infects peas, soybeans, beans and peas. The grain is damaged just like beans and Chinese beetles. spread Occurs in India, Turkey, Greece, Belgium, Algeria, Central Africa, the United States and Australia. Definition. The body of the beetle is elongated oval. the front of the back widens further backwards, with two grooves on either side of the back edge; there will be one large thorn on the inside of the next number. the main color of the beetle is brown, there are one dark spot near and in the middle of the tip of the wing, sometimes these spots are not clearly visible or not at all. The length of the beetle is 3.5-5 mm. the larvae and fungi are very similar to the larvae and fungi of the bean beetle. Living life. Basically, it's like a Chinese grain beetle. It is most often spread by damaged grains. develops in the grains of the above plants grown in the field and stored in warehouses.

Females lay up to 100 eggs. When the conditions are right, the eggs develop in 4-5 days and the larvae in 17-22 days, the full development period lasts up to 30-38 days. gives 3 joints per year.

Control measures. Measures will be taken to control bean and Chinese grain beetles. Egyptian pea beetle (*Brachidius incarnatus* Boh.).

Damage. This beetle, like other grain beetles, causes damage to peas, lentils and pea grains. Spread. Occurs in North Africa, Spain, Portugal, Southern France.

Definition The body of the beetle is short, oval, reddish-brown in color, with a slightly darker part near the base of its wings; on the wings there are elongated, sometimes bumpy spots of yellow short feathers. The pygmies are gray and covered with brown spots. the thighs of the next leg are very thick and have sharp teeth. The length of the beetle is 5-3.5 mm. The larvae and fungi are very similar to the larvae and fungi of the bean beetle.

Living life. In general, they live like Chinese and four-toed beetles. control measures. Effects of microorganisms on the grain mass of bean beetles.

The amount of dry matter loss in the grain and the degree of deterioration of grain quality depends on the conditions of development of microorganisms and their active life.

Microorganisms affect the grain mass as follows:

1. The purity of the grain batch is disturbed (color, smell, taste deteriorate);
2. Decreased seed-bearing properties of grain;
3. Grain mass exhibits toxicity;
4. The temperature of the grain mass rises as a result of the activity of microorganisms;
5. The dry matter in the grain begins to disappear.

The initial stage of development of microorganisms is insignificant from the outside. This condition can be clearly determined by observing the dynamics of the microflora of the grain mass, because at this time there are still no signs of spoilage in the grain. The danger of this stage is that when bacteria and fungi find an opportunity for their active development, they cause spontaneous heating or suffocation and putrefaction in the grain mass. Therefore, the active growth of microorganisms in the grain mass cannot be allowed. This is done by timely processing of the grain mass.

Changes in grain freshness under the influence of microorganisms

The color, gloss, odor, taste of grain are important indicators of freshness. Grains ripened and harvested under normal conditions should be stored in the same condition as grains of this type or variety.

As the vital activity of microorganisms increases, changes in grain viability are observed in the following sequence: the grain becomes dull, spotted and darkened grains begin to appear, in some grains colonies of fungi and bacteria are formed, much of the grain darkens, broken grains appear. The color of the grain mass darkens, the elasticity disappears, and the final stage of spontaneous heating begins. The presence of a distinct odor from the grain mass during storage indicates the development of each microorganism. The presence of a moldy and pungent odor on the grain mass indicates the development of storage fungi. The main role here belongs to the fungus *Penicillium*. The complex of substances in the grain mass and the substances released from the fungus give it a pungent odor and unpleasant taste. And it is swallowed by the grain. Not all frosts are completely removed when measures are taken to remove them. This odor is transmitted to it and to other grain products.

In addition to the stench of grain storage, there are odors of rot, barn and mite, the occurrence of which is associated with the vital activity of each microorganism. The development of yeasts causes the appearance of a warehouse odor in the grain mass.

REFERENCES:

1. fayzullayev B., Ahmedov S.I., Khudoykulov A.M. Laboratory classes on the basics of agricultural entomology and quarantine. Samarkand - 2014.
2. Fayzullaev B., Nishanov N. Practical training on insect ecology. Samarkand - 2015.
3. Hamraev A et al. agroentomological cartogram. Tashkent - 1994. 4.Hamraev A.Sh. Nasridinov K. "Plant lice, species composition and lifestyle." Tashkent - 2003.
4. Hamraev A.Sh, Nasridinov K. Biological protection of plants. Tashkent - 2003



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A BRIEF DESCRIPTION ON BIODIESEL

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ABSTRACT

Continuous usage of fossil fuels (non-renewable natural resources) is rapidly diminishing, and their combustion is causing an increase in carbon dioxide in the atmosphere. For environmental and economic sustainability, renewable carbon-neutral transportation fuels are needed. Biodiesel made from oil crops has the potential to be a carbon-neutral sustainable alternative to petroleum-based fuels. It is mainly generated via direct usage and mixing, microemulsions, thermal cracking (pyrolysis), and transesterification, and is made up of monoalkyl esters of long-chain fatty acids. Transesterification of vegetable oils and animal fats is the most prevalent technique for producing biodiesel. Batch procedures, supercritical processes, ultrasonic techniques, and microwave methods are all accessible for the transesterification reaction. Water content of oils or fats and free fatty acids, molar ratio of glycerides to alcohol, catalysts, reaction duration, and reaction temperature are all variables that affect the transesterification process. The significance, history, characteristics, suppliers, and methods for producing biodiesel are discussed in this study.

KEYWORDS: *Alternate Fuel, Biodiesel, Renewable, Transesterification, Vegetative Oil.*

1. INTRODUCTION

Petroleum consumption has been steadily rising as a result of industrialisation and modernisation. Energy consumption has increased as a result of economic growth. Fossil fuels such as petroleum, coal, and natural gas provide the energy required to meet demand. According to the International Energy Agency (IEA) and Shahid and Jamal, the world will need 50% more energy in 2030 than it does now, with China and India accounting for half of it. Climate change is now the world's most significant environmental issue. Nearly one million species may go

extinct if global temperatures rise by more than 2°C, and hundreds of millions of humans could perish. Between 2007 and 2020, approximately 4.1 billion metric tons of CO₂ are expected to be emitted into the atmosphere. From 2020 to 2035, an additional 8.6 billion tons CO₂ is projected to be emitted into the atmosphere[1]–[4].

The high viscosity, low volatility, and polyunsaturated nature of triglycerides cause problems when they are substituted for diesel fuels. Pyrolysis, microemulsification, and transesterification are three major methods that have been explored in an effort to overcome these limitations and enable vegetable oils and oil wastes to be used as a viable alternative fuel. Transesterification is the most frequent and generally recognized of these.

The transesterification reaction is the chemical process through which biodiesel is made. Triacylglycerols react with short-chain monohydric alcohols at high temperatures in the presence of a suitable catalyst (alkali, acid, or enzyme) to produce fatty acid alkyl esters (FAAE) and glycerol. Transesterification is the most straightforward and cost-effective method of producing biodiesel[5].

1.1 History of Biodiesel:

The diesel (compression ignition) engine was developed by Rudolf Diesel to operate on a variety of fuels, including coal dust suspended in water, heavy mineral oil, and vegetable oil. Diesel's early engine attempts were a complete disaster. He demonstrated his engine, which ran entirely on peanut oil, at the World Exhibition in Paris in 1900. 'The diesel engine can be fueled with vegetable oils and would assist greatly in the growth of agriculture in the nations that utilize it,' Diesel claimed in 1911. 'The use of vegetable oils for engine fuels may seem trivial nowadays,' Diesel wrote in 1912. However, such oils may become as significant in the future as petroleum and coal tar products are now.' Diesel passed away in 1913. Later, his engine was adapted to operate on the toxic petroleum fuel known today as "diesel." Nonetheless, his agricultural ideas and innovation laid the groundwork for a civilization powered by clean, renewable, locally produced fuel. Vegetable oils were utilized to substitute diesel fuel in emergency circumstances. Biofuels are becoming more popular as a result of their renewable nature and ability to reduce pollution[6], [7].

1.2 Source of Biodiesel:

Vegetable oil, waste cooking oil, and animal fats may all be used to make biodiesel. Algae, microalgae, and fungus may all be used to make biodiesel. However, the majority of research has focused on oil-producing plants. The selection of feedstock is the initial stage. More than 350 oil-bearing crops have been identified as possible biodiesel sources throughout the world. The most frequently utilized feedstocks for biodiesel manufacturing. The availability of a diverse variety of feedstocks is the most significant element in biodiesel manufacturing. Low manufacturing costs and large-scale production are two major criteria for the feedstock. Geographical locations, climate circumstances, local soil texture and conditions, and agricultural methods all influence the availability and output of biodiesel feedstock. There are four types of biodiesel feedstocks:

- Vegetable oils that is edible, such as rapeseed, soybean, peanut, sunflower, palm, and coconut.
- Vegetable oils that is not edible, such as jatropha, karanja, sea mango, algae, and halophytes.

- Oil that has been used before or that has been recycled.
- Beef tallow, yellow grease, chicken fat, and by-products from fish oils are examples of animal fats.

1.3 Biodiesel production technologies:

The extraction of oil is the second stage in the biodiesel manufacturing process. The oil contained in the seeds is removed during the oil extraction process. The primary result of this process is crude oil, with seeds or kernel cakes as significant by-products. The oil may be extracted using one of three methods:

- Enzymatic extraction.
- Solvent extraction.
- Mechanical extraction.

The most common technique (using mechanical expellers or presses) is the mechanical method. Whole seeds, kernels, or a combination of both are utilized in this technique, although whole seeds are the most frequent choice. Oil extraction yields are 68–80 percent using the mechanical technique. The chemical extraction technique uses just kernels as a feedstock. A liquid solvent is used to extract the oil from the seed in the solvent extraction technique. The pace of oil extraction is influenced by a number of variables (such as particle size, type of liquid chosen, temperature and agitation of the solvent). The solvent approach is used in three methods for oil extraction:

- Ultrasonication technique
- Soxhlet extraction.
- Hot water extraction.

1.4 Direct use and Blending:

It was proposed in 1980 that vegetal oil might be utilized as a fuel. The idea of utilizing edible oil as a fuel implies that petroleum will be used in lieu of vegetable oil and alcohol as alternatives, and that renewable energy must be used to replace non-renewable resources. Sunflower oil was investigated by academics in South Africa (during an oil embargo). In Caterpillar, Brazil, in 1980, pre-combustion chamber engines were run using a 10% vegetable oil mixture to sustain complete power without any changes or adjustments to the engine. At the time, replacing 100% vegetable oil for diesel fuel was not feasible, but a mix of 20% vegetable oil and 80% diesel fuel was feasible and effective. In certain short-term tests, a 50/50 mix of vegetal oil and diesel was utilized[5], [8].

1.5 Pyrolysis:

Thermal cracking is another name for pyrolysis. Pyrolysis is a chemical transformation caused by the application of heat energy in the absence of air or nitrogen in the presence of a catalyst. Vegetable oils, animal fats, natural fatty acids, and methyl esters of fatty acids may all be used as substrates for the pyrolysis process of producing biodiesel. The pyrolysis of triglycerides to produce biodiesel has been shown to be acceptable for diesel engines. The liquid portions of temperature-based vegetable oil conversion are expected to resemble diesel fuels. Alkanes,

alkenes, alkadienes, aromatics, and carboxylic acids are produced during this kind of triglyceride breakdown. The pyrolyzate was shown to have lower viscosity, flash point, and pour point than petroleum diesel fuel while having similar calorific values.

1.6 Catalytic transesterification:

Alkali, acid, enzyme, and heterogeneous catalysts are used in the transesterification of triglycerides. Sodium hydroxide, sodium methoxide, potassium hydroxide, and potassium methoxide are more effective alkali catalysts. Sulfuric, hydrochloric, and sulfuric acids are the most often used acid catalysts. Heterogeneous catalysts may also be used to produce biodiesel. Enzymes, titanium-silicates, alkaline-earth metal complexes, anion exchange resins, and guanidines heterogenized on organic polymers are examples of heterogeneous catalysts. The catalytic transesterification of vegetable oils/animal fats with methanol is a crucial industrial process in the production of biodiesel. This process, also known as methanolysis, has been extensively researched and established utilizing acids or alkalis as catalysts, such as sulfuric acid or sodium hydroxide. For long-chain alcohols, however, these catalytic systems are less active or totally inert. Sodium or potassium hydroxide, or sodium or potassium methoxide, are often used as catalysts since they are comparatively less costly and very active for this process.

1.7 Enzyme-catalysed transesterification:

Enzymes may also catalyze transesterification. Lipase is the most often utilized enzyme for transesterification. Lipase from *Candida antarctica*, *Candida rugosa*, *Pseudomonas cepacia*, immobilized lipase (Lipozyme RMIM), *Pseudomonas* sp., and *Rhizomucormiehei* has been described. Using a commercially available immobilized lipase, the enzymatic transesterification of soy bean oil with methanol and ethanol was studied (Lipozyme RMIM). The greatest results were obtained in a solvent-free system with a 3.0 ethanol/oil molar ratio, a temperature of 50°C, and a 7.0 percent (w/w) enzyme concentration. They got a 60% yield and it took 1 hour to complete the reaction. Using *P. cepacia* lipase immobilized enzyme on celite material at 50°C in the presence of 4–5 percent (w/w) water for 8 hours, Shah and Gupta achieved a 98 percent yield. The transesterification process in the enzyme-catalyzed system takes longer than the other two catalytic ways of transesterification. Extracellular and intracellular lipases may efficiently catalyze the transesterification of triglycerides in both aqueous and non-aqueous environments. Using alkali or acid-catalyzed transesterification, enzyme-catalyzed transesterification may solve the issues described above.

1.8 Catalyst effect:

Alkali, acid, or enzyme catalysts are employed in the transesterification of triglycerides. The most common commercially utilized transesterification is alkali-catalyzed transesterification, which is considerably quicker than acid-catalyzed transesterification. The most efficient catalysts were determined to be Na, NaOH, and KOH in that research. The authors used ultrasonic energy to examine the impact of various catalyst concentrations on base catalyzed transesterification during biodiesel synthesis from vegetable oil. When the catalyst was employed at a low concentration, such as 0.5 percent wt/wt of oil, the highest yields of ester were achieved. At greater reaction temperatures, hydrochloric acid outperforms sodium hydroxide, according to the findings of several researches[9].

1.9 The effect of temperature and time:

Depending on the kind of vegetable oil or fat used, transesterification may occur at various temperatures. At room temperature, there are few reports on the transesterification process. The reaction of palm oil transesterification with methanol (6:1) and 1% KOH was studied at various temperatures. Ester yields at 50 and 65 degrees Celsius were 73 and 82 percent after 4 minutes, respectively. At 40–70°C, the impact of reaction temperature on propyl oleate synthesis was investigated using free immobilized *P. fluorescens* lipase. At 60°C, the conversion ratio to propyl oleate was greatest, but at 70°C, the activity reduced.

1.10 Properties and qualities of biodiesel:

Physicochemical characteristics are used to characterize the qualities or quality of biodiesel. CN, caloric value (MJ/kg), density (kg/m³), viscosity (mm² / s), cloud and pour points (°C), flash point (°C), acid value (mg KOH/g-oil), ash content (%), water content and sediment, copper corrosion, distillation range, carbon residue, sulphur content, glycerine presence (percent m/m), phosphorus (mg/kg), and oxidation. The chemical and physical characteristics of biodiesel are determined by the kind of raw material used and the fatty acid content.

1.11 Viscosity:

The ability of a fuel to flow is described by its viscosity. This property is essential in the functioning of fuel injection equipment and spray atomization, especially at low temperatures when the fuel's fluidity is affected by the rise in viscosity[10].

1.12 Fuel density and relative density:

The density of a fuel is defined by its weight per unit volume. Oils have a higher energy density and are thus denser. Biodiesel density may be determined using the EN ISO 3675/12 185 and ASTM D1298 standards. Density should be evaluated using this reference standard at a temperature of 15 or 20°C. The density of the fuel in comparison to the density of water is known as relative density. Biodiesel's relative density is used to convert mass to volume, compute flow and viscosity characteristics, and evaluate the homogeneity of biodiesel tanks.

1.13 Flash point:

When exposed to a flame, the flash point of a fuel is the temperature at which it will ignite. Fuel volatility is inversely proportional to its flash point. Biodiesel has a higher flash point than petroleum diesel, making it safe to carry, handle, and store.

1.14 Titre:

Titre is the temperature at which solidified oil transforms into liquid oil. Because the transesterification process for biodiesel production is essentially a liquid process, oils with high titre may need heating, increasing energy requirements and production costs for a biodiesel plant.

1.15 Free Glycerin:

The quantity of glycerol left in the final biodiesel is referred to as free glycerol. The quantity of free glycerol in biodiesel is determined by the manufacturing method.

1.16 Ash of Sulphate:

The quantity of inorganic impurities in the fuel, such as abrasive particulates, catalyst residue, and soluble metal soaps, is referred to as ash content. To measure the proportion of sulphated ash present, the bio diesel is ignited and burnt, then treated with sulphuric acid. The ASTM D874 standard specifies that the samples may include no more than 0.02 percent sulphated ash.

2. DISCUSSION

Biodiesel is a biodegradable, renewable fuel made in the United States from vegetable oils, animal fats, or restaurant grease. Biodiesel is a liquid fuel that is often referred to as B100 or "neat" biodiesel. Biodiesel, like petroleum diesel, is used to power compression-ignition engines. Biodiesel is a resource that has a lot of potential. Esterification and transesterification are the two most important processes in biodiesel synthesis. The kind of feedstock oil, reaction circumstances, catalyst employed, and alcohol to oil molar ratio all have an impact on these reactions. Biodiesel produced from rapeseed oil and ethanols made from maize were formerly thought to be the pinnacle of future low-carbon transportation. Biofuels may account for 27% of worldwide transportation fuels by 2050, according to the International Energy Agency. By 2030, transportation fuels must achieve a 14 percent reduction. Biodiesel has a bright future since it is the perfect fuel for future generations.

3. CONCLUSION

Energy is a key need for sustaining economic development and maintaining human growth index norms. After the industrial sector, transportation is the second most energy-intensive sector, accounting for 30% of total supplied energy. Oil accounts for almost all fossil fuel energy use in the transportation industry (97.6 %). However, the anticipated depletion of fossil fuels, as well as the environmental issues connected with their use, has prompted many academics to look into alternate fuels. Biodiesel is a resource that has a lot of potential. Esterification and transesterification are the two most important processes in biodiesel synthesis. The kind of feedstock oil, reaction circumstances, catalyst employed, and alcohol to oil molar ratio all have an impact on these reactions.

Another method to save manufacturing costs is to recover glycerol. The biodiesel glycerol is more concentrated since water is present in the system. Physicochemical characteristics such as CN, density, viscosity, cloud and pour points, flash point, acid value, copper corrosion, glycerine, and oxidation stability define biodiesel.

REFERENCES:

1. G. Knothe and L. F. Razon, "Biodiesel fuels," *Progress in Energy and Combustion Science*. 2017, doi: 10.1016/j.pecs.2016.08.001.
2. K. A. Zahan and M. Kano, "Biodiesel production from palm oil, its by-products, and mill effluent: A review," *Energies*. 2018, doi: 10.3390/en11082132.
3. Y. Chisti, "Biodiesel from microalgae," *Biotechnology Advances*. 2007, doi: 10.1016/j.biotechadv.2007.02.001.
4. I. A. Musa, "The effects of alcohol to oil molar ratios and the type of alcohol on biodiesel production using transesterification process," *Egyptian Journal of Petroleum*. 2016, doi:

10.1016/j.ejpe.2015.06.007.

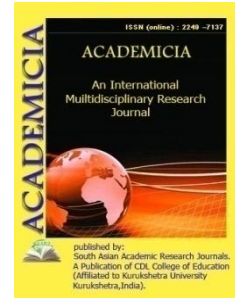
5. J. K. Kim, E. S. Yim, C. H. Jeon, C. S. Jung, and B. H. Han, "Cold performance of various biodiesel fuel blends at low temperature," *Int. J. Automot. Technol.*, 2012, doi: 10.1007/s12239-012-0027-2.
6. I. Ambat, V. Srivastava, and M. Sillanpää, "Recent advancement in biodiesel production methodologies using various feedstock: A review," *Renewable and Sustainable Energy Reviews*. 2018, doi: 10.1016/j.rser.2018.03.069.
7. A. Demirbas, A. Bafail, W. Ahmad, and M. Sheikh, "Biodiesel production from non-edible plant oils," *Energy Exploration and Exploitation*. 2016, doi: 10.1177/0144598716630166.
8. A. C. Pinto *et al.*, "Biodiesel: An overview," *Journal of the Brazilian Chemical Society*. 2005, doi: 10.1590/S0103-50532005000800003.
9. M. M. Hasan and M. M. Rahman, "Performance and emission characteristics of biodiesel–diesel blend and environmental and economic impacts of biodiesel production: A review," *Renewable and Sustainable Energy Reviews*. 2017, doi: 10.1016/j.rser.2017.03.045.
10. B. D. Nikolić, B. Kegl, S. M. Milanović, M. M. Jovanović, and Ž. T. Spasić, "Effect of biodiesel on diesel engine emissions," *Therm. Sci.*, 2018, doi: 10.2298/TSCI18S5483N.



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A BRIEF STUDY ON SMART GRID

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ABSTRACT

With the many manifestations of climate change and the ever-increasing need for energy, energy sustainability and environmental preservation have become global issues. Electricity consumption increases as cities and countries become more technologically sophisticated, reaching levels that may be unmanageable if left unchecked. The Smart Grid is a solution to the transition to more environmentally friendly technologies like distributed generation and microgrids. It is critical that the general public be aware of the issue, as well as prospective researchers and policymakers. This article provides an overview of the Smart Grid, including its basic characteristics, functions, and features. It explains the fundamentals of Smart Grid technology and how they connect to other technologies, as well as research efforts, difficulties, and concerns. It shows how these technologies created the current electrical grid and how it has continued to develop and enhance its role in better matching energy demand and supply. Smart Grid deployment and practices are also revealed in different places. Smart Grid efforts in different countries are aided by concrete energy legislation. Surprisingly, Smart Grid practices in various areas don't seem to suggest rivalry, but rather a cross-regional community with comparable goals and lessons to learn.

KEYWORDS: *Communication, Control, Network, Security, Smart Grid.*

1. INTRODUCTION

Smart Grids aren't something that just happened. They arose from a desire to upgrade the electrical system, make it more environmentally friendly, and enhance power distribution. Utility companies may utilize existing infrastructure instead of building new power plants and substations since Smart Grids are more autonomous and improve the efficacy and efficiency of electricity supply. Smart Grids enable renewable energy resources to be securely connected into the grid to augment the power supply with electricity generated and stored by consumers[1]–[3].

The goal of this article is to provide a high-level overview of the Smart Grid, including its features, functions, and characteristics. Its goal is to show how Smart System technologies have influenced today's energy grid. It looks at policies, pilots, and projects from around the world to see how far Smart Grid technology has advanced. It will also look for research activity, trends, problems, and opportunities. The more people who are aware of the Smart Grid, the better they will comprehend its importance, and the more willing they will be to make any necessary sacrifices. More information on Smart Grid achievements and problems promotes active involvement in efforts to enhance their capabilities and mitigate their drawbacks[4].

1.1 Smart grid:

A grid is a network of electrical wires that transmit energy to specific locations; smart denotes intelligence, neatness, trimness, style, or automation. One may get a sense of what the Smart Grid is like in certain ways. The term "smart grid" has no universally agreed-upon definition. It can be explained in both simple and complex ways. It was once merely a dream and a concept, but it is now one of the most widely discussed topics in modern electrical systems. Simply stated, a Smart Grid is a network that is aware of its surroundings. Electric electricity can only be transmitted or distributed via the conventional grid. This contemporary grid is capable of storing information, communicating with one another, and making choices. The Smart Grid replaces today's grid with one that is more cooperative, responsive, and organic[5]–[8].

1.2 Infrastructure:

A Smart Grid system's infrastructure and design are always in relation to predetermined goals and capabilities. The grid's resilience, self-healing capabilities, and integrability may all be improved by implementing a Smart Grid. The National Institute of Standards and Technology (NIST) has developed a conceptual model to aid in the design, specification, documentation, and organization of the Smart Grid's linked networks and equipment. Smart Grid actors and applications are divided into seven domains (with subdomains) by NIST. Furthermore, it classifies as actors devices (such as smart meters and solar energy generators), systems (such as control systems), programs, and stakeholders that make decisions and exchange information required for performing applications; applications are defined as tasks carried out by one or more actors within a domain (such as home automation, solar energy generation and energy storage and energy management). Actors with comparable goals are found in the same domain.

1.3 Smart Grid functionalities:

The Smart Grid proposes solutions and responses to the problem of insufficient electricity supply. The Energy Independence and Security Act (EISA) of 2007 lays the groundwork for grid modernisation. The following features of the Smart Grid are listed in the section:

1.4 Reliability, Security, and Efficiency of Grid:

Any power system needs a steady supply of electricity. It hinders the grid's ability to provide the services required by end users. Smart Grids provide self-healing and improved fault detection. It is becoming more difficult to analyze grid reliability as grids grow in size and complexity, but new analytical methods developed through research efforts have continued to strengthen the reliability foundation for modern networks. Bayesian networks may be used to predict grid service dependability using a data mining technique to identify grid system structure from raw historical system data. The effectiveness of hybrid generating is aided by remote monitoring and automated Smart Grid control for instable distribution[9]. The information network in Smart Grids allows for many features, and while it is vulnerable to attacks, it has been countered by promising solutions such as an intrusion detection system (IDS) or a wavelet-based steganographic technique that randomly hides household sensitive information inside normal readings.

1.4 Deployment as well as Integration of Distributed Resources and Generation:

Small sources of power known as distributed energy resources (DER) can assist in meeting regular power demand. The transition to Smart Grids is aided by DER such as storage and renewable energy. Renewable energy sources like distributed generators may assist alleviate the challenges of diminishing fossil fuel supplies and rising consumer demand. Thermal generating and electric cars may be included in distributed generation, which includes wind turbines, solar panels, and battery storage systems. However, combining these sources would necessitate the handling and processing of massive amounts of data.

1.5 Demand response and demand-side resources:

Demand response is defined as "changes in electric usage by demand-side resources from their normal consumption patterns in response to changes in the price of electricity over time, or to incentive payments designed to induce lower electricity use at times of high wholesale market prices or when system reliability is jeopardized," according to the Federal Energy Regulatory Commission. Consumers may participate in grid operations by reducing or shifting their energy consumption during peak times in exchange for financial incentives. One of the goals of the United States Department of Energy is to develop grid modernization technologies and techniques for demand response. Environmental, economic, and reliability concerns have prompted increased investment in demand-side resources, such as energy efficiency and load control programs.

1.6 Technologies:

This section explains Smart Grid technology and research, as well as where they are focused. It's difficult to cover everything due to the volume of articles accessible. This section, in general, provides an overview of what is being accomplished. In the preceding section on Smart Grid features, we highlighted some interesting research:

1.7 Control and communication:

Clean energy grid connected control methods and techniques are being used in the area of control for Smart Grids. Power electronics-based control, multi-agent system-based control, advanced fault management control, and virtual power plant (VPP) control technologies are all

examples of these techniques. VPPs are systems made up of tiny dispersed generating units that come together to create a single virtual generating unit. Individual management of these units is possible additional big power plants can now be linked into the grid system utilizing hundreds of tiny energy conversion units thanks to advancements in power electronics and contemporary inverter management techniques (ECS). These conversion systems may run independently, linked to the grid, or separated from the grid. Small and medium power conversion topologies, as well as their control (mostly for PV systems), are available, and wind turbine design and control have been established[10].

1.8 Sensing and measurement:

Sensors are vital components of the Smart Grid. These small nodes act as detection stations for equipment and energy sources, allowing for remote monitoring. Synchrophasors, also known as phasor measurement units (PMUs), are high-speed sensors that give synchronized measurements of real-time voltage and current phasors. Advanced power systems monitoring, protection, and control applications rely on phasor measurements. PMUs record grid conditions with great accuracy and are 100 times faster than Supervisory Control and Data Acquisition (SCADA). Resilient communication for Smart Grid ubiquitous sensor network is another study involving sensors. In the Smart Grid, secure and dependable surveillance is provided by cognitive radio sensor networks. Cognitive radio sensor networks: smart communication for Smart Grids—a case study of Pakistan, and Quality-of-service differentiation in single-path and multi-path routing for wireless sensor network-based Smart Grid applications.

1.9 EVs, PHEVs and V2G:

EVs and V2G have many advantages. V2G is a system that allows electric cars, plug-in hybrid electric vehicles, and fuel cell electric vehicles to connect with the power grid to provide peak power, spinning reserve, renewable energy storage, and backup. V2G scheduling may significantly reduce the peaks and valleys in power demand profiles. The V2G idea has the potential to enhance the grid's efficiency, stability, and dependability. The cost of owning an electric vehicle is approximately half, while EVs have a minimal effect on the network in terms of distribution system losses and voltage control. The V2G capacity for synchronized charging and discharging of the EV fleet in a distribution feeder may be enhanced by real-time communication, smart metering, and home area networks (HANs). A case study in Portugal demonstrates that EV smart charging and PV production characteristics are quite similar. Charging is a critical component of V2G technology and work on charging and discharging has been active, with a large number of papers and conferences.

1.10 Security:

Smart Grid security is an outgrowth of Smart Grids' sophisticated networks, which are made up of millions of interconnected devices and organizations. Smart meters, intelligent devices in electricity supply and demand, components in insecure physical locations, outdated equipment that may be incompatible with current devices, device-to-device communication, unorganized communication among teams involved, IP-based components that are vulnerable to attacks, and the fact that there are many stakeholders are the most common vulnerabilities in Smart Grids. The International Electrotechnical Commission (IEC), the IEEE Power & Energy Society (PES), the National Institute of Standards and Technology (NIST), and the National Standard of the People's Republic of China Smart Grid all contribute to the development of Smart Grid security

standards. The need for a framework for evaluating Smart Grid security is critical. ChakibBekara studied the security problems and challenges faced by IoT-based Smart Grids and identified the most important security services to consider. The Internet of Things (IoT) is the next stage in the development of the Internet today, in which actual things are endowed with computing and communication capabilities. The feasibility and efficacy of a physical security layer built using a conceptual layering model are shown in preliminary simulation results from a research on cross-layer security framework.

1.11 Integration of Renewable:

While numerous renewable energy studies have been performed to investigate additional sources of clean energy, integrating renewable energy sources into the power system is one of the difficulties in the modernization and smartening of the electric grid. Some systems are already overburdened, making it harder to get electricity from wind farms into the grid for consumption. Renewable energy sources are inherently variable and intermittent. Electricity has always gone in one direction, from a power plant to a consumer. Electricity must enter the system from various places as a result of the extra sources coming from alternative sources. To integrate wind, solar, and other alternative energy sources into the distribution system and transport them to their destinations, grid automation, two-way power flow, and sophisticated controls are required. New devices in Smart Grid systems must be able to interact with current equipment, and coordinated efforts are required to adapt solar photovoltaic and wind energy. There are additional computer tools for evaluating the integration of renewable energy into energy systems. In terms of applications, matching technology, and the goals they achieve, these energy instruments are varied. Feasibility and viability assessments are commonplace all around the globe. These may be used to help build different grid-connected renewable energy systems for particular areas.

1.12 Issues as well as challenges in Smart Grids:

Despite the apparent progress made in the creation of Smart Grids, their technology, and systems, problems and obstacles remain, and ultimate achievement remains a long way off. The following problems and challenges may be investigated further:

- V2G: battery wear, limited electric vehicle adoption, new battery technologies.
- Cost and benefit, expertise, and institutional inertia are all barriers to adoption.
- Expenses, customer engagement, data security, and privacy
- IoT-based Smart Grid security problems and difficulties
- The layout of the route.
- Standards compliance and interoperability
- AMI vulnerabilities, physical security, and cyber security
- Smart Grid simulators and co-simulators: capable of simulating just basic situations, such as time synchronization and data transfer.
- There is a scarcity of scalable, interoperable context-aware middleware platforms.

- Issues with interoperability with intelligent devices, as well as technical standards for data recording and transmission.

2. DISCUSSION

A smart grid is an electrical network that allows for a two-way flow of power and data, as well as the detection, reaction, and prevention of changes in consumption and other problems, using digital communications technology. Smart grids are self-healing and allow energy consumers to have an active role in the system. The Smart Grid idea has progressed from a pipe dream to a goal that is progressively becoming a reality. Devices and systems have become increasingly capable of supporting the development of a more intelligent grid as technology has advanced.

The Smart Grid is part of an Internet of Things architecture that may be used to remotely monitor and control anything from lights to traffic signals, traffic congestion, parking spots, road alerts, and early detection of things like power outages caused by earthquakes and severe weather. Time series forecasting in Smart Grids, dependability and power quality studies, power flow optimization, battery systems, cloud computing, and realistic large-scale renewable energy source integration are all areas where study is possible. Smart Grids have a bright future since new technologies will be utilized to create them.

3. CONCLUSION

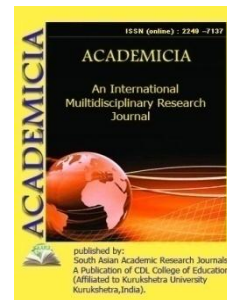
The Smart Grid idea has progressed from a pipe dream to a goal that is progressively becoming a reality. Devices and systems have become increasingly capable of supporting the development of a more intelligent grid as technology has advanced. Smart Grid efforts throughout the country are aided by concrete energy policy. Smart Grid activities in various areas seldom imply rivalry, but rather a cross-regional community with comparable goals and lessons to learn.

The Smart Infrastructure was born out of the necessity to upgrade the electric grid, according to this study. The traditional grid eventually grew limiting and required additional features. Smart Grids' functions and features have been discovered. The article outlined the fundamentals of Smart Grid technology and associated technologies, as well as the research efforts, difficulties, and concerns that surround them. Time series forecasting in Smart Grids, dependability and power quality studies, power flow optimization, battery systems, cloud computing, and realistic large-scale renewable energy source integration are all areas where study is possible. Even the problems and obstacles found, such as V2G battery wear, data protection, physical and cyber security, simulator limits, and distribution system automation, may serve as excellent starting points for future study. When starting on this complicated system, the Smart Grid's fundamental concept is insufficient. Even using existing experiences and technology as a guide, pursuing a Smart Grid requires a long-term commitment of time, money, and ongoing research and testing. The Smart Grid can be more successful in achieving energy sustainability and environmental conservation and preservation if more effort is put into Smart Grid research. Although the Smart Grid's precise future is impossible to foresee, recent developments show a dynamic fusion of sectors, mechanics, and communities.

REFERENCES:

1. M. L. Tuballa and M. L. Abundo, "A review of the development of Smart Grid technologies," *Renewable and Sustainable Energy Reviews*. 2016, doi: 10.1016/j.rser.2016.01.011.

2. Y. Zhang, T. Huang, and E. F. Bompard, "Big data analytics in smart grids: a review," *Energy Informatics*. 2018, doi: 10.1186/s42162-018-0007-5.
3. S. K. Kim and J. H. Huh, "A study on the improvement of smart grid security performance and blockchain smart grid perspective," *Energies*, 2018, doi: 10.3390/en11081973.
4. D. Kolokotsa, "The role of smart grids in the building sector," *Energy and Buildings*. 2016, doi: 10.1016/j.enbuild.2015.12.033.
5. X. Yu and Y. Xue, "Smart Grids: A Cyber-Physical Systems Perspective," *Proceedings of the IEEE*. 2016, doi: 10.1109/JPROC.2015.2503119.
6. X. Fang, S. Misra, G. Xue, and D. Yang, "Smart grid - The new and improved power grid: A survey," *IEEE Communications Surveys and Tutorials*. 2012, doi: 10.1109/SURV.2011.101911.00087.
7. C. Milchram, R. Hillerbrand, G. van de Kaa, N. Doorn, and R. Künneke, "Energy Justice and Smart Grid Systems: Evidence from the Netherlands and the United Kingdom," *Appl. Energy*, 2018, doi: 10.1016/j.apenergy.2018.08.053.
8. P. Siano, "Demand response and smart grids - A survey," *Renewable and Sustainable Energy Reviews*. 2014, doi: 10.1016/j.rser.2013.10.022.
9. S. Supriya, M. Magheshwari, S. Sree Udhyalakshmi, R. Subhashini, and Musthafa, "Smart grid technologies: Communication technologies and standards," *Int. J. Appl. Eng. Res.*, 2015.
10. J. Rodríguez-Molina, M. Martínez-Núñez, J. F. Martínez, and W. Pérez-Aguiar, "Business models in the smart grid: Challenges, opportunities and proposals for prosumer profitability," *Energies*, 2014, doi: 10.3390/en7096142.



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FOLKLORE TRADITIONS IN THE EPOS OF SAYYADI “TOHIR AND ZUHRA”

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ABSTRACT

This article discusses the fact that Sayyadi's epic "Tahir and Zuhra" reflects the traditions of folklore, in particular, it was created on the basis of a fairy tale and became one of the most famous works in the written literature of the East. The ideological content of the epic, the images and events depicted in it, the fact that Sayyodi was well acquainted with the examples of folklore and skillfully used the achievements of folklore in the creation of his work were studied in detail. The following motives are decisive in the narrative: childlessness of the vizir and the shah; wandering and blooming garden; noble old man; the unusual birth of Tahir and Zuhra by means of an apple; the death of the vizier and the shah's order to kill Zuhra; execution of Tahir in the river; the capture of the chest with Takhir by the scythes of the Ruman princesses; the return of Tahir; execution-dissection of Tahir. At first glance, the traditional plot of the eastern fairy tale "Tahir and Zuhra" contains the usual plot of the separation and death of lovers. In our opinion, the narrative contains the most ancient mythological, historical and cosmogonic realities rooted in the culture and science of Sumer and Ancient Egypt.

KEYWORDS: *Folklore Motifs, Fairy-Tale, Creative Approach, Epic Genre, Description Of Spiritual Experiences, Characters, Episodes, Originality, Rich Fantasy, Talent And Ability, Etc.*

INTRODUCTION

Examples of large and small volumes of artistic creativity, which include the plot dedicated to the love of “Tahir and Zuhra”, are distinguished by the fact that it has its own place in Oriental literature. In particular, this topic “found wide fame among the peoples of Central Asia, Arabia and India, absorbed artistic literature, the spirit of those who loved the folklore creativity of the

people and sang with interest in distant times" [1, p.56]. This popular plot theme also played an important role in the development of genres such as fairy tales, myths, epic, narratives in Turkish folk literature.

The theme of "*Tahir and Zuhra*" is not alien to Uzbek literature either. Especially among the samples of folklore creativity of the Uzbek people many works related to this plot. The fairy tale "*Tahir and Zuhra*" became one of the favorite works of Uzbeks. There are also several variants of the epic "*Tahir and Zuhra*", written from folk tales by folk poets.

MATERIALS

This topic was brought to Uzbek literature by the poet Sayyadi, who lived in the XVII-XVIII centuries. He further strengthened the relations of folk art and literature with his work "*Tahir and Zuhra*", artistically reproduced the famous plot and enriched it creatively. In fact, the ideological world of the epic, the world of images, its plot and composition are distinguished by its harmony with the Uzbek folk tale "*Tahir and Zuhra*".

As described in the fairy tale "*Tahir and Zuhra*", it turned out that in the past time there was a king, but he had no children. The motivation for childlessness is exactly met in the fairy tale of Sayyadi. The city of Totor had a king named Bobokhon, seven climates obeyed him, but he was not fully satisfied:

Вале камлиги фарзанди йўқ эрди,

Кеча-кундуз гаму ғусса ер эрди.

Бу шох кўнглида доим эрди бу гам,

Бу гамдин кўнгли ҳаргиз бўлмади жам [2, p. 21].

The idea of who will be the owner of the state in the future tormented the king in both works. Such illusions led them to melancholy, were always the main motivator of their sadness.

In the fairy tale it is said that one day from the days when the King was offended, a right-handed minister came to him. The minister is also indifferent. The king and the minister went to one house and decided that it was better to leave the kingdom rather than to live without a child. Then both left the richness and left the city and went to the same garden, walking along the road. In the garden they were met by an old man, and gave them a red apple each, and then he said: "*I gave you the apple on this condition that whichever of you give your wife this apple, she will give birth to a son, name him Tahir, whichever of your wife gives birth to a girl, name her Zuhra. But do not separate them from each other. When they grow, relative-in-law, do not forget, and left to the side that he has come*" [3, p.1]. It seems that in a fairy tale the old man recommends the names of the children who will be born, as well as the fact that they should be king and Queen.

The same is true of the minister's indifference to Sayyadifairy tale is also met. In contrast to the fairy tale, the minister in the epic asks the King Bohir and himself for a child, and prays the Creator. An avid pray gives its effect. The minister goes to sleep and dreams. In a dream it turns out that the king and himself will have children. When they wake up, he asks the nobleman King, saying that saints consider them too. The King Bobokhongot also delighted, and he himself and the children of his minister will intend that if a son - a friend, a girl will be born - a friend, a boy-

a girl will come to the world –“praise”, and whoever will recognize from this condition will be a rascal.

Now, returning to the fairy tale again, the king and the minister, who received apples from the old man, returned home and continued to travel around the kingdom. When the time came, their wives gave to birth when they were hunting. The King's wife gave birth to a daughter, and the minister's wife to a son. To the man who went to the gift for good news, the King became angry, and ordered to kill his daughter and bring handkerchief painted with in her blood. And the minister rode horse taking the road towards his house happily. On the way, the horse stumbles upon the stone, falling from the horse and the minister died. The event of the minister's death is also meant in Sayyadi. But this death is not accidental death, as in a fairy tale:

*Билинг: Тоҳирки беш ёшқа етибдур,
Бу Боҳир Тангри амрин биткарибдур,
Ки Боҳирнинг вафотин билди ул шох,
Дедиким: “Бу эрур тақдири Оллоҳ” [2, p. 29].*

That is, the death of the minister will lead to a violation of the condition in both works. The King's intention is changed and he denies the idea of making Tahir son-in-law.

The message that Tahir is engaged in the Zuhra is given both in the fairy tale and in the epic through interesting events and details close to each other. In the fairy tale it is said that one day, when Tahir was playing with a walnut, the thrown nut touched the charm of an old woman, in which the thread was spinned. Then the old woman got angry and said, “Hey, sly orphan! Rather than playing with me, you'd better go and play with Zuhra” she condemned him. This made Tahir much more interested. And the question which asked Tahir got no answer by the old woman, but she taught him ways to find answers from her mother. Through the trick taught by the old woman, Tahir learned about the events between his father and the king in the past. From the detail of the fried wheat is effectively used. That is, Tahir asks his mother to fry wheat, bring it in her hands. When he clasped his mother's hands tightly, the mother with a hand burn will be forced to tell her child the truth.

The same images are presented in Sayyadi. It is written in the epic that Tahir and Zuhra studied in the same school. One day, when both were going to school, a woman appeared in front of them. Tahir joked and he threw a talusto her side. When talus touched the women,

*Деди хотун: “Манинг-ла қилма бози,
Бўла кўр Зухроҳоним бирла сози,
Агар санда ақл бўлса, эй ўғлон,
Қила кўр Зухроҳоним бирла жавлон” [2, p. 31].*

After that, Tahir realized that he had some kind of secret that he did not know about. That woman said that he should ask his mother what this secret is. Tahir came to home and told his mother that he is hungry, that he wanted fried wheat. His mother quickly prepared what was said. And Tahir said that he would bring fried wheat in her hands, that he wants to eat from her mother's hands. The mother brought fried wheat, as the son wanted. Then tightly grabbed his mother's hand and asked her to tell the events related to his father:

Қўли куйгач, деди: “Эй нури дийда,
 Эшитсанг қиссани, бўлгунг рамида.
 Отанг бирла Бобохон қилди паймон,
 Ажал етди, отанг топмади дармон.
 Унуттуқ борисин, сан ҳам унутгил,
 На савдодур, болам, кўнглунг совутгил.
 Ки ул хоним эрур хонларга лойиқ,
 Кўнгул берма анга сан, бўлма ошиқ” [2, p. 32-33].

DISCUSSION

It turns out that the events in a fairy tale are exactly the same as the events in a tale. Only in a fairy tale the image of a nut changed to talus and an old woman turned into an image of a woman. But both also have the same duty in the work. The state of ordering the King to execute his daughter, but the fact that the girl will not be killed is met only in a tale. The fried wheat, knowing the secret of past events by burning his mother's hand - is described as one in both works.

Similarities are also observed in the image of Tahir and Zuhra in one school, as well as the events that take place in the school. School events will change the life of Tahir and Zuhra. The love brings both closer and progresses so that they can not live without each other. This closeness will go until the complain reaches to the king over them. If the distinctive aspect is the teacher's complaint, who teaches them in a fairy tale, warn the gardener warns the ruler in the epic about the relationship between them.

Then the conflict between the king and Tahir strengthens. The king begins to look for ways to get rid of Tahir. And the love of Tahir for Zuhra becomes more and more intense. In the tale it was said that “*Scientists*” said: “*Let the King kill Tahir*”. They said this to the King. The King called the craftsmen with anger and said to them: -make a big crate. I will throw Tahir to the river! Hearing this, Zuhra brought a dish full of gold to the craftsmen and said: “*take these gold, let the crate be so thorough, let the water not pass into it, let the poor man live wherever he goes*”, and she cried[3].

When the crate was ready, the King gathered the people in a large square. The people asked the king not to let Tahir flow into the river. However, this demand of the people did not come true.

“*Tahir and Zuhra*” fairy tale also has the image of events like these. However, due to the possibilities of the genre of the fairy tales, Sayyadi tries to explain more widely the events. For example, in the epic, The King Bobokhon calls to his presence Tohir and talks with him, and also Tahir's mother Shokhi Khuban appeals to the ruler. And in the tale there are no such episodes. Crate detail is available in both works. The decision to make a crate and throw Tahir into the river is issued by the King. The phenomenon of Zuhra's strengthening of the crate and the resistance of the flow of Tahir in the river is given both in the fairy tale and in the epic.

Now let's pay attention to the events of Tahir's throw to the river. In this, too, similarities and peculiarities are observed. The people gathered along the river. With grief, Tahir's mother also

came. *“At that moment herald announced:-Now Tahir will be brought! –he said. Everyone looked on the way to Tahir. Tahir’s mother was forced to see her poor son:-Where is my innocent son, let me see him once, -she cried. They tied Tahir’s hands behind his back and brought them to his mother. The mother was crying, hugging her child and died. The people gathered on the square and remained silent. After a while, who was crying, who was shouting, took the Tahir and put it in the crate”*[3, p.1].

In fact, in a tale, Tahir’s mother dies until her son is thrown into the river. The injustice and oppression done to her son will lead to her death.

In Sayyadi’s epic, he tries to describe in more detail the events associated with the image of the mother. Tahir’s mother – shokhi Khuban, is portrayed as a thoughtful woman, supporting the love of her son, raising his sympathy. Shokhi Khuban gives encouragement after hearing the message of his son’s throwing into the river, persuading that he must be brave and accept this decision.

Lentils bring Tahir and put it in the crate. They also put food and water for another couple of days. Lock the mouth of the crate, throw it into the water and let it flow. Zukhra and Tohir’s mothershokhi Huban, got in grief and cried.

The main events that will happen in the tale will move to the Land of Khorezm. Because when the crate in six months, flows into the Land of Khorezm. As long as the king of Khorezm has two beautiful daughters. Every Friday they go on a river cruise with their canines. On one of such days, they will see the crate, flowing in the water. Sister princesses are making an effort to catch the crate. The elder girl soaked her hair, but the crate was not caught. A crate was inserted into the younger girl’s hair and pulled it out to the edge of the water. *“Now the sisters started arguing.”* After a long quarrel, the end came to a consultation. The elder one said, *“I get the crate,”* the younger one said, *“I get what comes out of the crate.”* *They opened the crate. There was a young man, he was so handsome, that in the world he did not have a tenth. His hair was black, curly. His eyebrows were dark, the eyes are bright, and the figure is slender. The girls had a long quarrel. Younger girl stood up and said:-Why do you argue? What was in the crate, I said that I would take it. It will be mine, I will not give it to anyone,”* she said[3, p.1].

From this event, the king was also aware. He came to the river and saw Tahir. Supporting his younger daughter, even Tahir did not agree, he made a wedding for forty nights, forty days.

After Tahir flooded from Totor’s land, the place where the events in the fairy tale are depicted also changes. In its own way, Sayyadi approaches to the fairy tale with a creative side. The next life of Tahir will continue until a certain time in the city of Baghdad. Baghdad was ruled by a ruler named Adil, who became known for his righteousness. The King had three sons and three daughters. The name of one of his daughters was Mohim. Mohim dreams one day. In a dream, future events in life are evident. She asks baby-sit for interpretation of her dream. The nanny predicts that the princess will fall in love.

The three daughters of the King were also beautiful. They had a garden that each of them go in turn. The garden was so beautiful as Bogi Eram. It was time for Mohim to rest in the garden. There was a river along the garden. From afar she saw something darkening and flowing. When it came closer she found out that it was the crate. The diver pulled the crate out of the water.

Mohim unlocked it, became excited. Because that was the guy shedreamt. Shakhri asked Mokhim for the reason why she was so excited:

*Деди Шаҳрига Моҳим: “Бехабарсан,
Манинг оҳимни сан на деб сўрарсан?
Тушумда кўрганимни мунда кўрдум,
Ки Лайли бўлдуму девона бўлдум,
Кўрар бўлсанг, ётур сандуқ ичинда,
Ки қолдим кулфату қайғу ичинда” [2, p. 85].*

When Shakhri looked into the crate, a handsome young man lay unconscious. They woke him up and asked him why he lay here.

It turns out that Sayyadi gives a wider place to the image of events. To the Epic he also includes such personages as Jahongir, Shahri, and skillfully use them. Each of these images carries specific tasks. For example, after the Crate event, they hand over Tahir to Shakhri, and she takes care of him for a few days in her house until Tahir restores.

As Tahir lies Mohim, he lies to the King as well, hides from them the events associated with his life in the past. The king will council with the ministers, decidesto make the wedding of Tahir and give a wedding for three nights.

Events after the wedding play an important role in the composition of both works. During the narrative of events, the image of the Qorabotir emerges. In a tale, his father marries Zuhra to Qorabotir. In the epic, too, Bobokhon will want to Qorabotir to become his groom. As if, in this way, dreams that Zuhra would forget Tahir.

Both in the fairy tale, which is the product of folklore, and in the epic, which is considered an example of written literature, after the separation of Zuhra from Tahir, sorrow remains in grief, her mind is occupied only by Tahir.

In a tale it is said that one day Zuhra dreamed. She walked with Tahir in a dream. The grief woke up with sadness and began to search for Tahir. She went to caravansera and gave the caravan leader dish of full of gold and sent him to other lands to determine if there was Tahir. When the caravan leader after forty days, arrived in place where Tahir appeared in Khorezm.

The image of the caravan leader in the tale is given in the style of the image of Sayyadi as qosid. Qosid - means messenger. The main task of Qosid in the epic is to bring a message about Tahir for the Zuhra.

Both the caravan leader and qosid manage the tasks assigned to them. The caravan leader that came to the garden reads a poem in the thought that Tahir also exists among so many people. Tahir, who heard the poem, smiled and laughed. In the same way, the caravan leader finds Tahir and meets him. The park is described in the style of a walking are in the epic. Qasid also comes to Baghdad, telling the romantic ghazals:

Ки ногоҳ учради шаҳр, оти Бағдод,

*Бўлур ғамли киши Бағдодда дилиод.
Сайргоҳ эрди, шаҳлар сайр этарди,
У шаҳлар сайргоҳ ичра ўтарди.
Туруб шаҳзодалар бирла бу Тоҳир,
Нишона отар эрди, кўрди зоҳир[2, p. 113].*

Both in the fairy tale and in the epic, messengers find Tahir and acts as a place to meet him. After Qasid meeting with Tahir, he introduces himself and says that he came from the land of the Totor, that he is the messenger of Zuhra. Both cry, and hug. When Tahir hears the message of Zuhra, he places Qasid in a caravanserai and goes to Khan to get permission. He comes to the harem and tell the Shakhri the whole secret. All the people of the palace will be aware of it. The ruler hears from Tahir the events associated with his life and makes a fair decision. He appreciates the love of Tahir for Zuhra and gives him permission.

In the tale, too, special attention is paid to the process of Tahir's departure from Khorezm to his homeland. The caravan leader says to Tahir that Zuhra has married, there is no longer any benefit from it, he has only come to know his message. Still Tahir insists to leave. Here he speaks of the fact that the King arranged his daughter to him, even if he did not agree, but still did not speak a word to the girl, and did not even look at her face. Despite the fact that the caravan is revered, Tahir insists strongly. Then the caravan advises him to say goodbye to his wife. After that, Tahir's wife was left to cry, and he started on his road.

A tale is considered a smaller and more compact genre than epic. And in the epic there is an opportunity to describe events more broadly. It is natural that the depicted images in it also have more than a fairy tale. The desire to deeply immerse in the inner world of heroes, the spiritual world and dreams is considered a feature inherent in the more epic genre. For this reason, it also attaches special importance to the events in the process that happened in Sayyadi's epic until Tahir left home. The events after Tahir takes Khan's permission will not go smoothly. Especially in the process of the image of events associated with the mother of Mohim, such features are observed. For the mother, the fate and happiness of her daughter are in the first place. For this reason, she is very much in opposition to the departure of Tahir to his homeland. The spiritual state of the mother, the suffering of the grief of the child, the detail of 'belbog', the spiritual experiences of the Mohim, the marriage of Shakhrito Qasid, the episodes of the transfer of the Mohim to Qasid and Tahir's departure to the land of the Totor are only events that can be met only in the epic.

The caravan finally reached the destination. Here's the road divisible by three. One-if there is no return, the other-if there is a risk, and third – if there is way. Thinking not knowing which way the caravan would walk, Tahir offered to follow a dangerous path in his dream to see Zuhra as soon as possible. With it, they walked along a dangerous path and faced the robbers. The robbers threw them into the dungeon.

There is also a description of the events associated with the pirates in the epic "Tahir and Zuhra". After Tahir leaves Baghdad, he will be caught by robbers on the road. After knowing that he is in love, the robbers let him go. So he continues going. Then a second group of robbers catches Tahir. With poems in love, he also gets rid of them. On the road he faces the mountain. He has

difficulties in passing through the mountain, and becomes helpless and prays for the God. By the power of God, the path will be opened up. Tahir will be glad and continue again.

Even in the tale, the recovery of Tahir from pirates is described in a peculiar way. The liberation of the people of Tahir and caravan from the robbers is caused by one of his schoolmates. His friend, who was among the robbers, gave gold to the dungeon and sent Tahir and those who were coming with him to free him from the dungeon.

Another of the similar aspects in both works occurs in the process of Tahir's returning to the land and meeting him again with Zuhra. The awakening of Zuhra from the ghazel told by Tahir is considered a characteristic feature both for the fairy tale and for epic. In a tale, Tahir comes to the house, where Zuhra lives during the morning, he wakes her up, by telling ghazels. In the epic, too, it is also a warning that the beloved of Zuhra, Tahir tells ghazels.

Another of the similar aspects in the tale "*Tahir and Zuhra*" and the plot of Sayyadi's "*Tahir and Zuhra*" seems to be the story of the murder of Tahir. Death brings both works closer to the end. In the fairy tale it is said that the king laid a cliff and gathered the people on the field. The executioners also brought Tahir. Despite the fact that Zuhra asked his father so much, he did not listen. The executioner split the body of Tahir into two and hung it on the gate.

Sayyadi's skill is evident in the image of Mokhim remembering until Tahir's execution in the epic. After Tahir, Zuhra can not live in life. It is precisely that the poet reflects the experiences of Zuhra, that she is the owner of true love, and to what extent special attention is paid to her devotion to love, gives a special charm.

Another harmonious state can also be observed in the image of the death of Qorabotir. In both works, Qorabotir kills himself after the death of Zuhra. In the tale it was said that Qorabotir was put in the middle of Zuhra and Tahir. A red rose over Tahir, a white rose over Zuhra, and a thorn over Qorabotir is grown.

Sayyadi also impressively expresses the fact that the rose from the grave of Tahir and Zuhra, and thorn from the grave of Qorabotir grew. However, after the death of Zuhra, the entry of father into a dream, after which Qorabotir is buried in another separate place, the description of such events as one that dying after hearing about the events associated Tahir with Mokhim, occurs as a result of Sayyadi's creative activity.

Sayyadi uses the noble plot, which is popular among the people in the creation of his epic "*Tahir and Zuhra*". Uzbek folk tale "*Tahir and Zuhra*" emphasizes the fact that it was the basis for the poet's epic in the introductory part of the work. It is written in it that the poet dreamed one day. He dreamt of walking in a wonderful, beautiful park. It was spring, flowers opened, everything is beautiful around, everyone is glad. Immediately Sayyadi met Tahir and Zuhra, and asked him to write a book about their love. Events in this dream inspired the poet:

*Давот бирла қалам илгимга олдим,
Аларнинг ишқини кўнглумга солдим.
Аларнинг қиссасини назм қилдим,
Ки ошиқларга яхши базм қилдим.
Қуруқ жазра эди, бўстон қилдим,*

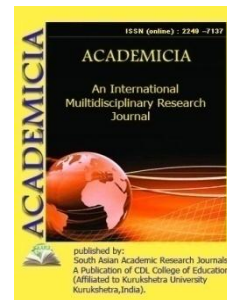
Бу ошиқларга хуб дoston қилдим[2, p. 20].

CONCLUSION

The main goal of the poet was to turn a common tale into epic among the people. On this road, he works hard for four years. As a result, one of the famous works in oriental written literature comes to the world. In fact, the ideological content of the epic, the images and events depicted in it, the harmony of events in the Uzbek folk fairy tale “*Tahir and Zuhra*”, proves that Sayyadi knew well the samples of the oral creativity of the people and skillfully used the achievements of folklore in the creation of his work. Creative approach, skillfully using the capabilities of the genre of the epic - will fully unleash the possibilities of Sayyadi. Therefore, “*Tahir and Zuhra*” takes the main place in a wider, more detailed description of events and in-depth presentation of the inner spiritual experiences of the main images. Also included in it are the personages, as well as additional episodes, which mean that the epic occurred as a product of the original, rich fantasy, specific talent.

REFERENCES

1. Абдуллаев В. Ўзбек адабиёти тарихи. Тошкент, Ўқитувчи, 1980.
2. Sayyodiy. Tohir va Zuhro. Toshkent, Mumtoz so‘z, 2019.
3. Тохир ва Зухро. <http://e-adabiyot.uz/kitoblar/ogzaki-ijod/1018-ertak.html>.
4. Mamatkulov M. R. Saikali’s epic “Bakhrom and Gulandom” and the folk tales. Scientific reports of Bukhara state university. 2020/5 (81)
5. Маматкулов М. Сайёдийнинг “Тохир ва Зухро” достони. Ўзбек тили ва адабиёти. 2020/6.
6. The Uzbek People Fairy Tales. Volume II. Tashkent: Fan, 1972. – P. 105-114.
7. Соколова, Л. М. Космогонические мотивы в узбекской народной сказке «Тахир и Зухра» // Молодой ученый. 2014. №17(76). С. 428-434.URL: <https://moluch.ru/archive/76/12854/>



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MEASURING AND CRUSHING THE STRENGTH OF ROCKS USE OF VARIOUS TYPES OF SURFACTANTS FOR GRINDING

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ABSTRACT

Surfactants, strength of crushed ores, stresses of concentration of active substances, physicochemical processes, changes in concentration, surface tension of substances. The results show that the refractive index, hydrogen index and electrical conductivity of surfactants such as CF-8201, OP-10, V-87 and Soapstock at concentrations greater than 0.2% are minimal. Studies have also shown that the mechanism of action of aqueous surfactant solutions on technological and physicochemical processes is adsorption at the interface of amphiphilic surfactant molecules, which leads to a decrease in surface tension, improvement and wetting of the solution.

KEYWORDS: *Adsorption, Solubility, Concentration, Hydrogen Index, Electrical Conductivity.*

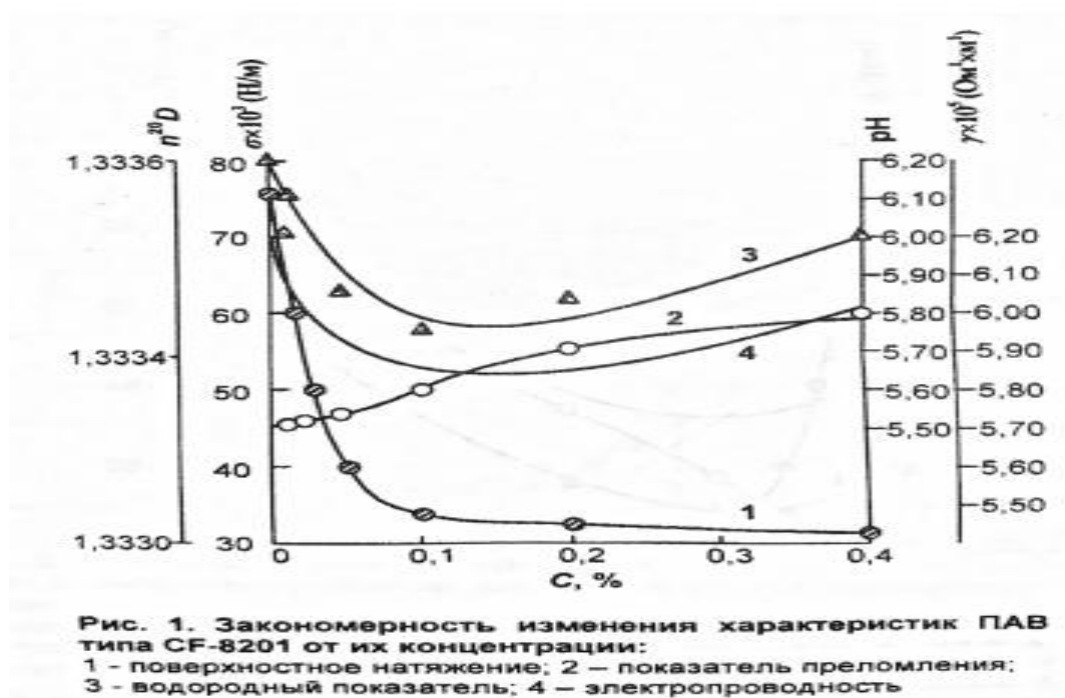
INTRODUCTION

One of the urgent tasks of preparing ore for enrichment is to reduce the energy consumption in crushing and grinding minerals. The simplest and most economical way to change the properties of a mineral is to physicochemically clean it with aqueous solutions of surfactants (surfactants).

Studies have shown that aqueous solutions of surfactants enhance the grinding process of ores, which reduces the strength of the liner, balls, and crushed ores. Studies have also shown that the mechanism of action of aqueous surfactant solutions on technological and physicochemical processes is adsorption at the interface of amphiphilic surfactant molecules, which leads to a decrease in surface tension, improvement and wetting of the solution.

To select the optimum concentration of surfactant and its aqueous solutions, we used changes in surface tension, refractive index, hydrogen index and electrical conductivity for surface conductors CF-8201, OP-10, Geronol V-87, the main properties of soap calcium we studied. Akilbinzolsulfonate depends on their concentration. The main properties of the solubility of surfactants in tap water:

1. The emulsifier CF-8201 is soluble in tap water at a concentration of 0.01-0.4% with strong stirring. Once completely dissolved, the solution becomes clear (actual solution).
2. Surfactant OP-10 is soluble in tap water at a concentration of 0.01-0.4%. Once completely dissolved, the color of the solution becomes clear (actual solution).



3. Geronol V-87 is soluble in tap water at a concentration of 0.01-0.4%. After melting, the color of the solution becomes clear (realsolution).

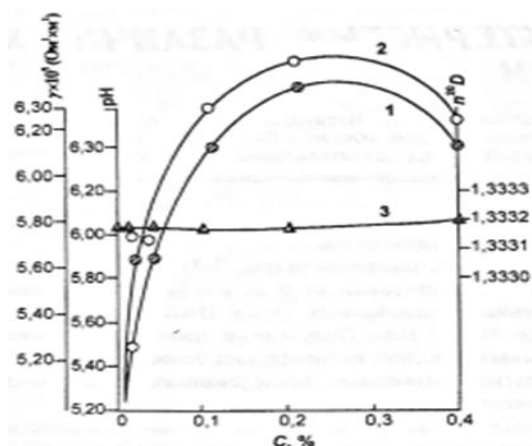


Рис. 2. Закономерность изменения характеристик ПАВ типа ОП-10 от их концентрации:
1 - поверхностное натяжение; 2 - показатель преломления;
3 - водородный показатель

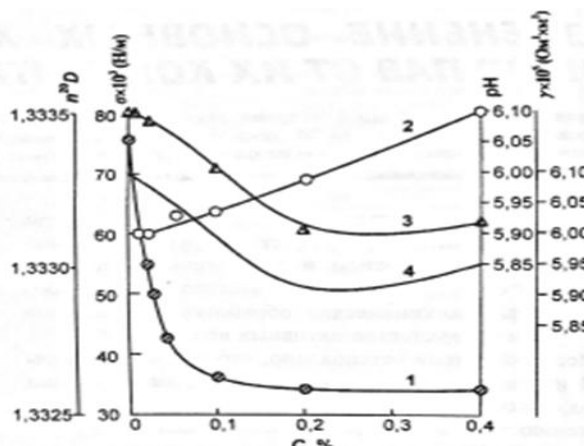


Рис. 4. Закономерность изменения характеристик ПАВ типа Собсток от их концентрации:
1 - поверхностное натяжение; 2 - показатель преломления;
3 - водородный показатель; 4 - электропроводность

4. Soap stocks with a concentration of 0.01-0.4% are soluble in tap water when rubbed with surfactants. Once completely dissolved, we have a system of suspended particles that, over time, slowly settle to the bottom (suspension). In the laboratory, we determined the laws of variation of surface tension, refractive index, hydrogen index and electrical conductivity of surfactants CF-8201, OP-10, V-87 and Soapstock depending on their concentration. shown in the pictureure. 1-4.

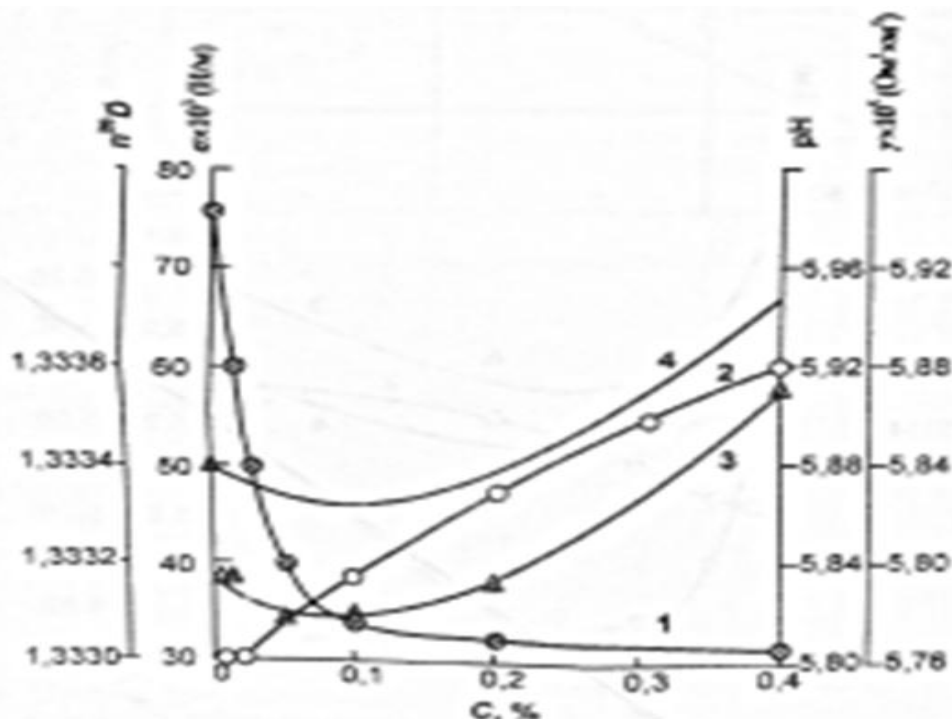


Рис. 3. Закономерность изменения характеристик ПАВ типа V-87 от их концентрации:
1 - поверхностное натяжение; 2 - показатель преломления;
3 - водородный показатель; 4 - электропроводность

The results obtained (Picture. 1-3) show that with an increase in concentration from 0 to 0.4%, the surface tension of the studied types of surfactants decreases from 73.5 to 30×10^3 N / m. The results show that the surface tension of the surfactants studied at a concentration of more than 0.1-0.2% decreases almost slightly.

Studies have shown that the change in surface tension of the concentrations of surfactants of the types CF-8201, OP-10 and V-87 is characterized by the dependence of the hyperbolic type. _

The results obtained (Pictureure 1-4) show that with an increase in concentration from 0 to 0.4%, the refractive index, high value index and electrical conductivity of surfactants such as CF-8201, OP-10, V- permeability 87 and Soapstock decreases. The results show that the refractive index, hydrogen index and electrical conductivity of surfactants such as CF-8201, OP-10, V-87 and Soapstock at concentrations greater than 0.2% are minimal. A further increase in concentration is accompanied by an increase in the refractive index of the hydrogen index and the electrical conductivity. The resulting pattern is characterized by parabolic results. The regularity of the change in the refractive index of surfactants of the Soapstock type to their concentration is characterized by the dependence of the linear type (Picture. 4).

CONCLUSION:

1. With an increase in concentration from 0 to 0.4%, the surface tension of surfactants decreases from 73.5 to 30×10^3 N / m. The results obtained show that the surface tension of the surfactants studied at a concentration of more than 0.1-0.2% decreases almost slightly.

The laws of variation of surface tension of the concentration of surfactants of the types CF-8201, OP-10 and V-87 are characterized by the dependence of the hyperbolic type.

2. As the concentration increases from 0 to 0.4%, the refractive index, hydrogen index, and electrical conductivity of surfactants such as CF-8201, OP-10, V-87, and Soapstock decrease. The results show that the refractive index, hydrogen index and electrical conductivity of surfactants such as CF-8201, OP-10, V-87 and Soapstock have a minimum value at a concentration of more than 0.2%. A further increase in concentration is accompanied by a refractive index of hydrogen and an increase in electrical conductivity. The resulting pattern is characterized by parabolic results. The regularity of the refractive index of surfactants of the Soapstock type to their concentration is characterized by a linear type dependence.

SOURCES

1. Brune J.N. Spectra of seismic shear waves of tectonic stresses and earthquakes // J. Geofis. Res., V. 75, 1970.-4997-5009.
2. Babello V.A., Grishin A.V., Nikiforova I.L. The problem of identification - parameters of rock strength to assess the stability of the waste rock mass // Vedomosti gorniy geodesiya № 6, - P.54-57.647.
3. B.P.Golubko Open-pit mining and geodesy: textbook / B.P. Golubko, A.A. Panjin. - Yekaterinburg: UGGU Publishing House, 2005.- 155 p.
4. Demin AM, Open pit mining and waste sustainability. M., "Nedra", 1973, - 232p.
5. Malovichko D.A., Linch R.E. Microseismic monitoring of aircraft. Mining Institute of the Ural Branch of the Russian Academy of Sciences, ISS International South Africa. 2007.

6. Muskhelishvili N.I. Some of the main problems of mathematical theory are elasticity. Basic solutions. Plane theory of elasticity. Turning and turning work / N.I. Muskhelishvili. - M.: Nauka, 1966.- 417 p.
7. Panjin A.A. Monitoring of geodynamic processes in mining enterprises and cities / A.A. Panjin, N.A. Panjina // Kon -analytical bulletin. - 2007. - No.



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A BRIEF STUDY ON CRYPTOGRAPHY

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ABSTRACT

Data security has become a top worry for everyone linked to the internet, as it has merged with our lives and grown at a breakneck pace over the past few decades. Data security guarantees that only the intended recipients have access to our information and prohibits any data modification or change. Various techniques and approaches have been developed to attain this degree of security. Cryptography is a set of methods for encrypting data using particular algorithms that render the data unreadable to the naked eye until decoded using preset procedures by the sender. In order to secure personal, financial, medical, and ecommerce data while maintaining a reasonable degree of privacy, cryptography will continue to be used in IT and business strategies. Cryptography is an ancient technology that is continuously being explored, with historical origins.

KEYWORDS: *Cryptography, Security, Algorithm, Cipher, Decryption, Data Security.*

1. INTRODUCTION

Cryptography is a method of ensuring message secrecy. In Greek, the word has a particular meaning: "hidden writing." Nowadays, however, people and organizations' privacy is protected by high-level encryption, which ensures that information transmitted is safe and only the authorized recipient has access to it. Examples date back to 2000 B.C., when the ancient Egyptians employed "secret" hieroglyphics, as well as other evidence from ancient Greece and Rome, such as hidden inscriptions and the renowned Caesar cipher[1]–[3].

Hundreds of millions of individuals use cryptography on a regular basis to secure data and information, but the majorities are unaware of it. Cryptographic systems, in addition to being very valuable, are also exceedingly fragile, since a single programming or specification mistake may undermine them. Figure 1 illustrates the concept of cryptography.

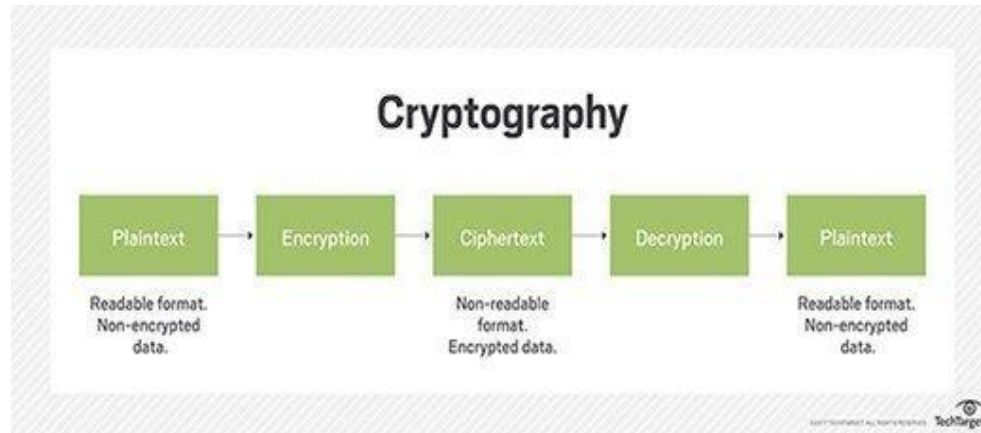


Figure 1: Illustrates the Concept of Cryptography[4].

1.1 Historical Algorithms:

This part will present a few historical algorithms, as well as pencil and paper examples for the non-mathematical reader. Long before public key cryptography was introduced, these methods were developed and deployed.

1.2 Caesar Cipher:

During the Gallic Wars, Julius Caesar, the Emperor of Rome, developed one of the oldest and earliest instances of cryptography. The letters A through W are encoded using the letters three positions ahead of each letter in the alphabet, while the remaining letters X, Y, and Z are represented by A, B, and C in this kind of method. This implies that a “shift” of 3 is employed, but we could have a similar effect on the encrypted text by using any value between 1 and 25. As a result, a shift is now often referred to as a Caesar Cipher.

The Caesar cipher is easy to crack since it is one of the most basic forms of encryption. The letters that were shifted must be moved three letters back to their original places in order to decode the cipher text. Despite this flaw, it may have been powerful enough for Julius Caesar to employ throughout his battles in the past. However, since the shifted letter in the Caesar Cipher is always three, anybody attempting to decode it just has to move the letters[5], [6].

1.3 Simple Substitution Ciphers:

Take, for example, the Simple Substitutions Cipher, commonly known as the Monoalphabetic Cipher. In a Simple Substitution Cipher, the alphabet letters are placed in random order beneath the correctly written alphabet, as shown here:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
J A U W P X H L C N G

The same key is used for encryption and decryption. The encryption rule is that "each letter is substituted by the letter underneath it," while the decryption rule is the inverse. For example, the plaintext CAN's equivalent cipher text is QDN.

1.4 Transposition Ciphers:

Other cipher families use a key and a specific rule to arrange the letters in plaintext to convert them to cipher text. Transposition is the process of changing the letters in plaintext using rules and a particular key. A columnar transposition cipher is one of the most basic kinds of transposition ciphers, and it comes in two flavors: full columnar transposition and partial columnar transposition. A rectangle shape is used to represent the written plaintext horizontally, regardless of which form is used, and its width should correspond to the length of the key being used. The message may be written in as many rows as needed[7]–[9]. When using full columnar transposition, the plaintext is transcribed and any empty columns are filled with null to ensure that each column has the same length. For example:

```

s e c o n d
d i v i s i o n
a d v a n c i n g
t o n i g h t x

```

Depending on the key, the cipher text is then generated from the columns. If we use the key "321654" in this example, the cipher text will be:

```
c v d n g e i a i s d n c n d o n o x n s a t t o i v g h
```

However, when it comes to an incomplete columnar transposition cipher, the columns are not required to be completed, so the null characters are left out. This results in columns of different lengths, which can cause the ciphertext to be more difficult to decipher without the key.

1.5 Modern Algorithms:

a. Stream Ciphers:

Stream ciphers use the key to create pseudorandom bits, and the plaintext is encrypted by XORing the plaintext with the pseudorandom bits. In the past, stream ciphers were often avoided because they were more easily cracked than block ciphers. However, after years of development, the stream cipher has improved in security and can now be used in connections, Bluetooth, communications, mobile 4G, TLS connections, and other applications.

Each bit in a stream cipher is encrypted separately. The first is the synchronous stream cipher, in which the key stream is dependent on the key; the second is the asynchronous stream cipher, in which the ciphertext is reliant on the key stream. A dotted line has been drawn. The stream cipher would be asynchronous if it was present; otherwise, it would be synchronous. An example of an asynchronous cipher is the cipher feedback (CFB).

b. Block Ciphers:

This type of cipher consists of both an algorithm for encryption and an algorithm for decryption:

- The encryption method (E) and a plaintext block (P) are given a key (K), and C is the result, which consists of a ciphertext block. $C = E$ can be used to express the encryption operation (K, P).

The decryption method (D) is the opposite of the preceding process, which involves decrypting the ciphertext for the plaintext, P. $P = D$ is a formula that can be written (K, C).

To make the block cipher more secure, a pseudorandom permutation (PRP) is employed. An attacker will not be able to decode the block cipher and calculate the output from any input if the key is kept secret. This is true as long as K's secrecy and randomness are guaranteed from the attacker's perspective. In a broad sense, this implies that the attacker won't be able to spot any patterns in the data that's either input to or output from the block cipher.

The size of the block and the size of the key are usually referred to in a block cipher. The value of both is crucial to the security. A 64-bit or 128-bit block is used in several block ciphers. Because it's critical that the blocks don't become too big, the memory footprint and ciphertext length are both modest. A block cipher processes blocks rather than bits when it comes to ciphertext length. To put it another way, if we wish to encrypt a 16-bit message and replace the blocks with 128-bit blocks, we must first transform the message to 128-bit blocks; only then can the block cipher begin processing and produce a 128-bit ciphertext. When it comes to memory footprint, we require at least 128-bit RAM to work with and process a 128-bit block. Most CPU registers are tiny enough to fit. Alternatively, specialized hardware circuits may be utilized to accomplish this. In most instances, 68 bits, 128 bits, and even 512-bit blocks are still small enough for efficient implementation. However, if the blocks grow in size (i.e., in kilobytes), the cost and performance of the system may suffer. Figure 2 illustrates the block diagram of cipher.

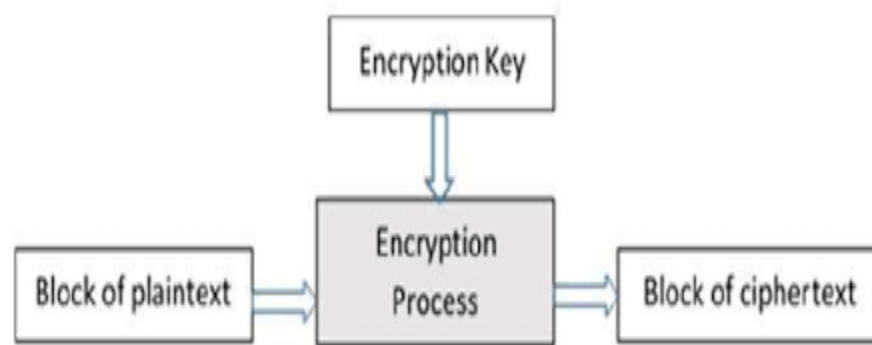


Figure 2: Illustrates the block diagram of cipher[10].

1.6 Hash Functions:

They operate by translating an arbitrarily-sized input to a fixed-size output via a process termed compression, which was formerly known as pseudo random functions (PRF). However, this is not the same as the compression found in .zip and .rar files. It is, instead, a non-invertible mapping. In order to be helpful, a hash function must satisfy two requirements:

It must have two properties: one, it must be one-way, and two, it must be collision resistant.

1.7 Public key Systems:

A cryptography revolution occurred with the introduction of public key encryption. Even in the 1970s and 1980s, broad cryptography and encryption were clearly restricted to the military and intelligence communities. Cryptography only expanded into other sectors as a result of public key systems and methods.

Because the public key may be shared without fear of being compromised, public key encryption allows us to communicate without relying on secret channels. The following is a list of the public key's characteristics:

- With the use of public key encryption, key distribution may be done via public channels, possibly simplifying the system's initial deployment and making system maintenance easier as parties join or depart.
- The use of public key encryption reduces the need to keep a large number of secret keys. Even if all parties wish to be able to communicate securely, everyone may keep their own private key in a safe manner.
- In open settings, public key cryptography is better, particularly when parties that have never interacted before wish to communicate and engage safely. For example, a business may be able to publish their public key online, and anybody who wishes to make a transaction may use the retailer's public key whenever they need their credit card information encrypted.

1.8 Digital Signatures:

Digital signatures, unlike cryptography, did not exist prior to the advent of computers. With the introduction of computer communications, the need for digital signatures to be addressed emerged, particularly in commercial settings where many parties are involved and each must agree to keeping their declarations and/or offers confidential. Unforgeable signatures were originally proposed hundreds of years ago, but they were handwritten signatures. Diffie and Hellman originally proposed the concept of digital signatures in their article "New Directions in Cryptography."

As a result, in a scenario where the sender and receiver do not have full confidence in one another, authentication alone will not be enough to bridge the gap. Something more is needed, namely a digital signature that functions similarly to a handwritten signature..

1.9 Digital Signature Requirements:

With the "digitalization" age that we are now seeing and living in, the connection that established the link between signature and encryption came into being. The following would be the criteria for an unforgeable signature schema:

- Each user should be able to create their own signature on any document they want.
- Each user should be able to quickly determine whether or not a given string is the signature of a different user.
- No one should be able to create signatures on papers that were not signed by the original owner.

1.10 Digital Signature Principles:

It is critical both within and outside the digital realm to be able to verify that a user or person delivered a message. Handwritten signatures are used to accomplish this in today's society. When it comes to creating digital signatures, public-key cryptography is used. The fundamental concept is that the person signing a document or message uses a private key (called private-key), and the person receiving the message or document must use the corresponding public-key.

1.11 Difference between Digital Signature and Message Authentication:

When communicating via an unsecured channel, parties may want to include authentication in the messages they send to the receiver so that the recipient can determine whether the message is genuine or if it has been altered. Message authentication generates an authentication tag for each message transmitted; receivers must validate it after receiving the message to guarantee that no external attacker has the capacity to create authentication tags that aren't being utilized by the communicating parties.

Message authentication is similar to digital signature in certain ways, but the distinction is that with message authentication, just the second party is needed to authenticate the message. There can be no third-party verification of the message's authenticity or if it was produced by the actual sender. However, in the case of a digital signature, other parties may verify the signature's authenticity. As a result, digital signatures have provided a message authentication method.

2. DISCUSSION

Cryptography is a technique of using codes to secure information and communications so that only those who are supposed to read and process it may do so. The prefix "crypt-" denotes "secret" or "vault," while the suffix "-graphy" denotes "writing." Secret-key cryptography, public-key cryptography, and hash function cryptography are the three kinds of cryptography. Authentication, integrity, secrecy, and non-repudiation are only a few of the main security objectives that cryptography helps to achieve. In the presence of an adversary, cryptographic methods are employed to guarantee data confidentiality and integrity. Various cryptographic techniques, such as symmetric key cryptography or public key cryptography, may be employed during data transit and storage depending on the security requirements and risks involved.

3. CONCLUSION

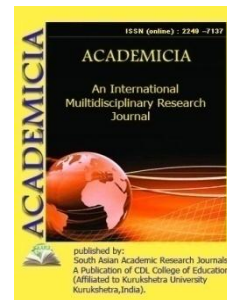
Authentication, integrity, secrecy, and non-repudiation are only a few of the main security objectives that cryptography helps to achieve. To accomplish these objectives, cryptographic algorithms are created. The aim of cryptography is to provide dependable, strong, and resilient network and data security. Various cryptographic techniques, such as symmetric key cryptography or public key cryptography, may be employed during data transit and storage depending on the security requirements and risks involved. We presented an overview of some of the research that has been done in the area of cryptography, as well as an explanation of how the various algorithms used in cryptography for various security reasons function in this article. In order to secure personal, financial, medical, and ecommerce data while maintaining a reasonable degree of privacy, cryptography will continue to be used in IT and business strategies.

REFERENCES:

1. V. Mavroeidis, K. Vishi, M. D. Zych, and A. Jøsang, "The impact of quantum computing on present cryptography," *Int. J. Adv. Comput. Sci. Appl.*, 2018, doi:

10.14569/IJACSA.2018.090354.

2. W. J. Buchanan, *Cryptography*. 2017.
3. W. J. Buchanan, S. Li, and R. Asif, "Lightweight cryptography methods," *J. Cyber Secur. Technol.*, 2017, doi: 10.1080/23742917.2017.1384917.
4. "security_cissp_cryptography_mobile." <https://searchsecurity.techtarget.com/definition/cryptography> (accessed Aug. 02, 2017).
5. J. Buchmann, K. Lauter, and M. Mosca, "Postquantum Cryptography-State of the Art," *IEEE Security and Privacy*. 2017, doi: 10.1109/MSP.2017.3151326.
6. D. J. Bernstein and T. Lange, "Post-quantum cryptography," *Nature*. 2017, doi: 10.1038/nature23461.
7. L. Jian *et al.*, "A survey on quantum cryptography," *Chinese J. Electron.*, 2018, doi: 10.1049/cje.2018.01.017.
8. A. Nitaj, "Post quantum cryptography," *Malaysian J. Math. Sci.*, 2017, doi: 10.1201/9781351021708-9.
9. "Fault analysis in cryptography," *Int. J. Latest Trends Eng. Technol.*, 2017, doi: 10.21172/1.91.29.
10. "cipher." https://www.tutorialspoint.com/cryptography/block_cipher.htm (accessed Aug. 02, 2017).



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AN OVERVIEW ON CHOCOLATE IN HUMAN HEALTH

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ABSTRACT

For ages, chocolate/cocoa has been prized for its flavor and potential health benefits. Chocolate was formerly chastised for its fat content, and its intake was considered a sin rather than a cure for acne, cavities, obesity, high blood pressure, coronary artery disease, and diabetes. As a result, many doctors tended to caution patients about the health risks of eating excessive quantities of chocolate. The discovery of physiologically active phenolic chemicals in cocoa has altered this view and sparked study into its impact on aging, oxidative stress, blood pressure control, and atherosclerosis. Chocolate is being praised for its high antioxidant content. In many research, however, conflicting findings and methodological problems have made it difficult for health experts and the general public to comprehend the current data on chocolate's health effects. The goal of this review is to evaluate studies on the advantages and dangers of chocolate intake over the past decade.

KEYWORDS: *Chocolate, Cocoa, Flavonoids, Polyphenols, Theobroma Cacao.*

1. INTRODUCTION

In the 16th century, chocolate was introduced to Europe. The contemporary chocolate business has evolved since then, and cocoa beans are now handled in a variety of methods. Chocolate is the most widely desired food in the planet. It was formerly believed to be a luxury item, but it is today considered a medication.

1.1 History:

Chocolate originated in Mexico, where the cacao tree was cultivated by the Mayas, Incas, and Aztecs. It was formerly thought to be an aphrodisiac, available exclusively to the wealthy and powerful. Due to its exorbitant cost, chocolate was eventually supplanted as the primary beverage by coffee and tea. Chocolate, on the other hand, eventually became a popular delicacy in most industrialized nations, including Europe and North America. Cocoa is now mostly cultivated in West Africa, Indonesia, and Sri Lanka[1]–[3].

It was formerly thought to be the drink of Gods because of its health benefits, a connection that gave birth to the scientific name of the cocoa tree, *Theobroma cacao*, derived from the Greek words *theo* (God) and *broma* (fruit) (drink). Carl Von Linné (1707–1778), a Swedish scientist, gave the tree its credit. In reality, this term is indicative of chocolate's social, religious, and economic significance in both New and Old World civilizations. In American English, the tree and its dried seeds are referred to as 'cacao' before being processed; after processing, such as roasting and grinding, the word 'cocoa' is used. The term "chocolate" refers to a meal made from roasted cacao seeds. The chemical composition of chocolate is shown in Figure 1.

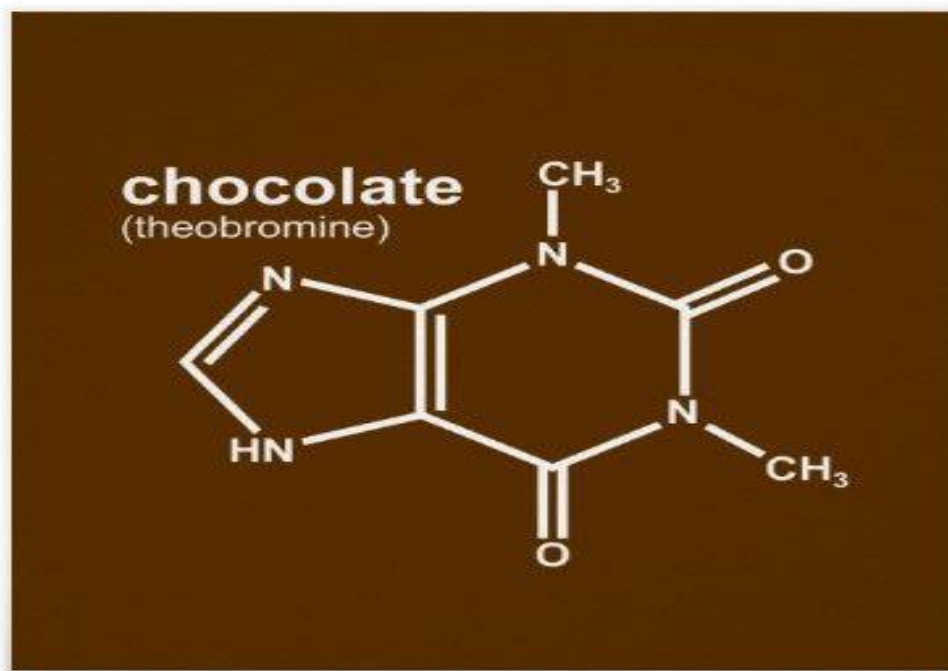


Figure 1: Illustrates the chemical compound of chocolate[4].

1.2 Chemical compounds of chocolate that may affect human health:

Several writers have praised chocolate's nutritional properties, and some have even referred to it as a "complete meal." The following are some of the most important compounds present in chocolate.

a. Fats:

Cocoa butter, which includes about 33% oleic acid (monounsaturated), 25% palmitic acid (saturated), and 33% stearic acid, is the most common fat found in dark chocolate (saturated). The fatty acid oleic acid has a beneficial impact on lipid levels. 5 Total cholesterol and low-density lipoprotein levels are negatively affected by saturated fats. Regardless of whether it is a saturated fat or not, stearic acid may have no impact on lipid levels or may raise them. The difference in stearic acid absorption between cocoa-derived and animal-derived sources may be due to the distinct nature of cocoa-derived stearic acid. Few studies, however, have ruled out this possibility[5]–[7].

b. Antioxidants:

Cocoa butter, which includes about 33% oleic acid (monounsaturated), 25% palmitic acid (saturated), and 33% stearic acid, is the most common fat found in dark chocolate (saturated). The fatty acid oleic acid has a beneficial impact on lipid levels. 5 Total cholesterol and low-density lipoprotein levels are negatively affected by saturated fats. Regardless of whether it is a saturated fat or not, stearic acid may have no impact on lipid levels or may raise them. The difference in stearic acid absorption between cocoa-derived and animal-derived sources may be due to the distinct nature of cocoa-derived stearic acid. Few studies, however, have ruled out this possibility.

c. Nitrogenous compounds:

Proteins as well as the methylxanthines theobromine and caffeine are among cacao's nitrogenous components. They're stimulants for the central nervous system, diuretics, and smooth muscle relaxants.

1.3 Minerals and other properties:

Minerals such as potassium, phosphorus, copper, iron, zinc, and magnesium are also found in cocoa mass, which enhance the health advantages of chocolate. Despite the presence of the stimulants caffeine and theobromine in chocolate, it also includes valeric acid, which works as a stress reliever.

1.4 Potential Health Benefits of Chocolate Consumption:

Regular use of cocoa is thought to be inversely related to the risk of cardiovascular disease. The possible anti-pathogenic effects of cocoa have piqued people's attention in the last decade. A variety of possible pathways via which cocoa may exert its health-promoting benefits have been suggested, but they are still being disputed. A few of them are covered in this article.

1.5 Cocoa and cardiovascular diseases:

Numerous studies have indicated that cocoa may be helpful in the treatment of cardiovascular disorders (CVD). Zomer et al. have found that consuming dark chocolate on a regular basis may be an effective cardiovascular preventative approach in individuals with metabolic illness. The following are some of the possible mechanisms involved in cocoa's positive benefits[8].

1.6 Rich source of antioxidants:

In the development of atherosclerosis, oxidative stress and decreased antioxidant defenses play a key role. Chocolate is the third most antioxidant-rich food in the United States. Chocolate's antioxidants have been proven to prevent plasma lipid oxidation. However, there is a research

that refutes chocolate's direct antioxidant capability, claiming that the significant rise in plasma total antioxidative capacity seen after eating flavonol-rich foods is most likely attributable to elevated uric acid levels caused by fructose metabolism, rather than flavonols.

1.7 Blood pressure lowering effects:

In the Netherlands, males aged 65 to 84 were recruited for a large-scale, longer-term research. When the participants first participated in the research, they were questioned about their food consumption, and then again at five-year intervals. Men who drank cocoa on a daily basis had substantially lower blood pressure than those who did not during the following 15 years. Dark chocolate bars were shown to lower systolic blood pressure in healthy individuals as well as young and elderly hypertension patients after 15 days of consumption.

1.8 Effects on blood vessels and nitric oxide:

The precise mechanism behind chocolate's antihypertensive benefits is unknown, although it may include enhanced nitric oxide (NO) bioavailability, flavonol-induced inhibition of angiotensin converting enzyme, and stearic acid-based diastolic blood pressure decrease.

1.9 Inhibits platelet activation:

Another typical aspect of atherosclerotic lesions is platelet dysfunction. Cocoa has aspirin-like effects on platelet function, and the combined effects of cocoa and aspirin are cumulative, implying that cocoa may help avoid clots. Platelets are affected in two ways by chocolate. It not only lowers platelet aggregation, but it also lowers platelet adhesion[9], [10]. When compared to a group that consumed low-procyanidin chocolate, consumption of high-procyanidin chocolate substantially reduced leukotriene levels and raised prostacyclin levels.

a. Antidiabetic effects:

To increase insulin sensitivity in diabetics, a variety of methods have been explored. In endothelial cells, NO bioavailability has a role in insulin sensitivity. As a result, flavonol may help to lower insulin resistance by increasing NO bioavailability. With healthy individuals and hypertension patients, flavonol-rich chocolate consumption resulted in a decrease in insulin resistance and an improvement in insulin sensitivity. Another research found that eating flavonol-rich chocolate improved glucose and insulin responses to an oral glucose tolerance test in hypertensive individuals with impaired glucose tolerance.

b. Antistress effects:

There are several bioactive compounds in chocolate that promote alertness. A study in Switzerland also confirmed that chocolate alleviates stress. Following 14 days of dark chocolate ingestion, stress parameters in the adults exhibiting high anxiety profiles became comparable with the low-stress subjects. Chocolate affects stress levels by prompting serotonin production which is a calming neurotransmitter.

c. Anti-obese effects:

Chocolate has many bioactive chemicals that enhance alertness. Chocolate also relieves tension, according to a research conducted in Switzerland. Stress indicators in individuals with high anxiety profiles were similar to those in low-stress participants after 14 days of dark chocolate

consumption. Chocolate reduces stress by triggering the synthesis of serotonin, a relaxing neurotransmitter.

d. Effects on the neurons:

A new research of young, healthy individuals utilizing magnetic resonance imaging discovered that cocoa consumption increases cerebral blood flow, indicating that cocoa may help cure diseases like dementia and stroke. Chocolate consumption was also linked to improved cognitive function, according to Nurk et al. Larsson et al. looked at the link between chocolate intake and the risk of stroke in males and found that eating chocolate every day lowers the chance of a stroke attack. Chocolate increases cerebral blood flow, according to Walters et al.

e. Antitumour effects:

Cocoa seems to prevent the development of malignant cells in vitro, according to a few studies. At this time, the precise mechanisms of anticancer action are unknown. On the other hand, other research indicate that eating too much chocolate increases the risk of cancer. To explore the processes involved in cocoa activities and to justify cocoa's use as a cancer preventive and treatment therapy, further preclinical and clinical studies are required.

f. Anti-inflammatory effects:

By attaching directly to the active sites of lipoxygenase enzymes, chocolate suppresses lipoxygenase pathways.

1.10 Cocoa and exercise recovery:

Chocolate supplementation before exercise has been shown to hasten the recovery of post-exercise physiological and metabolic alterations. When compared to the glucose levels of placebos, plasma glucose levels of participants rose substantially 15 minutes after chocolate consumption and remained at fairly high levels until 30 minutes after an hour of jogging.

1.11 Potential Health Challenges of Chocolate Consumption:

Surprisingly, there is little research on the negative consequences of chocolate, despite the abundance of studies extolling its advantages. One of chocolate's components, theobromine, is thought to induce heartburn by relaxing the oesophageal sphincter muscle, allowing stomach acidic contents to enter the oesophagus. Children's allergic responses to chocolate have been reported in a few studies.

2. DISCUSSION

Chocolate is a liquid, solid, or paste produced from roasted and powdered cacao pods that may be consumed on its own or used as a flavoring ingredient in other dishes. Cacao has been eaten in some form since the Olmec civilisation (19th-11th century BCE), and chocolate drinks were produced by the majority of Mesoamerican peoples, including the Maya and Aztecs. The cacao tree's seeds have a strong bitter flavor that must be fermented to bring out the flavor. The beans are dried, cleaned, and roasted after fermentation. The shell is removed to provide cocoa nibs, which are subsequently crushed into cocoa mass, which is raw chocolate. Chocolate liquor is made from cocoa material that has been liquefied by heat. It's also possible to chill the liquor and separate it into its two components: cocoa solids and cocoa butter. Baking chocolate, often known as bitter chocolate, is made out of various amounts of cocoa solids and cocoa butter, with

no additional sugar. Dutch cocoa is made from powdered baking cocoa, which has more fiber than cocoa butter and may be processed with alkali. Sweet chocolate, which is made out of cocoa solids, cocoa butter or additional vegetable oils, and sugar, accounts for the majority of chocolate eaten today. Milk chocolate is delicious chocolate with milk powder or condensed milk added to it. There are no cocoa solids in white chocolate, just cocoa butter, sugar, and milk.

3. CONCLUSION

The bulk of research touting chocolate's health advantages are small-scale and funded/conducted by chocolate producers, whose personal interests cannot be overlooked. This necessitates careful evaluation of the findings' implications, since there is a risk of study bias. Before doctors may confidently suggest 'a chocolate a day' to their patients, further large-scale observational and/or interventional research from non-biased sources are required.

Furthermore, the polyphenol content of the items utilized in controlled trials is typically considerably greater than that of most commercially available goods. Because flavonols have a bitter flavor, producers have developed cocoa processing methods that remove the bitterness along with the flavonoids. Cocoa processing may result in the loss of up to 90% of the flavonoids. As a result, it must be determined if consuming goods with reduced polyphenol concentration is linked to any health advantages in people.

REFERENCES:

1. A. Konstantas, H. K. Jeswani, L. Stamford, and A. Azapagic, "Environmental impacts of chocolate production and consumption in the UK," *Food Res. Int.*, 2018, doi: 10.1016/j.foodres.2018.02.042.
2. C. D. Di Mattia, G. Sacchetti, D. Mastrocola, and M. Serafini, "From cocoa to chocolate: The impact of processing on in vitro antioxidant activity and the effects of chocolate on antioxidant markers in vivo," *Frontiers in Immunology*. 2017, doi: 10.3389/fimmu.2017.01207.
3. M. Mirković, S. Seratlić, K. Kilcawley, D. Mannion, N. Mirković, and Z. Radulović, "The sensory quality and volatile profile of dark chocolate enriched with encapsulated probiotic lactobacillus plantarum bacteria," *Sensors (Switzerland)*, 2018, doi: 10.3390/s18082570.
4. "Chocolate." <https://in.pinterest.com/pin/185140234654003267/>.
5. I. M. da V. Moreira, L. de F. Vilela, C. Santos, N. Lima, and R. F. Schwan, "Volatile compounds and protein profiles analyses of fermented cocoa beans and chocolates from different hybrids cultivated in Brazil," *Food Res. Int.*, 2018, doi: 10.1016/j.foodres.2018.04.012.
6. B. P. Meier, S. W. Noll, and O. J. Molokwu, "The sweet life: The effect of mindful chocolate consumption on mood," *Appetite*, 2017, doi: 10.1016/j.appet.2016.09.018.
7. E. Tuenter, K. Foubert, and L. Pieters, "Mood Components in Cocoa and Chocolate: The Mood Pyramid," *Planta Medica*. 2018, doi: 10.1055/a-0588-5534.
8. A. G. T. Menezes *et al.*, "Investigation of chocolate produced from four different Brazilian varieties of cocoa (*Theobroma cacao* L.) inoculated with *Saccharomyces cerevisiae*," *Food Res. Int.*, 2016, doi: 10.1016/j.foodres.2015.12.036.

9. V. Glicerina, F. Balestra, M. Dalla Rosa, and S. Romani, "Microstructural and rheological characteristics of dark, milk and white chocolate: A comparative study," *J. Food Eng.*, 2016, doi: 10.1016/j.jfoodeng.2015.08.011.
10. C. Delbaere, D. Van de Walle, F. Depypere, X. Gellynck, and K. Dewettinck, "Relationship between chocolate microstructure, oil migration, and fat bloom in filled chocolates," *European Journal of Lipid Science and Technology*. 2016, doi: 10.1002/ejlt.201600164.



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DETERMINATION OF THE REVIVABILITY OF THE MULBERRY SILKWORM EGGS IN THE SPRING PERIOD BY AUTOMATED AND TRADITIONAL METHODS

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ABSTRACT

This article presents the results of a study on the process of reviving the eggs of a foreign hybrid of the silkworm "HUATONG", which was revived in the spring period in two ways, one of which is simple, widely used by specialists, and the other is used in automated hatcheries with optimal temperature and humidity. For these studies, the hatchery of the farm "Shukhrat bogi Baraka" of the Qorakhitoy region of the Akhangaran district of the Tashkent region was selected. The experiments were carried out with the first batch of eggs in 4 variants and 12 replications; in each replication was 1000 eggs. The number of revived caterpillars and non-revived eggs were analyzed, and the percentage of revivability by replication was comparatively analyzed.

KEYWORDS: Spring, Summer, Season, Breed, Hybrid, Silkworm Eggs, Silkworms, Party, Resuscitation Methods, Incubator, Temperature, Environmental Factors, Light, Food, Incubation.

INTRODUCTION

The growing demand for natural fabrics in the world market from year to year has led to the production of natural silk and silk products, as well as requires mulberry silkworm eggs, their revitalization, cocoon preparation, pre-processing, cocoon spinning and finished products on the basis of new intensive technologies

Based on the above, scientific and practical research on the production of quality superelite, elite and industrial mulberry silkworms is currently being conducted in more than 20 countries around the world.

Presently, 75-80% of mulberry silkworm eggs are produced in the Peoples Republic of China, 11-12.5% in India, 1.3% in Uzbekistan and the rest in other countries where silkworm breeding is developing.

Creation of a new generation of silkworm breeds and hybrids in scientific research institutions of developed countries, which are resistant to changing environmental conditions of spring and summer, meet all the requirements of biological and all productivity indicators worm farms, along with the development of excellent methods and intensive technologies for the revival of silkworm eggs, bringing their cocoon productivity and technological properties to a level that meets the requirements of industrial enterprises, certain results have been achieved in their production testing on farms and in specially organized incubators.

In order to further develop the silk industry in Uzbekistan, make full use of existing opportunities, increase the material interests of the rural population by providing them with permanent jobs, re-equip silk enterprises with new equipment and technologies and attract foreign investment and production of new scientific developments through the introduction of intensive technologies, particular attention is paid to increasing the quantity and quality of products.

Especially by the President of the Republic of Uzbekistan in 2018, Resolution No PQ-3616 of March 20 "On additional measures for the further development of the silk industry" defines the strategic directions and prospects of research in the silk industry, extensive testing of scientific and selection achievements through the rapid development of the industry, further development of mulberry silkworm breeds and hybrids, primary breeding of mulberry varieties, the widespread introduction of advanced scientific developments and intensive agro-technologies, taking into account the natural climatic conditions of the regions.

Research materials and methods

Our research was conducted in the incubator of the farm "Shukhrat Bagi Baraka" in the Karahitay region of Ahangaron district of Tashkent region. We know that the sharp changes in natural climatic conditions in recent years have created a number of difficulties in the process of timely implementation of agro-technical measures. It is especially important to keep the temperature and humidity in the incubator at a constant level in the process of revitalization of mulberry silkworm eggs in the spring in different regions of the country. Otherwise, the embryonic development and revitalization of mulberry silkworm eggs leads to a decrease in the biological and, in turn, the productivity of the larvae of the cocoon.

It has been proved that positive results can be achieved by reducing the impact of the above adverse consequences as well as scientific research has been conducted to increase the economic value traits of silkworms.

The main purpose of the study was to develop a modern innovative new agrotechnology to increase the percentage of mulberry silkworm eggs revitalization in the spring and summer seasons for silk clusters, farms and home-grown worms, as a result, the research showed that the percentage of revitalization of eggs revived by the automated method was higher and more positive than the percentage of revival of eggs revived by the simple (comparative) method.

As a starting material in the spring from the eggs of the 1st batch of silkworms "HUATONG" hybrids imported from abroad 3000 pieces of samples were taken in four variants of three replications.

The number of eggs in each variant and replication, egg yolk weight, one egg weight, arithmetic mean, number of physiologically defective eggs, and number of eggs laid for resuscitation (gr) were calculated, and each replication and variants were placed in two different ways.

The first method: In the method used by ordinary (comparative) local experts, the incubator temperature was heated with room-mounted heating equipment and the humidity level was adjusted using a damp sheet, the room floor was wetted every 2-3 hours and a bucket of water was placed in different parts of the room.

The temperature and humidity in the room was measured for 2-3 hours using psychrometer, and the results of the study were recorded in a special workbook.



The second method (experiment) the temperature and humidity in the automated incubator were kept constant and controlled by an ultrasonic device with an automatic control system to ensure that it did not rise or fall sharply above the norm.

The temperature and humidity in the incubator room were measured every 2-3 hours using an ultrasonic device and psychrometers, thermometers, and the results of the study were recorded in a special workbook.



Today, a group of leading scientists in Uzbekistan are working in order to create strains and hybrids of mulberry silkworms that are resistant to extreme natural climates and various environmental factors in the spring and summer seasons, as well as to improve their biological and cocoon productivity [1], creation of high-yielding hybrids, which are manifested during the breeding season of the breed in order to produce purebred hybrids at breeding seed stations and seed enterprises[2], changes in reproductive traits in the population of pure breeds of silkworms under adverse environmental conditions[3], manifestation of cocoon productivity indicators of F_2 generation breeds under adverse stress conditions[4], methods of obtaining interspecific and interspecific hybrid combinations of silkworms [5], the effect of differential resuscitation of mulberry silkworm breeds and hybrids, the correct timing of revival, the quality of cocoons collected, delivered and stored in rearing house [6], the effect silkworm feed on the biological cocoon productivity and technological properties of silkworm larvae of mulberry leaf varieties and the level of nutrients [7-11], extensive scientific research has been carried out and positive results have been achieved.

However, insufficient attention has been paid to scientific research on improving the viability, cocoon productivity and technological properties of mulberry silkworm eggs by reviving them at the same temperature and humidity, based on new technologies and mechanized electronic control, in the rapidly changing, unfavorable natural climate of spring and summer.

RESEARCH RESULTS

In our experiments, the goal is to grow fine-grained cocoons that meet the requirements of cocoon processing enterprises in the spring and summer cocoon clusters, farms and home-grown worms with a high recovery rate, healthy, in general, the biological, cocoon productivity and technological characteristics of larvae, we conducted experiments on the imported HUATONG hybrid.

When we compare our experience with the arithmetic mean differences in the percentage of seed revival of HUATONG hybrids in an automated incubator and a simple (comparative) incubator in the spring of 2021, the samples obtained are shown in Table 1.

**TABLE 1 REVIVAL RATE OF MULBERRY SILKWORM EGGS (SPRING 2021)
HUATONG №1 BATCH IN AUTOMATED HYGROTHERMAL MODE**

№	Breeds and hybrids	Number of batches	Number of samples	Total number of eggs, pieces	Number of live worms, pcs	Number of non-live worms, pcs	Revived worms, percentage
1.var.	“HUATONG”	1-batch	replication 1	1000	986	14	98,6
2. rep.	"HUATONG"		replication2	1000	985	15	98,5
3. rep.	"HUATONG"		replication3	1000	982	18	98,2
Average:				1000	984	16	98,4
2.var.	“HUATONG”	1- batch	replication 1	1000	984	16	98,4
2. rep.	“HUATONG”		replication2	1000	983	17	98,3
3. rep.	"HUATONG"		replication3	1000	984	16	98,4
Average:				1000	984	16	98,3
3.ver.	“HUATONG”	1- batch	replication 1	1000	983	17	98,3
2. rep.	"HUATONG"		replication2	1000	985	15	98,5
3. rep.	"HUATONG"		replication3	1000	986	14	98,6
Average:				1000	985	15	98,4
4.var.	“HUATONG”	1- batch	replication 1	1000	984	16	98,4
2. rep.	"HUATONG"		replication2	1000	988	12	98,8
3. rep.	"HUATONG"		replication3	1000	985	15	98,5
Average:				1000	986	14	98,5
Total:				1000	985	15	98,4

According to the analysis of the data presented in Table 1, the arithmetic mean between the various options and replications was determined by the percentage of silkworm eggs revival in spring by an automatic method.

In addition, the total number of silkworm eggs in each variant was 1,000 with 3,000 replications. At the same time the average number of live worms in our experimental variant was 985 eggs. It can be seen that the number of non-live eggs was 15 and the arithmetic mean of live worms was 98.4%.

**TABLE 2 REVIVAL RATE OF MULBERRY SILKWORM EGGS (SPRING 2021)
HUATONG №1 BATCH IN SIMPLE (COMPARATIVE) WAY**

HUATONG-V1 BATCH IN SAMPLE (COMPARATIVE) WAY							
№	Breeds and hybrids	Number of batches	Number of samples	Total number of eggs, pieces	Number of revived worms, pcs	Number of non-revived worms, pcs	Revived worms,percentage
1.var.	“HUATONG”	1-batch	replication 1	1000	965	35	96,5
2.rep.	“HUATONG”		replication 2	1000	961	39	96,1
3. rep.	“HUATONG”		replication 3	1000	957	43	95,7
Average:				1000	961	39	96,1
2.var.	“HUATONG”	1-batch	replication 1	1000	955	45	95,5
2.rep.	“HUATONG”		replication 2	1000	947	53	94,7
3. rep.	“HUATONG”		replication 3	1000	950	50	95
Average:				1000	951	49	95
3.var.	“HUATONG”	1-batch	replication 1	1000	943	57	94,3
2. rep.	“HUATONG”		replication 2	1000	945	55	94,5
3. rep.	“HUATONG”		replication 3	1000	951	49	95,1
Average:				1000	946	54	94,6
4.var.	“HUATONG”	1-batch	replication 1	1000	948	52	94,8
2. rep.	“HUATONG”		replication 2	1000	956	44	95,6
3. rep.	“HUATONG”		replication 3	1000	952	48	95,2
Average:				1000	952	48	95,2
Total :				1000	952	48	95,2

Analyzing the data presented in Table 2, the percentage of revitalization of mulberry silkworm eggs in the comparative spring season was as follows in terms of different options and reductions.

In simultaneous comparative variants, where the total number of silkworm eggs in each variant was 3000, the number of replications was 1000, the average number of live worms in each variant was 952, the average number of non-live worms was 48, and the arithmetic mean of live worms was 95.2%.

Experiments show that the eggs of HUATONG hybrids were 3.2% higher when revived in an automated incubator than in a normal (comparative) incubator.

This, in turn, has led to a positive increase in other economic values.

CONCLUSION

Based on the results of the above analytical studies, maintain room temperature and humidity at the same level in accordance with agrotechnical rules when reviving mulberry silkworm eggs for spring resuscitation improves survival rate of silkworm, cocoon yield and fiber technology.

REFERENCE

1. Umarov Sh.R., Nasirilayev B.U., Jumaniyazov M.Sh., Khudjamatov S.Kh. C.X. Productive indicators of F₁ generation obtained under unfavorable stress conditions of mulberry silkworm breed and systems. // Collection of reports on the introduction of modern

- technologies in the field of agricultural production and improving their use of system. Tashkent 2018. P.27-29 .
2. Khalilova M.F., Umarov Sh.R., Jumaniyazov M.Sh., Khudjamatov S.Kh., Abdukodirov M.A. Biological Indicators of Industrial Hybrids Involved in Sex-Regulated Lines of Bombyx Mori L. Silkworm. // Annals of R.S.C.B. Vol. 25, Issue 3, 2021, P.8990-8997.
 3. Valiev S.T., Nasirillaev B.U., Umarov Sh.R., Jumaniyazov M.Sh., Giasova K.S. Variability of reproductive traits in purebred silkworm populations under adverse environmental conditions. // Livestock and breeding work. Tashkent 2019. p25-27 .
 4. Umarov Sh.R., Umarov Sh.R., Rajabov N.O., Jumaniyazov M.Sh., Batirova A.N., Khudjamatov S.Kh. Embryonic and post-embryonic viability of Second generation (F₂) of silkworm breeds and Lines obtained under unfavorable stressful Conditions. // INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH. VOLUME 9, ISSUE 03, MARCH 2020 ISSN 2277-8616.
 5. Batirova A.N., Umarov Sh.R., Peculiarities of obtaining interdigital and interlinear hybrid combinations of silkworm. // Agricultural science. Moscow. 2019. №7-9. P. 29-30.
 6. Jumagulov K.A. Dissertation abstract 2019. p 8-11 .
 7. Akhmedov N.A. Revitalization of silkworm eggs. Tashkent, 1992. P.6-7.
 8. Akhmedov N.A. Feeding worms with varietal mulberry leaves is an effective way to increase productivity. // "Ipak" 1999. №4. p9-11.
 9. Umarov Sh.R., Nasirillaev B.U., Jumaniyazov M.Sh., Batirova A.N., Giasova K.S. The influence of mulberry silkworm breeding conditions on egg viability. Livestock and breeding work. Tashkent 2019. №4 (09). P.23-24 .
 10. Nasirillaev B.U., Umarov Sh.R., Jumaniyazov M.Sh., Khudjamatov S.Kh., The influence of the method of obtaining one-day-olds on the adaptive abilities of silkworm Bombyx Mori L. Silkworm. // Agricultural science. Moscow. 2019. №2. P. 32-35.
 11. Rajabov N.O., Umarov Sh.R., Nasirillaev B.U., Fozilova Kh.P. The importance of the new selection system and varieties of mulberry in the development of the silk industry of Uzbekistan. // Scopus, Impact factor: Solid State Technology, Volume: 63, Issue:4, publication year: 2020.



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FEATURES OF THE ACTIVITIES OF SOCIAL MOVEMENTS AND NETWORK FORMS OF ORGANIZING CIVIC ENGAGEMENT

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ABSTRACT

The article analyzes the sphere of civic activity, as well as the network form of its organization. The features of this sphere of public life, which are significant for predicting its development, are revealed. Theories of social movements are considered. The factors and reasons for the activation of network civic activity, the conditions for its implementation in modern society are noted.

KEYWORDS: *Civil Society, Civic Engagement, Social Movement, Network Analysis, Network Organizations, Social Actors, Social Structure.*

INTRODUCTORY PART

In modern civil society, great importance is attached to personal and informal relationships aimed at achieving a common result and public good. Citizens begin to resolve issues of concern to them, going out into the public space, attracting the attention of the public. As a result, there is a development of social mechanisms that spread in the horizontal environment of activists. In such movements, subjects on equal terms try to form a joint decision on issues of interest to them. They begin to use the resources at their disposal as openly as possible. One can observe a picture in which individuals seek solutions to their problems through social movements formed around them or other forms of activity created on a common interest.

Socio-political changes in modern Uzbek society over the past five years have changed significantly, as a result of which civic activity has received a new impetus for development. In

various spheres of public relations, there is an increase in the involvement of citizens and social groups in solving urgent social problems.

One of the features of civic engagement is the increasing use of the network principle for its organization. Network mobilization of the population in civil campaigns, actions and movements effectively affects the achievement of results and allows private initiatives to reach a new level. The network organization attracts by the presence of informal horizontal connections, openness, as well as the problems of the movement. Many social movements are networked and often involve issues of concern to the general population. Such movements are formed in the field of human rights protection, education, ecology, politics and the social sphere.

The motivation for participation in civic campaigns can be of different nature, but for the most part it is an expression of one's position. In addition, there are opportunities for the inclusion of activists in public activities without significant expenditure of resources. First of all, such opportunities are provided by the Internet.

Civil activity becomes an influencing mechanism of influence on the formalized structures of society and the state, as well as on ordinary citizens. It often happens that the state itself implements them, and tries to make the networked civic activity manageable. It often happens that civic activity comes from state institutions and various political forces.

Research methodology and methods

The study uses a range of sources, which include the fundamental works of researchers in the field of civil society and the network approach in the theory of organization. The analysis of civil movements in modern Uzbekistan is based on the criteria of network forms of organization formulated in the works of M. Castells, W. Mastenbrook and other scientists.

The methodological basis of the work was formed by the method of network analysis, used to study specific civic movements, methods of political analysis are also used, such as event analysis and content analysis, as well as situational analysis and case-study. General scientific methods were used: comparative and logical methods, methods of induction and deduction, as well as structural-functional and systems approaches. In addition, an expert survey method was applied to collect empirical data.

Research results and discussion

The term "organization" can be viewed from several angles. [1, p. 632; 7; nine].

The relationship in the organization between its elements can be built vertically and horizontally, in each case, the dominance of the type of management communication will determine the type of organizational structure. In this aspect, two types of organizations can be distinguished - network and hierarchical or non-network. A hierarchical structure is a multilevel form of organization of objects with a strict correlation of lower-level objects to a specific upper-level object. The most common form of hierarchical organizations is government agencies and structures, which, in turn, control political organizations, commercial and non-profit structures. Networked organizations are organizations that use networked connections, relationships, and technologies in manufacturing management. These are associations that are built on a common goal, on certain rules of cooperation in groups.

The organization of civic engagement can be expressed through both forms of organization - both through the network and through the hierarchical one. Now there is an active discussion of the development of network forms of organization and the shift of priorities from a hierarchical form of management to a network one.

Constant changes in various spheres of public life lead to an increase in civic engagement and the need to apply new forms of organizing activities. At present, the heated discussion of problems in society, the holding of various actions in the country shows an increase in the number of civil movements. They are becoming more and more dissatisfied with the rules of the game, the prevailing norms, the environment, etc. Against the background of all these problems, we see the creation of new movements and organizations that in various ways are trying to assist in meeting the legitimate rights and interests of citizens. Basically, they all start with local stocks. The effective use of mass media helps such movements to find supporters in other regions and cities, which ultimately turns them into large-scale campaigns.

There are many approaches to defining the concept of "social movement", the interpretation of which depends on the choice of the basic concept and key concepts. There are four main approaches to the study of social movements: the theory of "collective behavior" (Turner, Killian); the theory of "resource mobilization" (Zald, McCarthy); the theory of the "political process" (Tilly); theory of "new social movements" (Touraine, Melucci) [8, P.47].

The first three refer to the results of American studies, the last one to European ones. The theory of collective behavior connects the essence of a social movement with the public, its social base. G. Bloomer considered collective behavior as any group activity in which individuals act together in such a way that between them there is a certain division of labor and a certain mutual adaptation of various lines of individual behavior, identifies elementary collective groupings (crowd, panic, riot, riots, etc.) and more complex, organized forms of collective behavior, which include social movements, social organization, institutions [8, P.43].

Elementary collective groups are spontaneous and natural, function with the help of primitive mechanisms of collective behavior, and arise under certain conditions and circumstances. Social movements, according to G. Bloomer, in the process of their activities are formed from a poorly organized form, gradually assuming the character of society, social organization. Turner and Killian define a social movement as some kind of collective entity that acts with some consistency to promote or prevent change in the society or organization of which they are a part. [5, P.9].

The English researcher E. Giddens defines social movements as active subjects of the social structure of society. The author notes the meaningfulness of human action and behavior in movements, which refers this knowledge to an element of the structure of social action. In accordance with this theory, social movements are "social practices ordered in space and time", which "are not created by social actors, but only constantly reproduced by them" [8, p. 126].

Melucci argues that social movements do not coincide with "visible" political conflicts. Even when they are not involved in campaigns and mobilizations, social movements can be active in the area of cultural production. Melucci introduces the concept of "sphere of movement", defined by him as social networks of groups and individuals,

Russian sociologist O. Yanitskiy understands social movement as a stable collective social subject that has its own ideology, leader and organizational structure, capable of mobilizing resources and achieving through a sequence of collective actions social (political) changes in the interests of society or its partindependent and self-sufficient cells, which are not always, but quite often, build up into a more global movement structure. The public activity of these communities is focused on the social problems of private and everyday life, it is little politicized, specific (objective) and rejects abstractions, but at the same time does not exclude possible transitions to generalizing activities. [4, p.82].

It is possible to identify some characteristics of network organizational forms: the formation of a flat hierarchy, in which all departments are equal from the point of view of the main processes; minimization of the number of hierarchical constructions; equality and cooperation of divisions of the organization; the formation of a close and open relationship between the organization and its elements with the environment.

Note that the relationship in the organization between its elements can be built both vertically and horizontally. And one of the key aspects of the network is its contractual structure, voluntary participation and the general idea that brings people together.

CONCLUSIONS

Modern trends in the development of social movements are to increase the openness and publicity of collective action through social media.

Network forms of organizing civic engagement are successfully developing mechanisms of self-organization of citizens in modern society, allowing its organizers to achieve significant results.

Let us emphasize several characteristics of networks that allow them to exist in the field of public administration. First, networks link the state and civil society. This structure is empirically observable and is theoretically described as a multitude of diverse public, private, public organizations and institutions that have some common interest. Second, the network is formed to develop agreements in the process of exchanging the resources available to its actors. This means that there is a mutual interest of network participants in each other. Resources can be unevenly distributed, but regardless of the degree of their concentration and a certain dominance of a number of network participants, the latter are forced to interact. There is a resource dependence between network participants. Third, the common cooperative interest is an important characteristic of the network. This distinguishes this regulatory system from the market, where each participant pursues, first of all, his own interests. Fourth, from the point of view of making decisions, network participants do not line up in a certain hierarchy, where any organization has an advantage due to its position of power. All network participants are equal in terms of the possibility of forming a joint decision on an issue of interest. Here, not vertical, but horizontal relationships are observed. Fifth, the network is a contractual structure consisting of a set of contacts arising from agreed formal and informal rules of communication. The actions carried out by network organizations have an impact on the socio-political situation in society, especially in resolving acute social problems that require resources and costs.

LITERATURE

1. Public administration: Dictionary-reference / Based on materials from the "International Encyclopedia of Public Politicand Administration". SPb .: OOO "Publishing house" Petropolis ". 2000.
2. Inozemtsev V.L. New post-industrial wave in the West. Anthology. M .: Academia. 1999.
3. Castells M. Information age: economy, society and culture. M .: GU-HSE. 2000.
4. Klement K., Miryasova O., Demidov A. From ordinary people to activists. Emerging social movements in modern Russia. M .: Publishing house "Three squares". 2010.
5. Kostyushev V.V. Sociology of Social Movements: A Training Course. SPb .: State University - Higher School of Economics. 2009.
6. Powell W., Smith-Door L. Networks and economic life // Economic sociology. 2003.Vol. 4.No. 3
7. Political Science: Dictionary-Reference. comp. Prof. Paul Sciences / Ed. I.I. Sanzharevsky. 2010. [Electronic resource]. URL: http://dic.academic.ru/dic.nsf/enc_philosophy/2899/%D0%9E%D0%A0%D0%93%D0%90%D0%9D%D0%98%D0%97%D0%90%D0%A6%D0%98%D0%AF (date of access: 10/11/2021).
8. Skobelina N.A., Gulevskaya N.A. Modern social movements: global and regional aspects // Bulletin of the Chelyabinsk State University. Philosophy. Sociology. Culturology. 2010. No. 16.
9. 9-65 Explanatory Dictionary of the Information Society and the New Economy. 2007. [Electronic resource]. URL: http://information_society.academic.ru/329 (date accessed: 10/11/2021).
10. Yanitskiy O. N. Russia: environmental challenge (social movements, science, politics). Novosibirsk .: Siberian chronograph. 2002.



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A BRIEF DESCRIPTION OPERATING SYSTEM

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ABSTRACT

Operating systems are used in computers, and computers are extremely useful in saving time, thus they play an essential part in people's life. Computers mostly utilize operating systems. Users may describe an operating system as a system that runs their application programs and provides a user interface through which they can interact with the computer's hardware. The majority of commercially available operating systems today include flaws in their code, as well as security flaws and vulnerabilities. The author chooses to create this review paper due to a lack of knowledge about operating systems. In this review article, the author discusses operating systems, their history and development, applications, functions and types, as well as their advantages and difficulties. The author thinks that this article will aid in the comprehension of operating systems. The architecture of the robotics operating system is also used to write robot software. New updates have been released to address problems and defects, allowing OS to offer its users with the safest computing environment possible. As a result, the future of operating systems seems promising.

KEYWORDS: Computer, Hardware, Management, Operating System, Software.

1. INTRODUCTION

Humans will be unable to succeed, manage, and utilize computer systems without operating systems. A computer database/operating program's system is a system that provides software resources, processor hardware, and other mutual facilities. Operating systems are the most active kinds of system software and are regarded as the primary programs that execute when hitting a device. Users utilize operating systems to run their applications programs. It also provides users with a suitable interface for interacting with computer hardware. Operating systems are also responsible for providing a multi-level secure execution platform, hosting device drivers, regulating input and output peripherals, managing data storage, assigning main memory to different programs, generating threads, and launching processes. Linux, Mac OS, Windows, Unix, and other operating systems are examples of operating systems[1].

Operating systems such as Windows and Linux, like any other technology, have difficulties in terms of computer security, since they encounter many viruses, mistakes, and flaws throughout the course of their lives. To address these issues, the developers of these operating systems provide updates to address these issues and offer the safest computing environment for its operators and applications programs. The author of this review article discusses operating systems, their history and development, their types and functions, their benefits and difficulties, and their applications[2].

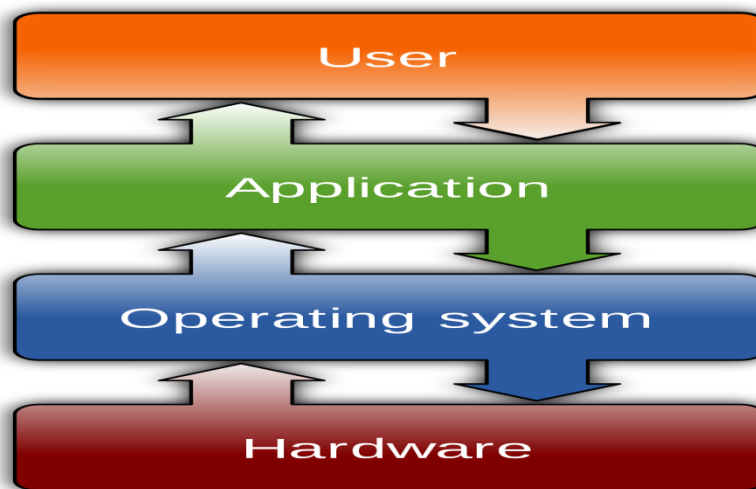


Figure 1:Representation of Architecture of operating system[3]

The design of operating systems is the interaction between computer software and hardware. Figure 1 depicts the operating system's design.

1.1 Various Type of operating system:

Figure 2 shows the many kinds of operating systems available today, including Mobile, Network, Distributed, Real-time, Multitasking, Multiprocessing, and Batch shown in Figure 2.

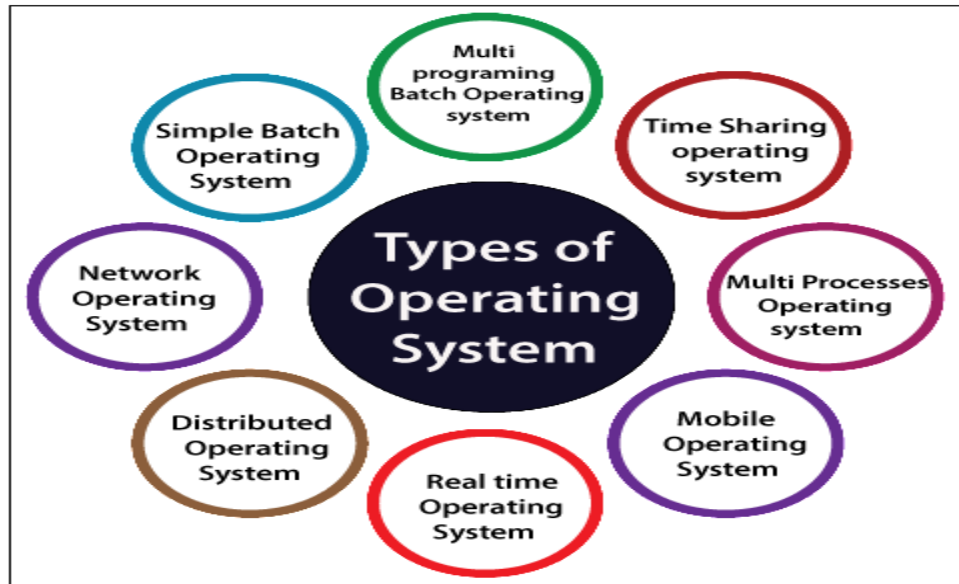


Figure 2: Various types of operating systems that are available in market[4]

a. *Mobile Operating System*: The systems that are intended to power wearable devices, tablets, and mobile phones are known as mobile operating systems. The following mobile operating systems are Android and iOS.

Advantages:

- It allows users complete access to all aspects of the device, including hardware and software.

Disadvantages:

- The upgrades are expensive and take a long time to complete.

Network Operating System: It's a networking solution that can help with application, security, groups, users, data, and a variety of other tasks. It's essentially a server that operates it.

Advantages:

- Centralized servers are very reliable.
- Servers may be accessible from a number of locations and platforms remotely..

Challenges:

- The cost of purchasing a server is expensive.
- It is necessary to preserve and update the information.

Distributed Operating System: It's a system that uses several mainframes spread over multiple computers to provide rapid computing to its workers.

Advantages:

- A user may utilize another resource that is available at another location by using the resource sharing feature.
- It provides superior services to its clients.

Real time Operating System: It is a system that operates on real-world applications and processes data in real time. RTOS include Windows CE, Vx Works, RT Linux, and QNX.

Advantages:

- This approach allows users to reuse their code.
- Priority scheduling is used in this system.

Multitasking Operating System: It's a system that enables several practices or activities to be completed at the same time using multiple CPUs. Sharing of time refers to the time on the mainframe that is shared by several operators.

Advantages:

- The idle time of CPU reduces.
- It removes the copy of software.

Disadvantages:

- Reliability is the main problem in multitasking.

b. Batch Operating System:

It is a system that does not interface with the computer directly. As certain computer procedures take a long time to complete. Work with a similar kind of need is collected together and executed as a collection to speed up the same process. Every operator creates a job on an offline device, such as a punch card, and delivers it to the computer operator in this format.

Challenges in Batch operating system:

- In this system, the interaction of user and job is less.
- Difficult to provide desired priority.

1.2 Operating System function:

In operating system, following tasks are shown in Figure 3.

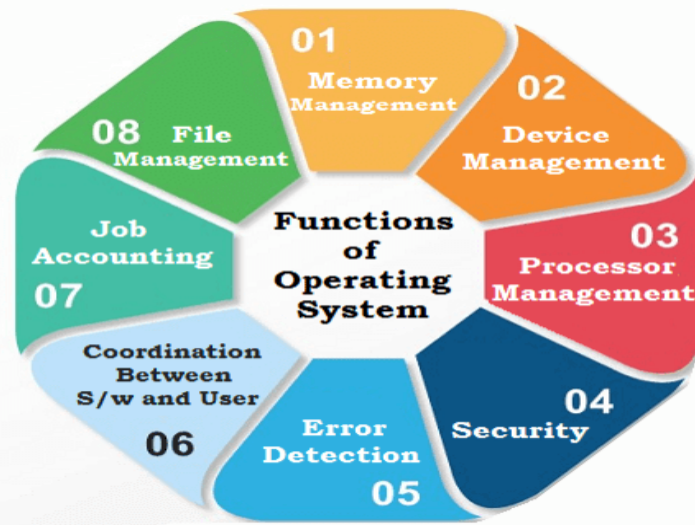


Figure 3: Various functions that are performed in operating system[5]

- *File Management:* This refers to the administration of file-related tasks such as file protection, sharing, name, organization, storage, and retrieval.
- *Job Accounting:* Job accounting may be defined as the keeping track of the resources and time spent by several operators.
- *Security:* Security is the function that protects a computer's papers and data from unauthorized access, danger, and viruses.
- *Process Management:* This is the management that creates and eliminates practices. It provides administration and communication tools, among other things.
- *Device Management:* This feature allows you to keep track of all of your instruments. Input/Output control is also part of this management. It also performs the task of device distribution.
- *Memory Management:* It is used in applications to allocate and de-allocate memory space.
- *Error Detection:* Error detection is the process of detecting a mistake produced by noise or other impairments during transmission from the transmitter to the receiver. The process of identifying errors in data and returning it to its original, error-free form is known as error detection.
- *Software-to-user coordination:* In this case, the user issues instructions to the system to coordinate it.

1.3 Benefits of Operating System:

- The operating system is in charge of input and output management.
- It enables you to conceal hardware specifics by creating an abstraction.
- Graphical User Interface (GUI) may be utilized in the form of buttons and icons, making it simple to experiment with.

- A user may run programs and apps.
- The operating system is used to synchronize practices.
- The Operating System is in charge of resource allocation.
- The operating system acts as a link between the application and the hardware..

1.4 Challenges of Operating system[6]:

- If there is a problem with the operating system, the user may lose all of their data.
- The operating system is not completely secure since viruses may strike at any moment.
- Operating system software is prohibitively expensive for small companies, adding to their financial burden. Consider the example of Microsoft's Windows operating system..

1.5 Common desktops operating system:

The common desktop Operating system which is mentioned below:

- *Linux*: It is a free or low-cost operating system for its users[12]. It has a lot in common with UNIX. Linux is well-known for being a fast and well-organized operating system[7][8].
- *UNIX*: It was created in the 1970s. The C programming language is used in the UNIX operating system. It's a multi-user operating system that prioritizes adaptability and flexibility.
- *Mac OS*: Since 2011, Apple Inc. has been manufacturing and marketing the Mac OS operating system. Mac OS is primarily utilized in Apple's Macintosh PCs and workstations.
- *Windows*: The first version of Windows was released in 1985. It's a graphical user interface-based operating system that comes in a variety of flavors, including Windows XP, Windows 7, and Windows 8. It is a Microsoft-based operating system that is often found in personal and corporate computers. Because of the user-friendly Windows 95, it was mainly responsible for the rapid growth of personal computers.

1.6 Applications of Operating System in human life:

- *Human-computer communication*: As technology advances, it is becoming clear that people are attempting to interact with computers. People may become more connected as a consequence of technology advances such as social media, mobile phones, videoconferencing, chat rooms, and e-mail. It allows you to save time, effort, and money. Radio, television, and print media all played an important role in our everyday lives. In terms of production, control, storage, and broadcasting, computers have an effect on them as well. A document may be written on a computer, viewed on a screen, edited, printed on a printer, or sent to the rest of the world through the World Wide Web.
- *Computer's Impact on Education*: The introduction of computers into the educational sector resulted in a high quality of learning and instruction. We may use a computer to connect to the internet and link this information to a variety of ways in order to study any topic. Computers are also used to facilitate interaction between students and instructors. Smart classrooms are also available at educational institutions[9].

- *Computer's newest trends and future expectations:* With the advent of computers, human life has altered dramatically. As a consequence, it's critical to emphasize the upcoming changes that computers will bring. Future changes will be focused on space travel, driverless vehicles, 3D printing, interest-based education, machine learning (ML), and artificial intelligence technology (AI)[10].

2. DISCUSSION

As previously stated, the operating system is the software that is used to run user programs and offer an interface for communicating with computer hardware. Many technologies, including as artificial intelligence, machine learning, and the internet of things[13], are now accessible on the market, and their inventors utilized operating systems to create them. People may also use the Robotics operating system framework to develop robot software. Introduction to operating systems, evolution and history, types and functions, benefits and challenges, and applications of operating systems are all covered in this article. This article, according to the author, will assist individuals who wish to learn about operating systems. Operating systems are important in human existence because without them, humans would be unable to utilize and manage computers. In today's operating systems, there are certain difficulties such as bugs, failures, and hardware issues. In light of this, developers are working hard to resolve these issues and offer their users with the safest computing experience possible. As a result, the operating system's future seems promising.

3. CONCLUSION

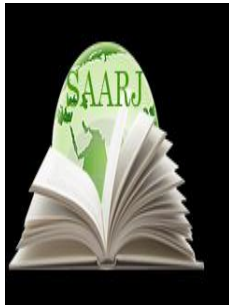
Currently, operating systems play a significant part in people's lives since computers and technology make work easier. An operating system is a system that runs user applications programs and provides a user interface for interacting with computer hardware. The following desktop operating systems are Linux, Unix, Windows, and Mac OS. People have shown a lack of knowledge about operating systems. The author chooses to write this paper in order to address this issue. The author of this review article addressed operating systems, applications, functions and types, as well as their advantages and difficulties. Operating systems are mostly used in computers, but robotics operating systems are increasingly being utilized to write robot software. Operating systems, like any other technology, are susceptible to bugs, viruses, and other problems. Updates are currently being developed to address these issues. Since a result, the operating system's future is bright, as it is employed in supercomputers and aids in the reduction of work load.

REFERENCES

1. M. O. Farooq and T. Kunz, "Operating systems for wireless sensor networks: A survey," *Sensors*, vol. 11, no. 6, pp. 5900–5930, Jun. 2011, doi: 10.3390/s110605900.
2. A. Musaddiq, Y. Bin Zikria, O. Hahm, H. Yu, A. K. Bashir, and S. W. Kim, "A Survey on Resource Management in IoT Operating Systems," *IEEE Access*, vol. 6. 2018, doi: 10.1109/ACCESS.2018.2808324.
3. "1200px-Operating_system_placement." https://en.wikipedia.org/wiki/Operating_system (accessed Jul. 06, 2017).
4. "Types-of-Operating-System." <https://www.tutorialandexample.com/types-of-operating->

system/ (accessed Jul. 06, 2017).

5. D. Chugh, "Functions-of-Operating-System_thumb." <https://electricalfundablog.com/operating-system-os-functions-types-resource-management/> (accessed Jul. 06, 2017).
6. A. K. Shukla, R. Sharma, and P. K. Muhuri, "A review of the scopes and challenges of the modern real-time operating systems," *International Journal of Embedded and Real-Time Communication Systems*, vol. 9, no. 1. 2018, doi: 10.4018/IJERTCS.2018010104.
7. M. Pavel, "Introduction to Unix," *Behav. Res. Methods Instrum.*, vol. 14, no. 2, 1982, doi: 10.3758/BF03202142.
8. G. Todino, J. Strang, and J. D. Peek, *Learning the UNIX operating system*, no. January. 1994.
9. V. DiLuoffo, W. R. Michalson, and B. Sunar, "Robot Operating System 2: The need for a holistic security approach to robotic architectures," *Int. J. Adv. Robot. Syst.*, vol. 15, no. 3, May 2018, doi: 10.1177/1729881418770011.
10. A. Singh, "Types of Operating Systems - GeeksforGeeks," *Geeks for Geeks*, 2018.



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A STUDY OF THE ECONOMICS AND USES OF PHOTOVOLTAIC THERMAL HYBRID SOLAR TECHNOLOGY

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ABSTRACT

Photovoltaic technology has advanced rapidly in recent years; with studies showing that only around 20% of solar energy is turned into electricity, while more than 50% of incoming solar radiation is converted into heat. By eliminating the surplus heat, the electrical efficiency and operating temperature of PV modules may be increased. As a result, the PVT collector, a hybrid collector, was born. PV cell cooling has become an essential research topic in order to enhance PV panel efficiency, power output, and performance characteristics. For several hybrid PVT solar collector designs, many theoretical, experimental, and economic investigations have been conducted. In various applications, other alternative concepts may be better. This article examines the historical and current trends in PVT technology development, focusing on the performance and economic feasibility of PVT systems in various application areas. Future suggestions and critical evaluations will be made in order to overcome the obstacles and difficulties that are preventing the advancement of PVT technology.

KEYWORDS: *Efficiency, Photovoltaic, Photovoltaic Thermal (PVT), Solar Energy, Thermal.*

1. INTRODUCTION

Due to its capacity to operate under diffuse radiation, solar PV panels are becoming more popular all over the globe. As a result, it's critical to understand how PV panels react to changing weather conditions. Only 15–20 percent of solar irradiation can be converted into energy in reality, with the remainder being lost as heat. With every one degree increase in module temperature, PV module efficiency drops by around 0.40–0.65 percent. In hot dry regions, PV

temperatures may exceed 80 degrees Celsius. As a result, constant attempts are made to improve photovoltaic efficiency. A photovoltaic thermal (PVT) system is a well-engineered solar cogeneration system that combines photovoltaic (PV) modules with solar thermal components to produce both energy and heat. The efficiency of PV cells decreases as their working temperature rises, which may be increased by removing the heat with appropriate cooling. The waste heat extracted to cool the PV module may be used in a variety of heating applications, including crop and fish drying, textile manufacturing, building heating, and dehumidification.

The main benefit of hybrid PVT systems is that they provide two yields, namely electricity and heat, for a little additional cost and a fraction of the area. This is a great example of optimization since the negative effects of overheating the panel are reduced by extracting the excess heat and repurposing it for beneficial purposes. Micro-channel cooling systems, thermo-electric cooling systems, heat pipe cooling systems, mist water cooling systems, water film cooling systems, PCM [1].

All of these systems operate with various kinds of fluids and may be categorized using the following criteria: single phase or two phase, moving parts or no moving parts, generation or no generation, active or passive, working fluid utilized. The following are some of the most frequently utilized cooling systems: Micro-channel heat exchangers are the most common kind of confinement heat exchanger. This system is used in electronic cooling and features channels with a hydraulic diameter of less than 1 mm. They may be machined on the backs of microelectronic component sub-strates in integrated circuits, where the heat produced by the electronic components is pushed into the coolant. Thermoelectric cooling systems use thermoelectric devices, which are made up of two types of semiconductors: n type and p type. Thermally, the materials are connected in parallel, while electrically, they are connected in series. When there is a temperature gradient, the majority of carriers diffuse from the hot to the cold side, resulting in a voltage and current. An applied voltage pushes a current through the materials in the opposite effect, resulting in an efficient heat pump that cools one side and heats the other [2].

Heat pipes transmit heat from a source via the evaporation and condensation of a fluid. Heat pipes are effective heat transfer devices that can transport heat over long distances and are intended to have a low temperature decrease. Several researchers cooperated on the photovoltaic cooling application of heat pipes cooling technology. This technique has been explored for concentrator photovoltaic panels in particular (CPV)[3].

Water is the operating fluid in the Liquid PVT Collector. In recent years, many researches on this cooling method have been conducted. The use of water as the working fluid improves efficiency significantly, according to studies. The energy delivered to the water in the tubes via conduction is transmitted to the posterior surface of the panel. Tubes, channels, and spiral tubes are all possible forms for the sheet and tube arrangement. Depending on the cooling technology employed, cooling systems have different limits. Because the PV module must be physically connected to the thermal absorber in order to have a better heat transfer, one of the most frequent restrictions is the need for glue. As a result, the average stagnation temperature for unglazed PVT is 80 C, whereas it may reach 130 C for glazed PVT[4].

Raghuraman presented two separate one-dimensional models for predicting the thermal and electrical performance of PVT photovoltaic combined air/liquid PVT collectors, as well as some

recommendations for maximizing the total energy gained from the collectors, such as selective absorber Optical premasters, distance interval of glass absorber plate, and thermal contact, two years later. Incorporated and tested a novel transparent hybrid a-Si PV/T in the hybrid unit. The findings indicate that simple and inexpensive hybrid systems with consistent photovoltaic and thermal efficiency may be built. According to a research on hybrid forced-air systems [5].

The system can only be autonomous for certain design parameters and flows. A flat plane booster reflector was added to a flat hybrid solar air heater to expand this research .A strong thermal contact between the photovoltaic element and the absorber plate is critical for achieving excellent thermal performance in a PVT collector. To join the two pieces, a coating of high conductivity glue is usually used. The thermal contact between the PV panel and the collector is assessed using various materials and application methods. It was discovered that the PV panel's power output improved by 10% above the original design. More sophisticated methods, such as laminating together all of the components, may be utilized. In compared to previous PVT approaches, the experimental results revealed a substantial improvement in both thermal and electrical performance. Using pc-Si PV cells, the thermal and electrical efficiency at zero decreased temperature was 79 percent and 8.8 percent, respectively a non-contact situation a photovoltaic-thermal collector, which comprises of a PV panel separated by a traditional sheet and tube solar thermal collector. The thermal efficiency of the non-contact type system surpasses that of the contact type collector at higher input temperatures when PV transmissivity is high (> 0.75) [6].

The average yearly efficiency of photovoltaic power generation improved from 2.8 percent to 7.7 percent using a hybrid system, according to Kalogirou. The economic study revealed a 4.6-year payback time. When a photovoltaic panel was combined with a solar air collector, discovered that the electrical efficiency improved from 8.6 percent to 12.5 percent. According to the numerical model created by Siddiqui and Zubair, hybrid collectors are more beneficial in regions with high solar radiation and ambient temperature, such as those prevalent in the Middle East. Another benefit of PVT is the low cost of production. As a result, the energy payback time for PVT collectors was shown to be much lower than for conventional collectors.

2. DISCUSSION

2.1. Application:

The number of transparent coverings that may be utilized in a sheet-and-tube arrangement has been thoroughly examined. Single-glazed PVT was mentioned. A glazed collector produces more heat than an unglazed one. Nonetheless, owing to increased optical losses, its electrical output is decreased .It was also discovered that the effectiveness of exogetics rises with the flow temperature up to a certain point. Maximum value of 13.36 percent for glazed and 11.92 percent for non-glazed the optimal flow temperature for unglazed PVT collectors is, 83.6°C and 38.8°C, respectively. Chow and his colleagues Chow took measurements in the open air on two comparable sites. thermosiphon PVT sheet-and-tube water collection systems in Hong Kong Kong is available in two versions, one glazed and the other unglazed.

Six factors have an impact. The effectiveness of a set of operational settings was assessed. The examination of the first law If any of these options is available; the glazed design is always preferable. The total energy output, or thermal output, must be maximized. However, an unglazed system is more beneficial for high values of PV cell efficiency, according to the energy

study. The packing factor, water mass to collector area ratio, and wind velocity are all beneficial for a glazed system, while the increase in solar radiation and ambient temperature are not. The use of additional coverings Reflection causes further losses. Other materials may be used instead of glass. Polycarbonate, for example, is a lighter, cheaper, and stronger material. For example, polymethyl- methacrylate and polyvinyl fluoride may be used.

The front cover the use of glass, on the other hand, is the finest choice because of its excellent optical characteristics, UV resistance, and high thermal tolerance Between the PV laminate and the cover layer, there is an air gap. must be thin enough to take advantage of the insulating qualities of air, while also inhibiting convective fluxes and microbursts turbulence.

Photovoltaic modules are usually attached to an absorber. EVA is used to encapsulate the cells. However, there are a few exceptions. PV lamination using conventional EVA presents technological challenges. It may disintegrate at high temperatures in the presence of acetic acid over 80 degrees Celsius As a result; traditional PV laminates are unable to survive the test. Temperatures in glazed collectors that are typically functioning at a standstill between 120 and 180 degrees Celsius A new idea for a glazed PVT collector The development of a PV laminate using Sloane gel is under underway. Using a gel instead of an EVA lamination material has many advantages. features such as high temperature resistance, transparency, thermal dilatation stress adjustment, and favorable In a PVT collector, heat transmission from PV to heat exchanger [7].

2.2. Advantage:

Other designs have been examined in addition to the conventional "sheet and tube" kind of water hybrid collectors .By changing the arrangement of the various components, the performance was examined .Sheet and tube, channel, free flow, and double absorption were recognized as the four major kinds of PVT based on the water flow pattern and heat exchange technique..

It is self-evident that a shorter distance between heat production and heat collecting results in more effective heat transfer. In the channel idea, this is achieved when the liquid flows directly over or below the PV cells.

The fluid absorption spectra should be sufficiently distinct from the PV absorption spectrum in channel PVT collectors. The inclusion of a second glass cover makes the assembly bulky and brittle.

The PV module may be transparent or opaque, with a black heat absorber underneath the channel. In comparison to a wide channel, this shape is more adapted to resist water pressures in the channels. In this arrangement, the absorber's "box channel" structure is used. Sandiness and Rested utilized this design to enhance heat transmission to running water by filling the square-shape box-type absorber channels with ceramic granulate. The findings for low-temperature water heating applications were encouraging. The BIPVT technique for facades uses a channel design with liquid flow beneath the PV cells. The system not only produces electricity and hot water at the same time, but also enhances the thermal insulation of the building envelope, thanks to the employment of wall-mounted water-type PVT collectors. According to the simulation findings, there is an optimal water mass flow rate for achieving the required energy performance. They also looked at the yearly energy performance of a BIPVT water system in both natural and forced circulation modes as part of their research. Both types of operation were able to decrease

heat transmission through the PVT water wall by 72 percent and 71 percent, respectively, when compared to a standard building façade. The payback time of the BIPVT water system was determined, and the economic benefit of the BIPVT water system was shown to be considerably superior to a standard BIPV.

2.3. Working:

The creation of theoretical and empirical models is an important technique in engineering for predicting the performance of solar PVT collectors, for example, across a broad variety of operating circumstances. These models may be used for design reasons once they have been validated. PVT collector analytical models are based on energy balance equations that take into account the necessary heat transfer modes and appropriate boundary conditions. Several software tools, such as EES or ANSYS Fluent, are available to solve the governing equations. EES is generic equation-solving software that solves a number of non-linear algebraic equations at the same time. In a PVT collector, there are many different kinds of flow pathways.

PV cells above an absorber plate block incoming radiation, resulting in a decrease in energy conversion to usable heat, as many studies have shown. Created a model to investigate the performance of a heat pipe PVT system and utilized it to do parametric tests on a variety of parameters, including Pf. By raising Pf from 0.7 to 0.9, the temperature of the solar cell was reduced. Found that although a larger packing factor improves PV efficiency by approximately 3.5 percent, it degrades thermal efficiency. Garg and his colleagues using a computer model investigated the performance of a direct forced flow hybrid system for residential hot water generation. The usable heat contained in a tank was used to obtain the entire thermal energy. They came to the conclusion that raising the packing factor from 50% to 100% improved overall daily efficiency. The ratio of absolute total thermal plus electrical energy to total sun insulation was used to calculate efficiency. Dubai and Tiwari created a thermal model for a PVT solar water heating system and tested it for Pf = 30.56 percent, 50 percent, and 100 percent. Because PV cells are encased in glass, the PV modules were used to replace the glass cover on the collector's water intake side. With the rise in the area covered by PV cells, there was a reduction in thermal efficiency. Analyzed the hourly fluctuation of cell temperature and solar cell efficiency over the course of one day to combine and compare the findings. Compared the thermal and electrical efficiency of a photovoltaic-thermosiphon collector system with various packing factors of 0.50 percent and 100 percent using an experimentally verified numerical model. For the absorber, a box channel structure was constructed from a number of extruded aluminum alloy modules [8].

Two layers of EVA and tedlar-polyester-tedlar were used to encase the solar cells. The PV module's location was also assessed. The findings for thermal and electrical efficiency were greater when the PV module was installed in the bottom portion of the collector rather than the upper. Herrando found that a full covering of the solar collector with PV and a lower collector flow-rate improve both heat and electrical conversion accomplished with the PVT collector, while optimizing CO₂ emissions reductions, with low solar irradiation and low ambient temperatures in the UK. A hybrid PVT system can provide 51 percent of total energy demand and 36 percent of total hot water demand over the course of a year with a completely covered collector and a flow rate of 20 l/h. The coverage value for power needs was only marginally

greater than for a PV-only system (49 percent). Geometric features, environmental, and operational conditions are all discussed in section A physical concept for a hybrid flat plate collector with finned water channel was described by The effect of variables such as fin width to tube diameter ratio, input temperature, and mass flow rate on thermal and electrical efficiency was investigated using a parametric analysis. They found that increasing the fin width to tube diameter ratio from 1 to 10 reduces thermal efficiency by almost half. The flow rate and the temperature of the input fluid were determined to be the most significant factors [9].

The impact of a water storage tank's capacity was investigated further. A lower capacity increased just the thermal efficiency, but the electrical and total daily efficiency decreased. Other writers have also noted the presence of an optimal flowrate. Solar PVT modules incorporated into the building structure (BIPV/T) were investigated by .For various kinds of cells, the impact of mass flow rate on system efficiency was investigated. Although an optimal value was not determined, it was discovered that efficiencies grew until they reached a certain flow-rate value, at which point they stabilized. The electrical performance was found to be unaffected by the collector flow-rate (just a 5% fluctuation), while the hot water output was substantially impacted. As the volumetric flow rate rose from 20 l/h to 200 l/h, it decreased by approximately 35%. Optimal flow rate estimates for various absorber plate structures and PVT kinds Energy performance utilizing the second law method was utilized to investigate factors for improving the PVT hybrid collector. Aside from the presence or absence of the cover glass, the mass flow rate was shown to be a critical factor in energy efficiency. In terms of thermal and global exergies efficiency, glazed PVT collectors have a rather low optimal flow rate of 2.3 g/s m². Under a broad variety of environmental circumstances, photovoltaic conversion efficiency decreased with solar radiation intensity (3.6 percent/kW m² at Ta = 20 C); whereas, the energy efficiency of PVT increased 3.6 percent per kW m² (at Ta = 20 C). As a result, PVT's benefit in terms of solar radiation will be much greater. Due to the intermittent nature of solar energy, various algorithms and circuits were developed to determine the maximum power production from PVT collectors. Despite this, no control mechanisms have been implemented to monitor maximum power production from the PVT system. According, a PVT control method based on Artificial Neural Network (ANN) may be used to modify the Maximum Power Operating Point (MPP) by taking into account PVT model behavior. For a given irradiation and ambient temperature, an optimal mass flow rate is determined. The simulation results show a high level of agreement with the ANN outputs. The operating water temperature is another factor that influences the thermal and electrical performance of hybrid collectors. Low temperatures promote the generation of electricity from PV cells, while higher temperatures increase the value of thermal energy [10].

3. CONCLUSION

Clean solar power harvesting that is both efficient and cost-effective may be extremely important in meeting today's increasing energy demands and calming climate worries. It is anticipated that in the not-too-distant future, Solar energy will be cost-effective, making it possible to invest in and install solar systems even without government subsidies. As well as incentives this article gives a synopsis of current research. PVT thermal regulation methods are a kind of PVT. The investigation is still ongoing. The information above about PV cooling technique has been simplified to help you find what you're looking for. the unsolved issues and the future

possibilities in this area. The many Solar photovoltaic system applications include building integrated air PVT systems, solar air heating PVT systems, and liquid PVT systems.

Although there is a level, it is still restricted by the product dependability and availability. As a result, considerable research in the area of PVT is needed. Primarily in the design and manufacturing of thermal absorbers, as well as in material and component selection. Coating selection, energy conversion and cost reduction, performance testing, system control, and system liability some topics have only been researched on a small scale till now. Theoretical foundation despite the fact that considerable work in the PV/T research has been done, there are still some possibilities for future development available.

This technology includes the following: Developing novel practical, cost-effective, and energy-efficient technologies, such as PV/T based on PCM slurry, Improving the structural/geometrical characteristics of the structure PV/T configurations that are currently in use, Investigating the PV/long-term T's dynamic performance systems, PV/T system demonstration in actual buildings and feasibility analysis Comprehensive economic and environmental assessments that take into account Long-term measurements are used to account for the impact of climatic variables on the system's performance. Desalination and ply-generation systems, for example, required to be researched further. The use of heat pipes (with thermostats) is also an option. PVT solar collectors (because to their various configurations) have not been tested. PCM and thermoelectric systems have also been widely explored. additional potential future emphasis area in PVT technology several researchers have also suggested it. Despite the fact that PVT technology research and development work is under progress. over the past 30–35 years, the economic and political elements, as well as some technological problems, such as the issue of energy storage, have yet to be resolved. In a broad sense, it's been addressed. All of these efforts sought to provide the most energy efficient PV/T system feasible.

REFERENCES

1. M. Gul, Y. Kotak, and T. Muneer, "Review on recent trend of solar photovoltaic technology," *Energy Explor. Exploit.*, 2016.
2. A. A. F. Husain, W. Z. W. Hasan, S. Shafie, M. N. Hamidon, and S. S. Pandey, "A review of transparent solar photovoltaic technologies," *Renewable and Sustainable Energy Reviews*. 2018.
3. G. D. Pimentel Da Silva and D. A. C. Branco, "Is floating photovoltaic better than conventional photovoltaic? Assessing environmental impacts," *Impact Assess. Proj. Apprais.*, 2018.
4. P. G. V. Sampaio and M. O. A. González, "Photovoltaic solar energy: Conceptual framework," *Renewable and Sustainable Energy Reviews*. 2017.
5. S. Sobri, S. Koohi-Kamali, and N. A. Rahim, "Solar photovoltaic generation forecasting methods: A review," *Energy Conversion and Management*. 2018.
6. M. M. Yang, D. J. Kim, and M. Alexe, "Flexo-photovoltaic effect," *Science (80-.)*, 2018.
7. B. Parida, S. Iniyan, and R. Goic, "A review of solar photovoltaic technologies," *Renewable and Sustainable Energy Reviews*, vol. 15, no. 3. pp. 1625–1636, Apr-2011.

8. K. Menoufi, "Dust accumulation on the surface of photovoltaic panels: Introducing the Photovoltaic Soiling Index (PVSI)," *Sustain.*, 2017.
9. Vinod, R. Kumar, and S. K. Singh, "Solar photovoltaic modeling and simulation: As a renewable energy solution," *Energy Reports*, 2018.
10. F. Huide, Z. Xuxin, M. Lei, Z. Tao, W. Qixing, and S. Hongyuan, "A comparative study on three types of solar utilization technologies for buildings: Photovoltaic, solar thermal and hybrid photovoltaic/thermal systems," *Energy Conversion and Management*. 2017.



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THE PROBLEM OF WRITTEN SPEECH IN RUSSIAN LANGUAGE COURSES AT HIGHER EDUCATION

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ABSTRACT

Language and literature play a key role in personality formation a person, his life in society, everyday communication and professional activity. An important stage in the development of language and literature is stage of general education. The purpose of the concept of teaching Russian language and literature in educational institutions of the Russian Federation – designate problems existing in the teaching of these subjects in schools of different types, outline possible ways to solve them and determine conditions conducive to the development of language and literary education school children. Together with legally approved Federal State Educational Standards (FSES) and Exemplary Basic Education Programs (VET) concept forms the basis of philological education at school.

KEYWORDS: *Designate, Federation, Determine*

INTRODUCTION

Russian language and literature traditionally form the basis of Russian education. The Russian language is necessary for a citizen of Russia as the main one a means of communicating with other people. Literature created in Russian, is the bearer of important for the self-awareness of the people and the individual meanings, spiritual and moral ideas. Language and literature preserve historical experience of generations and pass it on to descendants.

Since childhood, a person thinks and expresses his thoughts in his native language, with his with the help he learns the world and joins the national and world culture. The habit of using the language makes it difficult to realize that a full-fledged mastering it should be the result of conscious labor and applied effort. The better we are able to apply communication and stylistic the resources of the language, the more we can achieve, because the skill is competent and expressively speaking and writing, listening, reading and understanding is the basis intellectual

development of the personality, contributes to successful activities a person in any professional field.

Problems of studying the Russian language and literature

Long-term tradition of systematic study of the Russian language and literature at school, the accumulated methodological approaches, the developed examination base, approved educational and methodological complexes, specific scientific and pedagogical teams and educational practices - all this is undoubted important potential of the domestic teaching system. However, there is a whole a number of problems that still remain unresolved and are even aggravated in recent times. The origins of these problems are both inside and outside the system. Education, they need to be addressed comprehensively. These problems can be classified as follows.

Problems of reading and understanding text by modern schoolchildren

- Literary education at school is being built today in conditions a noticeable decrease in children's motivation to read. Modification of properties and conditions the existence of texts with which children and adolescents deal (electronic media with nonlinear text presentation capabilities, system hyperlinks, an abundance of short everyday texts that appear instantly in printed form and blurring the idea of the special status of the printed words, etc.), an increase in the total number of texts, a decrease in their volume and restructuring along with a range of social and linguo-social problems lead to the fact that the traditional, linearly unfolding large book text is more and more difficult to perceive and read children. This becomes a serious obstacle to the development of literary works and the soil on which the imitation reader's activities (reading short retellings, using ready-made essays and abstracts, etc.).
- The main type of educational work in literature lessons is analysis (checking) of works, acquaintance with historical and cultural information about work, author and literary process, mastering the conceptual apparatus literary criticism. This important analytical, interpretive activity makes sense if it was preceded by full reading and understanding artwork. Meanwhile, it is the stage of reading that is often falls out of school use, from the area of special attention and control, especially in high school. The reason is the elementary lack of educational time and volume of programs. A quick acquaintance with the texts or their retellings, reliance on the summary of the textbook, and not on the text of the work itself - signs of negative phenomena in the teaching of literature. During school study of literature (historical and literary facts and events, artistic features of outstanding literary works) a balance is needed between developing reading and comprehension skills literary text as an artistic reality, on the one hand, and mastering a set of analytical skills to understand laws of the historical development of literature as an art form and correctly interpret works of art - on the other.
- In many cases, the student is not formed interest in mastering the voluminous corps of Russian and world literature that the program offers him. Existed many decades external stimulus (in the form of compulsory graduation and introductory essay on literature) is missing today. Unified State Exam in literature needs to be taken by a very small part of schoolchildren. Need in literary education, its prestige in society today is small. The fundamental values that literature carries as an art form, come into conflict with momentary, pragmatic values, often coming to the fore in everyday life, in the means mass media. In fact, literary education collided today with a serious challenge - the search for internal motivation to attract children and adolescents to literature, the development of argumentation and methods for increasing interest in acquaintance with both

Russian classics and the most significant works of modern literature. Mastering the rich of classical and modern literature needs a thoughtful accompanied by adults, it is necessary to increase the attention of adults to the very process of interaction between the reader-student and literature.

Substantive problems

Russian language

- Analysis of examination test materials for the high school course and texts of the composition newly introduced to the Russian school (2014), as well as observations of the speech practice of school graduates show that many graduates do not have enough skills in correct and expressive oral and written speech (including in relation to different situations and communication conditions), the norms of the Russian literary language, features Russian speech etiquette, do not know how to correctly, accurately express their thoughts.

- In the school practice of teaching the Russian language, mastering theoretical knowledge in many cases turns out to be isolated from the ability to apply this knowledge in practical speech activity. Assimilation does not maintain a significant number of spelling and punctuation rules actively improving student literacy; skill phonetically to parse a word does not guarantee compliance with orthoepic norms when the use of this word in living speech; knowledge of sentence structure and the ability to draw up its scheme does not determine the correct construction of independent expression, etc.

- The course of the Russian language at school has changed significantly in recent years: more attention is paid to the development of students' speech abilities; goes to past prioritization of spelling and punctuation skills as such. However, the ratio of theoretical and applied elements the content of the subject "Russian language" is still far from optimal. The concepts of "consistency" and "scientific" are interpreted by the authors of various textbooks in different ways: in many cases, scientific character in them turns into pseudoscience, and consistency - redundancy of formal classifications. Formation of communication skills is possible only on the basis of solid theoretical knowledge and formed speech skills. However, this is where the main difficulty and one of the reasons for the loss of interest in the subject "Russian language". Linguistic theory and practice of the formation of linguistic skills in many modern textbooks does not give a holistic view of language as a means of expressing a certain meaning and reflection of the environment in the world, a tool of thought and therefore does not develop internal motivation to study the subject. A schoolchild who learns a language that has been spoken since childhood should understand why he is studying, for example, the morphology or syntax of Russian language, etc.

- The basic and advanced levels of learning the Russian language in practice are not implemented, since there is no special form of final control for philologically oriented students

- Unified State Exam in Russian profile level. As stated in the Federal State educational standard for complete (senior) school (2012, paragraph 9), substantive results at an in-depth level "oriented mainly to prepare for the subsequent professional education, the development of individual abilities of students through deeper than that provided by the basic course, mastering the basic sciences, systematic knowledge and methods of action inherent in this subject". Thus, the purpose of the subject "Russian language" at an advanced level consists, among other things, in providing continuity of learning the Russian language in the chain "school - university" for language and text oriented learners. Approaches to the final attestations in the Russian

language at the basic and advanced levels should be different. If the priority of the check is obvious at the basic level communicative competence of students, then at an in-depth level at the first the plan leaves the language competence, the level of which should allow students to solve linguistic problems, continue their studies at higher educational institutions according to their programs.

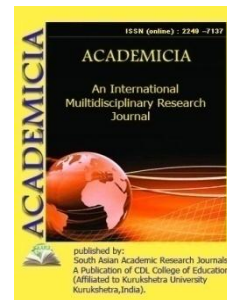
CONCLUSION

It is necessary to take into account the obligation to fully implement the creative potential of a language teacher, endowed with the proper degree public trust, with all the possibilities for creative work at school. To this end, regulatory requirements should be optimized. to the structure of the working programs of training courses, eliminate redundant parameters of control over the long-term planning of the teacher's work.

It is necessary to implement a set of measures to create textbooks Russian language and literature of a new generation, built on the basis principles of differentiation and individualization focused on the optimal combination of compulsory and optional components of educational programs involving the priority development of independent creative student work while minimizing all types of reproductive activities in the process of mastering linguistic and literary material. At this must take into account the fact that schoolchildren in their environment in reality, they are more likely to deal with materials consisting of parts with a varied presentation of information (text, sound, graphics, three-dimensional objects, etc.) rather than just linear text. This should be borne in mind when development of modern courses.

REFERENCES:

1. Actual problems of modern linguistics: textbook. manual / comp. L.N. Churilin. M.: Flinta: Nauka, 2009. 416 p.
2. Ananiev B.G. On the problems of modern human science. M., 1977. 346 p.
3. Anisimova E.E. Linguistics of the text and intercultural communication (based on creolized texts). Moscow: Academy, 2003. 128 p.
4. Anthology of speech genres: everyday communication. - M.: Labyrinth, 2007. 320 p.
5. Antonova E.S. Methods of teaching the Russian language: communicative-activity approach: textbook. - M.: KNORUS, 2007. 464 p.
6. Barkhin K.B., Istrina E.S. Methodology of the Russian language in secondary school. A textbook for higher pedagogical educational institutions and a manual for teachers. - M., 1934. 252 p.
7. Vinokur G.O. Selected works on the Russian language. - M.: Uchpedgiz, 1959. 492 p.



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THE HISTORY AND MODERNITY OF GENDER APPROACH IN EDUCATION

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ABSTRACT

The processes of modernization in the field of education are associated with the idea of creating conditions for the development of the personality and disclosure of the individuality of the student. Teachers are faced with the task of improving the system of forms and methods of work that contribute to the advancement of students in learning in accordance with their individual abilities. In the modern world, the problem of gender education is of concern to both scientists and practitioners. This is largely due to the fact that attention to the personality of the child is increasing, and gender characteristics are one of the main characteristics of the personality. Namely, gender upbringing presupposes the correct assimilation of gender roles by children, which implies gender equality in the future, the absence of gender prejudices and gender discrimination.

KEYWORDS: *Masculine Nature, Continuity Of Education, Upbringing, Female Education, Plato's Academy, Civic Education, General Educational Nature.*

INTRODUCTION

The gender approach in education has a thousand-year history. The first schools appeared in ancient Greece. The most well-known educational systems are Spartan, Athenian, as well as chivalrous upbringing and the upbringing of a gentleman (J. Locke). At that time, society considered it necessary to form in boys the qualities of a highly educated and business man, distinguished by sophistication in communicating with people and possessing the qualities of a businessman, warrior, entrepreneur. It's not hard to notice, that education, starting from Antiquity and up to the Renaissance, was of a masculine nature, that is, it was aimed at the upbringing and

training of the complex male characteristics of behavior. Female representatives were forbidden to attend educational institutions.

Nevertheless, women aspired to knowledge. In her book, Margaret Alik writes that in There were about 30 women among the teachers and students of the Pythagorean school. At the Academy Plato's representatives of the "weaker sex" came to lectures dressed in a man's suit, since the law did not allow women to attend public meetings.

It is known that Axiopea from the Peloponnese studied natural philosophy at Plato's Academy. Her area of special interest was physics. After Plato's death, she taught at his Academies. To the Epicurus School, established in Athens around the III century BC. as well as to the Academy.

According to Plato, women had equal access with men. The social status of women in ancient Rome was much higher than in Athens. Many of them had a good education. Plutarch, describing his impressions of During his life in Pompei, he mentions Cornelia Scipio, who was well educated and had a deep knowledge of geometry and philosophy. Among the Romans, medical classes were particularly attractive, to which women were also admitted.

These historical data suggest that, despite the masculine nature of education, women also had access to the sciences, however, in very limited quantities and as an exception. Attitudes towards women's education began to change during the Enlightenment. Then for the first time, the question of the possibility of developing women's intellectual abilities and women's education began to be considered. In the theory of differential gender education Jean-Jacques Rousseau (1712 - 1778), which he wrote in the novel "Emil, or about education" (1762) and "Yulia or new eloiza" (1761), pronounced the idea that the female has a number of positive qualities, which are absent in men and which have an important positive impact on the process of formation of male the subject. According to J.J. Rousseau, women are endowed with the ability to evoke the best human feelings in men - love, compassion, care and, thus, can have a beneficial effect on them.

The theory of "natural" female education is built by J.J. Rousseau as a concept of supervised education, the main conditions of which are: 1) home education, reducing to a minimum contact with the outside world and with society (since self-control of sensuality, sexuality through reason is not available to women, and strong dependence on others leads to moral decline and death, as, for example, the heroine of the novel "New Eloise" Julia, despite the best intentions); 2) the upbringing of a woman for motherhood; 3) The continuity of education, during which the functions of the father-educator after marriage, the woman passes to her husband.¹

Within the framework of the patriarchal society, the ideas of J.J. Rousseau, undoubtedly, were a breakthrough, but still did not reflect the role of a woman as a person equal to a man. A woman is still perceived as a secondary, dependent being.

In the age of Enlightenment, ideas for the protection of women's rights and women's emancipation were first expressed. Mary Wollstonecraft (1759 - 1797) in her book "In Defense of Women's Rights" (1792) defended women's rights to education. The philosophical concept of women's education by Mary Wollstonecraft is fundamental how does it differ from the concept of women's education Zh.-ZH. Rousseau. M. Wollstonecraft has hired teachers as mentors, which, in her opinion, forms a structural relationship of non-dependence in the teacher/student relationship. The leading role in education is played by the development of a woman's

epistemological, logical and philosophical abilities, within which her moral and civic education (aimed at the liberal transformation of society) is also carried out.

The liberal-rationalistic characteristics of subjectivity are considered by M.

Wollstonecraft as relevant to both sexes. At the same time, M. Wollstonecraft's great merit lies in the fact that for the first time she analyzed the traditional model of female subjectivity as an artificial social construct created within the framework of male culture and criticized many characteristics of patriarchal society.

In Russia, the breakthrough of women's education occurred in 1764, when Catherine II signed the decree "General Institution on the education of both sexes of youth". After that, she started organizing educational institutions in which, in her opinion, it was possible to grow a new type of subjects who would feel a sense of duty towards society and their loved ones. It is noteworthy that the education of women was legalized in the era of female rule. The first institutes for girls were founded in Moscow (1764) and in St. Petersburg (1767). And in the 1770s, public schools were organized, which were of a general educational nature.

It is believed that science is a man's business and all scientific discoveries are made exclusively by men. History proves the illegality of such an opinion. Returning to the development of women's education in Russia, it is worth noting that it was Russia that became the first in the world to proclaim in the Constitution of 1918 the legal equality of men and women in all spheres of social life. This led to an increase in the level of culture and education of women and by the early 1930s illiteracy among women has been largely eliminated.

Psychology shows that not all mental properties of men and women depend on their gender, and even where such determination definitely exists, it is mediated and significantly modified by environmental conditions, upbringing, occupation, etc."².

Therefore, in modern science, the concept of gender and gender are distinguished. The concept of "gender" refers to the anatomical and biological structure of women and men. Under the term "gender" is understood as a socio-cultural characteristic of gender. In this regard, the gender approach is based on the idea that "it is not the biological or physical differences between men and women that are important, but the cultural and social significance that society attaches to these differences"³. Initially, within the framework of a patriarchal society, the social roles of men and women were clearly separated: a woman is a mother, a hostess in the house, a man is a breadwinner, a defender.

This division was socially justified - the farm was large, there were many children, there was no one to deal with them except the woman-mother. Now the situation has changed. Democracy has granted equal rights to women and men in education, the realization of professional interests, participation in public and political life of society. But with all this, the methods and style of education remained the same - patriarchal. This is especially true of family education, where girls they are trained to do household work and raise children, and boys are aimed at development of professional abilities. On the one hand, society requires the education of a competitive professional, regardless of gender, on the other hand, family and school educate the younger generation within the framework of patriarchy.

Thus, the main idea of the gender approach in education is "to take into account the specifics of the impact on the development of boys and girls of all factors of the educational process

(content, teaching methods, organization of school life, pedagogical communication, a set of subjects, etc.)"⁴.

The goal of the gender approach, according to J.I.B. Shtyleva, is "deconstruction traditional cultural limitations of personal potential development depending on gender, understanding and creating conditions for maximum self realization and disclosure of the abilities of girls and boys in the process of pedagogical interaction". Continuing the thought of J.I.B. Shtyleva, in the article "Prospects of gender education in Russia: a teacher's view" (2001) the main task of gender education is determined by the need to "explain the nature of stereotypes, show their historical variability and social conditionality".

According to the authors of the article, "from the point of view of the age characteristics of students, gender education can be considered as the education of schoolchildren, students and adults. Then the inclusion of the topic of public perception of gender differences in the existing system of education and upbringing comes to the fore. Gender education of schoolchildren is aimed at helping them cope with the problems of socialization, an important part of which is the self-identification of the child as a boy and a girl and thus accepting a certain social role.

The education of students is based on the explanation of gender stereotypes faced by young people entering adulthood, and the joint search for ways to overcome these stereotypes". Thus, Russian scientists have conceptually spelled out the main ideas, goals and objectives of the gender approach in education. However, the intellectual tradition biological determinism, characteristic of most Russian specialists in the field of social sciences hinders the introduction of a gender approach in pedagogical science. V. Sukovataya notes in this regard that the traditions of the gender-role approach in education are applied "by default", as self-evident and "are not reflected by either scientists or practitioners as an essential component of the educational process"⁵.

Realizing this, O.A. Khasbulatova, O.A. Voronina, etc. at the meeting Coordinating Council on Gender Issues of the Ministry of Health and Social development of the Russian Federation (9.12.2005) discussed the introduction of a gender approach in education. Thus, O.A. Khasbulatova said that gender education is considered "as an integral factor in the formation of a democratic personality"

type. What is this role?

Gender issues contribute to a deeper understanding of human rights, a modern understanding of the concepts of sustainable democratic development.

Mastering the basics of gender knowledge helps to free oneself from the "captivity" of gender stereotypes. Gender education contributes to the growth of self-awareness of young people, their active integration into all spheres of society. Mastering the basics of gender knowledge helps to increase the responsibility of fathers for the upbringing of children. In the process of gender education, a tolerant and legal consciousness is formed"⁶.

For the introduction of a gender approach in education, it is necessary, according to O.A. Voronina, "1) to include in the state educational standards on social Sciences and Humanities gender approach; 2) to promote the inclusion of gender theory in educational programs in social Sciences and Humanities; 3) to review the system of issuing volumes MO and EMA and make recommendations MO or EMA only those books which do not contain any stereotyped concept

of the roles of men and women or discriminatory on the floor of claims; 4) support program the preparation and training of teachers of higher and secondary schools in areas of gender theory; 5) support the conduct of gender studies"2.

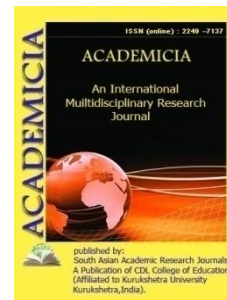
Thus, the introduction of a gender approach in education will make it possible to implement the principle of equality, will lead to an understanding of the concepts of sustainable democratic development.

When we think about a foreign language, we usually think about vocabulary, pronunciation and grammar. However, even if a person knows all the vocabulary and all the rules of grammar, and even if he speaks, reads and writes quite well, a lot of things in the language can be difficult for him. This is because understanding how a language is really used depends on more than just knowing vocabulary and grammar. In English, there are thousands of idioms alone (standard expressions, meaning more than the words they are made up of). Along with idioms, there are clichés, proverbs, sayings, metaphors, comparisons, euphemisms and allusions. Take, for example, the phrase "... to meet one's Waterloo", which has to do with Napoleon's defeat at Waterloo and is used in modern English in the meaning of "to suffer an important failure in life."

The historical component of language awareness deserves special attention. On the one hand, young people nowadays undoubtedly have a lot of knowledge in the field of grammar and vocabulary, thanks to the wide opportunities to learn the language abroad, in numerous language schools and use excellent authentic textbooks and teaching aids. On the other hand, most of them are very little reads, and general cultural awareness is at a very low level.

LIST OF USED LITERATURE

1. Kon I.S. Child and Society. - M.: Nauka, 1988.S. 169.
2. AlikM. Hypanthia's heritage: A history of women in science from Antiquity to the late 19th cent. - L.: Women's press, 1986
3. Theory and methodology of gender studies. Course of lectures / Ed. O.A. Voronina. - M.: MCGI - MVSHSEN - MFF, 2001.S. 150.
4. Gender approach in preschool pedagogy: theory and practice: in 2 hours / Ed. L.V. Shtylevoy. Murmansk, 2001.S. 78.
5. Shtyleva JI. V. Institutionalization of the gender approach // Higher education in Russia. No. 10. 2004.S. 144.



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A REVIEW ON BIOSENSORS AND RECENT DEVELOPMENT

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ABSTRACT

A biosensor is a device that combines a receptor and a transducer to transform a biological reaction into an electrical signal. Because of the broad variety of biosensor applications, such as health care and illness diagnostics, environmental monitoring, water and food quality monitoring, and medication delivery, the design and development of biosensors has taken center stage for researchers and scientists in the last decade. The main challenges in biosensor development are I efficient biorecognition signal capture and transformation into electrochemical, electrical, optical, gravimetric, or acoustic signals (transduction process), and (ii) improving transducer performance (i.e., increasing sensitivity, shorter response time, reproducibility, and low detection limits even to detect biorecognition signals). These problems may be solved by combining sensing technologies with nanomaterials that vary in size from zero to three dimensional, have a high surface-to-volume ratio, excellent conductivities, shock-bearing properties, and color tunability. Nanoparticles (NPs) (high stability and carrier capacity), nanowires (NWs) and nanorods (NRs) (high detection sensitivity), carbon nanotubes (CNTs) (large surface area, high electrical and thermal conductivity), and quantum dots (QDs) are some of the nanomaterials (NMs) used in the fabrication of nanobiosensors (color tunability). Furthermore, these nanomaterials may function as transduction elements in and of themselves. This review summarizes the evolution of biosensors, the different types of biosensors based on their receptors and transducers, and modern biosensor approaches that use nanomaterials such as NPs (e.g., noble metal NPs and metal oxide NPs), NWs, NRs, CNTs, QDs, and dendrimers, as well as their recent advancement in biosensing technology with the expansion.

KEYWORDS: *Biosensors, Carbon Nanotubes, Gold Nanoparticles, Nanomaterials, Nanobiosensing.*

1. INTRODUCTION

Nowadays, we take pleasure in the benefits of science and technology in our day-to-day life. We frequently use various types of appliances or gadgets to interact with the physical environment, such as computers, copy machines, mobile phones, microwave ovens, refrigerators, air conditioning and television remotes, smoke detectors, infrared (IR) thermometers, turning on and off lamps and fans. Many of these applications rely on sensors to function. A sensor is a device or module that detects changes in physical quantities such as pressure, heat, humidity, movement, force, and electrical quantities such as current and transforms them into signals that can be monitored and analyzed. A device that can transfer energy from one form to another is known as a transducer. A measuring system's heart is the sensor. Range, drift, calibration, sensitivity, selectivity, linearity, high resolution, reproducibility, repeatability, and reaction time are all qualities that an ideal sensor should have. Sensor technology has grown in importance as a result of a variety of applications, including environmental and food quality monitoring, medical diagnosis and health care, automotive and industrial production, and space, military, and security[1], [2].

1.1. BioSensor Classification:

Sensors are divided into many groups based on the physical amount (substance) or analyte to be measured, such as[3]–[5]

1. Source of energy (active and passive sensors),
2. Direct physical contact (contact and non-contact sensors),
3. compare-and-containment (absolute and relative sensors),
4. Sensors, both analog and digital, and
5. Detection of signals (physical, chemical, thermal, and biological)

1.1.1. Active and Passive Sensors:

Active sensors, such as microphones, thermistors, strain gauges, and capacitive and inductive sensors, need an external energy source to function. Parametric sensors are the name for these kinds of sensors (output is a function of the parameter). Thermocouples, piezoelectric sensors, and photodiodes are examples of passive sensors that produce signals without requiring external energy. Self-generating sensors are the name for these kinds of sensors.

1.1.2. Contact and noncontact sensors:

Touch sensors, such as temperature sensors, need physical contact with a stimulus, while non-contact sensors, such as optical and magnetic sensors and infrared thermometers, do not.

1.1.3. Absolute and relative sensors:

Absolute sensors, such as the thermistor and strain gauge, respond to stimuli on a scale of one to one thousand. Relative sensors detect stimuli in relation to a fixed or changeable reference, such as a thermocouple that detects temperature differences and a pressure gauge that measures pressure in relation to atmospheric pressure.

1.1.4. Analog and Digital Sensors:

An analog sensor converts a physical amount measured into an analog representation (continuous in time). This category of analog sensors includes thermocouples, resistance temperature detectors (RTD), and strain gauges. The output of a digital sensor is in the form of a pulse. The digital sensor category includes encoders.

1.1.5. Detection of signals:

Sensors are classified as physical, chemical, thermal, or biological depending on how they detect signals.

1. *Physical Sensors:* Physical sensors take physical measurements and transform them into a signal that the user can recognize. Environmental changes such as force, acceleration, velocity of flow, mass, volume, density, and pressure may be detected by these sensors. Physical sensors have been widely used in the biomedical sector, especially as microelectromechanical system (MEMS) technology has advanced, allowing for the creation of more accurate and smaller sensors, as well as the development of new measurement technologies.
2. *Chemical Sensors:* A chemical sensor is defined as “a device that converts chemical information into an analytically useful signal ranging from the concentration of a particular sample component to total composition analysis,” according to the International Union of Pure and Applied Chemistry (IUPAC). Chemical sensors are used to monitor the activity or concentration of chemical species in the gaseous or liquid phases. They're also utilized in environmental pollution monitoring, food and pharmaceuticals analysis, and organophosphorus chemical assay monitoring. They may also be utilized to make clinical diagnoses.
3. *Thermal Sensors:* A thermal sensor is a device that measures the temperature of an environment and converts the input data into electrical data so that temperature changes may be recorded or monitored. Thermocouples, thermistors, and RTDs are examples of temperature sensors.
4. *Biological Sensors:* Biomolecular activities such as antibody/antigen contacts, DNA connections, enzymatic interactions, and cellular communication processes are all monitored by biological sensors. In brief, biological sensors are referred to as biosensors.

2. BIOSENSOR

2.1. Principle and Design:

A biosensor is a device or probe that combines a biological element like an enzyme or an antibody with an electrical component to produce a quantifiable signal. The electronic component detects, records, and sends data on physiological changes as well as the presence of different chemical or biological elements in the environment. Biosensors are available in a variety of sizes and forms, and they can detect and measure even low amounts of infections, hazardous chemicals, and pH values. An analyte, bioreceptor, transducer, electronics, and display are all components of a conventional biosensor[6], [7].

1. **Analyte:** An interesting material whose components are being identified or discovered (e.g., glucose, ammonia, alcohol, and lactose).
2. **Bioreceptor:** A biomolecule (molecule) or a biological element (e.g., enzymes, cells, aptamers, deoxyribonucleic acid (DNA or RNA), and antibodies) that can detect the target substrate (i.e., an analyte) is known as a bioreceptor. During the interaction between bioreceptor and analyte, signal generation (in the form of light, heat, pH, charge or mass change, plant or animal tissue, and microbial products) is termed biorecognition.
3. A device that converts energy from one form to another is known as a transducer. A biosensor's transducer is an important component. It transforms a biorecognition event into an electrical signal that corresponds to a quantity or the presence of a chemical or biological target. Signalization is the name for this energy conversion process. The number of analyte–bioreceptor interactions is proportional to the number of optical or electrical signals generated by transducers. Transducers are classified as electrochemical, optical, thermal, electronic, or gravimetric transducers based on their working mechanism.
4. **Electronics:** The signal is transduced and processed before being displayed. The transducer's electrical impulses are amplified and transformed to digital form. The display unit quantifies the processed signals.
5. **Display:** The display unit consists of a user interpretation system, such as a computer or printer, that produces output so that the user may read and comprehend the appropriate answer. The output may be in the form of a numerical, graphical, or tabular value, or a figure, depending on the end-user need.

2.2. *Biosensor Evolution:*

The development of biosensors has been divided into three generations depending on component attachment, i.e., the technique of integrating the bio-recognition element (bioreceptor) with the transducer. The biosensors of the first generation (1st gen) detect the concentration of analytes and products of bioreceptor reactions that diffuse to the transducer's surface and generate an electric response. Mediators-less amperometric biosensors are another name for this kind of sensor. In his initial paper, the founder of biosensors, Leland Charles Clark Jr., outlined the components of a biosensor. An electrode that can monitor the oxygen content in blood was the subject of this 1956 report. Clark reported the use of an amperometric enzyme electrode for glucose detection in an experiment in 1962. Updike and Hicks improved Clark's work in 1967, creating the first functioning enzyme electrode based on glucose oxidase mounted on an oxygen sensor [8], [9].

2.3. *Biosensor Characteristics:*

Certain static and dynamic criteria are required to create a highly effective and competent biosensor system. The performance of biosensors may be adjusted for commercial usage based on these criteria.

1. **Selectivity:** When choosing a bioreceptor for a biosensor, selectivity is an important characteristic to consider. In a sample including mixed spices and undesirable impurities, a bioreceptor may identify a certain target analyte molecule.

2. *Sensitivity*: The smallest quantity of analyte that can be properly detected/identified in a few steps and at low concentrations (ng/mL or fg/mL) to confirm the presence of analyte traces in a sample.
3. *Linearity*: Linearity helps to ensure that the measured findings are accurate. The greater the linearity (straight line), the more accurate the detection of substrate concentration.
4. *Response time*: The amount of time it takes to get 95% of the results. (e) *Reproducibility*: Precision (similar result when the sample is tested more than once) and accuracy are two characteristics of reproducibility (capability of a sensor to generate a mean value closer to the actual value when the sample is measured every time). It refers to the biosensor's ability repeatability provide similar findings when the same sample is tested several times.
5. *Stability*: One of the most important qualities in biosensor applications that need continuous monitoring is stability. The degree of susceptibility to environmental perturbations both within and outside the biosensing equipment is referred to as stability. The affinity of the bioreceptor (the degree of the analyte's binding to the bioreceptor) and the bioreceptor's degradation with time are two variables that influence stability.

2.4. Biosensor classification:

Biosensor classification is a broad and interdisciplinary subject. Bioreceptors are the main component in biosensor fabrication, as previously stated. Enzymatic biosensors (the most common biosensor class), immunosensors (high specificity and sensitivity and are specifically useful in diagnosis), aptamer or nucleic acid-based biosensors (high specificity for microbial strains and nucleic acid-containing analyte), and microbial or whole-cell biosensors are the different types of biosensors. The second categorization is based on the transducer, with electrochemical (potentiometric, amperometric, impedance, and conductometric) biosensors, electronic biosensors, thermal biosensors, optical, and mass-based or gravimetric sensors being the most common. Bioreceptor analyte combinations, which are restricted, are another categorization. Detection systems (optical, electrical, electronic, thermal, mechanical, and magnetic) and technology (nano, surface plasmon resonance (SPR), biosensors-on-chip (lab-on-chip), electrometers, and deployable) are divided into categories.

2.5. Biosensor classification:

Bioreceptors-based Biosensors are categorized as catalytic, affinity, or non-catalytic biosensors based on the biorecognition principle. The interaction of analyte bioreceptors in a catalytic biosensor leads to the creation of a novel biochemical reaction product. Enzymes, bacteria, tissues, and entire cells are all included in this biosensor. The analyte is permanently attached to the receptor in an affinity (non-catalytic) biosensor, and no new biological reaction product is produced during the contact. Antibodies, cell receptors, and nucleic acids are among the targets for detection in this kind of sensor.

3. NANOMATERIAL-BASED BIOSENSORS (Nanobiosensors)

Biosensor research and development has grown more open and interdisciplinary as a result of advancements in nanotechnology. Exploring NMs for various features, such as NPs (metal and oxide-based), NWs, NRs, CNTs, QDs, and nanocomposites (dendrimers), offers the potential of

enhancing biosensor performance and increasing detection power via size and shape management.

Nanobiosensors have the same fundamental operating principle as their macro- and micro-counterparts, but they are built with nanoscale components for signal or data processing. Because of their dimensionality, nanobiosensors offer an advantage over their traditional macro- and micro-counterparts in terms of interdisciplinary applications[10], [11]. Nanobiosensors are useful in the field of nanotechnology for:

1. Biochemical detection in cellular organelles and medical diagnostics
2. Detecting nanoscopic particles in industrial and environmental settings, and
3. Identifying very low levels of potentially hazardous chemicals.

The role of NMs in the improvement of biosensing systems has been extensively researched based on their categorization. For example, NPs-based biosensors include all sensors that use metallic NPs as biochemical signal enhancers. Similarly, nanotube-based biosensors that use CNTs are utilized as enhancers of reaction specificity and efficiency, while NW biosensors use NWs as charge transport and carriers. QDs are also used as contrast agents in QD-based sensors to improve optical responses.

4. DISCUSSION

New methods to sensor technology have been used to satisfy the growing needs of different sectors. With advancements in nanotechnology and nanoscience, sensor technology has grown even more. Nanotechnology has spanned physics, chemistry, biotechnology, biology, bioinformatics, medical science, healthcare, food engineering or processing, aerospace, and electronics, as well as the energy sector and environmental research. The capacity to handle and control materials at the atomic and molecular level (nanometer range), as well as a subsequent knowledge of basic nanoscale phenomena, have opened up new possibilities for biosensor development. More significantly, dimensionality is a key factor in influencing the physical, chemical, biological, electrical, and optical properties of nanomaterials. Nanomaterials are divided into four categories depending on their nanoscopic dimensions: 0D, 1D, 2D, and 3D materials. A 0D NM (NPs and QDs) is a material with nanoscale dimensions in all three dimensions. It is 1D NM if two dimensions of a material are nanosized while the other dimension is considerably bigger (NWs, NRs, NTs, nanobelts, and nanoribbons). It's a 2D NM if just one dimension is nanosized (nanoprisms, nanoplates, nanocoatings, nanolayers, nanosheets, nanowalls, nanodisks, and CNTs). Bulk nanomaterials (also known as 3D NMs) are materials that are not limited to the nanoscale in any dimension (less than 100 nm) (nanoballs, dendritic structures, nanocoils, nanocones, nanopillars, multi-nanolayers, and nanoflowers). The ability to synthesize materials in the nanoscale range allows for unique physical, chemical, and biological characteristics, and is critical to nanotechnology's success. A top-down method (a bulk material is restructured to create nanosized materials) and a bottom-up approach (a bulk material is restructured to form nanosized materials) have both been used to synthesize NMs (materials of nanodimension are formed by assembling molecule by molecule or atom by atom). Lithography, laser ablation, ion milling, and chemical etching are some of the methods used in the top-down approach. Molecular beam epitaxy, physical or chemical vapor deposition and evaporation, and bio/chemical processes for the creation of supramolecular complexes, self-assembled

monolayers, and protein-polymer nanocomposites are all popular methods in the bottom-up approach.

Biosensor research and development has grown more open and interdisciplinary as a result of advancements in nanotechnology. Exploring NMs for various features, such as NPs (metal and oxide-based), NWs, NRs, CNTs, QDs, and nanocomposites (dendrimers), offers the potential of enhancing biosensor performance and increasing detection power via size and shape management.

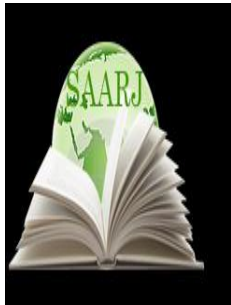
5. CONCLUSION

In this review article, we have discussed types and mechanisms of biosensors based on receptors (enzymes, antibodies, whole-cell, and aptamers), transducers (electrochemical, electronic, optical, gravimetric, and acoustic), and nanomaterials (gold NPs, Ag NPs, Pt NPs, Pd NPs, NWs, NRs, CNTs, QDs, and dendrimers). Biosensors offer versatile applications in the fields of engineering and technology, medicine and biomedical, toxicology and ecotoxicology, food safety monitoring, drug delivery, and disease progression. With the application of NMs in biosensors, we have witnessed rapid growth in biosensing technology is witnessed in the recent decade. This is because of the employment of new biorecognition elements and transducers, progress in miniaturization, design, and manufacture of nanostructured devices at the micro-level, and new synthesis techniques of NMs, all of which bring together the life and physical scientists and engineering and technology. The sensing technology has become more versatile, robust, and dynamic with the induction of nanomaterials. The transduction mechanism has been improved significantly (like greater sensitivity, faster detection, shorter response time, and reproducibility) by using different nanomaterials (such as NPs, NRs, NWs, CNTs, QDs, and dendrimers) that each has different characteristics within biosensors. Though there is considerable improvement in the use of nanostructured materials in biosensors applications, there are few limitations, which hinder these applications for the next level. For instance, lack of selectivity remains a setback for the CNT-based gas sensors, hampering its usage in CNT-based devices. However, this hurdle can be overcome by coupling CNTs with other materials. The other issues in these sensors include the sustainability of nanostructures in sensor applications, which have been insufficiently investigated, the fabrication of nanostructures, and the toxicity, which changes according to the physical properties of the material type. These issues should be investigated and addressed while expanding new nanostructured materials for their use in biosensors. Most nanobiosensor devices used in biomedical applications require a large sample for detection, which may lead to false-positive or false-negative results. Very few biosensors have attained commercial success at the global level, apart from electrochemical glucose sensors and lateral flow pregnancy tests. There is also a need for making nanostructure-based biosensors at an affordable cost that give rapid results with accuracy and are user-friendly. For example, nanomaterials should be integrated with a tiny biochip (lab-on-chip) for sample handling and analysis for multiplexed clinical diagnosis. More research should be done in this area and we expect the ongoing academic research to be realized into commercially viable prototypes by industries in near future.

REFERENCES

1. P. Mehrotra, "Biosensors and their applications - A review," *Journal of Oral Biology and Craniofacial Research*. 2016, doi: 10.1016/j.jobcr.2015.12.002.

2. N. Bhalla, P. Jolly, N. Formisano, and P. Estrela, "Introduction to biosensors," *Essays Biochem.*, 2016, doi: 10.1042/EBC20150001.
3. H. A. Alhadrami, "Biosensors: Classifications, medical applications, and future prospective," *Biotechnology and Applied Biochemistry*. 2018, doi: 10.1002/bab.1621.
4. R. Monošík, M. Stred'anský, and E. Šturdík, "Biosensors - classification, characterization and new trends," *Acta Chim. Slovaca*, 2012, doi: 10.2478/v10188-012-0017-z.
5. H. Kaur, A. Bhosale, and S. Shrivastav, "Biosensors: Classification, Fundamental Characterization and New Trends: A Review," *Int. J. Heal. Sci. Res.*, 2018.
6. S. N. Botewad, D. K. Gaikwad, N. B. Girhe, H. N. Thorat, and P. P. Pawar, "Urea biosensors: A comprehensive review," *Biotechnology and Applied Biochemistry*. 2021, doi: 10.1002/bab.2168.
7. F. Yang, Y. Ma, S. G. Stanciu, and A. Wu, "Transduction Process-Based Classification of Biosensors," in *Nanobiosensors*, 2020.
8. R. Mahr, C. Gätgens, J. Gätgens, T. Polen, J. Kalinowski, and J. Frunzke, "Biosensor-driven adaptive laboratory evolution of l-valine production in *Corynebacterium glutamicum*," *Metab. Eng.*, 2015, doi: 10.1016/j.ymben.2015.09.017.
9. Y. Liu, Y. Zhuang, D. Ding, Y. Xu, J. Sun, and D. Zhang, "Biosensor-Based Evolution and Elucidation of a Biosynthetic Pathway in *Escherichia coli*," *ACS Synth. Biol.*, 2017, doi: 10.1021/acssynbio.6b00328.
10. W. Zhang, Y. Du, and M. L. Wang, "Noninvasive glucose monitoring using saliva nano-biosensor," *Sens. Bio-Sensing Res.*, 2015, doi: 10.1016/j.sbsr.2015.02.002.
11. Y. J. Teh, A. Bahari Jambek, and U. Hashim, "A study of nano-biosensors and their output amplitude analysis algorithms," *Journal of Medical Engineering and Technology*. 2017, doi: 10.1080/03091902.2016.1223195.



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A BRIEF DESCRIPTION ON BIG DATA

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ABSTRACT

Big data refers to data or data sets that are so big or complicated that conventional data processing application are insufficient, necessitating the use of distributed databases. Big data has always been at the heart of companies like Google, eBay, LinkedIn, and Facebook. It's a collection of large and complex data sets that includes massive amounts of data, social media analytics, data management capabilities, real-time data, and so on. Sensor design, data curation, sharing, storage, analysis, visualization, and information privacy are all challenges. Big data refers to datasets with a lot of diversity and velocity, making conventional tools and methods challenging to manage. Big data analytics is the study of large amounts of data in order to uncover hidden correlations. Big Data is a kind of data whose complexity necessitates the development of new methods, algorithms, and analytics to manage it and extract value and hidden information. We need a new platform known as Hadoop as the fundamental platform for organizing Big Data and solving the issue of making it usable for analytics.

KEYWORDS: *Big Data, Challenges, Parallel Programming, Map Reduce Technique.*

1. INTRODUCTION

Big data is generated by every digital activity and social media interaction. Systems, sensors, and mobile devices all send data. Big data is pouring in from a number of places at an alarming rate, volume, and diversity. To extract real value from big data, we need the best processing power,

analytical capabilities, and expertise. Accurate big data may help you make more confident decisions. Good choices result in increased operational efficiency, cost savings, and risk reduction. Data collections may be analyzed to discover new connections, which can be used to "identify economic trends, prevent illnesses, and fight crime, among other things." Scientists, corporate executives, media and advertising practitioners, and governments all face challenges with big data sets in fields such as Internet search, banking, and business informatics. Because inexpensive and many information-gathering mobile devices, aerial (remote sensing), software logs, cameras, microphones, radio-frequency identification (RFID) readers, and wireless sensor networks are rapidly being used, data sets are growing in size[1]–[3]. The "scale" of big data varies greatly, ranging from a few hundred gigabytes to several petabytes. Real life examples are stated below:

- Consumer goods businesses and retailers are using social media platforms like Facebook and Twitter to get unparalleled insight into consumer behavior, preferences, and perceptions.
- Manufacturers may track minute vibration data from their equipment, which varies somewhat as it ages, to determine when it's time to replace or repair it. Changing it too early loses money, while replacing it too late results in a costly work halt. The idea of Big Data is shown in Figure 1.



Figure 1: Illustrates the concept of Big Data[4].

1.1 Three Vs of big data:

a. Volume:

Gigabytes to petabytes of data have been kept in corporate repositories. Many reasons contribute to the growth in data volume, including transaction-based data that has been kept over time, unstructured data from social media, and so on. Sensor and machine-to-machine data is being gathered in large quantities. Excessive data volume was a storage problem in the past. However, when storage prices fall, other challenges arise, such as determining relevance in huge data quantities and using analytics to extract value from relevant data. Amount of data is referred to as volume[5], [6].

b. Velocity:

Data is arriving at breakneck speed and must be processed as quickly as possible. The requirement to deal with fast-moving data in near-real time is being driven by RFID sensors and smart meters. Most companies struggle to respond fast enough to cope with data velocity. The term "velocity" refers to the rate at which data was processed. Big data must be utilized for time-sensitive operations like detecting fraud. It pours into your company in order to enhance its worth.

c. Variety:

Data is now available in a variety of forms. Traditional databases store structured and quantitative data. Line-of-business apps generate information. Unstructured text documents, email, video, audio, and financial transactions are all examples of unstructured text documents. Managing, integrating, and regulating various types of data is still a challenge for many businesses. There are many kinds and sources of data. From organized and historical data kept in corporate storage to unstructured, semi structured, audio, video, and other types of data, the diversity of data has expanded. We consider two additional dimensions when thinking about big data:

d. Variability:

Data flows may be extremely erratic with periodic peaks as velocity and types of data increase. It's all over social media. Peak data loads that occur on a daily, seasonal, or event-based basis are impossible to manage. There's much more unstructured data here. The inconsistency of the data, which may stymie the process of correctly processing and maintaining the data. The data's irregularity may sometimes stymie the process of effectively processing and maintaining the data.

e. Complexity:

Today's data is derived from a variety of sources. Linking, matching, and transforming data across systems is still a challenge. Relationships, hierarchies, and various data connections must all be connected and correlated. Otherwise, your data may soon get out of hand. Data management becomes very complicated when huge amounts of data are collected from various sources. Data, in particular, must be linked, integrated, and correlated so that consumers can understand the information or messages that the data is intended to communicate.

f. Veracity

The significant variability in data quality collected. The accuracy of data analysis is dependent on the accuracy of the original data.

1.2 Parallel Programming & Map reduce:

Data analysis software inherently parallelizes. Many programmers are interested in developing parallel applications. In the area of parallel databases, parallel research has had the greatest success. Parallel databases allow programmers to split up input data tables into parts and execute each piece via the same single-machine program on each processor, rather than having to untangle an algorithm into different threads to run on various cores. Parallel programming is as simple as programming a single computer using this "parallel dataflow" paradigm. It also works in data centers with "shared-nothing" clusters of computers: the machines may interact using simple data streams rather than costly shared RAM or disk infrastructure[7]–[9].

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Map Reduce is at the core of Hadoop. This programming paradigm is responsible for Hadoop's enormous scalability over thousands of servers. It can handle petabytes or zetabytes of data stored in Apache Hadoop in batches. If we've worked with clustered scale-out data processing systems before. The Map Reduce idea is therefore easy to grasp. The Map Reduce programming paradigm has turned a new page in the narrative of parallelism. The Map Reduce framework is a parallel dataflow system that divides data across many computers. They all use the same single-node logic. Map Reduce requires programmers to use conventional programming languages such as C, Java, Python, and Perl to create their programs. Map Reduce enables programs to be written to and read from conventional files in a file system rather than needing database schema definitions, in addition to its familiar syntax.

Map Reduce is a term that refers to two different jobs. The first is the task of map, which involves converting one set of data into another. Value pairs are used to break down individual components. Reduce takes the output of a map as input and merges the data values into a smaller set. After the map task, the reduce job is always run. As a result, the name Map Reduce is a series. Figure 2 depicts the Map Reduce idea in Big Data.

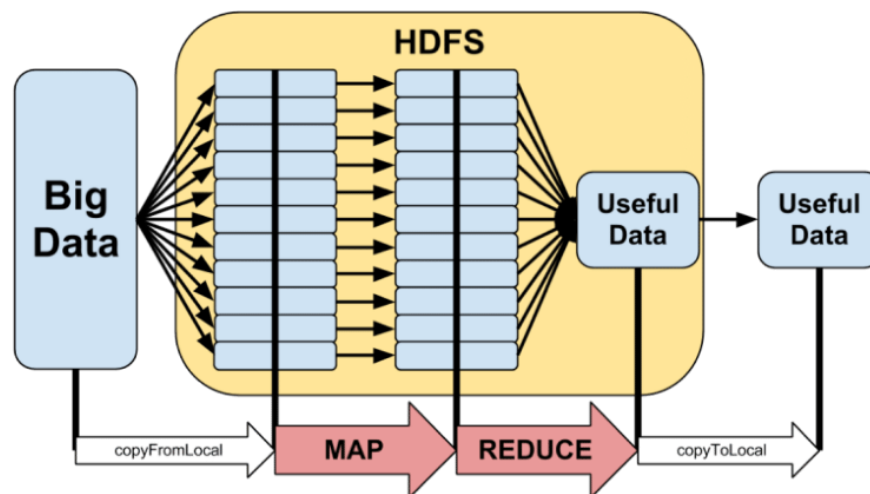


Figure 2: Illustrates the concept of MapReduce in Big Data[10].

1.3 Best Big Data Analytics Use Cases:

a. Sentiment Analysis:

Sentiment research provides valuable corporate information for improving customer experience, revitalizing a brand, and gaining a competitive edge. The capacity to dig for multistructured data collected from many sources into a single database is crucial to effective sentiment analysis.

b. 360-Degree View of Customer:

A 360-degree customer perspective allows you to get a better understanding of your customers' motives and behavior. To get a 360-degree customer evaluation, data from many sources, such as social media, data-gathering sensors, mobile devices, and so on, must be analyzed. As a consequence, more effective micro-segmentation and real-time marketing become possible.

c. Ad Hoc Data Analysis:

Ad-hoc analysis examines just the data that has been requested or required, adding another layer of analysis to data sets that are growing bigger and more diverse. By evaluating relevant data from unstructured sources, both external and internal, big data ad-hoc analytics may aid in the endeavor to acquire deeper insight into consumers.

d. Real-Time Analytics:

Real-time analytics systems rapidly interpret and analyze data sets, delivering findings even as new data is produced and gathered. This fast-paced approach to analytics may result in rapid responses and adjustments. Better sentiment analysis, split testing, and targeted marketing are all possible with it.

e. Multi-Channel Marketing:

Multi-channel marketing integrates various kinds of media, such as business websites, social media, and physical shops, to provide a seamless experience. Multi-channel marketing necessitates an integrated big data strategy at all phases of the purchasing process.

f. Customer Micro-Segmentation:

For smaller groupings, customer micro-segmentation allows for more customized and targeted communications. This customized strategy requires the analysis of large amounts of data gathered from sources such as consumer internet interactions, social media, and so on.

g. Data Warehouse Modernization:

To improve operational efficiency, combine big data and data warehouse capabilities. Optimize your data warehouse so that new kinds of analysis may be performed. Before deciding what data should be transferred to the data warehouse, utilize big data technology to create a staging area or landing zone for your incoming data. Using in sequence integration software and tools, extract rarely used or aged data from warehouse and application databases.

h. Bigdata Challenges:

Big Data's heterogeneity, size, timeliness, complexity, and privacy issues stymie progress at all stages of the value-creation pipeline. The issues begin during data acquisition, when the data tsunami forces us to make ad hoc choices about what data to retain and what to discard, as well as how to save what we keep consistently with the appropriate information. Today, a lot of data isn't in an organized format by default; for example, tweets and blogs are unstructured text, while pictures and video are formatted for storage and presentation. However, this is not the case for semantic content and search. A key test is converting such information into a structured format for subsequent examination. When data can be linked to other data, its value skyrockets. As a result, data integration is a significant source of value. Today, the bulk of data is produced directly in digital format; we have the potential and the task to influence production in order to

ease subsequent linking and to automatically connect data that has not yet been created. Other fundamental problems include data analysis, organization, recovery, and modeling. Data analysis is an obvious bottleneck in many applications, owing to the original methods' limited scalability as well as the complexity of the data to be processed. Finally, non-technical domain specialists must present the findings and explain them in order to extract actionable knowledge.

i. Volume of data:

The amount of data, particularly machine-generated data, is expanding, as is the pace at which it grows each year, thanks to new data sources that are emerging. In the year 2000, for example, the world's data storage capacity was 800,000 petabytes (PB). It is expected to reach 35 zettabytes (ZB) by 2020, according to IBM. Twitter, for example, produces more than 7 terabytes (TB) of data per day. Facebook has a storage capacity of ten terabytes. Mobile gadgets play a significant role as well.

j. Big data skills are in short supply:

There is already a scarcity of data scientists available. This involves a scarcity of individuals who can work effectively with huge amounts of data and large data sets. Companies need the appropriate mix of people to help them make sense of the data streams that are flooding in. This includes the ability to apply predictive analytics to large data, which is a skill set that even most data scientists lack.

2. DISCUSSION

Big data is a collection of technologies for storing, analyzing, and managing large amounts of data, as well as a macro-tool for seeing patterns in the chaos of this information explosion in order to develop smart solutions. It is now utilized in a wide range of fields, including medical, agriculture, gaming, and environmental protection. The three main ideas of big data were initially linked with three essential concepts: volume, diversity, and velocity. Because large data analysis poses sampling difficulties, only observations and sample were previously allowed. As a result, big data often contains data in quantities that conventional software cannot handle in a reasonable amount of time or for a reasonable price. Big data is used by Amazon, Netflix, and many other businesses to offer services to their consumers.

3. CONCLUSION

The combination of Big Data, low-cost commodity technology, and analytic software has created a watershed moment in data analysis history. Because of the convergence of these developments, we now have the capability to analyze massive data sets rapidly and cost-effectively for the first time in history. All of these skills aren't theoretical or simple. They offer a significant step forward and a clear opportunity to achieve massive improvements in efficiency, production, revenue, and profitability.

When large data systems are accessible, requirements for handing out that may appear impossible now will become commonplace. We learn how to take advantage of them. Systems of the size of Facebook and Google would have been science fiction not long ago. 100 transactions per second for airline and financial systems was unheard of at the time. A number of new criteria will integrate data from a variety of sources, not all of which will be held by the business. Some

will, for example, make advantage of government "open data." There are many opportunities for inventors!

REFERENCES:

1. A. Oussous, F. Z. Benjelloun, A. Ait Lahcen, and S. Belfkih, "Big Data technologies: A survey," *Journal of King Saud University - Computer and Information Sciences*. 2018, doi: 10.1016/j.jksuci.2017.06.001.
2. A. Gandomi and M. Haider, "Beyond the hype: Big data concepts, methods, and analytics," *Int. J. Inf. Manage.*, 2015, doi: 10.1016/j.ijinfomgt.2014.10.007.
3. W. A. Günther, M. H. Rezazade Mehrizi, M. Huysman, and F. Feldberg, "Debating big data: A literature review on realizing value from big data," *J. Strateg. Inf. Syst.*, 2017, doi: 10.1016/j.jsis.2017.07.003.
4. B. Data, B. Data, and B. Data, "Big Data." <https://medium.com/@raghav0278/what-is-big-data-and-why-is-it-important-15afe114b8b7> (accessed Aug. 01, 2017).
5. E. Al Nuaimi, H. Al Neyadi, N. Mohamed, and J. Al-Jaroodi, "Applications of big data to smart cities," *J. Internet Serv. Appl.*, 2015, doi: 10.1186/s13174-015-0041-5.
6. R. Kitchin and G. McArdle, "What makes Big Data, Big Data? Exploring the ontological characteristics of 26 datasets," *Big Data Soc.*, 2016, doi: 10.1177/2053951716631130.
7. M. M. Najafabadi, F. Villanustre, T. M. Khoshgoftaar, N. Seliya, R. Wald, and E. Muharemagic, "Deep learning applications and challenges in big data analytics," *J. Big Data*, 2015, doi: 10.1186/s40537-014-0007-7.
8. C. H. Lee and H. J. Yoon, "Medical big data: Promise and challenges," *Kidney Res. Clin. Pract.*, 2017, doi: 10.23876/j.krcp.2017.36.1.3.
9. A. Zwitter, "Big Data ethics," *Big Data and Society*. 2014, doi: 10.1177/2053951714559253.
10. "Big-data-map-reduce-process-22." https://www.researchgate.net/figure/Big-data-map-reduce-process-22_fig4_317825624 (accessed Aug. 01, 2017).



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THE FIRST MEDIEVAL URBAN CULTURE OF SAMARKAND SOGD (ON THE EXAMPLE OF THE MONUMENT TO QULDORTEPA)

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ABSTRACT

The fact that the territory of Uzbekistan has ancient roots of urban culture in this article. We can see this situation in the presence of the ruins of Goktepa, Afrasiab, Yerkurgan, Podayotoktepa, Poykent and dozens of other major and ancient cities in the territory of our homeland.

KEYWORDS: *Sogd, Monkey, Quldortepa, G.V.Grigoryev, I.A.Sukharev, V. I. Sarianidi, "Tan Shu", Basista, Baside, B.Eat it.Stavisky, M.K.Urmanova, Talibarzu,Panjikent, Kafirkal'a, Afrosiab, Choch, Jizzakh, Nakhshab, urban culture.*

INTRODUCTION

The territory of Uzbekistan has ancient roots of urban culture. We can see this situation in the presence of the ruins of Goktepa, Afrasiab, Yerkurgan, Podayotoktepa, Poykent and dozens of other major and ancient cities in the territory of our homeland. Along with these large cities there are more than a hundred small towns and large villages in the territory of Uzbekistan, many of which have reached to our days in the territory of the Samarkand oasis in the form of large archaeological monuments such as Kafirkal, Dobuscal, Ofarinkent, Robinjan, Ishtikhan, Mingtepa, Kushaniya. There is general information in science about the ruins of these cities¹. In the sentence of such cities of sogd, it is possible to include a large archaeological Quldortepe, which is located around the village of Bahrin, Urgut District of Samarkand region. Interest in the study of this monument began in the late 30-ies of the XX century.

Archaeological and written sources confirm that Quldortepa Sogd served as the central city of the monkey, that is, its capital, which at that time was among the great possessions. Total area 17

g.ga equal. We can also find out that this city, in turn, consists of three parts, namely ark, Shahristan and Rabot, through the following studies.

The archaeological study and research of qoldortepe has been carried out in four stages to date.

First stage: on the eve of the Second World War, the first marotaba archaeologists G. In the town of Quldortepa.V.Grigoryev and I.A.Sukharevites conducted archaeological research. The main purpose of this study was to find out the answer to the question of whether the city of Boside, which was considered the capital of the monkey, Quldortepe was the region of the first medieval Sogdian, was exactly itself, or another city. But the researchers did not achieve the expected result, but finished the research work.

The second stage: after that there were V. in 1953-1954 years. I. Sarianidi is engaged in partial excavation work. It was also assumed that the purpose of this excavation was the destruction of the city of Boside, which was considered the capital of the monkey, the region of the first medieval Sogdian here².

In the second phase of the study, the following data were collected. The city of Boside is the residence of the governor of the monkey, an important source covering the history of the Tan dynasty (618-907), one of the ruling dynasties of China, was mentioned in Tan shu. Also there are opinions about this city that the city of Basista is the same as the city of Boside, which was recorded in the works of some scientists of the muarriks of antiquity and was mentioned in connection with the Alexander Makedonsky walks. It is not surprising if the subsequent period when historians did not pay attention to the information about the city of Boside, which was recorded in Chinese sources, caused a different interpretation of the place of this toponym³. This monument is located in the eastern part of the village of Bahrain, 35 km to the east-south from the city of Samarkand. It is preserved in the form of a hill with a length of 6 meters, which is now 1700 meters in height. The total area of the monument is about 17 hectares, and there are also Hills slightly elevated in the north-east, south-east and South-West corners, that is, the place of the zodiac. In addition, in the north western corner are located several large hills, which are clearly distinguished. The center of the city is occupied by an elevated Massif, which is equal to its high places. In the western corner of the monument there is an arch with a height of 15 meters, next to it is a small water basin, which at that time provided the city with drinking water. As a result of excavations, a variety of ceramics found here belong to different periods. The most ancient of them dates back to the beginning of our era, and the earthenware from the upper layers dates back to the XI-XII centuries⁴.

The third stage: in 1955-1956, in cooperation with the Museum of history of Culture and art of Uzbekistan in Samarkand and the State Hermitage Museum in Leningrad began digging. Archaeologists B. for these excavations.Eat it.Stavisky, M.K.Those who were led byovovas⁵. This excavation work was carried out on an area of 100 m² in the north-eastern part of the Ark. From the top layer of the excavation area, it was studied by finding fragments of ceramic and glass dating back to the IX-XII centuries. In the Ark, a building with four periods of construction from top to bottom has been opened and studied.

Archaeological finds from quldortepe are very similar to those found in Talibarzu, Panjikent and Kafirkal. The remains of an artifact and a wall found in separate layers of the monument made it possible to determine its age. Here such findings prove that the age of the Kuldortepe is not less than the I century of our era.

Archaeological materials indicate that the Kuldortepa was formed on the banks of a small lake formed from groundwater (Springs) and was quickly surrounded by a defensive wall. In the III-IV centuries on the banks of this lake, a 10-meter-high urban raft was restored. When it comes to the VIII century BC, life around the ark ceases, as a result of which quickly the city wall of mudafa also becomes a ruin.

Although life in qoldortepa continued even in the IX-XII centuries, but during this period the population was significantly reduced and the prestige of the city was significantly reduced⁶.

During this excavation work, the central part of the Ark and the north-west sides of the city were explored. In addition, as a result of archaeological research conducted in 1956 year, the study of the defensive walls of the north-eastern part of the ancient city was completed. According to the technique of making found ceramics, it became known that the Tali-Barzu monument was characteristic of the third layer.

The study of the Quldortepa archaeological monument provides information about the features inherent in the culture of the first medieval Sogd urban settlement. In the IV-V centuries-old strata of the city, part of the sewerage networks of the city were opened⁷.

During the study of the remains of buildings adjacent to the outer walls of the Ark dating back to the VIII-IX centuries, a bronze coin was minted in Sogd belonging to an unknown ruler who ruled in the VIII century. On the first side of the coin is the face of the ruler, and on the second side is the Sogdian stamp. It is worth noting that out of such coins, four were found in the form of fluff, and another one was also found in Afrasiab.

It provides information on various household items made of ceramic, glass, copper, bronze and silver, as well as the stages of the discovery of suvd deposits and coins of cuneiform Origin, the emergence, development and destruction of the Ark, the period.

At the same time with the excavations on the central hill of the Ark, new excavations were carried out in another part of the city territory. This excavation was carried out in the place where it was assumed that the monumental architectural monument remains. It was here that the ceramics of the Middle Ages did not exist, it became clear that this architectural complex dates back to the early stages of city life. As a result of Archaeological Research in 1956-1957 years, the energetic walls of four rooms of this architectural complex were identified, which were built from pakhsa. The walls of the room are built of a large block and rectangular baked brick⁸.

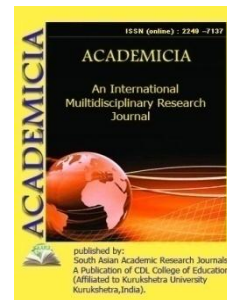
The excavations carried out in quldortepa in 1956-1957 years revealed our impressions about the life of this ancient city. As a result of these studies, the monumental building on the central hill of the Ark of the materials obtained from the I excavation point is demolished in the VIII century, but in the IX century new buildings on the slopes of this hill were erected. Among the findings found from excavation I, the absence of ceramic objects dating back to the beginning of the X-XI century, suggests that during this period there was no life in the Ark, at least in part of it. In qoldortepa, in the XI-XII century, temporary life is restored. As a result of the excavations carried out at the III excavation point of the monument, it became known that during the period of the arab occupation, life in the north-western part of Quldortepa was stopped. The research of the years 1956-1957 gave valuable archaeological data that nominate the features inherent in the urban culture of sogd⁹. But after this study, it remains only to stop carrying out inspection work for a long time at the monument.

The fourth stage: in July 2018 and in 2019, the scientific staff of the National Center of Archeology of the Academy of Sciences of the Republic of Uzbekistan and the professors of the Faculty of history of Samarkand State University will start scientific research at the monument again. In particular, as a result of excavations in the Memorial Arch, it became known that it was built in antiquity and was rebuilt in the IV – V centuries. Two periods of construction have been identified as a result of a stratigraphic excavation on the defensive wall in the south of the city. The first period of construction of the defense wall was reverted to the outer, southern side of the forty, and the bunda was excavated from the pakhsa platform and over it from the raw brick, while the outer side was built in antiquity in the form of a semi-circular (corrugated) high wall. The second construction period was recorded on the inner side of the defensive wall, with a new wall in the form of an additional “rubashka” with raw material over the platform. As a result, he received 11 m.ga reached.¹⁰ As a result of the archaeological excavations carried out in the fourth stage, it was determined that the arch and the walls of Shahristan were formed in the I century BC.

In conclusion, Quldortepa is a city located in an important network of Samarkand Sogdians. In the monument we can see that in the first Middle Ages there were cultural ties with Afrasiab, Choch, Panjikent, Jizzakh, Nakhshab, there were mutual similarities of ceramic objects, with architectural styles of that period, with building styles, too. In addition, the material and material evidence found from the monument shows that Quldortepa was one of the important political and cultural centers of Sogd in his time.

LIST OF USED LITERATURE

1. Beyaenisky A.M., Bentovich I. The B., Bolshakov horse. Srednevekoviy Gorod Sredney Azii. The L. 1973., P.187.
2. Semyonov G. The L. Sogdyskaya fortification V-VIII vekov. SPB. 1996. S.155.
3. Begalyaev N. Quldortepa and found hieroglyph label.// IMG.O. Vipusk 30 .Samarkand. 1999. S.319-320
4. Stavisky B. Eat it. Raskopki Goroditshe Kuldortepa V 1956-1957 G .) / / S A. Location, 1960.. № 4. 118
5. Stavisky B. Eat it. , ovaova M. The X. Goroditshe Kuldortepa (Raboti 1955 G .) / / S A. Location, 1958.. № 1. S. 231, 232, 233, 234, 235
6. Buryakova E. No, it's not. Poselanie Lolazar-predshestvennik gorodana Afrasiabe / / K istoricheskoy topografi drevnego I Srednevekovogo Samarkand. Tashkent. 1981. S.4.
7. Arrival V. The L. Architecture drevnego Pyandjikenta. Trudi Tae. The T.III, MIA, № 66. 1958. S.212.
8. Litvinsky B. The A., Solovyov V. S. Srednevekaveya Kultura Takharistana . Location, 1985. S.60.
9. Nilsen V. The A. Stanovlenie feodalnoy architecture Sredney Azii (V-VIII VV). - What?, 1966. S.232-237
10. Orolov A. S. Harmonize and decorate architectural forms. S., 2003. The B.176.
11. The A. What? Sandibaev authored” the first Middle Ages of the ownership of the monkey”. Tashkent: 2020 14-15 bet



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FEATURES OF POLYPROPYLENE MODIFICATION FOR FILM THREAD MANUFACTURING

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ABSTRACT

The article discusses various methods for modifying polypropylene. Compositions have been developed that have improved physical and mechanical characteristics and have an optimal composition for the production of thin oriented products. A comparative analysis was carried out for various indicators: melt flow rate, ultimate strength, deformation, activation energy of thermo-oxidative destruction. Industrial approbation of some compositions has been carried out.

KEYWORDS: *Polypropylene, Composition, Approbation, Deformation.*

INTRODUCTION

Polypropylene belongs to the class of polyolefins and is a synthetic thermoplastic non-polar polymer. It is a white solid that is industrially obtained by the polymerization of propylene. Polymerization is carried out at low and medium pressures in the presence of organometallic catalysts. Polypropylene is produced stabilized, dyed or unpainted. Polypropylene is a plastic material that is highly resistant to repeated bending and impact. It is also characterized by wear resistance and good electrical insulating properties over a wide temperature range. It has a gloss and good transparency, is chemically resistant and does not crack when exposed to the environment.

Polypropylene is characterized by a more complex molecular structure compared to most industrially produced polymers, since, in addition to the chemical composition of the average

molecular weight monomer and molecular weight distribution, its structure is influenced by the spatial arrangement of the side groups with respect to the main chain. In technical terms, the most important and promising is isotactic polypropylene. Depending on the type and ratio of the stereoisomers present, the properties of polypropylene vary over a wide range [1].

By the type of molecular structure, three main types of polypropylene can be distinguished: isotactic, syndiotactic and atactic. Isotactic and syndiotactic polypropylenes are referred to as stereoregular polymers. Isotactic polypropylene is a polymer in which the methyl groups are directed to one side of the imaginary plane of the main chain; syndiotactic - methyl groups alternate strictly; atactic - methyl groups are randomly located. Depending on the molecular weight and isotactic content, the properties of polypropylene can vary over a wide range. Of greatest industrial interest is polypropylene with a molecular weight of 80,000–200,000 and an isotactic content of 80–98%.

Due to its crystal structure, stereoregular polypropylene retains good mechanical properties and shape up to the melting point. Effective expansion of the brand assortment of polymeric materials is achieved due to their directed modification, which makes it possible to significantly improve their technological and operational properties, to create new types of products for new areas of application, including in more severe operating conditions [2].

Modification of polymers should be understood as a purposeful change in their properties by carrying out chemical reactions on the functional groups present in the polymer, or by changing its supramolecular structure.

This definition logically implies the division of polymer modification into chemical and structural.

Chemical modification of polymers consists in a directed change in the properties of the polymer by conducting interactions of the polymer macromolecules with low- or high-molecular substances - modifiers [3].

Chemical modification includes several varieties.

1. Reactions not accompanied by a change in the degree of polymerization of macromolecules (polymer-analogous transformations and intramolecular reactions). Intramolecular reactions occur with the participation of functional groups or atoms belonging to the same macromolecule. Often, as a result of such reactions, sufficiently heat-resistant polymers with a system of conjugated double bonds or polymers with intramolecular cycles are formed.

The introduction of a small number of units of a different nature into the composition of macromolecules at the stage of their synthesis can lead to significant changes in the properties of the polymer material. Monomers containing a peroxide or hydroperoxide group, unsaturated derivatives of dyes, stabilizers, physiologically active substances, etc., are used as modifying agents. When using the chemical modification method, it is possible to obtain polymer materials in one stage in which all components, including poor compatible with the polymer, are bound to its macromolecules by strong covalent bonds. This prevents the release of components on the surface of polymers during their processing and use.

1. Reactions leading to an increase in the degree of polymerization.

2. Reactions during which the degree of polymerization decreases.

Structural (physical) modification of polymers is a directed change in the physical and mechanical properties of polymers by modifying their supramolecular structure under the influence of physical factors. The physical modification of polymers does not change the chemical structure of macromolecules.

One of the methods of structural modification is polymer orientation, which is achieved by stretching the polymer body. The simplest and most common orientation for linear polymers is uniaxial orientation. As a result, chain macromolecules, chaotically (statically) oriented in the original body, under the influence of an external directional stretching effect, acquire one or another degree of orientation. In an amorphous flexible-chain polymer, the oriented state is non-equilibrium and, in order to fix it, it is necessary to cool the polymer below the glass transition temperature without removing the tensile stress. In the case of flexible-chain crystallizing polymers, the oriented state can be considered equilibrium below the melting point of the crystallites, and the removal of the tensile stress at the drawing temperature does not lead to misorientation, since the crystallites form an oriented framework that preserves the amorphous regions of the polymer body in the oriented state.

Physicochemical modification can be distinguished as a separate type, in which a physical effect on a polymer entails a change in the chemical structure of macromolecules. In this case, as a rule, the physical structure of the polymer also changes, which manifests itself in the rearrangement of supramolecular formations.

Modification of industrial polymers is widely used to obtain polymer materials with improved properties. The introduction of small amounts of polymer additives has become widespread. At the same time, there is a complex effect of additives on the structure and properties of polymers.

The introduction of the modifier can be carried out both during the synthesis process and during the processing of polymers. With the introduction of small amounts of modifiers, the physical and mechanical properties of the material increase, the durability increases, and the performance of plastic products increases. In addition, the reduction and stabilization of viscosity due to modification improves the processability of materials at the stage of forming products, increases productivity and reduces equipment wear [4].

Main part. The work investigated compositions based on polypropylene, to which various modification methods were applied. Specimens were made by injection molding; the rheological and physical-mechanical characteristics of the material were assessed by the existing methods. Polypropylene of the PPG1035-08 grade (TU 2211-008-50236110-06) was used as a base polymer in the work, and polyamide of the Grodnamid PA6-L-U1 grade was used as a modifier. According to the production regulations, it is necessary to introduce a chalk additive, therefore, compositions containing chalk and also without chalk were made. This was necessary to assess the interaction of the chalk with the modifier.

Based on the listed requirements for thermal stabilizers, a choice was made from three thermal stabilizers of different classes: phenolic type Hostanox 03 Pills, phosphite type Sandostab-P-EPQ, complex type Kretilen. In fig. 1 shows the structural formula of Hostanox 03 Pills. It consists mainly of ethylene-1,2-bis (3,3-bis (4-hydroxy-3-tert-butyl-phenyl) -butyrate).

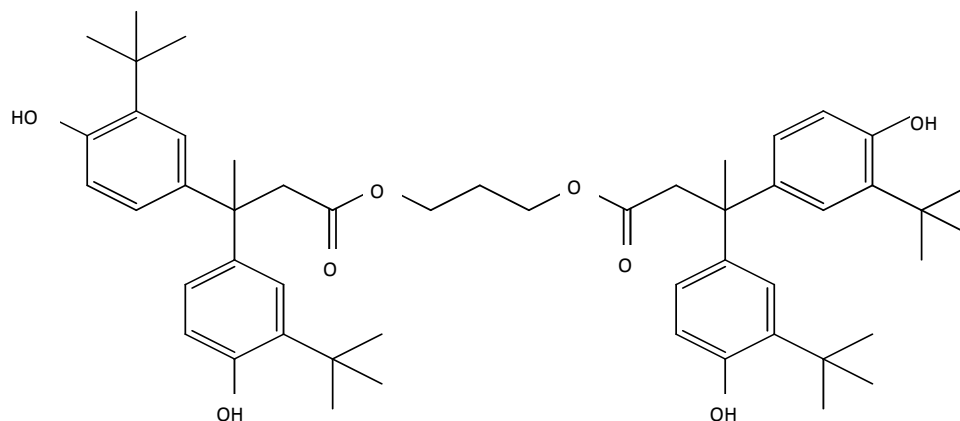


Fig .1. Structura formula H ostanox 03 Pills

Sandostab-P-EPQ is used for thermal stabilization of polymers, especially polyolefins and polycarbonates. Sandostab P-EPQ consists mainly of a phosphonite of the formula tetra- (2,5-di-tert-butyl-phenyl) -4,4-diphenylene diphosphonite (Fig. 2).

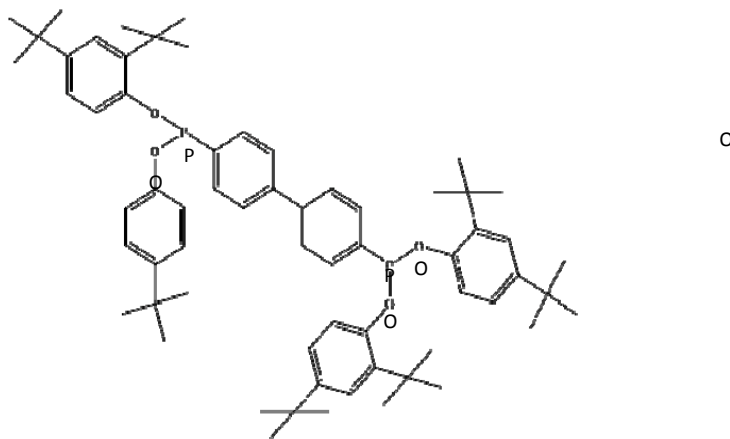


Fig. 2.Structural formula of Sandostab-P-EPQ stabilizer

Based on the analysis of scientific literature, we came to the conclusion that it is necessary to use a complex stabilizer [5]. The thermal stabilizer, known under the trademark "Kretilen" PP AO 15 (TU 2243-001-796831892009), has the necessary qualities and is also more affordable compared to its counterparts. This thermal stabilizer is a synergistic mixture of phenolic and phosphite type stabilizers. Has a complex effect and protects the polymer from thermal oxidative degradation during processing by extrusion and during the operation of products from it at elevated temperatures. Has some UV protection. To date, such mixtures are the most effective.

An important characteristic of a polymeric material is its supramolecular structure. Crystal size control allows you to adjust the basic physical and mechanical characteristics of the material. Substances that can change the supramolecular structure are called nucleators. The introduction of a nucleator leads to the formation of a more perfect crystal structure (it increases the number of crystallization centers and thereby reduces the size of crystalline formations). Under the action of nucleators, the size of crystalline formations becomes less than the length of the visible light wave. The described effect leads to an increase in the heat resistance of polypropylene by 12–15

° C. As a rule, the active substance in the composition of nucleator concentrates are salts of organic acids: sodium benzoate, potassium benzoate, sodium naphthenate; in addition, finely dispersed powders of silica, talc, quartz, kaolin and other mineral compounds are used. Therefore, in some compositions, a P0023 / 22-PP nucleator was used.

It follows from the results of rheological tests that the modified polypropylene has a lower MFI. Values range from 3-4 g / 10 min. These are optimal values for the extrusion process, but they are also suitable for injection molding processes.

The resistance of the developed compositions to thermal oxidative destruction can be estimated based on the values of the activation energy of thermal oxidative destruction (E_d). Calculations were made according to [6].

The values of the activation energy indicate that the composition of the composition: polypropylene, nucleator 1 wt. %, stabilizer 1 wt. %, dye ≈ 0.1 wt. %, has a higher value of the activation energy of thermal oxidative destruction. This means that the potential barrier to the destruction reaction increases. Products made from this composition should have improved physical and mechanical characteristics, and the service life should also increase.

The values of physical and mechanical characteristics confirm that some compositions are superior to primary polypropylene in these indicators.

Then, under production conditions at the SPO Khimvolokno enterprise, an oriented thread was made from the developed compositions and physical and mechanical tests were carried out.

The mechanical properties of polyolefins vary over a very wide range. The properties of products made of polymeric materials differ from those of the initial isotropic polymers in that, as a rule, the properties of products are not the same in different directions. The filaments have the greatest modulus in the direction of stretching, the films - in the plane of the surface.

Physical and mechanical characteristics of polypropylene yarn

Composition of the composition	Specific strength, S_N / tex	Specific thickness, tex	An effort, H	Deformation, %
Primary polypropylene, chalk 3 wt. % (according to TU BY 400031289.169)	48,2	93	45	22,8
Polypropylene, stabilizer 1 wt. %, polyamide 3 wt. %, chalk 3% wt.	49	112	54,88	19
Polypropylene, stabilizer 1 wt. %, dye ≈ 0.25 wt. %, nucleator 1 wt. %	49,9	45,6	23,2	90
Polypropylene, polyamide ($\phi = 0.15$) 3 wt. %, stabilizer 1 wt. %, dye ≈ 0.25 wt. %	51,5	42	22,7	80

The table shows the results of physical and mechanical tests of polypropylene yarns from the developed compositions. All strength indicators fit into the regulations for the production of polypropylene yarn. However, it should be noted that when using undried polyamide during the

production of the film, frequent breaks of the web are observed. We assume that the moisture contained in the polyamide interacts with the chalk additive during processing, which leads to a strong heterogeneity of the material. Further, when orienting the polypropylene thread, it breaks. Drying the polyamide eliminates frequent film breakage. When using dried polyamide, the film is uniform in thickness.

CONCLUSION

The use of complex stabilizers in the composition has shown its effectiveness. The use of a nucleator leads to the formation of a finer crystal structure, which is confirmed by the values of the activation energy of thermooxidative destruction ($E_d = 157.7$ kJ / mol) and an improvement in the strength parameters of the polypropylene thread.

The use of polyamide leads to an increase in the strength characteristics of products made by casting, however, an increase in the physical and mechanical characteristics of the thread is not observed.

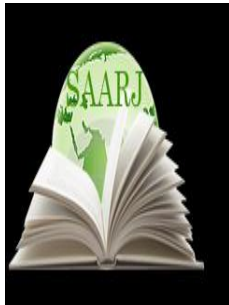
The introduction of a chalk additive into the composition is necessary to control shrinkage and prevent the formation of crazes during thread orientation.

All the compositions obtained correspond to the NLA for a thin oriented polypropylene thread. The developed compositions are supposed to be used in the production of oriented film thread intended for the production of woven bags.

LITERATURE

1. White, J. L. Polyethylene, polypropylene and other polyolefins / J. L. White, D. D. Choi; lane. in English, ed. E. S. Cobcallo. - СПб .: Profession, 2006. - 256 p.
2. Profession, 2006. - 256 p.
3. Teraoka, I. Polymer Solutions: An Introduction to Physical Properties / I. Teraoka. – Brooklyn, N.Y.: John Wiley & Sons, Inc., 2002. – 349 p.
4. Paul, DR Polymer mixtures: in 2 tons /
5. D. R. Paul, C. B. Bucknell; per. from English ed. V. N. Kulezneva. - SPb .: Scientific bases and technologies, 2009. - T. 2: Functional connections. - 606 p.
6. An effective approach to the creation of modern polymer composite materials / E. L. Kalinchev [and others] // Polymer materials. - 2008. - No. 3. - P. 4–14.
7. La Mantia, F. Recycling of plastics / F. La Mantia; per. from English ed. G.E. Zaikova. - SPb .: Professiya, 2006 .-- 400 p.
8. Polymeric products for construction. Method for determination of durability by activation energy of thermo-oxidative destruction of polymeric materials: STB 1333.0-2002. - Introduction. June 28, 2002. - Minsk: Ministry of Architecture and Construction of the Republic of Belarus, 2002. - 11 p.
9. Plastics. Tensile test method GOST 11262-80. - Introduction. 21.11.80. - M .: USSR State Committee for Standards. - 25 p.

10. Otabek Abdulkarimovich Mirzaev, Shavkat Serabovich Tursunov // Theoretical substantiation of the deformed state of the shell of the feeding cylinder of spinning machines // Oriental renaissance: Innovative, educational, natural and social sciences // 2021.1092-1103 <https://cyberleninka.ru/article/n/teoreticheskaya-obosnovaniya-deformirovannogo-sostoyaniya-obolochki-pitayuschego-tsilindra-priyadiynyh-mashin>
11. T Khankelov, S Tursunov, Z Maksudov // Domestic Solid Waste Crusher // International Journal of Psychological Rehabilitation 24 (issue 07), 8090-8096 psychosocial.com/article-category/issue <https://www.psychosocial.com/article/PR270784/18957/>
12. Tavbay Khankelov¹, Zokir Maksudov^{1*}, Nafisa Mukhamedova¹ and Shavkat Tursunov² // Crushing and screening complex for the production of compost from organic components of municipal solid waste // Interaction of Materials Resistance Science With Other General-Military Disciplines In Engineering Specialties // 2021. https://www.e3s-conferences.org/articles/e3sconf/abs/2021/40/e3sconf_conmechhydro2021_01026/e3sconf_conmechhydro2021_01026.html
13. OliyaNurova Salomovna¹, AsrorNazarov Allanazarovich², TursunovShavkatSerabovich // Interaction of Materials Resistance Science With Other General-Military Disciplines In Engineering Specialties // <https://www.annalsofrscb.ro/index.php/journal/article/view/5911>
14. TursunovShavkatSerabovich // Analysis of existing designs of crushers for crushing municipal solid waste// International Journal for Innovative Engineering and Management Research(IJIEMR) // <https://scopendatabase.com/documents/00000181/00000-84600.pdf> // 2021



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AN OVERVIEW OF 4G WIRELESS TECHNOLOGIES

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ABSTRACT

In the last several decades the development of wireless broadband technologies has been a response to rising demand for mobile Internet and wireless multimedia applications such as live TV, live movies, video conferencing, and so on. In the telecommunications industry, mobile communication is critical. WiMAX and LTE have facilitated the convergence of mobile and fixed broadband networks through a common wide area radio access technology and flexible network architecture. Since 2007, the IEEE 802.16 working group has been working on a new revision of the IEEE 802.16 standards as a higher level air interface to satisfy the ITU-R/IMT-advanced requirements for 4G systems and the next generation. 4G mobile technology ensures great mobility by providing high data rates and high capacity IP-based services and applications. The 4G wireless system, its design, security services, advantages, and difficulties are all described in this article.

KEYWORDS: *LTE, Mobile Communication, Networks, Wireless Technology, 4G Networks.*

1. INTRODUCTION

A packet switched wireless system with broad area coverage and high throughput is referred to as a 4G wireless system. It is cost-effective and spectrally efficient. Orthogonal Frequency Division Multiplexing (OFDM), Ultra Wide Band (UWB), and Millimeter wireless are all used

in 4G wireless. A 20 megabit per second data rate is used. The maximum mobile speed will be 200 kilometers per hour[1]. Long-term channel prediction, both in terms of time and frequency, user scheduling, and smart antennas coupled with adaptive modulation and power management are all used to accomplish the high performance[2]. 2 to 8 GHz is the frequency range. It allows users to access mobile phones from anywhere in the globe. 4G improvement promises to take the wireless experience to a whole new level with amazing user applications including complex graphical user interfaces, high-end gaming, high-definition video, and high-performance photography[3].

Consumer expectations for mobile phones and other comparable goods are evolving. Consumers want a better user experience as well as more sophisticated and helpful apps on a more ergonomic device. To enable future 4G applications such as three-dimensional (3D) and holographic games, 16 megapixel smart cameras, and high-definition (HD) camcorders, existing 3G devices will need to increase in areas like as imaging and computing power. These types of apps will require more processing capacity than existing 3G phones can provide, necessitating the development of more effective application processors[4]. The development of mobile and wireless communication technology has been fast. Gadgets continue to shrink in size while increasing in processing power. Power. Users, on the whole, prefer more complex and sophisticated products. Apps that are useful As a result, capacity development is essential[5].The most important need in wireless communications .Various mobile services have evolved since their inception. The transition from 1G to 4G (first to fourth generation) has started.In the following manner:

1. 1G: The first-generation (1G) wireless network. Essentially, it was made up of an analog cellular system and architecture of a circuit switched network These wireless devices. Only rudimentary voice telephony was provided by networks, and Low capacity and restricted coverage are the major issues they face. region. As a result, there has been considerable rise in the telecommunications industry. High frequency ranges were required, which opened the door for With the invention of digital transmission methods techniques for analog transmission [6].
2. 2G: In the early 1990s, second generation (2G) wireless technology was introduced. Technology was developed to fulfill the capacity needs of Voice and telephone are growing in popularity, but circuit switching is restricted. Text messaging and data services This technique was used. A digital transmission system is one that can send and receive data in real time. Reducing the signal's size and compressing it more effectively as compared to analog systems, yet at the same time more packets may be sent in the same amount of time as time permits. Broadband with lower power[7].
3. 2.5G: 2.5G is an intermediate step made after 2G but before 3G. The transition from 2G to 3G was essentially a refinement of the two main 2G technologies. technologies. This technology allowed for a better experience. Capacity on 2G radio frequency (RF) channels, as well as reported data rates of up to 384 kbps throughput [3]. 3G refers to the third generation of mobile and wireless technology. technology, which succeeds 2G and comes before 4G. 2.5G was a transitional technology between 2G and 3G. 3G is used to provide high data speeds. As a result, 3G wireless Technology was developed to provide faster data transfer rates, increased network capacity, and other benefits. network services that are more complex and improved. In May of that year, The first pre-commercial 3G service was offered

by NTT DoCoMo. FOMA is a Japanese television network[6]. After that, after that, after that, after that, after that, after NTT DoCoMo was the first company to offer a pre-commercial service. In October 2001, Japan launched its first commercial 3G network.

4. 4G: 4G stands for fourth-generation cellular service. It has improved from 3G and is now the most widely used. Wireless service that is widely available, quick, and high-speed. 4G is currently only accessible in a few areas. 4G The wireless service was created to provide high-speed data. Regardless of the technology that powers 4G. For instance Sprint makes use of a technology known as WiMax. Verizon Wireless, on the other hand, uses Long Term Evolution (LTE). LTE stands for Long Term Evolution. 4G wireless is, on average, more expensive than 3G wireless. Data speeds of four to ten gigabits per second are anticipated to be available via technology. 10 times more powerful than today's 3G networks. Because 4G is a multifunctional and flexible technology, it can make use of almost all packet switching technologies.

Both orthogonal frequency division multiplexing (OFDM) and orthogonal frequency division multiple access (OFDMA) may be used (OFDMA). The OFDM method divides a digital signal into narrowband and frequency segments. The capacity of 4G to reduce the interaction among symbols and channels connected with data streaming is the rationale for its adoption. Multiple input/multiple output technology is also possible with 4G. (MIMO). 4G includes the Universal Mobile Telecommunication Service (UMTS), which is essentially a broadband 3G technology. Frames or packets are used to transmit data with this broadband technology. As a result, it can transport audio, video, text, and other kinds of multimedia datagrams at a speed of 2 megabits per second. UMTS is a component of 4G since it allows 4G to utilize GSM-based international mobile phone roaming (Global system for Mobile Communications). Time division synchronous code division multiple access (TD-SCDMA), a wireless telecommunications technique, enables 4G to transmit both circuit switched and packet switched data[8].

1.1 History 4G Wireless Networks:

The International Mobile Telecommunications-Advanced (IMT-Advanced) standard launched the first stages of what became known as 4G in 2008. Although competing approaches such as LTE and WiMAX (Worldwide Interoperability for Microwave Access) aimed to fill the gap between 3G and 4G, no mobile network or cellular carrier was able to achieve the 100 Mbps speed that 4G stipulated in 2008, there were competing approaches such as LTE and WiMAX (Worldwide Interoperability for Microwave Access) that directed to fill the gap between 3G and 4G. Sprint was a big supporter of WiMAX, while Verizon pushed for LTE. WiMAX and LTE vary in that WiMAX does not utilise OFDM, which has been a critical component of alcommercial 4G installations over time. Sprint shifted gears in 2011 and started to offer LTE throughout its network, while WiMAX began to go away. Since 2011, LTE has gradually improved in speed and performance, with 4G LTE-A technology delivering the full 100 Mbps of network throughput specified by the original IMT-Advanced standard to cellular networks. The development and deployment of 4G's successor, 5G, will take many years. A new generation of technology takes many years to roll out, just as it did with previous generations. The deployment of new carrier technology and antennas, as well as mobile devices that accept the new standard, are all part of the 5G rollout. It will take time for all of those efforts to bear fruit. As with 1G, 2G, and 3G networks, 4G networks will eventually be phased out in favour of future generations at an undetermined period[9].

1.2 Benefits of 4G networks :

- *Technology Performance Improvement:* Increases uplink and downlink throughput while lowering latency and expanding network possibilities. In the next years, it is widely expected that mobile data traffic would continue to increase substantially. Regardless of the 4G technology utilized (LTE or WiMAX) in contrast to 3G, the bulk of the fundamental transport and throughput constraints will definitely be provided by the technology itself. 4G technologies provide at least a twofold increase in spectrum efficiency, improved support for real-time applications, and higher maximum speeds. Though there are other network and capacity challenges, such as edge or gateway management, signaling management, that must be completely addressed in order to maximize the upgrade's advantages.
- *New Mobile Application Enablement:* This feature allows new mobile apps to be developed to complement current ones (Streaming Music). The improved 4G bandwidth and latency will benefit a variety of 4G services, such as digital storage and smart home monitoring. Other services, such as MMS, digital picture frames, and various near-field communication applications, will not benefit from using a 4G network. As a result, it's critical to take a close look at the services and applications that are likely to benefit from 4G advancements. We can see that video streaming, MMOG/gaming, and expertise applications like interactive learning benefit the most from the deployment of 4G technology.
- *Addressable Device Expansion:* Network potentials and chipset scale may allow for the expansion of connectivity to a variety of innovative devices. Smart phones and more specialized gadgets continue to evolve handset technologies to include a wide range of features and value added services. The Terminal operating model has always supported a carrier-controlled service experience. Commercial operating systems like Windows Mobile and RIM have attracted heavy data users, causing network congestion by reducing control. Furthermore, the growing open eco-systems, which are further enabled by 4G, present a difficult opportunity for operators, as third parties develop services, applications, and customization tools to meet user needs. Because to open standards, gadgets are becoming more configurable, and more specialized devices such as netbooks, readers, and tablets are entering the market. We believe that manufacturers should consider a micro-segmentation-based device roadmap to satisfy the requirements of smaller user segments; different new distribution channels are required to enable the acceptance of Converged Mobile Gadgets and 4G apps.
- *Differentiated Customer Experience:* It allows you to manage the user's expectations and experience when using new features and services. We consider the user's experience in gaining a deep understanding of how these services are completely facilitated and how they integrate into the fabric of our lives, the need or capability to deploy expertise or configured gadgets to support enhancement, and finally, how to make money and when to share the revenue from service delivery. It has been insufficient in comprehending the experience of a 4G user until now, and it is unclear how much the user experience will change as more and different 4G services become available [5]. We are well aware that customer expectations in terms of price points are shifting, with increasing expectations to pay "a little for a little," which contrasts with current pricing and expects an extra bundling of services and apps into a

"solution" that helps them live better. As a result, the adoption of 4G services will rely heavily on addressing the most likely Use-Cases for 4G services.

- *Changes in Business Models:* 4G wireless technology will be critical in enabling new collaboration and monetization models. The industry has been exposed to the illusion of all-you-can-eat pricing structures, or flat-rate phone and data plans, during the last several years. This has driven performance in line with Pareto's data consumption rule, which states that 4 percent of users consume more than 70% of the bandwidth. In areas with a large number of smart devices, the resulting network bottlenecks limit access [5]. According to the bandwidth needs of many 4G use cases, the aforementioned issue will only grow worse if current pricing mechanisms are not changed. One option now being explored by operators is to move toward tiered pricing depending on traditional characteristics such as time, speed, and service quality. The bandwidth on demand service model, as well as the related pricing technique of charging premium price for these burst needs, is another viable service type. This may be useful for organizing high-bandwidth events like video streaming or live television. Given what we know now, 4G wireless technology will need a shift in pricing structures to favor smaller upfront costs (subscriptions, one-time purchases, ad-based, fermium, and per-use). Open development manifestos and collaborative solution deployment/creation techniques, on the other hand, may have an impact on how various pricing models operate. Without a doubt, the new 4G service eco-system and use-cases arrangements raise the important question of who will pay for the services and how the revenue will be divided.

1.3 Challenges of 4G Networks :

- *Security and Privacy:* When developing 4G Wireless Networks, security measures must be implemented to ensure the safest possible data transmission technique. "The 4G core delivers mobility, security, and QoS by reusing existing methods while still working on a few mobility and handover concerns," the authors state explicitly [5]. As a result, in order to protect data being transmitted across the network from hackers and other security breaches, the organization must develop an efficient and effective set of tools that will support the most stringent 4G security measures. Because of the nature of the 4G wireless network, there is a higher risk of security breaches, so multiple levels of security, including increased validation requirements, will be required to protect data and information transmitted across the network. One of the main goals of 4G wireless networks is to provide faultless service to a large geographic area. Smaller local area networks, obviously, will use various operating systems[10]. The diversity of these networks, which exchange various types of data, exacerbates privacy and security concerns. Furthermore, because new gadgets and services are introduced in 4G wireless networks for the first time, the encryption and decryption schemes used in 3G wireless networks are incompatible with 4G wireless networks. There are two approaches that may be used to overcome these problems. The first method entails adapting existing privacy and security techniques for use in heterogeneous 4G wireless networks. When existing methods fail to adapt to 4G wireless networks, the latter method relies on developing new, fresh dynamic reconfigurable, lightweight, and adaptive mechanisms.
- *Quality of Service:* In terms of network quality, various telecommunication service providers, such as Ericsson's 4G Wireless Networks for Telia Sonera, assure users of enhanced

connectivity and the highest possible data quality that is transmitted across the network. It allows users to stay connected at all times, even while "on the move," thanks to data rates nearly ten times higher than today's conventional mobile broadband networks and real-time performance. As a result, service providers must develop an efficient and effective method for 4G Wireless Networks that improves quality, implements effective security measures, and ensures that all users have access to a wide range of options for downloading music, video, and picture files without delay. Integrating IP-based and non-IP-based devices is a significant challenge for 4G wireless networks. We all know that non-IP address based devices are often utilized for applications like VoIP. IP address-based devices, on the other hand, are often employed for data delivery [5].

1.4 Evolution Of Mobile Wimax Technology :

Mobile WiMAX has proven to be an essential component of today's contemporary, digital environment. As a consequence, individuals are becoming more reliant on mobile computers. The demand for high-speed data downloading and transport on mobile devices has prompted the development of new techniques to meet the various requirements of mobile computing. In the past two decades, our globe has seen many innovative developments in the area of wireless networks. Today, wireless networks have become an important part of people's daily lives, and they are becoming more popular with each passing day due to the need for mobility and high-speed broadband access. In the area of wireless networks, new and rapidly developing technologies are now being developed that enable high-speed broadband wireless access. Mobile WiMAX (Worldwide Interoperability for Microwave Access) is a sophisticated next-generation mobile broadband wireless network that supports 4G and is based on IEEE 802.16e-2005[7].

It was originally designed to solve problems with wired networks, but it later evolved into a 4G wireless network with upgrades from 802.16-2004, 802.16e-2005, and 802.16m. IEEE 802.16e - 2005 is an upgrade to IEEE 802.16 -2004[8], which was the fixed data transmission technique for broadband connections to MAN at the time. The Wireless MAN-OFDMA specification helps to provide an improved air interface for use in unlicensed or licensed bands. Nowadays, users want to be able to stay online at all times, as well as have fast data transmission at a low cost with no data loss. Currently, a large number of PDAs (Personal Digital Assistants) on the market are capable of flawless wireless data transmission while maintaining mobility. Such requirements will become increasingly common in the future, so developers (such as the WiMAX Forum) are on the lookout for them in order to make these devices more user-friendly. For such issues, WiMAX (802.16e-2005) is the solution. WiMAX has a range of nearly 30 miles and can support data rates of up to 75 Mbps.

2. DISCUSSION

Fourth (4th) Generation Technology is abbreviated as 4G. 4G technology is essentially a 3G technology extension with increased capacity and service offerings. However, no one knows what the actual meaning of 4G is at this moment. Some argue that 4G technology is a future technology that is mainly in its maturation stage. The main expectation for 4G technology is high-quality audio/video streaming via an end-to-end Internet Protocol connection. Nothing of this may matter if the Internet Protocol (IP) multimedia subsystem movement accomplishes its goals. WiMAX or mobile structural design will become more transparent over time, making the adoption of many designs by a single network operator more common. Application flexibility

and high dynamism consumers traffic, radio environment, air interfaces, and quality of service are the key characteristics of 4G services that users are interested in. The wireless industry will benefit from numerous advances in fourth generation (4G) technology, including downlink data speeds well above 100 megabits per second (Mbps), reduced latency, efficient spectrum utilization, and low-cost implementations. With impressive network capabilities, 4G enhancements promise to take the wireless experience to a whole new level with impressive user applications like sophisticated graphical user interfaces, high-end gaming, high-definition video, and high-performance Ad hoc and multi hop networks (multi hop networks are required for voice due to the strict delay requirements).

3. CONCLUSION

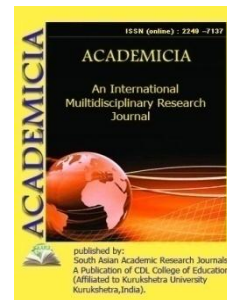
This paper provides an overview of 4G wireless networks and technologies, as well as the development of WiMAX and LTE network design and the OFDMA method. We've seen that the number of people using wireless internet has exceeded the number of people using fixed broadband. As a result, in an increasingly digital and wireless world, technologies with greater throughputs are becoming more important. Coverage and capacity are critical components of a successful and advanced 4G wireless network. The most viable technologies for a successful 4G rollout are LTEAdvanced and WiMAX. As a result, a new technology that is cost-effective, has greater throughput, better coverage, and capacity is required in today's world. It is clear that 4G technologies will have a global impact on web-based communications. Improved applications such as telemedicine, which may save lives, will be possible thanks to 4G technology. It is a completely IP-based network that will vastly enhance data transmission. There will be minimal signal interruptions, and downloads will be completed in a couple of seconds, quicker than ever before. A 5G cell phone, as well as a 5G network based on 4G technology, will be released in the near future, enabling the whole globe to connect indefinitely.

REFERENCES

1. U. Varshney, "4G wireless networks," *IT Prof.*, 2012, doi: 10.1109/MITP.2012.71.
2. S. C. Yang, "Mobile applications and 4G wireless networks: A framework for analysis," *Campus-Wide Information Systems*. 2012, doi: 10.1108/10650741211275107.
3. A. N. Bikos and N. Sklavos, "LTE/SAE security issues on 4G wireless networks," *IEEE Security and Privacy*. 2013, doi: 10.1109/MSP.2012.136.
4. M. Kaur Gondara and S. Kadam, "Requirements of Vertical Handoff Mechanism in 4G Wireless Networks," *Int. J. Wirel. Mob. Networks*, 2011, doi: 10.5121/ijwmn.2011.3202.
5. S. Rajeswari, "4G wireless networks: Opportunities and challenges," *Middle - East J. Sci. Res.*, 2012, doi: 10.5829/idosi.mejsr.2012.12.12.1231.
6. M. S. Hayat, S. I. A. Kazmi, R. Hasan, and A. H. Bhatti, "An architecture of future wireless network for smart cities by improving 4G LTE wireless network," 2016, doi: 10.1109/ICBDSC.2016.7460361.
7. J. A. Shaheen, "4G Wireless Networks Architecture an Overview and Security Issues On 4G," *Int. J. Futur. Gener. Commun. Netw.*, 2017, doi: 10.14257/ijfgcn.2017.10.1.02.
8. P. Rengaraju, C. H. Lung, and A. Srinivasan, "QoS-aware distributed security architecture

for 4G multihop wireless networks,” *IEEE Trans. Veh. Technol.*, 2014, doi: 10.1109/TVT.2013.2292882.

9. S. Chavan and V. Mane, “4G Wireless Networks Challenges and Benefits,” *Int. J. Emerg. Technol. Adv. Eng.*, 2013.
10. R. Attia, R. Rizk, and H. A. Ali, “Internet connectivity for mobile ad hoc network: a survey based study,” *Wirel. Networks*, 2015, doi: 10.1007/s11276-015-0922-3.



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A REVIEW ON SIDE EFFECT OF HEAVY METALS IN AGRICULTURE

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ABSTRACT

When heavy metals are exposed to stress, they decline into molecular oxygens, releasing highly reactive transitional chemical products such as hydrogen peroxide (H₂O₂), superoxide radicals, and hydroxyl radicals, all of which are classified as reactive oxygens. Heavy metal pollution is a serious global environmental problem because it disrupts plant growth and causes genetic dissimilarity. Heavy metals, both necessary and non-essential, have similar fatal effects on plants, such as poor biomass accretion, chlorosis, growth inhibition, photosynthetic inhibition, altered water balance and nutrient integration, and senescence, which ultimately leads to plant disease. The goal of the research was to look at the impacts of heavy metals on plants and biological systems, as well as remediation techniques. Precipitation, Biosorption, Ion Exchange, and Filtration are all efficient techniques for overcoming this issue, but they are not cost-effective. Phytoremediation was shown to be the most efficient and cost-effective method in this respect. Although bioremediation seems to be the greatest option, it does have certain drawbacks. In order to use this technique effectively, a longer study must be accompanied in order to decrease the constraint.

KEYWORDS: Agriculture, Anthropogenic, Metals, Pollution, Soil.

1. INTRODUCTION

Human usage and management of water and soil resources have impacted the growth, survival, degradation, and revival of anthropoid advancements supported by agriculture. Soil and water are essential natural resources for the domesticated food production system based on plants and animals. Despite the fact that soil is often referred to as the "productive substrate," not all soils are suitable for crop development. In ideal agricultural soils, mineral inputs, soil organic matter, air, and water are all present. The balanced contributions of these components enable water retention and drainage, root zone oxygen, nutrition to assist yield growth, and plant physiological care. The circulation of soil components in a particular soil is influenced by five factors: parental material, time, weather, species, and landscape.

Each component has a direct and overlapping impact on the suitability of a soil for agricultural use. Agriculture disrupts the natural cycle of nutrients in soil. Plant nutrients may be extracted from the soil using precision agronomy and harvesting of crops for human and animal use. To maintain soil richness for sufficient yield harvests, soil amendments are generally required. To improve soil fertility, early hominids used animal dung, charcoals, ashes, and lime in their arenas (CaCO_3). Farmers now employ a range of soil additives, including inorganic compound manures and carbon-based sources of nutrients, such as manure/compost, to enhance soil richness, which has resulted in an oversupply of primary macronutrients. Excess nutrients, especially nitrogen and phosphorus, may pollute the soil and groundwater when they are transferred from agricultural areas through surface runoff or leaching[1], [2].

Soil is an important component that receives a significant amount of pollutants each year from a variety of sources. Soil, in general, serves as a natural barrier by controlling the movement of chemical components and chemicals into the atmosphere, as well as a sink for substance pollutants. Heavy metals are usually thought to be naturally occurring substances, although they are found in large amounts in certain ecological areas as a result of human activity. As a consequence, the environment's ability to replace lifecycles is damaged, posing a threat to human, animal, and plant health. This is due to the non-degradability of heavy metals, which causes bioaccumulation in food chains. In a broad range of biological patterns, heavy metals may be found in both degraded and uncontaminated soil coverings. Because heavy metals cannot be tarnished or removed, they accumulate in soils, water, and residues[3], [4]. Heavy metals in soils may also form naturally as a result of human activity (Figure 1). Atmospheric emissions from volcanoes, movement of mainland soils, and weathering of metal-supplemented rocks are examples of natural bases.

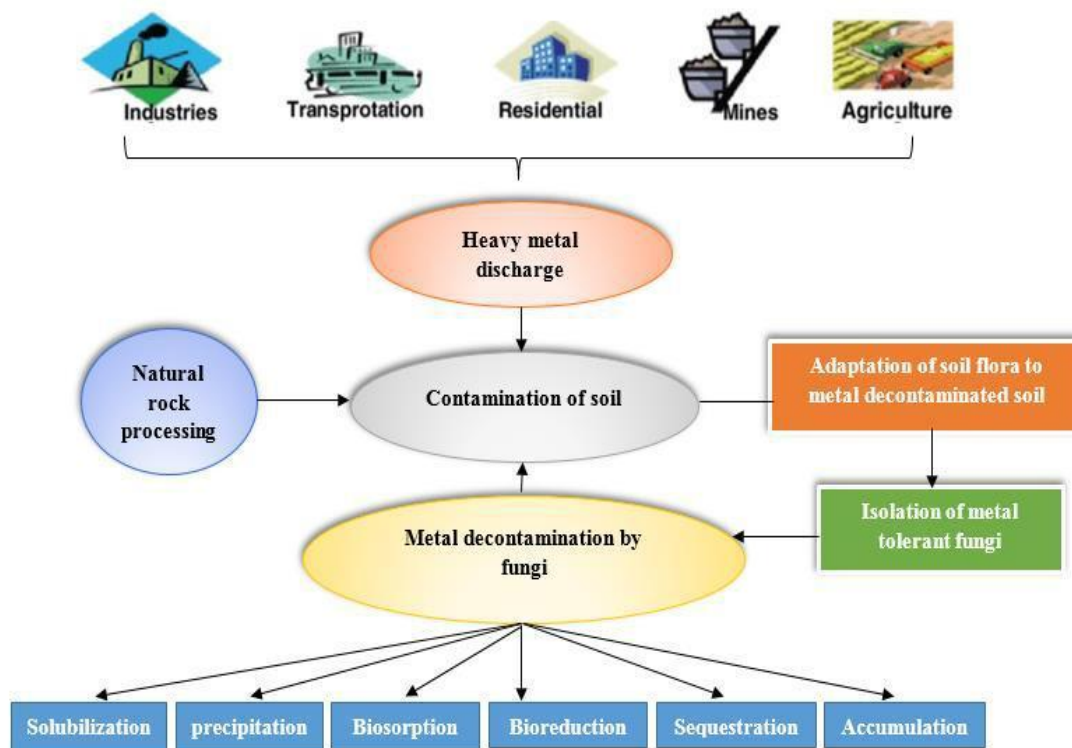


Figure 1: Heavy Metal Pollution Sources And The Approved Approaches For Metal Refinement [5].

Adulteration of agricultural and forestry soils with trace metals and metalloids has been a major source of worry throughout history. Metals in agricultural soils may enter food chains, increasing human exposure and risk (both cancer-causing and no carcinogenic hazards), while metals in woods are mainly a danger to pore water supplies, environmental risk, and woodland health. Metalloid and trace metal pollution in agricultural and forest soils has been a significant issue for decades. Due to rapid automation in emerging nations, the global world's excessive use of metals and manufactured chemicals, coupled with inadequate environmental management, resulted in widespread contamination. Heavy metal contamination in agricultural soils has sparked concern in recent years about the risk of direct consumption, bioaccumulation via the food chain, and ecological system effects to human health. Heavy metals such as copper, zinc, and manganese, as well as unneeded heavy metals such as cadmium, chromium, manganese, and lead, are the most hazardous to humans and marine life.

The presence of metallic elements in soils is a major issue since they accumulate in food chains, causing damage to the whole environment. Organic pollutants are biodegradable, but the presence of heavy metals in the atmosphere reduces the biodegradable frequency, thus doubling the emissions, i.e. organic pollutants and heavy metals. Heavy metals endanger people, animals, plants, and natural ecosystems in a number of ways. Variations in soil pH, penetrability, pigment, and usual interaction, as well as uninterrupted ingestion, plant adsorption, food-cycle, drinking contaminated marine, and changes in soil pH, penetrability, pigment, and usual interaction, all have an impact on soil value.

2. LITERATURE REVIEW

A.Mahar et al discussed toxic metals have been released into the environment as a consequence of mining activities, industrial production, and household and agricultural usage of metal and metal-containing compounds. Metal contamination has grave consequences for human health and the environment. Few heavy metals are toxic and fatal in small amounts, and some are teratogenic, mutagenic, and endocrine disruptors, while others induce behavioral and neurological problems in babies and children. As a result, heavy metals polluted soil remediation may be the sole viable alternative for reducing the detrimental impacts on ecosystem health. In light of the above facts, this paper attempts to evaluate the present state, difficulties, and possibilities in phytoremediation for heavy metals removal from polluted soils. Phytoextraction and phytostabilization are highlighted as the most promising and alternative techniques for soil reclamation[6].

A. N.Ganeshamurthy et al. describes about the ecological risk related with metallic element contamination into water, plants and soil in developed and under-developed agriculture. Since the invention, the percentage of Indians living in towns and developed regions has increased to 27%. Despite restricted regulations and restrictions, underdeveloped agribusinesses are operated on a large scale in many developed regions throughout the globe. Non-degradable pollutants introduced into the system by human activities, such as metallic elements in soil, water, air, and crops, cause more concern since they have a tendency to bio-accumulate. Metallic element poisoning has wreaked havoc on humanity in the past, destabilizing intellect and causing embarrassing conduct. The body suffers from a shortage of important elements such as Cu, Zn, and others as a result of these pathogenic elements. With current level knowledge, a long-term and assured technique to block the entry of metallic elements into the food cycle is challenging. There are a number of options for reducing the outcome's concentration. Crop lands used in a different manner, which is indirectly eaten by people and animals, is a superior tonic for retaining element entrance into the food chain. There are many ecological regulations in India that regulate water, air, soil, and trash. Governmental foundations are built on the belief that a regulatory paradigm is sufficient. Regulatory mechanisms may not be in place in all instances, but they are essential derivators to complement other methods by putting a "limit" on the degree of deprivation that is informally acceptable, as well as allowing for alternative, cleaner, and appropriate replacements to be "possible." [7].

ShaliniArora et al. discussed soil analysis and its potentially harmful impacts on human health. The study of the environment has been going on for a long time, and the molecular structure of naturally occurring topsoil has been changing through time in response to the ecological conditions of the environment. This percentage is the deciding element of soil richness because when the soil arrangement changes, the richness and quality of the soil degrades quickly. Metallic poisoning is a common side effect of long-term, low-level exposure to fundamental pollutants in the environment. Exposure to hazardous metallic elements has been linked to a number of long-term illnesses and may result in a wide range of health problems. Urban soil receives various contributions of metallic elements from a variety of moving and stationary sources, such as vehicular traffic, power generation facilities, waste incineration, and resuspension of surrounding polluted top soil, and contributes significantly to contamination in developed areas. Because roadside topsoil is more polluted than any other location, such as grounds or a farm home, the percentage of the composition of the top soil varies in various

regions of the atmosphere. Due to significant growth in automobiles and industry, these differences are particularly noticeable in Indian metro areas. As a result, studying urbanized top soil is crucial for determining the source, movement, and metallic pollution in developed regions[8].

3. HEAVY METAL BASES

Heavy metals may originate mutually from regular and anthropogenic procedures and finish up in dissimilar environmental sections shown in Figure 2.

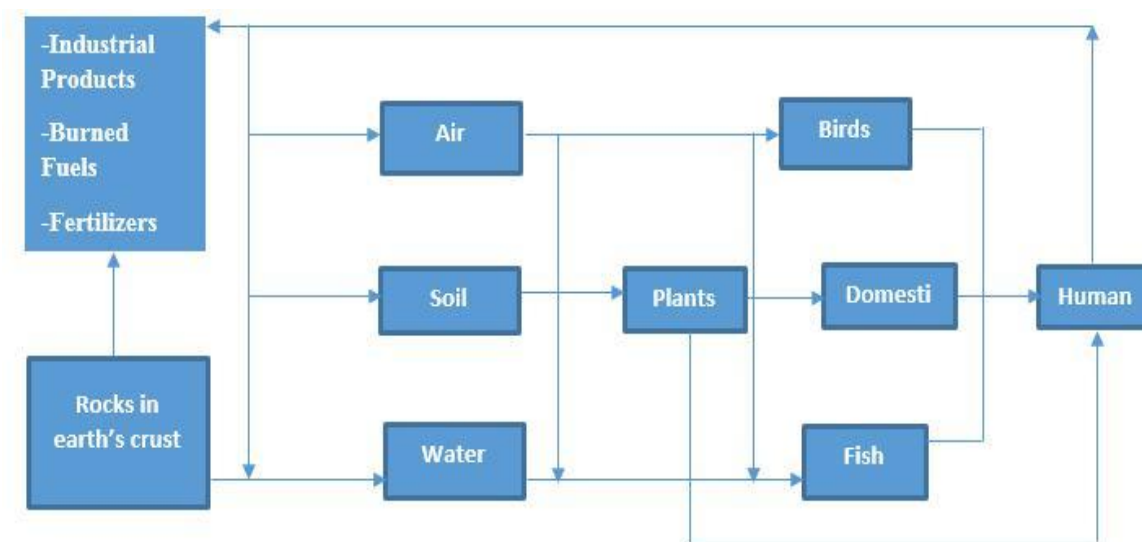


Figure 2: Illustrates the metallic element and their cycling in the soil-water-air organism ecosystem.

2.1. Natural Processes:

Natural heavy metal emissions occur as a result of a variety of environmental factors. Such pollutants include volcanic eruptions, sea-salt sprigs, forest fires, rock cracking, biogenic source, and wind-borne soil particles. Metals may be released from their usual spheres and into various environmental sections as a result of natural weathering processes. Heavy metals include hydroxides, oxides, sulphides, sulphates, phosphates, and carbon-based compounds. Even though residues of the above-mentioned heavy metals have been discovered in humans and other animals, they continue to cause serious health issues.

2.2. Anthropogenic Processes:

Heavy metal anthropogenic activities have been shown to go beyond natural metal variations. Metals often detected in wind-blown dusts come from industrial locations. Smelting, which releases arsenic, copper, and insecticides, which releases arsenic; and the flickering of fossil energies, which releases nickel, mercury, and extra heavy metallic elements, are all significant anthropogenic bases that knowingly contribute to heavy metal adulteration in the atmosphere. Because of everyday production of products to meet the needs of the large population, anthropological activities were discovered to pay greater attention to environmental pollution.

4. MECHANISMS OF REMEDIATING HEAVY METALS

Due to a range of metals, metalloids, and anionic elements, acid mine water treatment methods generally yield high density slush that is dissimilar, making disposal difficult. As a result, recent research has focused on chemical types recovered from Acid Mine Drainage (AMD) and subordinate slush. This helps to recover scarce resources while also making sludge treatment and disposal easier and safer, decreasing their ecological footprints. Metal laden leftover is disposed of in landfills and leftover retention tarns, causing subordinate contamination of exterior and sub-surface water sources. It can also clue to soil pollution, which reduces efficiency. So as to protect humanoid well-being, floras, faunas, soil, and including other habitat sections, heavy metal remediation technologies should be given appropriate and thorough consideration[9], [10]. The majority of physical and chemical metallic element remediation methods necessitate the processing of massive volumes of sludge, devastate habitats, and are extremely costly (Figure 3).

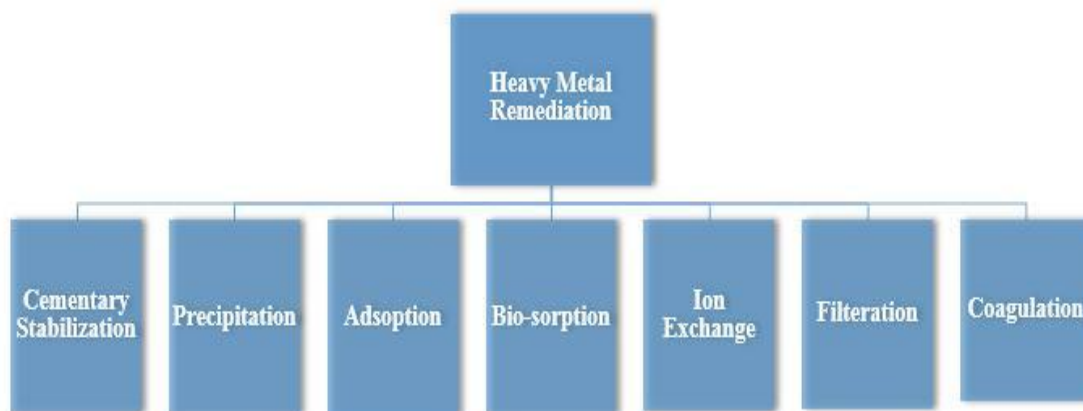


Figure 3: Illustrates the various methods to remove heavy metals from agricultural soil.

4.1. Precipitation:

Various alkaline chemical reactants have been employed to neutralize AMD (Acid-Mine-Drainage) throughout the years in order to increase the pH and, as a consequence, precipitate and recover the metals. The most common alkaline reactants utilized for successive recovery of reserves resources from AMD and magnesium hydroxide ($Mg(OH)_2$) are caustic potash ($NaOH$), clastic rock ($CaCO_3$), burntlime (CaO), sodium carbonate (Na_2CO_3), and calcium hydroxide ($Ca(OH)_2$).

4.2. Adsorption:

Because of its instability and elution capabilities, surface assimilation is regarded the most efficient and economically viable option for eliminating metals from liquid blends. With highly concentrated solutions, surface assimilation is unsuccessful because the adsorptive rapidly becomes saturated with the adsorbate. It's only useful for very dilute mixes, it takes a long time to renew, and it doesn't discriminate between metals when it comes to attenuation.

4.3. Ion Exchange:

Between a solid substrate and a soil solution, this is often referred to as ion exchange. Clay and mastics with an increased atomic interchange potential are often used to approve alloys made from liquid blends. This method, however, is time intensive and only works for a limited number of metal concentrations in the combination. Heat and alkalinity affect this arrangement as well.

4.4. Biosorption:

Biosorbents have many benefits, including accessibility, performance, and capacity. This is a basic and easy process. It's simple to regenerate, which makes it attractive. However, if the feedstuff blend concentration is too high, the progression will rapidly outstretch, preventing advance impurity removal.

4.5. Membrane Technologies:

When the water includes a significant concentration of pollutants, sheath equipment for acid mine drainage recovery is especially effective. Either assisted diffusion or reverse osmosis are used in this process. Some of the membranes used in mine water treatment filtration include ultrafiltration, Nano filtration, diffusion, microfiltration, and element percolation.

5. CHALLENGES IN THE PHYTOMINING OF METALLIC ELEMENTS POLLUTED SOIL

Several biological, physical, and biochemical techniques have been employed to remove heavy metals from the soil during the last two centuries. These approaches, however, have significant drawbacks. They need a lot of time and effort, as well as a lot of disturbance in the native soil microbiota and constant changes in the physio-chemical characteristics of the soil. Phytoremediation technique is given unique attention amongst different perspectives to repair the heavy metal contaminated soil undisturbed. Phytomining is a method that uses natural or genetically engineered plants to remove dangerous chemicals from the environment, such as radioactive elements, fungicides, polychloroterphenyl and polynuclear pungent natural gas, and convert them to safe combinations. The emphasis of phytomining is divided into three layers: I plant-centered element removal with monetary advantages, (ii) threat reduction, and maintainable soil supervision, in which phytoremediation gradually increases soil richness, allowing crop development to be tracked. High biomass fabrication and fast-budding plants, such as poplar, jatropha, and willow, are being used for the twin aim of energy generation and phytomining in the accumulation. Phytomining is a solar-powered, recyclable machine that has a good reputation in the community. In the near future, phytoextraction of metallic elements is expected to be a cost-effective equipment for agromining of metallic elements.

6. DISCUSSION

There is a complicated connection between environmental chemical composition of natural resources and emissions, according to their independent study. Ferrosol sewage sludge is the source of heavy metal's environmental impact. The impacts of heavy metal emissions from different sources on topsoil and flowing water in various regions of the globe, as well as their dominance of pollution or metallic residues. Heavy metals such as chromium, manganese, copper, mercury, and zinc pollute soil, posing serious environmental problems since they are non-essential and detrimental to flora and wildlife, as well as having a direct hazardous effect on human health. Anthropogenic activities such as mining, industrial development, and agronomic practices such as the use of pesticides, fungicides, and composts have lately discharged heavy metals into the topsoil, water, and atmosphere. Through a number of physiological processes, these metallic elements are released into the plant system, affecting plant growth. The absorption of metallic elements into the environment varies according to a variety of factors, and it becomes hazardous when it exceeds acceptable limits. The possible genesis of these components has led

to an increasing presence of metallic elements in the environment, whether via direct absorption from contaminated soil, depletion of fully-fledged crops on polluted soils, or drinking wastewater that has infiltrated through these soils. The goal of this study was to look at how heavy metals affect agriculture and how they affect human health, as well as to propose some ways for removing heavy metals from crops and soil. Heavy metal buildup occurs only when vegetal crops are cultivated in a contaminated region with metallic elements, and these metallic elements subsequently enter the food chain. When people consume a metallic element-contaminated root vegetable, they develop a range of severe health issues. These heavy metals have an impact on soil nutrient status, soil strength, water supplies, and extramarine living organisms, in addition to plants and people.

7. CONCLUSION

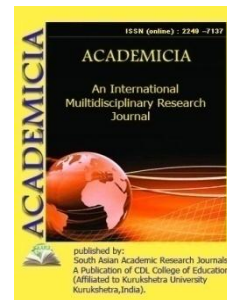
By producing different types of garbage and dumping them without proper management, modern lifestyles and industrialisation have created countless environmental problems. These trashes contaminate the environment, causing the most critical and fatal impacts on living creatures, jeopardizing their survival. The most hazardous feature of industrial wastes and other trashes is the discharge and buildup of metals, particularly heavy metals. Metallic element contamination of agricultural soils as a result of growth and industrial development is of great concern due to the potential health risk caused by consuming contaminated crops. Vegetables are an important component of the human diet because they provide vital nutrients for optimum health. As a consequence of frequent applications of fertilizers and pesticides, heavy metals have accumulated in plants. The toxicity of heavy metals ingested via contaminated vegetables is a major issue.

However, just a few research have been conducted to establish the permissible limits of heavy metal music. As a result, it is recommended that trash be processed before being thrown in the environment in order to reduce the sound impacts on the atmosphere by converting them into less hazardous forms. Effective treatments are too costly. The most efficient and cost-effective approach in this respect has been determined to be bioremediation, which entails the use of living organisms to address certain pollution-causing circumstances via effective absorption of pollutants from the desired environment. It has been discovered that phyto-remediation, or the employment of plants to clean up trash, is extremely successful. In addition, a new research on heavy metal exposure in babies, the elderly, and women, especially pregnant women, is required. In addition, strategy and policy are needed to monitor the limits of accretion in vegetables and hyperactive accumulators specified for certain plants.

REFERENCES

1. S. J. Parikh and B. R. James, "Soil: The Foundation of Agriculture Agriculture," *Nat. Educ. Knowl.*, 2012.
2. B. Sanjai and W. Resources, "Soil : The Foundation of Agriculture Agriculture and Human Society," *Nat. Educ. Knowl. Proj.*, 2014.
3. J. A. Sandor and J. A. Homburg, "Anthropogenic Soil Change in Ancient and Traditional Agricultural Fields in Arid to Semiarid Regions of the Americas," *J. Ethnobiol.*, 2017, doi: 10.2993/0278-0771-37.2.196.
4. D. R. Montgomery, "Soil erosion and agricultural sustainability," *Proc. Natl. Acad. Sci. U. S.*

- A., 2007, doi: 10.1073/pnas.0611508104.
5. A. Zaidi, M. Oves, E. Ahmad, and M. S. Khan, "Importance of Free-Living Fungi in Heavy Metal Remediation," 2011.
 6. A. Mahar *et al.*, "Challenges and opportunities in the phytoremediation of heavy metals contaminated soils: A review," *Ecotoxicology and Environmental Safety*. 2016, doi: 10.1016/j.ecoenv.2015.12.023.
 7. A. N. Ganeshamurthy, L. R. Varalakshmi, and H. P. Sumangala, "Environmental risks associated with heavy metal contamination in soil, water and plants in urban and periurban agriculture," *J. Hortic. Sci.*, 2008.
 8. S. Arora, "Review of Heavy Metal Contamination in Soil," *Int. J. Environ. Sci. Nat. Resour.*, 2017, doi: 10.19080/ijesnr.2017.03.555625.
 9. T. Rahman and M. F. Seraj, "Available Approaches of Remediation and Stabilisation of Metal Contamination in Soil: A Review," *Am. J. Plant Sci.*, 2018, doi: 10.4236/ajps.2018.910148.
 10. M. Monachese, J. P. Burton, and G. Reid, "Bioremediation and tolerance of humans to heavy metals through microbial processes: A potential role for probiotics?," *Applied and Environmental Microbiology*. 2012, doi: 0.1128/AEM.01665-12.



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FORMATION OF A PROFESSIONALLY-ORIENTED LEXICAL COMPETENCE FOR CS STUDYING FOREIGN LANGUAGES, ISSUE OF TEACHING IN THE EDUCATIONAL PROCESS

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ABSTRACT

The article explores the professionally oriented lexical competence of cadets and about the problem lecture and its use in the educational process. The concept of lexical competence, solving communication problems. Role-playing games, project methods, search methods. Formation of lexical skills.

KEYWORDS: *Linguistic Competence, Professionally Oriented Vocabulary, Lexical Skills, Professionally Oriented Approach, Teaching Method, Pedagogical Problem, Problem Lecture, Educational Technologies, Problem Presentation, Problem Game.*

INTRODUCTION

One of the components of linguistic competence is professionally oriented competence. The main task for teachers is to teach cadets professionally oriented vocabulary for the need to understand texts in their specialty and work with them. The student must be able to correctly correlate a specific lexical unit with other lexemes in thematic and semantic groups, with synonyms and antonyms. Master the rules of specific word formation and combination, the rules for choosing and using a lexical unit in its grammatical and stylistic structure.

Motivation plays an important role. It acts as the main direction of the process of forming professionally-oriented lexical competence.

Lexical competence is the ability of a cadet to determine the meaning of a word in context, the ability to use it orally and in writing. It should be noted that lexical competence also includes knowledge of the system and norms of the target language, which are subsequently applied in practice. Lexical competence is based on lexical skill. Lexical skills include knowledge of the word as the most important unit of the language, its forms, meanings and use.

In pedagogy, in many situations, the concept of "problem" is used to solve compound-pedagogical, psychological, and educational problems. A pedagogical problem is a pedagogical problem that must be solved, but the method of solution is not yet known. Problem-learning technologies are educational technologies that allow students to develop creative searches for small-scale research, promote obvious hypotheses, substantiate results, arrive at specific results, etc. Problemlearning technologies are based on enhancing student functions.

A problem lecture is a lecture in which the student's performance improves by participating in problem situations and towards solving problem problems. In drawing up problem-based learning, the methods used by the teacher are of particular importance. Therefore, the choice of teacher must be paid special attention. The main methods of problem-based learning are as follows: - research method; - heuristic method; - a method for creating a problem situation; - creative method; - partially creative method.

Researchers such as A.E. Sizemina, A.N. Shamov conditionally distinguish several levels in the formation of foreign language lexical competence, under which the process of forming the ability of students to solve communicative problems associated with the practical use of foreign language vocabulary in speech activity on the basis of acquired knowledge, skills and abilities is considered [5].

A professionally oriented approach is one of the main tasks of teaching a foreign language. The use of new teaching authentic materials gives the effectiveness of teaching any foreign language.

So, role-playing games, project methods, search methods, which also form social and communicative competence, help to form professionally-oriented vocabulary among cadets.

Role-playing is a way of expanding the experience by presenting them with an unexpected situation, in which it is proposed to take the position (role) of one of the participants and then work out a way that will lead this situation to a worthy end.

The project method is always focused on the independent activity of cadets: individual, pair, group, which students perform for a certain period of time.

The method of the educational project is one of the personality-oriented technologies, a way of organizing the independent activity of cadets aimed at solving the problem of the educational project, integrating the problem approach, group methods, reflexive, presentation, research, search and other methods [4].

With the problem-search method of teaching, research activity acts as a form of organizing the educational process aimed at acquiring new knowledge. First of all, of course, we are talking about the fact that when this kind of action is included in the lesson, research abilities are developed and the competence of cadets is formed.

At present, professionally oriented teaching of a foreign language is recognized as a priority area in the renewal of education.

A lecture is a report of educational material, a monological method of cooperation between a teacher and a cadet. The lecture is also a mediator of the objective connection between evidence and what happened. A lecture is the ratio of using short auxiliary dialogs that provide diagnostics, and is a factor of a qualitatively - material interpretation of the teacher's knowledge for students. This refers to the reverse relationship. The lecture consists of a connection form and

style of learning. A lecture is a connection between learning forms. This is listening to her with attention, a visual examination of the aids, a synopsis and with all this a finished lesson.

The useful aspects of a problem lecture are known: Gaining knowledge through personal research work, interest in the educational process, the development of practical effectiveness and other learning outcomes. Problematic lecture in the educational process helps to independently develop knowledge, development provides students with creative thinking and teaches them to actively participate in the learning process.

P.I. Obratsov made a huge contribution to the development of the theory of professionally oriented teaching of a foreign language. He substantiated the principle of the professional orientation of educational material when teaching a foreign language in a non-linguistic university. P.I. Obratsov emphasized that the study of a foreign language should not be an end in itself, but a means of achieving the goal of increasing the level of education, erudition within the framework of their specialty [2].

Working on professionally oriented vocabulary requires solving a number of questions: how to explain new words, what should learners know about each new vocabulary unit, and what are the difficulties in mastering it ?

There are several approaches to explaining new words: when a new foreign word is associated either directly with the concept that it denotes, or with a word of the native language using translation.

The formation of lexical skills involves the passage of certain stages: the semantisation of lexical units; automation of lexical units (the formation of lexical skills); further improvement of lexical skills.

Professional vocabulary is the main component of both expressive and receptive types of speech activity, and if cadets have mastered or, more importantly, learned to assimilate vocational lexical material and can use it in various situations of professional interaction, then we can say with a certain degree of confidence that students mastered both vocabulary knowledge and skills and abilities in all types of speech activity.

The lecture saves study time and is effective in understanding information. Problematic lecture is one of the active types of lecture. A problem lecture in the educational process helps to solve different types of problems. This type of lecture is distinguished by the fact that helps the student in creative thinking and develops. Technology problem lectures are not distinguished by variability, because the process of obtaining student knowledge is divided into several stages, they are connected with each other. When a problem situation arises, the introduced training problem is complex, but students must solve it. In the second (closed) stage of solving this problem, he himself must strive for a solution. He must understand what information and what is needed to solve this problem. In the third (open) stage, there are many ways to solve the problem of this situation.

REFERENCES

1. Andreeva, N.D. Methodological and theoretical foundations of the formation of biological education at the senior level of secondary school. Natural education, theory, methodology. - 2005. - P.58-63.

2. Obratsov PI, Ivanova O.Yu. Professionally oriented teaching of a foreign language at non-linguistic faculties of universities. Orel: OSU, 2005. 114 p.
3. Panfilova A.P. Innovative pedagogical technologies: Active learning: Textbook / A.P. Panfilov. - M.: Publishing Center "Academy", 2009. S. 159-160.
4. Theoretical foundations of methods of teaching foreign languages / ed. A. A. Klimenko, A. A. Mirolubova. - M.: Pedagogika, 2007. - 456 p.
5. Filyuta S.V. Formation of professionally oriented lexical competence among foreigners of a non-linguistic university.
6. Nabiyeva N. N. Civilizational approach to the history of the society // Modern structure and development of science in our life. – 2019. – T. 1. – №. 1. – С. 45-48.



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THE NEED TO USE MODELING IN THE TEACHING OF SYNTAX IN GENERAL SECONDARY EDUCATION

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ABSTRACT

The article discusses the use of modeling technology as a modern approach in the teaching of mother tongue in secondary schools. The article also provides information on the need and benefits of modeling in education.

KEYWORDS: Education, Upbringing, Teaching, Modeling, Modern Approach, Optimization, General Secondary Education, Continuing Education, Pedagogy, Linguistics, Linguistics

INTRODUCTION

Methods: In the article we tried to cover current issues of Uzbek linguistics using such methods as "Observation", "Analysis", "Comparison", "Comparative". We have highlighted the need for modeling technology in mother tongue education today.

Conclusions: Today's state educational standards place great demands on the suitability of students for independent learning activities. Most of the disciplines in the social and humanities were theoretical. At present, the traditional form of education does not meet the needs of the public education system and students. That is why we have a task to enrich the native language lessons of general secondary schools with modern, optimal, independent teaching technology. This article presents the basics of the need for teaching methods based on the technology of modeling the syntax of native language lessons.

Discussion: The technology of modeling mother tongue lessons in the general secondary education system is being introduced as a necessity for the teaching process today. These processes are being carried out step by step. The results of the process are aimed at the effectiveness of the education system.

President of the Republic of Uzbekistan ShavkatMirziyoyev chaired a video conference on August 23, 2021 on the development of public education, improving the skills and prestige of teachers in society, raising the morale of the younger generation. . From the first days of his presidency, the head of our state has been paying special attention to the training of innovative and creative-minded modern cadres in our country, educating young people in the spirit of patriotism and high spirituality.

At the meeting, the President reflected on the ongoing reforms in the country to reform the school education system and the urgent tasks ahead in this regard. emphasizing the importance and significance of these issues. Indeed, if we look at the history of the developed countries of the world, we see that the reforms aimed at changing the life of society in them began with the education system, kindergartens, schools, upbringing. Because you can't change a person or a society without changing the school. The basis of education and upbringing is the school. The driving force behind the school is the teacher. In order to grow up and bring up a harmoniously developed young generation that is physically healthy, spiritually mature, independent-minded, has deep knowledge and a modern outlook, and is able to take responsibility for the fate and future of our country. work is underway. First of all, the head of state stressed the need to reconsider the workload and the number of lessons in schools, to create a methodology that encourages students not only to memorize, but also to think. The experience of Finland in this regard was cited as an example. It is one of the most advanced countries in the world in general literacy, natural sciences and mathematics. "If the teaching methods in schools do not change, the quality, content and environment of education will not change," said ShavkatMirziyoyev [1,143]. In fact, as the President said, the school system, textbooks and programs should be in optimal condition. Our students need to acquire knowledge that encourages them to think and act independently, using their golden time effectively. As a result of today's rapid globalization, there is a growing body of information that needs to be studied, and yesterday's knowledge is becoming obsolete. Therefore, in our opinion, schoolchildren should be able to start their independent activities in the future with the help of this knowledge, while studying the information in the textbooks. In other words, the knowledge gained during the eleven years of education remains a real foundation for our youth. "We need to develop our material and spiritual life in harmony," he said. The school should be the main link in this. The development of school education should become a great national goal for us, a nationwide movement, "the head of state said during the meeting. [2,202-203] State educators, who have such a strong focus and demand for education and upbringing, have responsibilities. We need to research this in depth and enrich it with the most effective and optimal versions of school textbooks and teaching technologies. It should be noted that mankind has long been interested in creating conditions for a prosperous life, the early detection of natural disasters. Therefore, it is natural for human beings to study phenomena of the external world.

Specialists in the field of science study only the features of a process that interest them. For example, geologists study the history of the earth's development, such as when, where, and how animals lived, how plants grew, and how the climate changed. This will help them find minerals. But they do not study the history of the development of human society on earth, as historians do. The study of the world around us can lead to inaccurate and incomplete information. But this does not prevent others from flying into space, discovering the secret of the atomic nucleus, mastering the laws of development of society, and so on. Based on them, a model of the event

and process being studied is created. The model should reflect their characteristics as fully as possible. The approximate nature of the model can take many forms. For example, the accuracy of the instruments used during the experiment affects the accuracy of the result obtained. The concept of model is derived from the Latin word "modelus", which in the natural sciences or science in general is understood as a material device that, when information about a particular object is entered into it, the same object is formed as a product. In other words, the model is an imitation of natural objects (similarity, imitation, natural appearance) [3,97], which corresponds to the Uzbek template and standard words [3,97]. It serves as the basis for the occurrence of events and is studied in concrete or abstract objects, reduced objects and schemes. Explaining this with a simple real-life example, the characteristics that characterize an apple - its roundness, fruitfulness, sweetness, etc. - are an intellectual model of that concept. If we make an apple from clay or an artificial material, this is its material model [3,57-59]. The model is important to know on the following grounds:

First, modeling is a method that simplifies each science object. The modeling of linguistic units is based on the stable relationships of the elements within these characters. Therefore, the division of relations between the elements of the whole into stable and unstable types is of great importance for linguistic modeling. Second, Modeling is a general scientific method common to all disciplines and is based on the following principles: deductiveness - is based on logical reasoning and is based on the principle of specificity to generality; The use of a thinking experiment is to interpret the model as an idealized object.

The concept of linguistic model was introduced by such representatives of structural linguistics as E. Sepir, L. Bloomfield, R. Jacobson, Chomsky, Harris, Hocket. Its development dates back to the 60s and 70s of the twentieth century (the period when mathematical and cybernetic linguistics began to develop). The linguistic model can be divided into the following types:

1. Models of human speech activity. These models reflect specific speech processes and events. For example, the pronunciation model of a specific sound or the speech pattern of speech.
2. Linguistic research models. It reflects a research process based on specific linguistic phenomena.
3. Metamodels - in which linguistic models are selected, which have a hypothetical-deductive character, are very abstract and rationalized. The method of modeling is actively applied in some languages, including English.

The structure of a simple sentence in Uzbek: $S + O + V$: *I picked flowers. I ate fruit.*

S = subject, **O** = object, **V** = verb.

In determining the linguistic essence of a simple sentence, linguists rely on the following interpretation of syntactic theory about speech:

1. The smallest pattern of speech, as a linguistic unit, is the general unity that exists in our minds, and it is the ability to form and express thought in our speech in accordance with the laws of language.
2. In determining the smallest form of a sentence, its external structure, internal structure and essence are distinguished.

3. The definition of the essence of the components of the minimum sentence pattern is based on the coherence (valence), ie the semantic (semantic) and syntactic, as well as morphological cohesiveness of lexical units. and those representing them) were removed.

4. In determining the smallest sentence pattern in Uzbek, the main difference in sentence structure between Indo-European and Turkic languages was the focus. The difference is that Indo-European languages are not unique to monosyllabic sentences and can never be ownerless.

There is no significant difference between Turkic languages, especially Uzbek, “I write a letter, you carry a letter” and “I write a letter, you carry a letter”, ie in Uzbek the cut is perfectly formed in terms of personality [4,54].

Based on the four principles outlined above, **[WPm]** is defined as the smallest building block of a simple sentence. In **[WPm]**, **[W]** is the part of speech that serves as a noun, a lexical meaning, and belongs to an independent group of words, that is, to a word, a phrase, an extended compound (adjective, adverb, movement names turnover). More specifically, **[W]** is a linguistic pattern that can act as a noun unit in speech and can occur in the form of any unit of speech (word, phrase, or even sentence). **[Pm]** is a symbol of the set of tools that make the noun unit **[W]** into a speech pattern, which is expressed in speech in the form of cut-off category indicators.

[WPm] = The following speech derivatives of SG consist only of a unit of atov formed by cross-sectional indicators:

	[W]	[Pm]
1.	<i>Yoz</i>	<i>-moqchi+miz</i>
2.	<i>Ketmoqchibo'l</i>	<i>-ma+sa +kerak</i>
3.	<i>O'qi</i>	\emptyset
4.	<i>Oqko'ngil</i>	<i>-siz</i>
4.	<i>Aytib qo'y</i>	<i>-ma+sa+ngiz</i>
5.	<i>Talaba</i>	<i>-man</i>
6.	<i>Ona bo'l</i>	<i>-gan+ekan</i>
7.	<i>Bola</i>	<i>edi+m</i>
8.	<i>Kim</i>	<i>-san</i>
9.	<i>O'ttiz</i>	<i>-dir</i>
10.	<i>Baxtiyor</i>	<i>-siz+lar</i>

The main criterion in defining the smallest sentence pattern in Uzbek language - **[WPm]** = SG is that Turkic languages, in particular, Uzbek, form the center of speech in the sentence structure. After all, the smallest construction pattern of a sentence consists of a unit of atov formed by cross-sectional indicators. **[WPm]** = SG exists in our minds as a linguistic syntactic unit, an opportunity to shape and articulate thought in our speech in accordance with the laws of language.

WPm is a model of minimal simple speech. M: *I read. You wrote*

Therefore, the smallest model of a compound sentence in Uzbek is:

S1 + V1, S2 + V2: *Autumn has come, the weather has started to cool.*

The simple sentence construction in English and Russian is defined as follows: $S + V + O$: *I'm writing a letter. He's playing a checker.*

I have write the letter. I am reading an interesting article.

The general linguistic pattern of compound sentences is $[WPm \ R \ WPm] = QG$, which is divided into three intermediate forms:

- $[WPm \ , \ WPm] = QG$
- $[WPm \rightarrow WPm] = QG$
- $[WPm \leftrightarrow WPm] = QG$

At first glance, these intermediate scenes seem to be a symbolic representation of the following conjunctions and conjunctions without the traditional conjunctions. (For example, *Spring has come and the universe is flourishing* - $[WPm, WPm] = QG$. *When spring comes, the universe is flourishing* - $[WPm \rightarrow WPm] = QG$. *When spring comes and the universe is flourishing* - such as $[WPm \leftrightarrow WPm] = QG$). But this is not the case. In her research, Professor R. Sayfullayeva states that "if freed from the influence of the paradigm of connectives, which is reflected in the spiritual relations between the components of compound sentences, it, like all linguistic units, has a very simple, concise and clear structure. shows [30], - he writes. The general linguistic pattern of compound sentences - $[WPm \ R \ WPm] =$ As a result of generating QG and observing its variants, distinguishes three typical types: In fact, these construction patterns are not based on the means of connecting simple sentences in compound sentences when simple sentences are excluded from the compound sentence on the basis of whether they can be used independently. As a continuation of the above models, there is a phrase and a sentence model. **T - H** phrase model. In this case, **T** = subordinate word, **H** = dominant word (subordinate-governor). Creative models have emerged as a result of the development of linguistics, this method has a number of advantages and pragmatic aspects:

- modeling is a practical method, not a descriptive one;
- the modeling method is optimal ("most convenient", "most optimal") in any situation;
- The modeling method is based on the principle of economy. There is no need for lengthy descriptions and descriptions;
- Facilitates and simplifies the explanation and interpretation of the object.

The method of modeling has recently begun to be actively applied in linguistics. Since the concept of "model" is used in different senses in science and technology, there is no single classification of types of modeling. Depending on the nature of the classification model, the nature of the object being modeled, modeling can be performed depending on the area or direction in which it is applied [4,46]. Models can be conditionally classified as follows:

1. A natural model is a model that is identical to the object under study and differs from it only in size, speed of processes, and in some cases the material from which it is made.
2. Mathematical model - a model that differs from the prototype (original) in its physical structure, but has the same mathematical image as the prototype.

3. Logical-mathematical model - an abstract model consisting of symbols, used in the study of the thought process.

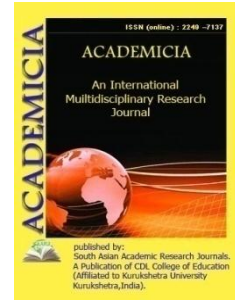
4. Computer model - a model created on a computer using algorithms and programs based on mathematical, logical modeling methods.

For many years, observational methods have been the only method in linguistics. But with the help of these methods the inner essence of linguistic phenomena is not revealed. The observation method allows you to study word forms, sentence structure and other structural features. Due to the complex structure of language and speech, it is not possible to study them in detail using the observation method. Models of human speech activity have been created on the basis of observation methods. These models reflect specific speech processes and events. For example, the pronunciation model of a specific sound or the speech pattern of speech. Linguistic research models and metamodels are also studied. It reflects the research process based on specific linguistic phenomena. For example, a general model of morphological word formation in Uzbek: base + word-formative addition; custom models: base + th; basis + -dosh; like base + -dose.

Metamodels - in which linguistic models are selected, which are hypothetical-deductive, abstract and rational [5,76 - 78]. We have only considered the basics of modeling technologies and models of certain objects in linguistics. Based on these construction patterns, the student is able to systematize the information being studied. The model simplifies and speeds up the learning process. It should be noted that the above models do not provide a complete picture of the object under study. At the same time as the process of optimizing general secondary school textbooks is underway, there is a need to use the most effective, time-saving, and at the same time informative technologies in the teaching of textbooks. Today, you can't get students interested in the science of their mother tongue by memorizing the rules and taking a traditional lesson with theoretical information. The process of globalization, the development of IT technologies, encourages people in society to move faster. There is a lot of information, innovations, creative ideas, which are accepted by our society. You can't step into tomorrow without studying today's information. Because tomorrow's study may be more complicated. The thinking of children growing up in such a society is also growing rapidly. Students realize that a forty-five-minute lesson in general secondary school is a waste of time if they do not receive new information in a particular area, and they lose interest in the subject in the next lesson. Children's interest in science and natural sciences in schools is satisfactory, but in the humanities, including mother tongue lessons, teaching students in a non-traditional, live way is one of the most pressing issues today. Because, as mentioned above, theory can be reliable, robust, and interesting if taught in practice. Children learn their mother tongue quickly, easily, and perfectly in practical processes. Based on the compatibility of mathematics in the mother tongue lessons, the theoretical knowledge can be solved independently, just as a child solves an independent example on the basis of formulas, as in mathematics. we would have a lot of success. The expected result of this process is, firstly, saving time, secondly, raw materials (paper), and thirdly, human energy and money. Teaching and learning syntax based on mathematical models can be quite effective. Because mathematical models allow the child to think independently, to innovate, to easily study scientific information. The future of the country is in the hands of young people who have the same independent thinking, creative ideas and innovations.

USED LITERATURE:

1. Mirziyoyev SH.M. Together we will build a free and prosperous, democratic state of Uzbekistan. - Tashkent: "Uzbekistan", 2021-147b
2. Mirziyoyev SH.M. New Uzbekistan strategy.- Tashkent: "Uzbekistan", 2021-203p
3. Po`latov A., Muhammedova S. Computer linguistics.-Tashkent, 2007-23p
4. Grishman R. Computational linguistics // Cambridge University Press. 1994-7-8b
5. Modelnoe poznanieiglobalnyeprotsessy / Unformalized elements of global modeling. Seminar materials. M.: BSh1SI, 1981. - p. 5-16 (in co-authorship).
6. Modeling and methodology of science / Structure and development of scientific knowledge. Systematic approach to the methodology of science. - (Materials of the All-Union Conference "Science of Logic and Methodology"). M., 1982. - p. 171-173.
7. Sayfullayeva R., Mengliyev B., Bakiyeva G., Kurbanova M., Yunusova Z., Abuzalova M. Modern Uzbek literary language. Syntax. - T.: O'z MU publishing house, 2006. - 171 p.



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AN OVERVIEW OF ANDROID OPERATING SYSTEM

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ABSTRACT

The Android operating system is essentially a mobile operating system that is quickly gaining market share, with dozens of smart phones and tablets now available or soon to be available. It's a mobile operating system based on a modified version of the Linux kernel version 2.6. The Open Phone Alliance, a collection of more than 30 mobile and technology firms aiming to open up the mobile handset ecosystem, created Android. Because the Android developer kit supports many of the standard packages used by Jetty, as well as Jetty's modularity and small footprint, it was feasible to convert Jetty to it and make it operate on the Android platform. These days, the Android operating system is one of the most frequently utilized. The kernel, libraries, application framework, and apps are the four major layers of the Android Operating System. Its kernel is Linux-based. The Linux kernel is responsible for fundamental system functions including virtual memory, networking, drivers, and power management. Different aspects of Android OS architecture, as well as security features, are addressed in this article.

KEYWORDS: *Android, Framework, Linux, Operating System, Sandbox.*

1. INTRODUCTION

The Android operating system is now one of the most popular mobile operating systems. Google developed the Android mobile operating system, which is based on the Linux kernel. The Android operating system was created with smartphones and tablets in mind. Android is the fastest growing mobile operating system because it is open source. It has become a favorite of many consumers and developers due to its open nature. Furthermore, software developers can

easily modify and enhance it to meet the latest mobile technology requirements. Each month, Android users download over 1.5 billion apps and games from Google Play[1]. Users and software developers may build their own apps for a broad variety of devices thanks to its powerful development framework. Application Framework, Dalvik virtual machine, Integrated browser, Optimized Graphics, SQLite, Media Support, GSM Technology, Bluetooth, Edge, 3G, Wi-Fi, Camera, and GPS are some of the key features of the Android operating system. Android provides an Android Software Development Kit to assist developers in better software development (SDK). For application development, it provides the Java programming language[2].

A debugger, libraries, a handset emulator based on QEMU (Quick Emulator), documentation, sample code, and tutorials are all included in the Android software development kit. Android is the most widely used operating system on many mobile devices across the globe. By the end of 2020, it will have taken up roughly 75% of the global market[3]. Open Handset Alliance, for example, has created the first Android operating system that is based on a modified version of the Linux kernel as well as other open-source applications. Google first funded the initiative in 2005, and it eventually acquired the whole business. The first Android smartphone was launched in September 2008, and it quickly became the market leader owing to many characteristics such as user friendliness, community support, customization, and large-scale production of Android devices. As a result, the market assesses the need for clever developers to create Android-enabled gadgets. As a result, the Android operating system has evolved into a comprehensive collection of operating systems for a variety of devices, including wearables, mobile phones, laptop computers, smart TVs, tablets, set-top boxes, and more[4].

Android is a Linux-based operating system that is mainly intended for touch-screen mobile devices like smartphones and tablets. Starting with black and white phones and progressing to smartphones and small computers in the past 15 years, the operating system has evolved significantly[5]. Android is one of the most popular smartphone operating systems these days. Android is a piece of software that was created in 2003 in Palo Alto, California. Android is a sophisticated operating system that supports a wide range of Smartphone apps. These apps are more user-friendly and sophisticated. The ARM architectural platform underpins the hardware that runs Android software. Android is an open-source operating system, which means it is available for free and may be used by anybody. Android offers millions of applications that may help you manage your life in one way or another, and it is accessible for a cheap price in the market, which is why it is so popular[6].

The entire Java programming language is supported by Android development. Other API and JSE packages aren't supported either. The android developer kit (SDK) was originally published in 2008 with version 1.0, and the most recent upgrade is jelly bean. Android is a mobile software stack that consists of an operating system, middleware, and essential apps. Android is a mobile operating system that is built on a modified Linux kernel. The industry's growing interest stems from two main factors: its open source nature and its architectural model. Because Android is an open-source project, it can be thoroughly analyzed and comprehended, allowing for feature understanding, bug fixes, new functions, and, ultimately, porting to new hardware. On the other hand, its Linux kernel-based architectural paradigm brings Linux to the mobile sector, enabling users to benefit from Linux's expertise and capabilities. Both of these features make Android a desirable target for usage in a variety of settings[7].

Another thing to keep in mind while using Android is that it has its own Virtual Machine (VM) environment. Android apps are written in Java, which necessitates the usage of a virtual machine (VM), which has both benefits and drawbacks[8]. A solution stack is a collection of software subsystems or components required to provide a fully functioning solution, such as a product or service, in computing. Middleware is a kind of computer software that links software components or individuals with their applications. Software that connects two or more different software programs. Because it links two programs and transfers data between them, middleware is often referred to as plumbing[9].

Data from one database may be accessible via another using middleware. On top of Java core libraries running on a Dalvik virtual machine with JIT compilation, the Android opensource software stack comprises of Java apps running on a Java-based, object-oriented application framework. Surface manager, Open Core media framework, SQLite relational database management system, OpenGL ES 2.0 3D graphics API, WebKit layout engine, SGL graphics engine, SSL, and Bionic libc are just a few of the C libraries. The Android operating system, which includes the Linux kernel, has around 12 million lines of code, including 3 million lines of XML, 2.8 million lines of C, 2.1 million lines of Java, and 1.75 million lines of C++. WAVE and CALFIT are used by Android. WAVE is an Android API that makes it simple to administer sensor networks (BSNs) on mobile devices[10].

1.1 Architecture Of Android Operating System:

The Android operating system is made up of a number of different software components. The Linux kernel, native libraries, Android Runtime, Application Framework, and Applications are the main components of the Android Operating System Architecture or Software Stack and shown in Figure 1.

- *Linux Kernel:* The Linux Kernel is the software stack's lowest layer. The whole Android operating system is based on this layer, with a few tweaks from Google. It includes the following features, much as the core Operating System: Process management, memory management, and device management (camera, keyboard, display, and so on) are all things to consider. This layer is how the Android operating system communicates with the device's hardware. Many essential hardware device drivers are also found at this layer. Virtual memory, networking, drivers, and power management are all managed by the Linux kernel.
- *Layer Native Libraries:* Android's native libraries sit on top of the Linux Kernel layer. This layer allows the device to process a variety of data kinds. Data is hardware-specific. These libraries are all developed in the C or C++ programming languages. The java interface is used to access these libraries. The following are some of the most significant native libraries: Surface Manager: This program is used to control the device's display. Surface Manager is a program that allows you to arrange windows on your screen. SQLite is the database that Android uses to store data. It is a relational database that can be accessed by any program. Web Kit is the HTML content display engine of the Safari browser. Playback and recording of numerous audio, video, and image formats are provided via the Media Framework. MP3, AAC, AMR, JPG, MPEG4, H.264, and PNG are just a few examples.
- *Runtime for Android:* Dalvik Virtual Machine and Core Java libraries make up the Android Runtime. It shares the same layer as the library layer [5]. Dalvik Virtual Machine is a Java

Virtual Machine that is used to execute apps on Android devices. Every Android application may operate in its own process, with its own instance of the Dalvik virtual computer, thanks to the Dalvik VM. Multiple instances of the Dalvik Virtual Machine may be generated at the same time, offering security, isolation, memory management, and threading support. Unlike the Java Virtual Machine, which is based on processes, the Dalvik Virtual Machine is based on registers. The Dalvik Virtual Machine runs .dex files generated by the dx tool from .class files. The dx tool is part of the Android SDK. DVM is designed for settings with limited processing power and memory. DVM was created by Google's Dan Bornstein.

- **Framework for Applications:** In the form of Java classes, the Application Framework layer offers numerous higher-level services or key APIs to applications. These services are permitted to be used in apps by application developers. These are the building elements that developers' programs interface with directly. The following are important components of the application framework: The Activity Manager is in charge of the application life cycle. Content Providers: This component controls data sharing across apps and how data is accessed from other applications. The Telephony Manager is in charge of all voice call-related functions. Location Manager: This program is designed to manage locations using GPS or cell towers. Manage the different kinds of resources that are utilized in application.
- **Application Layer:** The top layer of the Android architecture is the Applications Layer. Some apps, such as an SMS client app, a dialer, a web browser, and a contact manager, come preloaded on every device. A developer may create his own application and then replace it with one that already exists.

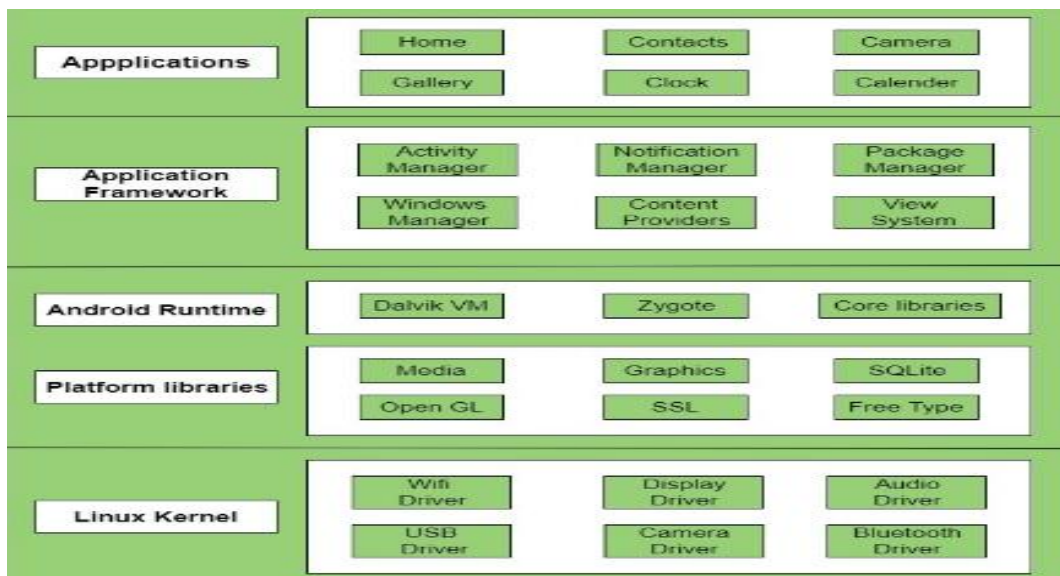


Figure 1: Diagrammatic Representation of Architecture of Android Operating System [GEEKSFORGEES]

1.2 Feature Of android operating system :

- **User Interaction:** The Android operating system offers a stylish, appealing, and pleasant user interface.

- *Smartphone Layout:* For the purpose of storing data in databases, SQLite, a lightweight relational database, is utilized. Android supports a variety of connection protocols, including Bluetooth, Wi-Fi, and Wi Max. In the Android operating system, you may send SMS, MMS, and use the android cloud to device messaging infrastructure.
- *Web browser:* The Android operating system's browser relies on web kit, which is combined with Chrome's V8 JavaScript engine to support it.
- *Support for Java:* Although the majority of Android apps are written in Java, the platform lacks a Java virtual machine, therefore DVM is used instead. DVM is optimized for Android and battery-powered mobile devices.
- *Multitasking:* Android offers multitasking, which allows you to go from one program to another or run several apps at the same time.
- *Multitouch:* Android includes native multitouch capability, which was originally introduced in the HTC Hero. Video or still cameras, touch screens, GPS, accelerometers, gyroscopes, magnetometers, proximity and pressure sensors, thermometers, and other hardware are all supported by Android.
- *GCM (Google Cloud Messaging):* Google Cloud Messaging is a service that enables users on Android smartphones to send brief messages to other users. Transferring files, accessing the phonebook, voice calling, and sending contacts between phones are all supported via Bluetooth. Support for keyboard, mouse, and joystick is provided. The many versions of Android operating systems, as well as their versions logos, are given below.

1.3 Security features of android operating system:

- *Linux Kernel:* the Linux kernel underpins the Android operating system. Many research developers investigate, attack, and repair it due to its open source nature. As a result, Linux has developed into a reliable and secure kernel. Android comes with a number of important security measures, including:
 - a. A permissions model based on the user each file and directory in the Linux file system has three user-based permissions. Other users, group, and owner - The Owner permissions only apply to the file or directory's owner. Group - Only the group that has been allocated to the file or directory is affected by the group permissions. Other users - This term refers to a group of people that aren't Permissions granted to one user are granted to all other users on the system. There are three fundamental permission kinds for any file or directory: read - The read permission indicates that the user has the ability to read the file's contents. Write - A user's ability to write or modify a file or directory is defined by their write permissions. Execute - A user's ability to run a file or see the contents of a directory is defined by the execute permission. This permission model guarantees that while accessing Android files, appropriate security is maintained.
 - b. Process isolation: The Android operating system gives each Android application a unique user ID (UID) and executes it as a distinct process.
 - c. Secure IPC extensible mechanism
 - d. The ability to delete insecure and unneeded kernel components .

- *The Application Sandbox:* A sandbox is a security feature that separates running applications and limits the device's resources to the application. It's often used to run untested code or applications from untrustworthy individuals or websites. Sandboxing is a method that restricts access to a device's resources. As a result, the system's security is enhanced. Sandboxing technology is often used to test unknown applications for the presence of a virus or other malicious code without causing damage to the host device. Untrusted programs can only access those resources of the device for which permission has been given with the aid of sandbox. If it attempts to access the device's other resources, permission is refused.
- *Inter-process communication that is secure:* For inter-process communication, some of the programs still utilize conventional Linux methods like network connections, file systems, and shared files. However, the Android operating system has additional IPC features like as Binder, Services, Intents, and Content Providers. All of these mechanisms enable developers to authenticate an application's identity and define security rules.
- *Signing the Application:* Applications must be digitally signed in order to be installed and operate on Android OS. Android OS uses this technique to identify an application's creator. This functionality may also be used to build confidence between apps. If a program is not correctly signed, it will not be able to be installed on the emulator. To create keys and sign applications, common tools like Key tool and Jarsigner are utilized. apk files
- *Permissions specified by the application and given by the user:* Permissions are a security feature in Android that allows or restricts application access. Android apps have no permissions by default, which keeps them secure by preventing them from accessing protected APIs [14]. Camera functions, location data (GPS), Bluetooth functions, Telephony capabilities, SMS/MMS functions, and network or data connections are just a few of the APIs that are secured. Only the operating system has access to these resources.

2. DISCUSSION

Android has become one of the most significant competitors in the mobile industry because to widespread backing from major corporations, particularly Google. Because smartphones and tablets are so widely used and available, manufacturers may customize the system to meet their specific requirements, including both the hardware and software layers. However, the platform's unpleasant feature, fragmentation, continues to exist. Manufacturers require time to integrate a new version of Android into previously launched devices on the market. Typically, they do not offer constant assistance to everyone. Despite the challenges, a new version is released about once a year. As additional hardware and software firms join the initiative, the scope of the development may expand. It's worth noting that the platform has a lot of support outside of the core Android project. Android is a mobile operating system. In today's economy, mobile phones are popular commodities. Mobile features are determined by software. Because mobile phones are low-powered devices that operate on batteries and are rechargeable, the operating system for mobile phones has played a critical role. The need for creating apps that can operate on mobile devices is increasing these days. Google created Android in order to provide such functionalities. The Dalvik Virtual Machine makes the runtime environment easier. To build the apps, you'll need Android components. Google created the Android operating system, which was subsequently adopted by the Open Handset Alliance. The Android operating system offers a

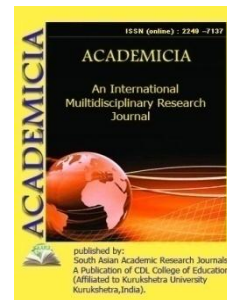
versatile environment for developing Java apps. This operating system is free, stable, and easy to use.

3. DISCUSSION

It is apparent from the preceding explanation that the Android Operating System employs a number of security mechanisms. When a developer installs an application, it creates a new user profile for that program. Each program runs on its own Dalvik VM instance. As a result, apps are unable to access each other's data. Permissions are required for apps to access shared data or resources. All Android apps are signed, so consumers know they're getting the real deal. Developers may use the signature process to regulate which apps can give access to other applications on the system.

REFERENCES

1. K. Tam, A. Feizollah, N. B. Anuar, R. Salleh, and L. Cavallaro, "The evolution of android malware and android analysis techniques," *ACM Comput. Surv.*, 2017, doi: 10.1145/3017427.
2. R. Singh, "An Overview of Android Operating System and Its Security Features," *Eng. Res. Appl.*, 2014.
3. Z. Yuan, Y. Lu, and Y. Xue, "Droiddetector: Android malware characterization and detection using deep learning," *Tsinghua Sci. Technol.*, 2016, doi: 10.1109/TST.2016.7399288.
4. Google Inc, "Sensors Overview | Android Developers," *Http://Developer.Android.Com.* 2014.
5. M. Gargenta, *Learning Android*. 2011.
6. P. Teufl, M. Ferk, A. Fitzek, D. Hein, S. Kraxberger, and C. Orthacker, "Malware detection by applying knowledge discovery processes to application metadata on the Android Market (Google Play)," *Secur. Commun. Networks*, 2016, doi: 10.1002/sec.675.
7. P. A. A *et al.*, "Location Based Restaurant Seat Booking Application For Android Phones : An overview," *Int. Res. J. Eng. Technol.*, 2017.
8. X. Xia, C. Qian, and B. Liu, "Android security overview: A systematic survey," 2017, doi: 10.1109/CompComm.2016.7925209.
9. R. Cohen and T. Wang, *GUI Design for Android Apps*. 2014.
10. K. Paul, S. Govindarajan, and D. Chatterjee, "Cloud Computing : Emphasizing Hybrid Cloud Computing on Android Computing Platform – An Overview," *Int. J. Appl. Sci. Eng.*, 2013.



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A REVIEW ON SUSTAINABLE ORGANIC FARMING IN INDIA

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ABSTRACT

The biggest challenge India faced after independence was producing enough food to feed its expanding population. As a result, high-yielding varieties are utilized in conjunction with water, fertilizers, and chemical infusions. This combination of high-yield processing methods aided in the growth of the country's food surplus, soil quality, deforestation, pesticide toxicity, and long-term farming. Furthermore, many scientists are rethinking agricultural practices based on biological data rather than the heavy use of artificial chemical fertilizers. Organic agriculture is gaining popularity throughout the globe as a way to improve agricultural efficiency, income, food security, and environmental protection. In addition, the report's goal was to evaluate the status of organic farming in India. Organic farming has the potential to offer high-quality food without compromising soil, environmental, or human health; nevertheless, large organic farms must produce enough food to feed India's entire population. The present study will aid future research and raise awareness about the advantages of organic farming as well as the advantages of organic food production.

KEYWORDS: *Environment, Organic Farming, Pesticides, Soil, Sustainable.*

1. INTRODUCTION

Having agriculture as the cornerstone of the Indian economy, which is supported by almost 67 percent of the population and 55 percent of the overall workforce, is reaching the criteria for satisfying the demands of the growing Indian population via agricultural and other related activities. For India to attain double-digit GDP growth, agricultural growth of about 4% or more was expected to be required. While farming has the potential to meet the demands of an ever-increasing population, it also confronts many difficulties. It is undeniable that India's agricultural production increased dramatically during the green revolution. The inventions used at the outset of the green revolution, assisted by policy, and further encouraged by agrochemicals, equipment, and irrigation availability, have been the main driving factors in increasing agricultural output. While these innovations certainly improved Indian food security, there was one major drawback: farmers had to depend on the supplies they had purchased. When manufacturing fertilizers and insecticides, the two most essential inputs in green revolution (GR) technologies, the requirement for fossilizing fuel or expensive energy, both of which are linked to major health and environmental problems, was a critical consideration[1], [2].

Organic agriculture, in its most basic form, refers to plant cultivation without the use of synthetic fertilizers or pesticides. The maintenance of the soil and the use of natural instruments to add organic matter to the soil are all part of organic agriculture. Organic farms are those that avoid or limit the use of pesticides and fertilizers, chemicals, growth regulators, and animal feed additives to the greatest degree feasible. The term "organic" refers to agricultural processing methods for the production of food and fiber. Organic farming is used to produce both agricultural products such as grains, foods, milk, and eggs, as well as fibers such as flowers, cotton, and refined food products. Organic agriculture regulation is dependent on the establishment of biological variety in the field in order to eliminate pest species' habitat and properly maintain and regenerate soil fertility. Organic farmers should not use synthetic pesticides or fertilizers[3], [4].

The ecological approach to agriculture and horticulture recognizes that the environment in which plants thrive is far larger than the sum of its individual parts, and that all living things are interdependent and linked. Organic farming entails treating the soil and the nutritional ecology in a way that benefits future generations. The provision of a healthy source of food to land living forms via the use of composts, manure, and/or organic materials. Rather of being discarded and burnt, renewable resources should be chosen, a viable planet developed, the atmosphere lowered, and waste repurposed.

Organic manures, such as agricultural manures, cultivation residue, biogas slurry, crop waste, oil cakes, earthworms, and compost, enhance fertile soil. The rhizosphere's environment will be influenced by changes in porosity, ventilation, temperature, water retention, and soil microorganisms as a result of these soil changes. Sulphur, nitrogen, potash, phosphate, magnesium, and calcium are all elements that these crustaceans provide to plants. Earthworms are important for aeration, microflora development, and soil turnover, all of which are important for growing plants. One acre of organically rich soil with high humidity may produce 25-30 tons of earthworms, ranging from 50,000 to 4,00,000. The castings of earthworms are rich in soil nutrients such as magnesium, sulphur (2.9 percent), nitrogen (2.5 percent), calcium, and potash (1.4 percent), among others. Aside from organic alteration and the addition of earthworm castings (the highest in Actinomycetes) to the soil, a range of diseases and nematodes also had a role in regulating[5], [6].

1.1. Main Principles of Organic Farming:

The following are the fundamental concepts of organic agriculture:

- Work in a closed setting as much as possible, relying on local services.
- Long-term soil fertility should be preserved.
- Remove all possible sources of contamination from agricultural practices.
- Produce high-quality, nutrient-dense foods.
- Reduce the use of fossil fuels in agricultural techniques.
- Providing cattle with living conditions that meet their physiological requirements.
- To enable farmers to make a living and develop their human potential via their labor.
- Adhere to organic farming's four foundations (Figure 1).

1.1.1. Organic Certificates:

Organic foods that have been certified are those that have been grown and processed in compliance with universal standards that have been verified by an independent government or a USDA-accredited private organization. Both "organic" and "non-organic" goods must be certified. The yearly submission of an organic framework schedule, as well as a farm and production facility assessment, are required for certification. Organic measures such as long-term soil management, buffering between organic farming and conventional neighborhood farms, and record keeping are all checked by inspectors. Production inspection includes procedures such as cleanup and pest control, component shipment and storage, and documentation and audit management. Biological foods are treated gently to maintain food safety without the need of additives or containers. Approved organic goods are exempt from synthetic agrochemicals, irradiation, and genetically engineered crops or additives[7], [8].

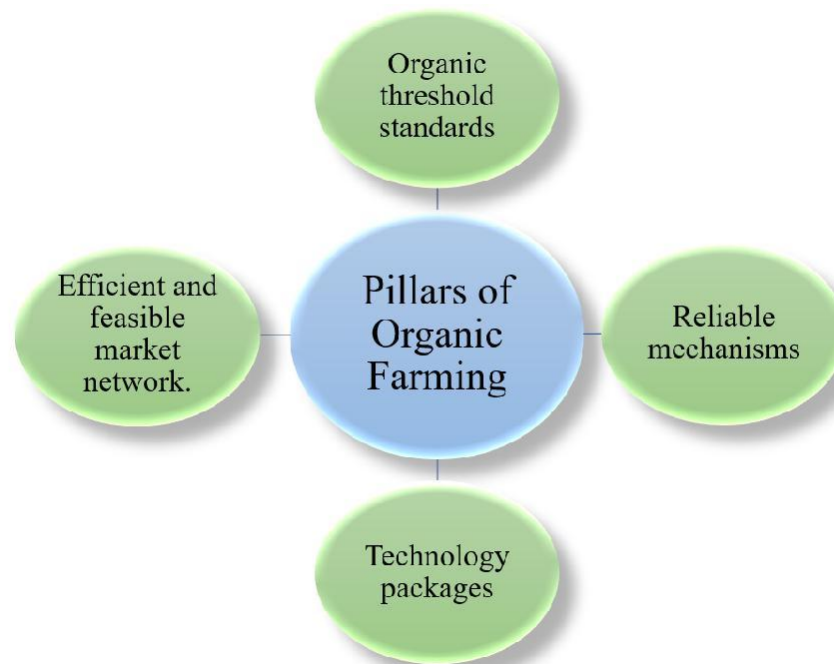


Figure 1: Displays pictorial representation of the four main pillar of organic farming

1.2. Organic Food Vs Conventional Food:

Organic foods are significantly less likely than conventional meals to contain pesticides, according to a 2002 research. Organic food prices are higher than conventional food prices because the organic price tag more closely reflects the true cost of food production: replacement labor and the extensive use of chemicals, both of which have nutritional and environmental consequences that society bears. Water cleansing and pesticide residue removal are two examples of such costs. Costs of organic food include expenditures for cultivation, harvesting, storage, and transportation. In the case of packaged goods, manufacturing and service costs are also applied. Organic foods must adhere to stricter regulations than conventional foods when it comes to any of these processes. Organic farming is usually (but not always) more expensive than conventional farming because of the intensive management and labor required. The evidence is mounting that organic foods will cost the same as or less than conventional foods if all of the operational costs of standard food processing are included into food pricing.

1.3. Safety of Organic Food:

Organic foods are just as healthy as any other kind of food. Customers, like any other product, should be cleaned before use to ensure maximum hygiene. Organic goods, as previously mentioned, have much less pesticide contamination than conventional items. Organic crops are thought to be more susceptible to *E. coli* contamination as a result of different raw manure implementations, while conventional farmers utilize tons of raw manure with little supervision. Organic laws impose strict manure requirements for organic agriculture, such as composting or spreading manure at least 90 days before harvest, giving pathogens more opportunity to break through microbially. [9].

1.4. Organic Food Industry:

Approximately 2% of American food supply are generated using organic methods. Sales of organic products, the fastest growing agricultural sector, have increased by at least 20% on average over the past decade. Organic vegetables may be found at natural and mainstream grocery stores, as well as straight from producers such as CSAs and the farming sector. Organic food CSAs are also available. Many chefs utilize organic food in their restaurants throughout the globe, and they seek greater flavor and consistency. Organic food acceptance is also increasing internationally, with major global organic food industry nations such as Japan and Germany leading the way [10].

2. BENEFITS OF ORGANIC FARMING IN INDIA

While switching from conventional agricultural methods to organic farming offers numerous advantages, in the context of the rural Indian economy, many of these advantages may not be realized. Finally, the advantages that are really possible to be considered as benefits for Indian agricultural methods must be clarified. Here are a few of the advantages of this partnership (Figure 2) [9].

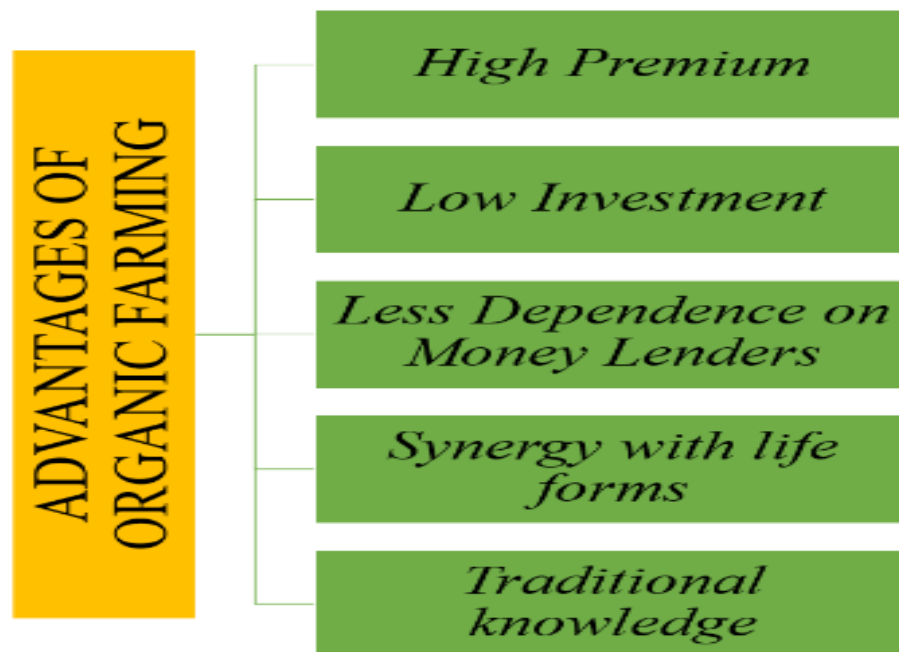


Figure 2: Illustrates the Major Advantages that are Associated with the Organic Farming in India.

2.1. High-Priced:

Despite the fact that organic food is on the rise and costs 20-30% more than conventional produce, a moderate farmer has plenty of room for the income of medium-sized farmers to keep food on the table with a meal and flourish.

2.2. Low Capital Expenditure:

Organic agricultural costs are lower when compared to traditional chemical farming techniques. Furthermore, organic fertilizer manufacturing does not need the use of sophisticated techniques. Furthermore, since organic fertilizers and insecticides may be manufactured locally, farmers have reduced yearly expenses. Because agriculture is heavily influenced by various factors such as temperature, pests, and diseases, as well as various weather factors, including the rainy season, whenever crop failure occurs, small producers in organic farming have very little to lose because their investments are low, so natural disasters, pesticides, or disease attack are not a concern.

2.3. Reduction in reliance on money lenders:

Farmers' suicides are frequent in India as a consequence of overwhelming debt. Farmers are not dependent on greedy money lenders since excessively expensive chemical supplies are not required in biological agriculture. By failing to produce crops, this would not compel farmers to perform a certain action.

2.4. Synergy with living things:

Synergies with many kinds of flora and animals are part of organic agriculture. This synergy is easily understood by small farmers, making it simple to execute.

2.5. Traditional knowledge:

Farmers should be introduced to organic agriculture based on their conventional expertise in order to obtain excellent outcomes in organic farming methods. In the case of organic agriculture, small farmers do not depend on those who provide chemical knowledge.

3. AGRICULTURE POLLUTION

The public's attention is still focused on the more apparent indications of agriculture's environmental consequences, whereas the unseen or less visible effects of air pollutants are likely to cost the most money[10]. Agricultural output has four major effects on air quality and the environment:

- reduced particle pollution and greenhouse gas emissions from fires (mainly rangeland and woodland fires);
- rice methane emissions and poultry production;
- nitrous oxide from fertilizer and manure;
- ammonia from manure and urine

3.1. Rural Development and Organic Farming Cooperation:

Organic and sustainable agriculture is also a multi-level genuine potential to contribute to dynamic rural economies via sustainable development. In actuality, the organic market's growth has already created new employment possibilities in agriculture, manufacturing, and associated services. These agricultural methods have the potential to offer significant economic and social advantages to rural communities while also having a positive environmental effect. To assist the industry's expansion and associated businesses in the food chain, financial support and other tools to convert farmers to organic farming are available.

3.2. *Organic Food Exports and Consumption in India*

People believe that organic food is just a misleading phrase that is solely meant to help poor countries. While India is making strenuous efforts, the majority of organic food is destined for export. But that isn't the case. While 50% of organic food production in India is for export, many individuals are searching for organic food for local use.

The health of children has been a significant factor in deterring people from consuming organic food. Organic food costs in India are more than 25% more than conventional food prices. However, due of the nutritional advantages of organic fruit and the fact that organic food is deemed completely safe for home use, many families are now able to spend more money. The proliferation of organic food shops in India demonstrates the country's growing interest in organic goods. Organic food is becoming a common sight in many supermarkets and restaurants. India has a wider range of organic food consumption than other emerging nations. For the Indian organic food consumer, however, knowledge is needed. Several consumers are unaware of the difference between natural and processed foods.

Many people purchase natural products that they assume to be organic. Customers are also unaware of the credential system. Because a certificate for the domestic market in India isn't actually required, there are a lot of fake organic products on the market. In terms of organically generated exports, India's organic food production is on the increase, with farmers shifting to organic agriculture. India is becoming a significant producer of organic basmati rice, organic spices, organic herbs, and other organic products. Exports account for more than 53% of organic food presently produced in India, which is considerably higher than organic food exports in 2003-2004, when they accounted for just 6 to 7% of total agricultural commodities manufactured in India.

However, although the cost of manufacturing organic farming pre-requirements is low, the cost of transitioning from chemicals to organic farming is very expensive. Many more organic farmers in India are in the process of converting and are still paying a high price. As these farmers embrace organic farming, production costs are expected to drop, making India one of the most important producers of organic food. The following ingredients are presently found in organic foods produced in India and exported:

- Barley, wheat, corn, or maize are all organic grains.
- Black grammes and red grammes are organic pulses.
- Bananas, peaches, limes, pineapples, passion fruits, cassavas, and walnuts are all organic fruits.
- Soya, sunflower, mustard, cotton seeds, and groundnut oil and seeds are all organic.
- Organic vegetables include onion, potato, garlic, brinjal, and cabbage. Cloves, mace, cardamom, chilly, almonds, tamarind, pepper, vanilla, chocolate, amla, and other organic herbs and spices etc.
- Other ingredients include coffee, jaggery, cotton, tea, textiles, and sugar.

4. DISCUSSION

With 67 percent of its population and 55 percent of its workforce depending on agriculture and associated industries, India is a nation that is heavily reliant on agriculture. Agriculture fulfills the required criteria, accounting for 30% of total income in India, the world's fastest-growing population. Bio agriculture has also been recognized as an old Indian tradition that has been practiced for millennia in a variety of rural and rural civilizations. The use of synthetic fertilizers, artificial pesticides, genetic altering techniques, and other approaches has increased as a result of the introduction of new technologies and a rising population pressure. The proclivity towards traditional farming. Organic food items are becoming more needed in industrialized countries as people become more aware of environmental protection and food quality, and soil quality, which is free of chemical pests, is significantly affected by organic processes. Organic farming still offers a lot of money-making potential. Different types of organic nutrient sources are available naturally in India's soil to enable organic agriculture.

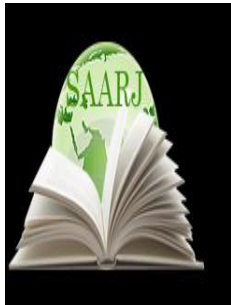
India has an inventive, long-lasting traditional agricultural system, extensive drylands, and little use of chemical fertilizers and pesticides. Furthermore, abundant precipitation occurs as natural organic soil in the northeastern hilly areas of the country, with just a few minor chemicals utilized for a long time. Traditional Indian peasants have a broad viewpoint, in-depth research, perseverance, and experience in maintaining soil fertility and pesticides, which has resulted in increased organic food and economic development in India. Organic farming has made tremendous progress. India is now the world's largest organic producer, with 1.78 million hectares of organic agriculture in 2017. Several innovations in organic agriculture have been discovered, including the incorporation of mycorrhizal fungi and nano-biostimulants, more conscientious mapping of cultivation areas through sensor technologies and geo-datography, 3D printers, the development of side streams and wastes, as well as the major resources, development, and enhancement of organic farming through drip irrigation advancements. The Bee Scanning App, which enables apiculturists to fight the parasitic Varroa mite while also providing the foundation for community modeling and captive breeding, is another step forward in organic agriculture.

5. CONCLUSION

Organic farming is seen in a variety of ways. However, there is broad agreement on its environmental friendliness and inherent ability to protect human health. Organic agriculture has also been proven to be efficient and healthful in a variety of studies. Organic agriculture is labor-intensive and employs more people in poor countries, therefore the price of organic output is higher. However, in a nation like India, where labor is abundant and relatively cheap, organically-based agriculture offers a major potential answer to the issue presented by chemical agriculture. The government has made efforts to encourage organic farming in general. In addition, a number of organizations for the marketing of organic agricultural goods have been established. The organic food business in India is being driven by the continuing expansion of organic goods in developing countries and the Indian government's export promotion policies, which are expected to promote economic development as well as health and safety standards for the Indian people.

REFERENCES

1. R. Roychowdhury, M. R. A. Gawwad, U. Banerjee, S. Bishnu, and J. Tah, "Status , Trends and Prospects of Organic Farming in India : A Review," *J. Plant Biol. Res.*, 2013.
2. S. A. Wani, M. A. Wani, S. Mehraj, B. A. Padder, and S. Chand, "Organic farming: Present status, scope and prospects in northern India," *J. Appl. Nat. Sci.*, 2017.
3. I. Mergel, "OpenCollaboration in Public Sector: The case of social codign on Github," *Gov. Inf. Q.*, 2012.
4. C. M. Nair and K. R. Salin, "Current status and prospects of farming the giant river prawn *Macrobrachium rosenbergii* (De Man) and the monsoon river prawn *Macrobrachium malcolmsonii* (H.M. Edwards) in India," *Aquaculture Research*. 2012.
5. H. M. Chandrashekar, "Changing scenario of organic farming in India : An overview," *Int. NGO J.*, 2010.
6. D. Singh, T. Singh Dhillon, R. Singh, and C. Davinder Singh, "Organic farming in India: Prospects and practices," ~ 227 ~ *Int. J. Chem. Stud.*, 2018.
7. K. M. Nielsen, "Organic farming," in *Encyclopedia of Ecology*, 2018.
8. O. Therond, M. Duru, J. Roger-Estrade, and G. Richard, "A new analytical framework of farming system and agriculture model diversities. A review," *Agron. Sustain. Dev.*, 2017.
9. T. Radovich and V. Valenzuela, "Vegetable crops update," *CTAHR Coop. Ext. Serv.*, 1999.
10. H. Harizanova-Bartos and Z. Stoyanova, "Impact Of Agriculture On Air Pollution," *Cbu Int. Conf. Proc.*, 2018.



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THE PECULIARITY OF PSYCHOLOGISM IN A.KADYRI'S NOVEL "BYGONE DAYS"

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ABSTRACT

The article, based on two translations into Russian of A.Kadyri's novel "Bygone Days", examines the problem of recreating the inner world of the hero in a literary translation. The variety of means of depicting the inner world of the character, on the one hand, and differences in artistic tradition, mentality, lifestyle, etc. on the other, create certain difficulties in recreating the inner world of the character in translation. Now one sentence from the heart of the proverb goes: "the separation of Two Souls is the dream of parents, not the flange of this Falcon!" This verse, which seems to take away the prospect of Your Own Secret Meaning Father, finally makes him cry. Thus, the PP was implemented during the Soviet period, when the doctrine secretly or explicitly prevailed, according to which nationalities and, accordingly, national languages would gradually disappear – a single Soviet people would be formed over time.

KEYWORDS: *Literary Translation, Adequacy Of Translation, Original, Artistic Psychologism, Inner World, National Identity.*

INTRODUCTION

Psychologism in literature is a complete, detailed and in-depth depiction of feelings and emotions, thoughts and experiences of a literary hero. Psychologism is the author's attempt to describe the inner world of the hero by artistic means.

One of the main attractive features of fiction is its ability to reveal the secrets of the inner world of a person, to express spiritual movements as accurately and vividly as a person cannot do in everyday, ordinary life. Andrey Borisovich Yesin correctly notes: "psychologism is "a fairly

complete, detailed and in-depth depiction of feelings, thoughts, experiences of a fictional person (literary character) with the help of specific means of fiction" [1, 12].

The psychological dictionary edited by Vladimir Petrovich Zinchenko defines "psychologism" as a stylistic characteristic of literary works, in which the inner world of the characters is depicted in detail and deeply, i.e. their feelings, thoughts, feelings, and, perhaps, a subtle and convincing psychological analysis of mental phenomena and behavior is given [2, 386].

The variety of means of depicting the inner world of the character, on the one hand, and differences in artistic tradition, mentality, lifestyle, etc. on the other, create certain difficulties in recreating the inner world of the character in translation. The primary task of the translator is to maximally approximate his perception of the translated work with the perception of the same text by the implicit reader. And this is a very difficult, almost impossible task, since for this it is necessary to know the culture, language, customs, religion, etc. at the level of the "implicit" reader. Therefore, there cannot be a completely adequate translation in principle, but every translator should strive for this. However, in practice, translators are content to convey what is directly reflected in the text, and everything that is behind the text remains out of their field of vision. As a result, the translation cannot reflect all the shades of colors that were easily applied by the hand of an artist who trusted his reader.

The character is expressed in the internal psychological state, in the way of thinking, in the manner of speaking, holding oneself. That is, the character embodies in its individuality the spiritual and moral qualities, aesthetic and ethical views of a certain people, which is reflected in speech, actions, psychological states, portrait, landscape, etc.

In the novel "Bygone Days" Abdullah Kadiri reveals the emotional world of his main character - Atabek, full of drama and emotions, by intertwining the characteristics of the character with the fixation of his condition. At the same time, he avoids a detailed description of the entire process of the mental movements of the actors, but very accurately reproduces the psychological moment, the inner state of a person at some point in his life. So, for example, the rich inner world, the ability to deep feelings, the moral basis of the character of Atabek are revealed through a severe life test - separation from his wife (chapter "Will you not forget me?").

"The singing of the young man who drove a double in the distance is heard:" the flange of this Falcon, which separates the two Yors!"The spirit, as the strength comes out of the chest, gives a different effect to the Otabek, as if this singing had made tevara a zir-r. The fur is as if this peasant was hiccup from his perspective. This verse is repeated again from the mouth of the peasant and illuminates the Tabarak. Now one sentence from the heart of the proverb goes: "the separation of Two Souls is the dream of parents, not the flange of this Falcon!"This verse, which seems to take away the prospect of Your Own Secret Meaning Father, finally makes him cry. The face of the tears is the spoon of the rear saddle and the mane of the horse begins to drip..."[4, 143]

The first sentence of the above passage in the PP reads as follows: "From afar comes the song of a man driving a team of oxen on arable land: "Time changes the color of the heavens, and fate separates lovers..."

In-first, in the original we are not talking about a singing person in general, but about a singing horseman, i.e., a young man - a young man. It would seem that there is no great trouble. But the

author emphasizes that it is the dzhigit who sings. And that is why the song is so touching, because the burning pain of the singer's loss is still fresh, and it seems to infect Atabek, makes him empathize with him, vividly feel the pain of loss threatening himself in the future. Thus, the author psychologically prepares the hero to make a fateful decision: "...I will not return to Tashkent" [5,148]. On the other hand, songs of love content are sung by the young, while the singing of such by others - both still "green" and "mature" - is considered indecent. From what has been said, it is clear that national identity is already observed in the choice of a word, or rather, quite often it determines a particular choice. We will not call the translation of the song line successful either: "Time changes the color of the heavens, and fate separates lovers ..." As we see, there are not one, but already two verses, between which there is a figurative-thematic parallelism, very characteristic of the Russian folklore tradition. In our opinion, such stylization is inappropriate, it nullifies the function of the song line as an artistic detail. Moreover, the figurative-thematic parallelism gives the verses a kind of semantic completeness, whereas in the original you can hear an endless complaint: "Oh, fate, fate is a lover's lover!..." What to do, such was the national mentality, only in one out of a thousand, or even in as many as ten thousand such cases there was a riot, and in all other cases – humility, with a burning pain in the soul, which broke out in such songs, poems, etc. From this point of view, the situation is no better in the VP, where the verse has acquired the following form: "By the will of fate, lovers' hearts are separated!" In our opinion, there is no feeling in this verse, it carries nothing but dry information. If so, how could he touch the Atabek to the quick, make him tremble, get emotional to such an extent that tears involuntarily flowed from him.

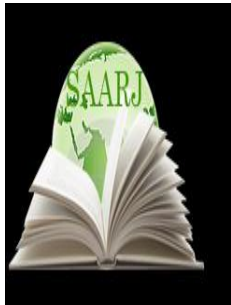
A comparison of the first (PP) and second (VP) translations of the novel "Bygone Days" suggests that the authors of the PP did not attach due importance to the reconstruction of national color, whereas in the VP there is a desire to recreate national identity in places, even to the detriment of the acceptability of the translation. Of course, this is primarily due to the socio-cultural conditions of the time when these transfers were carried out. Thus, the PP was implemented during the Soviet period, when the doctrine secretly or explicitly prevailed, according to which nationalities and, accordingly, national languages would gradually disappear – a single Soviet people would be formed over time. The EAP already belongs to the era of sovereignty, when the national is emphasized, which is very important when entering the world community as a full member.

Our research allows us to conclude that the work on the translation of the novel "Bygone Days" into Russian has not yet been completed, and that, relying on existing translations, it is possible to achieve better results in terms of recreating a deep image of the feelings and emotions, thoughts and experiences of the literary hero.

LITERATURE:

1. Yesin A. B. Psychologism of Russian classical literature. M., 1988.
2. Psychological dictionary / Edited by V. P.Zinchenko. M., 1997.
3. Kulinskaya S.V. The picture of the world as a national and cultural phenomenon // Bulletin of the Krasnodar University of the Ministry of Internal Affairs of Russia. 2010. No. 4. - 105 p.
4. Abdullah Kodiriy. Utgan kunlar. - T: Shark. - 2014. - 400 b.

5. Abdullah Kadiri. Past days. - T.: Publishing house lit. and art, 1984. - 336s.
6. Abdullah Kadiri. The past days. - T.: Shark. - 2009. - 432 p.7. Ўзбек тилининг изоҳли луғати. 5т. Ташкент. “Ўзбекистон миллий энциклопедияси”, Давлат илмий нашриёти. 3т. - 2007. – 545 б.



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WAYS OF USING THE GEOGEBRA PROGRAM FOR CONSTRUCTING THE POLYHEDRONS SECTION

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ABSTRACT

The article discusses the use of the Geogebra program in geometry lessons on the topic of cross-sections of polyhedra. Brief information about the Geogebra program is given. The drawings in the conditions of the problem were drawn using the Geogebra program. The relevance and practical significance of the research topic is indicated.

KEYWORDS: Polyhedra, Section, Prism, Cube, Truncated Pyramid, Geogebra Program.

INTRODUCTION

The development of students' ability to visualize and deal with spatial figures is one of the primary challenges in the teaching of stereometry in school geometry. In stereometry, different planes are used to examine parts of figures, and in some circumstances, polyhedras. Here are some tips on where to search for polyhedra sections and how to schedule an appointment. There are three sorts of geometric problems: 1) the computation; 2) the proof; and 3) the constructing;

When studying a polyhedra's cross section, pupils first learn about the plane, which is defined as:

- Through three points;
- Through straight line and a point;
- Through two parallel straight lines;
- Through two parallel straight lines;

The ability to construct two intersecting straight lines is required.

There are three techniques for calculating age, and the trace method is one of the simplest and most widely used in school. To begin with, a convex polygon is a convex flat polygon with ends that are usually the points of intersection of the cutting plane with the polygon's edges and sides

that are the intersections of the convex polyhedras. In any type of stereometry, solving problems necessitates not only math and analytical abilities, but also the capacity to describe.

Two locations are usually located and a straight line drawn through them to produce a straight line of intersection of planes. The passing straight line is used to find a point of junction of a straight line with another straight line. The sought point is then found by crossing the given straight line with the given straight line.

Geometry is one of the most difficult courses in high school. The transition from plane to spatial figures is one of the most difficult aspects of this task.

Making polyhedras and their easy sections is allocated 1 hour in the 10th grade plan, which is a relatively short time. We'll look at the illustrations on the tables in the Geogebra program to make the most of our time during the class. Let's begin with the Geogebra application. GeoGebra's first version was launched in 2002. Markus Hohenwarter, an Austrian mathematician and professor at the University of Salzburg, wrote it.

The program is developed in Java and may be downloaded for free. The platform is interactive (Windows, Linux, Mac OS, etc.) It works on a wide network, on personal computers, tablets, and even cellphones, and is available in more than 60 languages.

The word GeoGebra is made up of the first and last portions of the words Geometry and Algebra. One of GeoGebra's best qualities is its reliance on the unity of two-dimensional algebra and geometry.

Geogebra helps you to foster a creative environment in scientific classes at high schools and colleges by producing high-quality geometric drawings and picturing the outcomes in the form of dynamic models. You can get the latest version of GeoGebra from the manufacturer's website, <https://www.geogebra.org> [3: 7], and install it on your computer.

Let's look at some examples of how the above general concepts are put into practice. We look at the challenge of constructing the conditions given in Geogebra Problems 3.22,3.23 in the 10th grade geometry textbook.

Problem 1: Using squares, draw a plane through the opposite side of a rectangular prism's lower base. The base's side is the same as. Locate the surface of the section that was made. [2: 303] [2: 303] [2: 303] [To answer the problem, we must first do what is specified in the Geogebra program's problem condition, which is to make a section. It is difficult for kids to make a section. That is why the Geogebra program was chosen.

The reason for choosing the program Geogebra is that it is very easy and convenient to create geometric figures in this program.

Solution

Passes through sections AB and E_1D_1 straight lines. AB and E_1D_1 the sides are the sides of the polygon in the section. Find the side of this polygon CC_1D_1D that lies D_1X on the side. D_1X on a straight line D_1 we know a point. Find the F point of intersection of the other point AB and CD the straight line. It CC_1D_1D lies in the plane of the collar and in the plane of the section, so that their intersection is a straight line D_1X . D_1 and F connect the points with a straight X line to get a

point. D_1X section CC_1D_1D is the side of the section on the side. Y We find a similar point. There will be a sought polygon in the section $ABXD_1E_1Y$ (Figure 1).

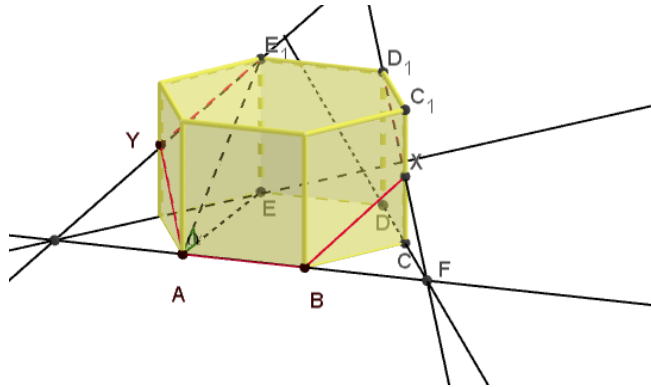


Figure 1

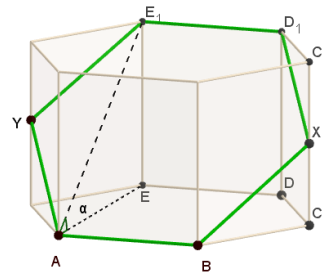


Figure 2

Now we find the surface of the section. (Figure 2). The hexagon at the base of the prism is the orthogonal projection of the hexagon in section. Hence the surface of the section $S = \frac{S_0}{\cos \alpha}$, in this S_0 —the surface of the base of the prism, α and the angle formed by the section plane with the base plane. EA and AB Since it is perpendicular, E_1A and AB perpendicular. (Theorem on three perpendiculars.) Therefore $\alpha = \angle EAE_1 = \angle EAE_1$. $EE_1 = a$, $AE = a\sqrt{3}$ (side of a right triangle drawn inside a circle of radius), $AE = \sqrt{a^2 + (a\sqrt{3})^2} = 2a$.

$$\text{So, } \cos \alpha = \frac{a\sqrt{3}}{2a} = \frac{\sqrt{3}}{2}.$$

$$\text{The surface of the base of the prism } S_0 = 6 \cdot \frac{1}{2} a^2 \sin 60^\circ = \frac{3a^2\sqrt{3}}{2}.$$

$$\text{The surface of the section } S = \frac{S_0}{\cos \alpha} = 3a^2$$

Next in the tables we give the figures made in geogebra.

Problem 2. $ABCD A_1 B_1 C_1 D_1$ of the cube AD and CD its edges M and N are given. The cube of MNB_1 make the section that is formed by cutting with a plane [1: 139] (Figure 3)

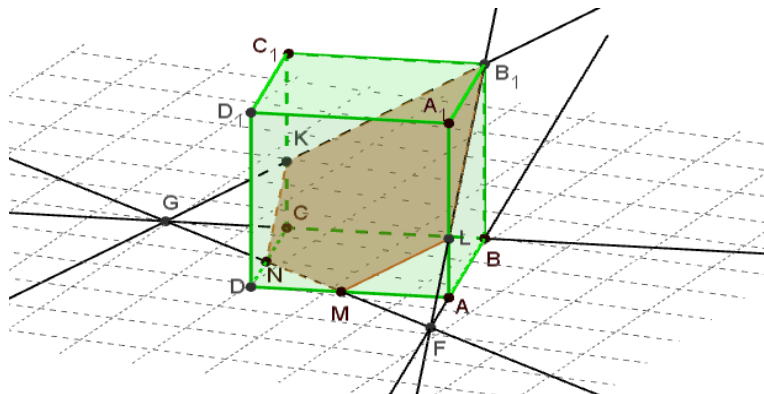


Figure 3

Problem 3. ABCDAA₁B₁C₁D₁ draw the cube and AB, BC and BB₁ which are the middle of the edges, M, N and L mark the points. Make the section that is formed when you section the MNL cube evenly [1:139].(Figure 4)

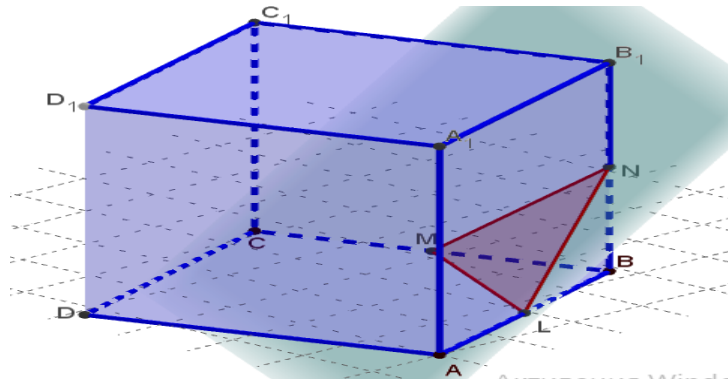


Figure 4

Problem 4. in a right triangular prism the sides of the base are 10 cm, 17 cm and 21 cm, and the height is 18 cm. Find the surface of the section through the small heights of the sides and base of the prism. [2: 303].

Solution. Given: ABCA₁B₁C₁ - in a triangular prism, A₁B₁ = 17cm, B₁C₁ = 10cm, A₁C₁ = 28cm AA₁ = DD₁ = 18cm.

Need find: $S_{BDB_1D_1}$ -?

How to find: To solve this problem, draw a straight line B perpendicular to AC the end of the base and mark its AC point of intersection with the side. Then a straight line is drawn from the BD end B₁ of the prism parallel to the straight line.(Figure 5). Its AC₁ is the point of intersection D₁ with the side. After then, from these points B, D, D₁, B₁ we make a rectangle that is we seached BDD₁B₁ will be rectangle. Let's find the surface of this rectangle. For this, we first find the surface of the base using the Heron formula. So for Geron's formula, we first determine the perimeter of the rectangle:

$$P_{ABC} = 17 + 10 + 21 = 48 \text{ cm}$$

According to Geron's formula:

$$S_{ABC} = \sqrt{24(24 - 10)(24 - 17)(24 - 21)} = \sqrt{24 \cdot 14 \cdot 7 \cdot 3} = 3 \cdot 7 \cdot 4 = 84$$

Now we find the height of the triangle using another formula to find the surface:

$$S_{ABCD} = \frac{1}{2} AC \cdot BD$$

$$\text{From there: } BD = \frac{84 \cdot 2}{21} = 8 \text{ cm}$$

$$S_{BDB_1D_1} = BD \cdot DD_1 = 18 \cdot 8 = 144(\text{sm}^2)$$

Hence, the surface area of the section sought is 144(sm²).

Problem 5. The height of the rectangular pyramid is 4 cm. The sides of the bases are 2 cm and 8 cm. Find the surface of the diagonal sections [4,308]

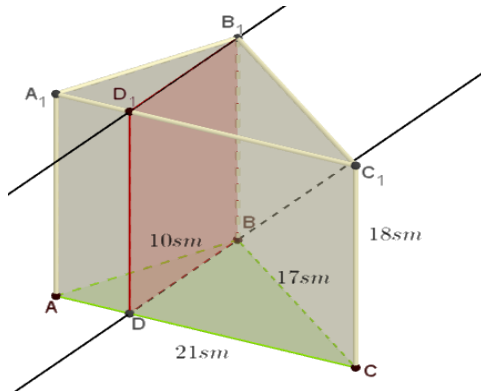


Figure 5

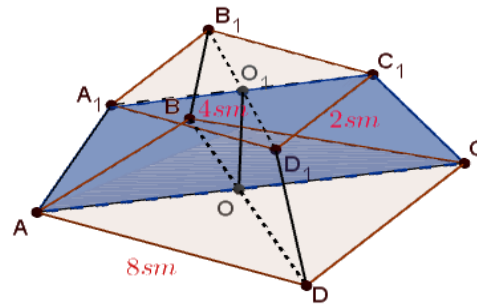


Figure 6

Solution. Given: $ABCD A_1 B_1 C_1 D_1$ - truncated pyramid $OO_1 = 4\text{cm}$, $AB = BC = CD = AD = 8\text{sm}$, $CD = AD = 8\text{sm}$, $A_1 B_1 = B_1 C_1 = C_1 D_1 = A_1 D_1 = 2\text{cm}$. (Figure 6). Need to find:

$$S_{ACC_1 A_1} = \frac{AC + A_1 C_1}{2} \cdot OO_1.$$

$$\Delta ADC \text{ from } AC = \sqrt{AB^2 + BC^2} = \sqrt{2 \cdot AB^2} = 8\sqrt{2} \text{ cm}$$

$$\Delta A_1 B_1 C_1 \text{ from } A_1 C_1 = \sqrt{A_1 B_1^2 + B_1 C_1^2} = \sqrt{2 \cdot A_1 B_1^2} = 2\sqrt{2} \text{ cm}.$$

These are:

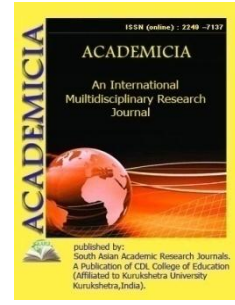
$$S_{ACC_1 A_1} = \frac{8\sqrt{2} + 2\sqrt{2}}{2} \cdot 4 = 20\sqrt{2} \text{ sm}^2$$

CONCLUSION:

It is critical to pique pupils' interest in science and to encourage in-depth study of the subject. When Geogebra is used to teach geometry, it helps to increase the quality of the lessons. The findings can be used to further research and improve multi-subject themes in a school geometry course. At the same time, higher education institutes in the field of mathematics teaching methods, teacher retraining centers, and school mathematics classes should teach how to utilize the Geogebra program.

LIST OF REFERENCES:

- Fundamentals of Algebra and Analysis. Geometry Part I, Textbook for pupils of 10 classes of secondary schools and secondary special, vocational education institutions, Tashkent, "Teacher", 2017, 144b
- A.B. Pogorelov Geometry 7-11 grades, Toshkent, "Bookkeeper", 1991
- A. R. Yesayan, N. M. Dobrovolsky, E. A. Sedova, A. V. Yakushin. Dynamic mathematical educational environment GeoGebra. Textbook. allowance, Publishing house Tul. state ped. un-ta them. L. N. Tolstoy, Tula, 2017.- Part I.- 417 p.



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AN OVERVIEW ON AGRICULTURE IN AFRICA

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ABSTRACT

In most developing countries, agricultural growth is at the core of poverty reduction and improved food security. However, Sub-Saharan Africa (hence referred to as Africa) is the only area in the world whose agricultural output per capita has stayed unchanged for the last 40 years. The application of customized methods and technology has revolutionized agricultural practice and production throughout Asia and Latin America, resulting in the so-called "green revolution." On the continent, no indigenous African green revolution technology have been disseminated. This chapter will argue that if adequate investments are made in key interventions such as soil fertility improvement, improved seeds, water management, market access, extension services, access to credit, and weather forecasting, Africa can achieve similar increases in productivity and food security. Where they have occurred, even in part, the results have been spectacular. However, bringing them to scale in a manner that increases agricultural production and alleviates poverty on a long-term basis would need greater investments and novel institutional structures. Thankfully, many research and development initiatives on the continent, such as the Millennium Villages Project, are giving useful information. Finally, this chapter highlights the major difficulties that remain.

KEYWORDS: Agriculture, Africa, Security, Subsistence, Urbanisation

1. INTRODUCTION

Many of the world's rural poor are smallholder farmers, and most of South and Southeast Asia, as well as most of Sub-Saharan Africa (hereinafter referred to as "SSA"), are smallholder farmers. Agriculture is dominated by smallholders in places like Africa. But why do small-scale farmers continue to be poor[1]. One such example is despite being highly efficient consumers of, the answer is that remain impoverished despite their abundant resources because most poor

nations provide them limited technological and economic possibilities to which they can react. This is especially true in Africa, the world's sole continent the globe in which agricultural output per capita is high over the last 40 years, it has stayed unchanged. This has led in food instability and an increase in reliance on food assistance and the continent's growing poverty Food insecurity is a key indicator of poverty. One of the continent's most serious challenges Africa is now experiencing a food crisis comparable to that of the United States.

In the 1960s, Asian nations were defined by Famine, chronic food insecurity, widespread poverty, fast population increase, weak institutions, corrupt governments, and Western pessimism are all factors. What factors contributed to Asia's Green Revolution's success against the backdrop of this architects claim that the Green Revolution in India, It was successful due of There have been significant technical and institutional developments. The lack of significant investments in agriculture, which is a characteristic in most African nations, was a key reason in India's agricultural output stagnation in the 1960s. when there are similarities The Green Revolution occurred as a result of investments made in Africa[2]. The spurts in the water are an example. Before and after the manufacturing that took place in Zimbabwe 6 years after independence Kenya has been independent since independence. From the 1960s through the 1970s Following the collapse of the Derg regime in Ethiopia, and after the banning of maize and rice in Nigeria imports.

There is a lot of evidence that smallholder farming is beneficial[1]. Can work productively in a competitive market when given the appropriate assistance this may have a negative impact. There are significant impacts on poverty alleviation. To the majority of observers, reducing poverty entails increasing smallholder agriculture. Agriculture as a source of broad-based economic growth Agricultural and non-agricultural enterprises are both growing and employing people. 8 It's also critical for lowering the continent's increasing population of undernourished people, which is projected to reach 212 million. Approximately one-third of the population. Smallholder farming is usually seen as a strategic asset. Agriculture is critical to overall development, yet expansion in impoverished rural regions may exacerbate poverty. decrease through three different methods[3].

- the direct effects of increased agricultural productivity and incomes on the rural poor,
- benefits of cheaper food for both the urban and rural poor, and
- Agriculture's contribution to economic growth and the generation of more opportunities in the nonfarm rural sector.

Economic shift defined by a rise in the significance of the nonfarm economy and a decrease in the agriculture sector's relative importance. Smallholder agriculture is often seen as a win-win alternative for fair development in this regard[4]. Agriculture is back on the policy agenda for donors and poor nations alike, after almost two decades of neglect. Accordingly, the most significant reason for this progress is a shared awareness that economic growth is the most effective means of alleviating poverty, and that expansion in the agricultural sector, which includes smallholders, drives this growth and is critical to overall economic development. Africa has the world's most severe and persistent poverty, with more than half of the population being smallholder subsistence farmers. 12 In July 2004, former United Nations Secretary-General Kofi Annan emphasized what he called "Africa's 21st Century Green Revolution" to achieve the

Millennium Development Goals by 2015 against the backdrop of growing food insecurity and poverty, as well as the realization of agriculture's enormous potential.

He emphasized the need of paying particular attention to agricultural methods in regions that are mostly cut off from functional markets. This is true in Africa, Asia, and Latin America's distant regions. Increasing smallholder agricultural production requires scaling up a number of practical initiatives. This chapter covers the scientific foundations of the main interventions that are required. Beginning with the introduction, the chapter is split into four sections. The biophysical limitations to increased output are discussed in the next section. The third section focuses on practical ways to control soil fertility, which is increasingly being recognized as a major contributor to decreasing production. Other complementing initiatives, such as better germplasm, water management, weather forecasting extension, markets, and microfinance, are discussed in the fourth part. The last part shows how impacts may be scaled up to national levels, showcasing some of the Millennium Villages Projects' methods and outcomes. In conclusion, we stress that the knowledge foundation needed to reverse Africa's perilous food situation is accessible, and that there is space in the necessary expenditures for targeted input subsidies. One may ask why Africa is unable to feed itself, given its vast variety. There are many factors that restrict output potential, including decreasing soil fertility, insufficient utilization of enhanced germplasm, and limited irrigation[5]. Without initially addressing the issues of soil and land degradation, little progress in smallholder farming in Africa is likely to be made.

Agriculture is inappropriate for around 55 percent of Africa's land area. Only 11% of the continent, distributed across several nations, contains high-quality soil that can support more than twice the continent's present population. 14 The majority of the remaining arable land has a medium or low potential for agriculture, with at least one significant restriction. Under low-input systems, this land is at a significant risk of deterioration. Soil deterioration was projected to have impacted 500 million hectares, or 17% of Africa's land, by 1990[6]. 15 Susceptible dry regions (arid, semiarid, and subhumid aridity zones), which encompass 43 percent of Africa and impact 485 million people, are the worst-affected areas. 16 In 1990, it was projected that 65 percent of agricultural land, 31 percent of permanent pastures, and 19 percent of forest and woodland in Africa were degraded in some way[7]. The present state of affairs is unquestionably worse. Soil moisture stress limits land production on 86 percent of African soils¹⁴, but soil fertility deterioration has now added a significant human-induced constraint to productivity. Other issues frequently mentioned³ include a high human illness burden, especially HIV/AIDS; a large rural inland population; a lack of significant river basins for irrigation; insufficient regulatory frameworks (albeit improving); and markets that do not function for the poor. One method to boost agricultural yields is to utilize inorganic fertilizers. Since the mid-1960s, fertilizer usage has resulted in a 50–75 percent rise in agricultural yields in developing nations outside of Africa.

Unfortunately, only a tiny percentage of African farmers utilize fertilizers, and the quantities used are often insufficient. Each acre gets an average of less than 9 kg of nitrogen and 6 kg of phosphorus. A typical crop requires at least 60 kg of nitrogen and 30 kg of phosphorus per hectare. Africa uses approximately 10% of the world's chemical fertilizer per hectare of agriculture, which is by far the lowest. The present level of fertilizer usage in Africa is unsustainable. This causes nutrient depletion, which is exacerbated by the poor intrinsic fertility of many African soils, with over 80% of them having chemical or physical restrictions on crop development[8]. Fertilizer usage is limited, owing to its high cost, and it contributes substantially

to the unprofitable character of smallholder farming seen across Africa. Few subsistence farmers can afford fertilizers, which may cost almost four times as much in many areas of Africa as they do in North America or Europe.

Transport expenses in Africa are about seven times greater than in the United States (in tons per kilometer). By the time fertilizers reach the farmer in rural Malawi, transportation and associated expenses (import tariffs, demurrage, and a variety of levies) have more than doubled the worldwide price. Thus, smallholder farmers in Africa have not reaped the benefits of actual worldwide price reductions of approximately 38% for nitrogen and more than 50% for phosphorus over the last 25 years[9]. The high expense of transportation is a major driving force behind this. For example, transporting one ton of fertilizer 1000 kilometers costs \$15 in the United States, \$30 in Asia, and \$100 in Africa. Similarly, transporting 1 ton of corn from Iowa (USA) to Mombasa (13,600 km) costs \$50, while transporting 1 ton of maize from Mombasa to Kampala (900 km) costs \$100. According to estimates from the mid-1990s, every African country's soils had a negative nutrient balance, indicating that the quantity of nitrogen, phosphorous, and potassium supplied as inputs was substantially less than the amount taken at harvest or lost via erosion and leaching.

This is in stark contrast to the nutrient excess of northern hemisphere soils, which presents a significant environmental risk. It also contrasts with Asia's average fertilizer nutrient usage rates of 150 kg/ha and Latin America's average of 75 kg/ha. Fertilizer use in Africa has grown by just 0.64 percent since 1980, despite a population growth of 75%, from 345 million to 607 million people. Fertilizer consumption in the Association of Southeast Asian Nations area of Southeast Asia increased at a rate of more than 12% each year during the same time, although having a somewhat lower overall population than Africa. In Asia, production increases with better crop types are predicted to be 88 percent, but only 28 percent in Africa, due to low input usage. Nutrients and soil moisture are complimentary inputs[10]. This is especially true in Africa, where chemical fertilizer prices are expensive at the farm level and rainfall is unpredictable in many places.

High yields require a lot of fertilizer, good seeds, and other expensive inputs. Farm-level investments in fertilizers, seeds, and other inputs, on the other hand, are hazardous in regions where rainfall is unpredictable and crops often fail due to drought. A key disparity in crop productivity in Asia and Africa is explained by this dilemma, in which farmers cannot afford to apply the inputs needed to produce high yields. More than half of arable land in Asia is irrigated, and the average yearly fertilizer application is about 40 kg/ha of arable land. Irrigation is used on less than 5% of agriculture in Africa, and the average fertilizer application is less than 10 kg/ha.

Farming is subject to a wide range of meteorological conditions. Weather extremes are anticipated to become more common in certain areas as a result of long-term climate change. Improved water and fertilizer usage efficiency will need innovations in water collection and reuse, the development of small-scale irrigation techniques, and the use of water-saving irrigation systems that allow for precise nutrient delivery. Millions of small-scale farmers in Asia have benefited from low-cost irrigation technology, which have increased agricultural production, income, and family food security. In Kenya, Tanzania, Zambia, and other nations, efforts to increase groundwater usage include the distribution of low-cost treadle pumps and drip irrigation kits. In much of Africa, surface water is now the main source of irrigation. As a result,

across most of Africa, surface water storage systems are required to maximize the utilization of river water.

However, in certain locations, the expense of construction and possible environmental consequences may prevent the establishment of surface water storage. Reducing the huge yield gap between actual and prospective yields is another important element in improving agricultural production in Africa. For maize, a major food crop in many African nations, the disparity is more than 50%. Other key crops in the area, such as cassava, sorghum, and rice, are also affected. This yield gap demonstrates Africa's unrealized potential for improving agricultural output and productivity. In Africa, adoption of enhanced germplasm is usually low. Even in maize, where adoption rates are about 57 percent, the gap between research and adoption is increasing. Cassava production is increasing rapidly, but it is still below 40%. The poor adoption of the various technologies available may be attributed to a number of reasons.

The high cost of inputs (fertilizers and pesticides), the lack of liquidity and credit, and the lack of access to supplemental irrigation are all factors that contribute to farming's high risk. Furthermore, unstable land tenure rights are a major deterrent to farmers investing in soil amendments or soil and water resource conservation initiatives. Despite the fact that techniques and technology are relevant and accessible, smallholder farmers often lack access to them. As a result, extension and input distribution systems are mutually reinforcing extension contributes to agricultural productivity increase when input distribution systems are operating, and vice versa. Agricultural technology are likewise evolving at a fast pace. Farmers must be educated on which technologies are most effective, how to utilize them, and how to create effective demand for viable new technologies in order for the input distribution system to provide them.

Unfortunately, in many African nations, agricultural extension is weak and decreasing. Where agricultural extension services are available, the ratio of agricultural officers on the ground to farmers is often enormous. Retrenchments after structural adjustment programs, HIV/AIDS, conflicts, and civil wars are among causes that have led to the decline of extension services. Private extension services are disproportionately geared toward affluent areas and high-value crops. Remote regions and impoverished farmers with little marketable surplus, particularly those producing low-value commodities, are underserved. Thankfully, nonprofit private providers are increasingly focusing on these groups. Based on many multilocal research, a consensus has developed that combinations of inorganic (fertilizers) and organic (nutrients) inputs provide the greatest and most sustained production increases per unit nutrient supplied. This agreement departs from the fertilizer package strategy, which has historically failed in the area. However, this adds to the already difficult task of guaranteeing fertilizer supply, as well as the additional issue of increasing farmers' capacity to generate organic matter.

Agroforestry technologies, such as improved fallows with fast-growing leguminous trees and cover crops that mobilize atmospheric nitrogen, biomass transfer from nutrient-mobilizing plants, such as *Tithonia diversifolia*, compost, crop residues, and animal manure, are all promising organic soil fertility strategies. When cattle are given leguminous tree fodder, the nutritional content of manure, particularly phosphorus, may be greatly enhanced. Leguminous tree technology improves soil fertility, yields, weed control, and provides fodder and fuel, as well as serving as stakes for higher-value crops like tomatoes and climbing beans. Increased biodiversity, carbon sequestration, and watershed protection are all benefits of agroforestry

technology. Mineral fertilizers, particularly phosphorus, would still be required if agroforestry and other organic fertilizers were used.

This may come from more traditional phosphorus fertilizers or finely ground phosphate rock, and Africa has numerous “reactive” rock resources that might be explored further. Agricultural research projects in western Kenya, a highly populated area with more than 1000 people per square kilometer in some places, best illustrate the benefits of this integrated approach to soil fertility management. The issue of poor and decreasing soil fertility is exemplified in this area, and the ongoing danger to land resources is exacerbated by the desire to increase food production and decrease poverty. Reversing agricultural stagnation (due largely to low and declining soil fertility), safeguarding the natural resource base, slowing population growth rates, combating the negative effects of the HIV/AIDS pandemic on the community, and reducing poverty are all intrinsically linked to achieving food security.

The World Agro forestry Centre and other partner organizations tested a low-cost integrated soil package to address this issue. Recapitalize phosphorus-deficient soils; supplement phosphorus dressings with organic manure to increase phosphorus use efficiency; use existing on-farm organic resources (including biomass transfer) to supply nitrogen to crops; use improved fallows of agro forestry species to replenish soil nitrogen and reclaim *Striga*-infested soils; supplement phosphorus dressings with organic manure to increase phosphorus use efficiency; supplement phosphorus dressings with organic manure to increase phosphorus use. Thousands of farmers embraced the technology, and maize (the main food crop) yields rose two to three times above normal yields of 1–2 tons/ha or less in only one growing season. The tree fallows offer numerous advantages, including in situ fuelwood production, collection of leached nitrates, recycling of other nutrients, and *Striga* management, in addition to nitrogen recycling at 100–200 kg/ha. Farmers were also encouraged to diversify and obtain better kinds of other crops, such as cassava, sweet potatoes, beans, sorghum, and fruits, such as mangoes, avocados, and passion fruit, as a result of the increased maize yields.

Access to lunch for school-aged children in one of the communities was a spillover effect of improved agricultural yields. Others in the area used the communities as learning centers. They also served as field laboratories for researchers and farmers to test institutional and technological advances. This significantly contributed to the project's success. The initiative, however, lasted just three years and terminated before farmers were able to maintain efforts to get the required supplies and support community-based farmer-to-farmer distribution networks. Thankfully, the Millennium Villages Project has taken up the project and is pushing the same nutrient mobilization agroforestry initiatives. However, increasing soil organic matter and nitrogen advantages takes time and may only occur when inorganic fertilizers are used to boost plant biomass development. Mulch management is one of CT's most difficult tasks. Farmers must protect the mulch by preventing animals from eating agricultural leftovers and suppressing bushfires. To achieve this, a variety of techniques are suggested, ranging from the use of green manure and leguminous tree cover crops to weed-controlling and mulch-producing cover crops to herbicide-based CT systems. CT is a knowledge-intensive system, with the farmer's actions (management) being more important than the inputs he or she uses. Spreading CT among smallholder farmers necessitates a focus on information transfer and knowledge development to and within agricultural communities. It entails academics and extension workers collaborating with farmers and other stakeholders to create regionally tailored conservation agricultural

methods. It necessitates the involvement of many partners. The African Conservation Network is pursuing this objective, and it has also given a thorough assessment of the current information base.

Through market-led procedures, Africa has a lot of potential to boost agricultural development and relieve hunger and poverty. Despite some pessimism, sufficient market possibilities exist that have yet to be completely explored and may enable more fast and sustainable agricultural development in Africa. Staple foods, for example, represent a promising domestic market opportunity, not only because Africa is a net importer of many staple foods, but also because projections show that demand for human consumption and livestock feed will double by 2015, adding an additional \$50 billion per year to effective demand. Many African farmers are in a strong position to compete in these essential markets.

Furthermore, Africa's expanding urban markets are boosting demand for more varied and higher-value-added commodities, opening up new possibilities for many African farmers. Many African nations also have a competitive edge in the goods that other African countries buy. African nations may boost intraregional agricultural trade by more than 50% by lowering trade barriers in both the agricultural and non-agricultural sectors. Intra-African commerce may also help to improve food security by allowing output to be transferred from high-potential agro ecological zones to regions with structural food shortages. Intra-African commerce may be more accessible to smallholders since cross-border exports may not be subject to the same degree of rigorous quality requirements needed for foreign markets. In drought years, increased cross-border commerce in agricultural staples may also assist to stabilize food supply and prices at the sub regional level.

Farmers' competitiveness and capacity to enhance their market position is a key problem with growing market volatility and competition for smallholders. Taking use of economies of scale is one method to boost production. Small-scale farmers confront a variety of challenges, including a lack of money, inaccurate information, geographic dispersion, and inadequate infrastructure and communications. Collective marketing via rural producers' groups may be one effective method to address these challenges. The state's retreat from economic activity, along with a relatively undeveloped private sector, exacerbates these limitations. Farmers may reduce transaction costs and therefore get the advantages of collective marketing by acting collectively via farmer organizations. This is an important element in smallholder tea, coffee, and dairy producers' success in Kenya's highlands. Contract farming is another method for increasing market access that may potentially replace the state's role in supplying knowledge, inputs, and financing. The degree to which contract farming may benefit small farmers who are the focus of poverty reduction initiatives is a crucial issue. Almost all contract farming programs, according to the data thus far, exclude small farmers. 60 Weak institutions are to blame for many of the transaction expenses that prevent companies from working with smaller farmers.

Growers might, for example, directly obtain vital production information if information markets were better established, rather than depending on the company for the high fixed costs of extension services. There are many success examples in Africa that may be used to help further improve this system. Smallholder tea producers in Malawi, dairy farmers in Kenya, and confectionery peanut growers in Senegal are just a few examples. How should smallholders react to changes in agrifood organizations, such as the global expansion of supermarkets one apparent solution is to accept these developments as a business reality and to organize around

them. In practice, this entails establishing direct ties with new markets, as well as information providers, non-governmental organizations, commercial players, and the government. Small farmers must create a new generation of economic organizations that operate at greater degrees of detail, coordinate technology, and enhance scheduling as a result of their interaction with new markets. Knowledge transfer from other areas with more sophisticated connections, such as Asia and Latin America, is critical.

However, lowering the bloated marketing margins caused by transportation and processing costs must come first. Improvements in road and transportation networks, greater access to market information systems, and improved coordination and contractual agreements among farmers, dealers, and purchasers are all part of reducing these margins. These investments in rural infrastructure and market development would also enable linkages with the nonfarm sector, boosting total income and employment in both rural and urban regions and increasing demand for agricultural goods. It is essential for success in the post-reform period to define an acceptable and realistic role for the public sector. Because agricultural commodities demand is inelastic in general, and more so in the face of market failure, even modest increases in aggregate production may significantly lower output prices.

As a result, technological advancements have resulted in greater output. In that order of significance, Africa produces all of the major grains: maize, wheat, and rice. Corn is the most widely cultivated crop, being planted in almost every ecological zone. Egypt and the Indian Ocean islands of Réunion and Mauritius, where cultivation is irrigated, have the highest yields per acre. Millet and sorghum are also grown throughout the continent, although mostly in the savanna areas. Rice production and consumption have grown in importance in recent years, and they are strongly linked to regions of growing urbanization. Egypt, Guinea, Senegal, Mali, Sierra Leone, Liberia, Côte d'Ivoire, Nigeria, Tanzania, and Madagascar are the most significant rice-producing nations. Wheat production was previously limited to South Africa, North Africa, and the highland zones of Ethiopia and Kenya, but new cultivars have allowed it to be grown (with irrigation) in savanna nations like Nigeria.

Except in the subtropical regions of North Africa and the highland zones of East and Southern Africa, where pure stands of alfalfa (lucerne) are cultivated, fodder crops are not commonly planted. Berseem (a kind of clover used for fodder) is also cultivated under irrigation in Egypt and Sudan. Protein-rich legumes are extensively grown, typically in combination with other crops. Velvet beans, cowpeas, soybeans, and lablab are among them (hyacinth beans). Broad beans and vetches are also grown in North Africa. Peanuts (groundnuts) are extensively produced in Western Africa, for both local and export use. Cassava farming has exploded in popularity, especially in western and central Africa; it has replaced yam production in many regions and is no longer considered a famine reserve. Potatoes are grown at greater altitudes in nations like Ethiopia, Kenya, and Madagascar, as well as in North and South Africa's Mediterranean climatic zones. Sweet potatoes are more common in tropical and subtropical areas, while plantains are often cultivated in tropical forest zones.

2. DISCUSSION

Agriculture is Africa's most significant economic activity by a long shot. It employs about two-thirds of the continent's working population and contributes an average of 30 to 60% of gross domestic output and approximately 30% of the value of exports to each nation. Despite this,

arable land and land planted with permanent crops account for just approximately 6% of Africa's total land area. Except in countries with large populations of European ancestors, such as South Africa, Zimbabwe, and Kenya, agriculture has largely been confined to subsistence farming and has been heavily reliant on the inefficient system of shifting cultivation, in which land is temporarily cultivated with simple implements until its fertility declines, then abandoned for a period to allow the soil to recover. Furthermore, arable land has been distributed throughout much of Africa via a complicated system of community tenure and ownership rather than through personally acquired title, and peasant farmers have had rights to utilize relatively small and dispersed holdings. This land ownership structure has tended to keep agricultural output intensity low and has slowed the pace at which capital has been mobilized for modernization. A number of nations have attempted to increase productivity by utilizing improved seed and planting materials, tractors and other automated equipment, and increased use of mineral fertilizers and pesticides. However, such efforts have been rather restricted, raising worries about their role in speeding up soil erosion and desertification. Land has become private rather than communal property in places where commercial crops are grown, and cultivation is intense. A lack of integration between crop production and animal husbandry is also to blame for the continuation of relatively low-productivity agricultural systems over vast swaths of the continent. Sedentary cultivators such as the Hausa in Nigeria and the Kikuyu in Kenya have traditionally lived apart from their nomadic herdsman neighbors (the Fulani and Maasai, respectively), resulting in a lack of access to animals for draft power and manure for fertilizer across large swaths of the continent. In many places, the presence of insect pests such as the tsetse fly inhibits mixed farming.

3. CONCLUSION

The consequences of decreasing agricultural production in Africa, the region where this decrease is most visible, will increase poverty, particularly in rural and urban areas. Underperforming agriculture, on the other hand, hinders economic development and may have severe environmental effects. This chapter has emphasized some of the unique challenges that African smallholder agriculture confronts, such as decreasing soil fertility, limited adoption of improved germplasma, reliance on unpredictable rainfall, inadequate farmer extension services, and restricted market access. On the continent, the technology and ideas required to solve these issues already exist. The difficulty is to make them available to farmers at a large scale. This objective is critical for the success of the African Green Revolution, which has been long overdue. African governments and leaders have increased their efforts and are working to find answers to long-standing issues, such as providing targeted input subsidies. As Malawi's input subsidy program and the Millennium Villages Project have shown, the impacts on food security may be swift. These impacts must be scaled up, and governments must be assisted in developing the technological and institutional ability to keep them going. Identification of the kind and size of public-private partnerships required for establishing comprehensive and sustainable input and product markets will be a major issue and focus of future study. To this aim, cross-country cooperation among developing countries may be very beneficial to this process, particularly in terms of technology transfer and market skill development.

REFERENCES

1. A. A. Adenle, "Response to issues on GM agriculture in Africa: Are transgenic crops safe?," *BMC Res. Notes*, 2011, doi: 10.1186/1756-0500-4-388.

2. L. Christiaensen, "Agriculture in Africa – Telling myths from facts: A synthesis," *Food Policy*. 2017, doi: 10.1016/j.foodpol.2017.02.002.
3. B. Sultan and M. Gaetani, "Agriculture in West Africa in the twenty-first century: Climate change and impacts scenarios, and potential for adaptation," *Frontiers in Plant Science*. 2016, doi: 10.3389/fpls.2016.01262.
4. V. K. Ogemah, "Sustainable agriculture: Developing a common understanding for modernization of agriculture in Africa," *African J. Food, Agric. Nutr. Dev.*, 2017, doi: 10.18697/ajfand.77.16560.
5. A. Kuyvenhoven, "Africa, agriculture, aid," *NJAS - Wageningen J. Life Sci.*, 2008, doi: 10.1016/S1573-5214(08)80031-0.
6. K. Winkler, U. Gessner, and V. Hochschild, "Identifying droughts affecting agriculture in Africa based on remote sensing time series between 2000-2016: Rainfall anomalies and vegetation condition in the context of ENSO," *Remote Sens.*, 2017, doi: 10.3390/rs9080831.
7. FAO, "Scaling-up Conservation Agriculture in Africa: Strategy and Approaches," *FAO Sub Reg. Off. East. Africa*, 2009.
8. J. Sumberg, N. A. Anyidoho, J. Leavy, D. J. H. te Lintelo, and K. Wellard, "Introduction: The Young People and Agriculture 'Problem' in Africa," *IDS Bulletin*. 2012, doi: 10.1111/j.1759-5436.2012.00374.x.
9. J. W. Hansen, S. J. Mason, L. Sun, and A. Tall, "Review of seasonal climate forecasting for agriculture in sub-Saharan Africa," *Experimental Agriculture*. 2011, doi: 10.1017/S0014479710000876.
10. C. Thierfelder *et al.*, "Conservation agriculture in Southern Africa: Advances in knowledge," *Renewable Agriculture and Food Systems*. 2015, doi: 10.1017/S1742170513000550.



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EXPLORING THE COMPETENCE OF FAMILIES OF THE SAME-SEX COUPLES

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ABSTRACT

The research focuses particularly on two important areas lacking from the existing literature: variables promoting perseverance in same-sex parented families; as well as health and wellbeing results for same-sex couples who experience separation, such as the negotiation of joint custody arrangements post-separation. The present article seeks to give a thorough review of the design and methodology of this longitudinal research and evaluate its relevance. The work, love, play research is a mixed format, three wave, longitudinal controlled trial of same-sex interested parents. The sample comprises lesbian, gay, bisexual as well as transgender families in Australia and New Zealand caring for any kids under the age of 18 years. The research will be performed over six years from 2008 to 2014. Quantitative data are to be gathered through three on-line questionnaires in 2008, 2010 and 2012 from the cohort of parents recruited in Wave. Qualitative data will be gathered through interviews with purposively chosen subsamples in 2012 and 2013. Data collecting started in 2008 and 355 participants to Wave One of the research have consented to participate in future polls. Work is now ongoing to expand this sample size. The methodology and survey tools are discussed. This research will make an essential addition to the current research on the same parented households.

KEYWORDS: *Bisexual, Heterosexual, Same-Sex Parent, Transgender.*

1. INTRODUCTION

Families led by same-sex couples have achieved greater public visibility over recent years in the Western world, with increasing media and political attention focused on debates about gay marriage, and lesbians' and gay men's reproductive rights, including access to in vitro-

fertilization and surgical rights. In addition, this is a developing academic study project that aims to improve the sociological and psychological knowledge of lesbian, gay, bisexual and transgender (LGBT) parents and their children's experiences[1]. While families led by same-sex partners have gained more public exposure in recent years, there will still be numerous difficulties for these families in coping with legal and societal settings that are not favorable of same-sex partnerships. The Work, Love, Play research is a major randomized trial of same-sex parenting. It seeks to explore various aspects of family life within this group and analyses how they evolve over time.

It is impossible to properly determine the number of families led by parents of the same sex in any nation. Data from the Australian Census of 2001 show that one in five lesbian couples and up to 5% of homosexual men have children living with them in their homes. This statistic may well underestimate the real number of parents who are attracted by the same sex because it does not include single parents and parents who have children who do not live at home with them. The United States Census Bureau also projected in 2000 that 1/3 of lesbians and 1/5 of homosexual families presently tend to raise children. Regardless of exact statistics, it is nevertheless evident that a significant percentage of lesbians and gay men may at some time in their life become parents[2]. Strengths of the research design also include longitudinal approach, which will enable understanding of changes with time within inner family connections and societal supports. The mixed approach design also allows for data triangulation. A high sample size was achieved by recruiting both homosexual males and lesbians.

Research indicates that homosexual couples and homosexuals attracted only parents in many respects. A significant percentage of lesbians and homosexual men have straight offspring. Many lesbian couples conceive their children via anonymous sperm donors obtained through fertility clinics or a known donor who could or cannot become a child's father or become a child's father. Donation of sperm to lesbians offers many homosexual men a chance to become parents, some of whom have continuing co-parenting/care agreements with the mother of the children. A lesser but growing number of homosexual men via surrogacy agreements have become parents. Lesbians and homosexual men may also support or adopt children in situations that are legally allowed. Many parents of the same sex have mixed families, which include children from prior partnerships and children conceived during one or both parents' relationships. This family diversity is challenging conventional, heterosexual, family conceptions or definitions[3].

The greatest difficulty for most homosexual family members is to address the legal and communal environment which usually does not accept same sex partnerships and frequently does not take various forms of the family into account. Normative conceptions of the family center on the biological relationship between children and their heterosexual parents. Non-biological parents of children conceived within the same sex frequently have limited tools to make sure they are legally recognized as a parent. Large families may also not recognize non-biological children or parents as part of their families[4]. Parenting families of the same sex may face discrimination in health, welfare, education and legal systems or suffer unfavorable attitudes from service providers while dealing with key milestones of life such as pregnancy, pre- and post-natal services, child care and schooling. Even if there are no obvious prejudices, involvement with official institutions such as childcare, schools and the health system necessitates that homosexual parents constantly negotiate procedures that all homes are led by a heterosexual spouse. For example, most registration or child-related information forms do not

include space for two moms or two dads. This implies that parents of the same sex have to haggle frequently with the service providers to make sure both parents are recognized. The process of 'out' on frequent times may be difficult for some parents and many worry about their children becoming homophobic or discriminatory at school[5].

More personally, some lesbian and gay parents experience lack of support within their own extensive family network or, in some instances, outright hatred. Furthermore, if lesbians or homosexuals become parents, they may lose some of their links in the lesbian and homosexual society, an essential source of support and confirmation for many people who love same sex. Extensive research has shown that same-sex individuals have been marginalized and stigmatized by their sexual identity. This may lead to decreased social connectivity and has a detrimental effect on physical and mental health and access to healthcare attracted by the same sex. This may be exacerbated by parents of the same sex who feel insecure and suffer psychological anguish due to their worries about the effect of homophobia on their children. Researchers performed a research comparing lesbian and heterosexual moms' psychological well-being and the United States. The research showed that sexual orientation does not in itself contribute to lesbian women's mental health but to their legal and social environment. In the United States, lesbian moms reported more concern about their legal status as parents and had more depressive symptoms than lesbian mothers in Canada[6].

Despite such difficulties, there is a broad range of studies showing that developmental, social and emotional results are at least comparable to those of their heterosexual parents for kids raised in same sex homes. Studies show that there are mechanisms in the family, including relationship quality and parents' psychological well-being, which lead to a greater degree of well-being among children, regardless of their sexual orientation. In addition, recent studies have revealed that lesbian moms are more equal than heterosexual couples in organizing families and working duties that may lead to greater levels of happiness in the relationship. There are nevertheless significant gaps in the study on parent families of the same sex. First of all, the dominance of research aimed at results for children brought up in homosexual parenting homes implies that there are just a few studies on the health and well-being of same-sex parents. Factors which promote and increase resilience in homosexual households are similarly scarce. What allows a family to survive under difficult circumstances while others fight?

A significant gap in study pertains to the experiences of separation of parents of the same sex. Although it is widely established that at least one in three Australian heterosexual marriages ends in divorce, Australian research on the separation of homosexual couples or the experience and effect of separation on the health and well-being of parents and children has been extremely sparse. Approximately 20% of couples had split by the conclusion of the trial in a small Australian study of 25 lesbian parent households. A worldwide longitudinal study of lesbian moms who had children via donor insemination showed that by the time their children were 10 years old 38 per cent (n = 30) of pairs had split. Research has not, however, investigated whether separated spouses may get enough assistance or health and well-being results[7]. A number of research in heterosexual households have used the idea of resilience. Family resilience may be considered to balance stress and pressure with the skills and strengths of that family unit – or "excellent results despite adversity." If demands or stresses exceed capacities and resources, there may be a family crisis or collapse. A resilient family may use their ability to handle demands, risks and stresses effectively[8].

The study of family resilience includes identifying variables protecting families against crisis or collapse (separation). These protective variables are identified in the research on family resilience at three different, but interconnected levels: individual, family and community levels. Individual level protection factors include: better parenting and income levels, good markers of mental health; excellent coping abilities and an overall feeling of positivity. Family level protection factors include: family cohesion, the quality of the connections between parents (including communication quality and negotiation of household and childcare duties) and the quality of interactions between parents and children. Protective factors at the Community level include: availability to resources and assistance, access to community networks, a feeling of connectedness to local communities and extended families and strong social networks. Formal institutional support and informal networks and support systems are essential at this level. Legal acknowledgment of partnerships has also been proven to promote resilience in the case of homosexual families. The increasing legitimacy with legalization makes it possible for the family to get greater official cash assistance and also offers up possibilities for social relationship development[9].

Some studies have looked at the resilience of homosexuals and lesbians, but few studied resilience in homosexual families. The Work, Love, Play (WLP) study investigates the extent to which the factors contributing to family stability are linked with resilience in families identified in previous research on heterosexual families when a parent or more identifies as being attracted to the same sex and which are more diverse in structure than traditional heterosexual family structures. The WLP research will also investigate variables that contribute to the resilience and well-being of families in social settings, characterized by legal and heterosexual community and prejudice against same-sex parents and children[10]. The research will also examine the experience of separation amongst same-sex couples with children. The objectives of the WLP study are given below.

1. It describes the features and variety of parent families of the same sex in Australia and New Zealand
2. Investigate the causes of breakdown in relationships and resiliency in parent families of the same sex
3. Examine changes in the stability and parenting of relationships between individuals
4. Exploring the effect on same-sex family parents of discrimination and homophobic societal views
5. Find obstacles to adequate provision of services to homosexual parent families across a variety of sectors, including community and health services
6. Develop methods for research findings to be translated into Good Practice Guidelines for use by providers in mainstream services and services aimed at homosexually attracted people and families in same sex families.

2. METHODOLOGY

2.1 Design:

A mixed methodological research comprising three waves and longitudinal cohort studies of same-sex parents in Australia and New Zealand was planned to be performed between 2008 and

2014 over a period of six years. The sample includes lesbian, homosexual, bisexual and transgender parents who care for children under 18. In 2008, the first online survey gathered quantitative data, with two further online polls scheduled for 2010 and 2012. Qualitative data will be gathered via interviews in 2012 and 2013 using deliberately chosen subsamples and open-ended interviews. The key findings of interest for sub-studies are the following: increased understanding of variables that contribute to resilience in homely families and increased knowledge of the experiences of parents in partner separation and post-separation parenthood.

2.2 Sample:

The cohort sample includes participants from Australia and New Zealand who identify gay, lesbian, bisexual and transgender persons as same-sex persons and presently active parents or children under 18 years of age. Alone parents who are attracted to the same sex are able to join. The method for sampling is restricted to one respondent per household. The self-finished survey asks that participants speak and write English. There is no sufficient census data available in Australia and New Zealand to determine the population size of the same-sex parents. In addition, prior investigations of this demographic group included relatively small samples and were mainly qualitative. As such, insufficient information is provided to perform a power calculation to establish a suitable sample size for this research. Data from Wave One were gathered from June to November 2008. During the time, the survey was carried out by 445 eligible individuals with 355 (80%) consenting to participate in the longitudinal research. In 2009/early 2010, further sampling and recruiting for particular categories started to increase the sample, with the objective of having at least 50 cases in all interest areas, including gender and location of residence.

Among the 445 first-round Wave One respondents, 85% (n = 377) lived in Australia and 15% (n = 68) in New Zealand. Most were lesbians (75 percent, n = 334) and 15 percent (n = 65) were homosexual, 8 percent (n= 36) were bisexual and 1 percent (3) were takatapui and 2 percent (n = 7) were transgender responses. The bulk of respondents (76 percent, n = 340) lived in urban regions within or outside of the country. Just under a quarter of the participants identified their homes as regional or rural/remote areas (23 percent n=102). Of the 355 people consented to be contacted for future polls, 301 were women, 49 were males and four identified their sex as "other". Objective cohort sub-samples for qualitative interview research in two particular areas of interest will be recruited from the Wave one cohort: determinants of resilience in homosexual families and the experience of parental separation for homosexual parent families.

2.3 Data Collection:

The surveys for 2008, 2010 and 2012 are done online. A survey hosting firm put up the questionnaire online, collects and maintains data on a secure server which is only available to researchers through a password for the Wave One survey (2008). The Wave One questionnaire included more than 100 questions and occupied around 30 to 60 minutes. Only relevant questions could be asked of each individual responder using the computerized format. Questions regarding present relations, for example, were not raised if an interviewer indicated that they are now single in a prior inquiry. At the conclusion of the survey, participants were invited to participate and if so, to give contact information for future study. The respondents were told that this choice was optional and anonymous and that they could only participate in the Wave One research. Volunteer participants were sought for the Wave One survey through.

1. A sponsored banner of the website was posted on the 'Pink Sofa' website for three months.

2. Gay and Lesbian Health advertising Vitoria newsletters and websites and Brisbane Lesbian news "City- Lickers"
3. Business cards in size were created and distributed to community and health centers across Australia and New Zealand and to social supporting organizations of gay and lesbians.
4. Information on the study was posted in a series of e-mail lists including: Gay Dads Australia (and their state-based e-lists); Rainbow Families Council; ACT Queer; Australia's Lesbian Medical Association; Gay and Lesbian Researchers; GLBT Research Network of New Zealand; Auckland Gay and Lesbian Welfare; New Zealand Families; Gay & Lesbian Line; HOT News (South Australia); Pride and Hospitality (South Australia).
5. Informal advertising via e-mail to personal networks was created, and individuals were asked to forward it to friends and colleagues.

3. RESULTS AND DISCUSSION

The poll covered a range of demographic questions such as sex, sexuality, age, location, training, employment, cultural/ethnic backgrounds, languages spoken and respondents' income and their spouse, when applicable. If the respondents answered that they are presently in a relationship, questions were asked regarding their relationship, including the time and the duration of cohabitation. They were also questioned whether they now had a parenting agreement with someone else. One open question asked respondents to describe the structure of their existing family. Respondents were questioned about the conception techniques and their relationship status at conception for each of their children. Options were provided for the promotion, adoption or other permanent care arrangements. The "Negotiation the Life Course" (NLC) study, a longitudinal study of Australian couples carried out by the Australian Demographic and Social Research Institute at the Australian National University and the School of Social Sciences at Queensland University, adapted a series of questions on the division of labor in the home. The NLC survey utilizes a CATI technique to gather information every three years from 1500 Australian respondents. The NLC's first wave took place in 1996 and 1997, followed by three waves in 2000, 2003 and 2006.

The Work, Love, Play research is the first large-scale study undertaken in Australia and New Zealand by same sex family members. Its importance rests in its significant contribution to national and worldwide family resilience literature. Furthermore, because the experience of separation among homosexual parent families has not before been studied, this study will fill a large vacuum in international literature. The research will also provide a significant addition to evidence on the health and well-being of parents and their children attracted by the same sex. Other features of the research include bigger samples compared to prior studies by lesbian and homosexual male parents. There is few published research on homosexual male parents and prior studies of lesbian parents tended to be qualitative studies exploring small samples.

The combined approach (qualitative and quantitative) to this research is suitable for investigating the notion of resilience in parent households of the same sex. Because little research has been carried out on this subject, the gathering of qualitative data will allow additional investigation and explanation of the main themes arising from the study Waves 1 and 2. The projective, longitudinal design of the research provides the chance to examine the separation experience of a same-sex parent sample, including an assessment of pre- and post-separation variables and

parental well-being. In addition, the design allows the study of family well-being in Australia over time, and in areas where since Wave One the rules on same-sex parenting have altered. For example, 83 responders from Victoria, Australia have consented to take part in the future research waves. New rules that allow two moms to appear on a birth certificate and provide potential lesbian parents wider use of reproductive technologies came into effect in January 2010 in this State.

The WLP study has several drawbacks. There is no sample framework for lesbian and homosexual parents to generate a random selection of participants for the research. The unlikely sampling techniques employed in this research may generate some partiality in the sample, as individuals more related to social networks and support networks are likely to be exposed to data regarding the study. Unfortunately, this implies that the sample may be underrepresented for individuals who are more socially isolated, or who have worse mental health. The online survey technique also implies that a response rate cannot be determined since it is not known how many individuals viewed and refused to participate in the research.

4. CONCLUSION

In this research, the current Wave One sample had a very high level of education. This is not unusual. Most gay, lesbian, bisexual and transgender (GLBT) studies in Australia use samples who have greater average levels of education than the overall population. It is not apparent whether this represents an actual greater degree of knowledge among Australians who openly recognize that same sex is attracted to them, or if individuals from poorer socio-economic backgrounds, especially online research, are less inclined to engage in study. Similarly, the sample included a low proportion of non-English speakers. Again, in Australian studies this is not unusual and does not focus particularly on a cultural group. The ethnic variety in Australia and New Zealand makes it difficult for all individuals from a wide range of cultural backgrounds to properly reflect their experiences. It is difficult to acquire sufficient numbers to guarantee representation within the total sample without a broad targeting of certain cultural groups. It should be emphasized that experiences of same-sex attracted parents in Australia and New Zealand may vary in various socioeconomic and cultural groupings.

REFERENCES:

1. L. Gahan, "Separated same-sex parents: Troubling the same-sex parented family," *Sociol. Res. Online*, 2018, doi: 10.1177/1360780418754699.
2. J. J. Power *et al.*, "Understanding resilience in same-sex parented families: The work, love, play study," *BMC Public Health*, 2010, doi: 10.1186/1471-2458-10-115.
3. A. Titlestad and J. A. Pooley, "Resilience in Same-Sex-Parented Families: The Lived Experience of Adults with Gay, Lesbian, or Bisexual Parents," *J. GLBT Fam. Stud.*, 2014, doi: 10.1080/1550428X.2013.833065.
4. H. Von Doussa *et al.*, "Building healthcare workers' confidence to work with same-sex parented families," 2016, doi: 10.1093/heapro/dav010.
5. D. Dempsey, "Same-sex parented families in Australia," *CFCA Pap.*, 2013.
6. D. Breshears and C. L. De Beer, "Same-Sex Parented Families' Negotiation of Minority Social Identity in South Africa," *J. GLBT Fam. Stud.*, 2016, doi:

10.1080/1550428X.2015.1080134.

7. M. G. Welsh, "Growing up in a same-sex parented family: The adolescent voice of experience," *J. GLBT Fam. Stud.*, 2011, doi: 10.1080/1550428X.2010.537241.
8. S. Tang, "Same-sex partnering and same-sex parented families in Singapore," in *Family and Population Change in Singapore: A Unique Case in the Global Family Changes*, 2018.
9. S. R. Crouch, R. P. McNair, E. B. Waters, and J. J. Power, "What makes a same-sex parented family?," *Med. J. Aust.*, 2013, doi: 10.5694/mja12.11234.
10. A. Hardie, "Picture books with same-sex parented families: Unintentional censorship," *Int. J. Learn. Divers. Identities*, 2014, doi: 10.18848/2327-0128/CGP/v20i01/48559.



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ELECTROCHEMICAL TITRATION OF PALLADIUM IN NON-AQUEOUS MEDIA

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ABSTRACT

The article shows the conditions and the possibility of amperometric titration of noble metal ions with solutions of 4-methoxyphenylcarboxymethyl-diethyldithiocarbamate (MFKMDETC) and 4-methoxy phenylcarboxy methyl-dithio-carbamate (MFKMDFTC) in non-aqueous and mixed media (n-acetic acid), DFA with background electrolytes with different acid-base properties. Methods of amperometric titration of micrograms of amounts of noble metal ions in the presence of foreign ions containing foreign ions are proposed.

KEYWORDS: *Palladium, Mpkmdetk, Mpkmdftk, Solution, Acetic Acid, N-Propanol, Dmf, DmsO, Background Electrolytes.*

INTRODUCTION

Amperometric titration of metal ions in non-aqueous and mixed media with various complexants will expand their analytical capabilities and simplify the solution of many complex analytical problems. First of all, this is due to the fact that the nature of the solvent strongly affects the strength of the resulting complex, moreover, it is not the same for different cations, which determines the selectivity and rapidity of the method. In addition, the methods of non-aqueous compleximetry successfully solve the problem of accurate and selective determination of metals in objects of organic origin, as well as directly in extracts obtained during concentration.

We tried to find the optimal conditions for the amperometric titration of a number of noble metals with solutions of 4-methoxyphenyl-carboxymethyldiethyldithiocarbamate (MPKMDETC) and (4-methoxyphenylcar-boxymethyl) -diphenylthiocarbazone (MPKMDFTK) in various non-aqueous protolytic acids, on basic electrolyte media. There are no data in the literature on the amperometric titration of ions of various metals with solutions of the above reagents, since they were synthesized relatively recently [1] and, in addition to their biological activity, their other properties have not yet been studied [2].

Reagents and equipment. The initial 0.002 M Na_2PdCl_4 solutions, as well as 0.01 M solutions of MPKMDETC and MPKMDFTK were prepared by dissolving the corresponding weighed portions of these reagents in acetic acid (n-propanol, DMF, and DMSO). The concentration of noble metals was determined amperometrically using a 0.01 M potassium iodide solution. Amperometric titration was performed on a setup with two platinum wire electrodes rotating (1000 rpm) on a common axis. The design of electrodes, piston automatic microburettes and apparatus are described in detail in [3].

Amperometric titration was carried out on a setup with two rotating (1000 rpm) electrodes on a platinum wire on a common axis. The design of electrodes, automatic piston microburettes and equipment are described in detail in [3].

In accordance with the voltammetric behavior of MPKMDETC, MPKMDFTK and other products participating in electrochemical media, amperometric titration of noble metal ions must be carried out at a polarization voltage of 0.75-1.15 V, depending on the nature and concentration of the background electrolyte (acetates, nitrates, chlorides, perchlorates of alkali metals and ammonium) [4]. In this case, the indicator current should arise beyond the equivalence point (i.e.) due to the oxidation of the free reagent and the reduction of the dissolved oxygen in the air.

The experimental data showed that in the studied media and backgrounds 0.15-0.40 M solutions of noble metal ions with solutions of MPKMDETC and MPKMDFTK titrated quite well and quickly, and the shape of the curve coincides with the expected one with some constancy of current at the beginning of titration, followed by a sharp transition (kink) at the titration endpoint (CTT).

Determination of noble metal ions in individual solutions.

It was found that when titrating ions of the following noble metals, the corresponding molar ratio Me: reagent is: Pd: reagent 1: 2 and Pt: reagent 1: 4, the titrated solution acquires a reddish-brown color. When passing from acetate backgrounds to perchlorate ones, containing a certain amount of perchloric acid, the shape of the titration curve of noble metal ions deteriorates significantly, which ultimately leads to a decrease in the reproducibility and accuracy of the results. This is explained by an increase in the acidity of the analyzed medium during the transition from acetates to perchlorates [4]. Some of the data obtained are shown in Table 1.

The results of determining various concentrations of noble metal ions with a solution of MPKMDETC in 10.0 ml of the test solution under optimal conditions indicate the good accuracy of the developed method. The effect of additives to acetic acid, n-propanol, DMF, DMSO, such as chloroform, tetrachloromethane, benzene, toluene, hexane, methyl ethyl ketone, dioxane, etc., as in the titration of noble metal ions in their individual solutions, with the only difference that

the content of the protolytic solvent in the analyzed sample was controlled in strict accordance with the volume of the added inert solvent. Due to the decrease in the solubility of the background electrolyte under these conditions to values less than 0.2 M under the influence of large additions of an inert solvent, the background concentration (from 40-50 vol.% Of an inert solvent) must be continuously reduced close to values of the order of 0.05 M. Addition of any of the above solvents in the amount of 10-20 vol.% (depending on the nature of the solvent) practically does not interfere with the shape of the titration curve becomes less steeply inclined to the axis of the volumes. For the same reason, at solvent contents above 50-60 vol.%, The reproducibility and accuracy of determinations of noble metal ions deteriorate.

TABLE 1 RESULTS OF AMPEROMETRIC TITRATION OF VARIOUS AMOUNTS OF PALLADIUM (II) IONS WITH A SOLUTION OF MPKMDETC IN DMSO AGAINST THE BACKGROUND OF 0.20 M LITHIUM PERCHLORATE

Mixture composition,%	Found Me, μg ($P=0,95; x \pm \Delta X$)	n	S	S _r
Pd 247,00	246.91 \pm 0,41	4	0,21	0,001
Pt 493,10	493,80 \pm 0,52	3	0,62	0,001
Pd 740,71	739,45 \pm 1,43	4	0,91	0,001
Pt 998,10	987,91 \pm 1,54	4	0,63	0,001

The revealed nature of the influence of inert solvents on the form of the titration curve is explained by the mode of a decrease in the electrical conductivity of the titrated solution at a high content of an inert solvent in the protolytic medium, which leads to a significant and continuously increasing ohmic voltage drop in the analyzed solution with an increase in the indicator current.

LITERATURE

1. Abdushukurov AK, Ahmedov KN, Mamatkulov NN, Choriev AU Chloroacetylation of p-methoxyphenol in the presence of catalytic catalysts // Vestnik NUUZ. -Tashkent, 2010. -№4, -S. 101-103. (02.00.00.№12).
2. Abdushukurov AK, Choriev AU Nucleophilic exchange reactions based on parachlorophenylchloroacetate // News of the National University of Uzbekistan. - Tashkent, 2012. -№3 / 1. -B. 61-63. (02.00.00. №12).
3. Money. // Titration in non-water environments. M: Peace. 1971.413 s.
4. RakhmatovKh.B., DjurayevaSh.D., UbaydullaevaD.I., KhidirovaZ.U., BobilovaCh.Kh. Ampermetrictitrationof noble metals by organic reagents solutions in non-aqueous media // Austrian Journal of Technical and Natural Sciences. 2018 №5-6 (May-June). p.53–56
5. Otabek Abdukarimovich Mirzaev, Shavkat Serabovich Tursunov // Theoretical substantiation of the deformed state of the shell of the feeding cylinder of spinning machines // Oriental renaissance: Innovative, educational, natural and social sciences // 2021. 1092-1103 <https://cyberleninka.ru/article/n/teoreticheskaya-obosnovaniya-deformirovannogo-sostoyaniya-obolochki-pitayuschego-tsilindra-priyadilnyh-mashin>

6. T Khankelov, S Tursunov, Z Maksudov // Domestic Solid Waste Crusher // International Journal of Psychological Rehabilitation 24 (issue 07), 8090-8096 psychosocial.com/article-category/issue <https://www.psychosocial.com/article/PR270784/18957/>
7. Tavbay Khankelov¹, Zokir Maksudov^{1*}, Nafisa Mukhamedova¹ and Shavkat Tursunov² // Crushing and screening complex for the production of compost from organic components of municipal solid waste // Interaction of Materials Resistance Science With Other General-Military Disciplines In Engineering Specialties // 2021. https://www.e3s-conferences.org/articles/e3sconf/abs/2021/40/e3sconf_conmechhydro2021_01026/e3sconf_conmechhydro2021_01026.html
8. OliyaNurova Salomovna¹, AsrorNazarov Allanazarovich², TursunovShavkatSerabovich // Interaction of Materials Resistance Science With Other General-Military Disciplines In Engineering Specialties // <https://www.annalsofrscb.ro/index.php/journal/article/view/5911>
9. TursunovShavkatSerabovich // Analysis of existing desings of crushers for crushing municipal solid waste// International Journal for Innovative Engineering and Management Research(IJIEMR) // <https://scopedatabase.com/documents/00000181/00000-84600.pdf> // 2021



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GRAMMAR TERMS: PROBLEM AND SOLUTIONS

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ABSTRACT

The article discusses the stages of development of grammar and related phenomena, the creation of an electronic database of linguistic units and its inclusion in the National Corps of Languages, improving the quality of automatic translation in computer linguistics, linguistic modeling of language, the theory of lemma.

KEYWORDS: Grammar, Electronic Database, Computer Linguistics, Automatic Translation, Lemma Theory.

INTRODUCTION

The study of grammar and related phenomena in world linguistics has its own stages of historical development, and is mainly one of the processes that has been rapidly improving since the second half of the XVII century and the beginning of the XIX century. The issue of creating an electronic database of this category of linguistic units with different interpretations and its inclusion in the National Corps of Languages has been addressed only in the largest corps in the world.

However, even the practice in this area does not satisfy theoretically and practically researchers from countries that intend to form their own National Corps. In world linguistics, the lexicographical forms of the National Corps in the 21st century and before have been relatively well developed. In particular, linguistic dictionaries. Consequently, at a time when the movement for the scientific and theoretical study of corpus linguistics is intensifying, these dictionaries are gaining in importance in the semantic layout of the corpus.

In the field of computer linguistics, computerization has become a topical issue in world linguistics in order to improve the quality of automatic translation, linguistic modeling of language, the development of the theory and algorithm of lemma of words in each language and

increase the use of centuries-old national and cultural heritage. Computer linguistics, in particular, the creation of the corpus, the expansion of the existing corpus size, the development of programs that automatically process text, remains one of the most important issues facing linguistics. In world linguistics, corpus linguistics became the object of study in the 1960s.

Although the view that "reliable linguistic information can only be obtained from a large set of massive texts" was stated by RG Piatrovsky in the 1960s, targeted research in the field of corpus began in the 1940s by Bloomfield, Fries and Bonjers. Brown Corps (1961-1964) founders Nielson Francis and Henry Kuchera were the first to develop corpus building principles. The work of John Sinclair, author of the Bank of England (1980) project, is also noteworthy in this regard.

In Russian linguistics VP Zakharov, AB Kutuzov, EV Nedoshivina, VV Rykov, V. Plungyans conducted research on the corps, its types, peculiarities, the social significance of the corps, the principles of corps formation. Author's corps was studied by OV Kukushkina, AA Polikarpov, EV Surovtseva. In Uzbek linguistics, a lot of research has been done on computer linguistics, lexicographic processing of text and linguostatistical analysis. The observations of A.Pulatov, S.Muhamedov, M.Ayimbetov, S.Muhamedova, S.Karimov, G.Jumanazarova, A.Babanarov, D.Urinbaeva, N.Abdurahmanova, A.Norov and others are noted as such works.

It should be noted that these studies have gained relevance by proposing modern methods of lexicographic and linguostatistical research of the text using the innovative approach - the achievements of computer linguistics. Although a number of studies have been conducted during the years of independence in computer linguistics to achieve automatic translation, understanding and processing of the Uzbek language by artificial intelligence, the approach to corpus linguistics as a whole, in a monographic plan, is weak.

However, in all areas of linguistics, the definition of "... the task of comprehensive support of scientific and creative research, the creation of the necessary conditions for them" indicates the need for in-depth research on the integration of disciplines. In world linguistics, the process of adaptation to modern information technologies is accelerating. In particular, "Computer Linguistics" has achieved certain success in Western linguistics, Russian linguistics, and even Turkish and Kazakh linguistics. With the advent of computer technology, software developers have created a new type of dictionary - the electronic dictionary.

This type of dictionary is an entirely new word in the history of lexicography, marking a new qualitative stage of its development. Now, electronic dictionaries remain in the shadow of paper dictionaries, and the need to create electronic content for a language platform is growing. Indeed, electronic dictionaries have a number of obvious and important advantages over traditional dictionaries. Their only drawback is that they are dependent on a personal computer and are therefore relatively limited. However, while this shortcoming is not complete, at least it will soon be remedied due to the increasing pace of computerization, including the availability of laptops.

Linguistic dictionaries in Russian are now very common electronic dictionaries, so we will focus only on bilingual Uzbek-English and Uzbek-Russian dictionaries. It is known that a host of grammatical terms belong to Russian and English. There are some terms of Latin origin, but it should be noted that Uzbek linguistic terms are formed mainly on the basis of Russian terminology, through translation. To study this issue, it is necessary to conduct a comparative study of Uzbek linguistic terms with terms of other languages.

It is interesting to compare these dictionaries because the communities that create them have different views on the principles of electronic lexicography. Electronic dictionaries are also becoming increasingly important when it comes to the National Language Corps. In this regard, some research in Uzbek linguistics, including practical work, is now underway.

It is known that the language is reflected in dictionaries, and today in Uzbek lexicography, in the field of computer linguistics, there are a number of problems. For the creation of an electronic platform of the Uzbek language, the development of the language corps, the educational corps, sectoral terminology, linguistic dictionaries, educational dictionaries should be created. Effective use of the works of such scientists as K.D.Bak, J.Malkil, P.N.Denisov, V.G.Gak, L.A.Novikov, V.V.Morkovkin, S.G.Barkhudarov as world experience in this regard should.

Today, there is a need for a new approach to the issue of creating linguistic dictionaries, both to improve the content of education and to create educational and language corps. In particular, it is advisable to create electronic dictionaries by categorizing linguistic dictionaries according to their level of importance. For example, the use of noun and verb phrases in speech is more active than other categories.

The educational process is also in greater need of e-learning materials than printed information. In this case, first of all, it is necessary to create separate dictionaries on word groups, which will also speed up the search process and save time. In addition, electronic dictionaries divided into categories for researchers in the field of philology, linguistics, including lexicology, create the conditions for increasing the efficiency of work, gaining an immediate idea of the general appearance.

In particular, the dictionary of famous horses can be developed in different forms.

1. "Dictionary of famous horses"
2. "Dictionary of famous horses"
3. "Dictionary of place names"
4. "Dictionary of active industry terms"
5. "Dictionary of names of organizations"

The difference between these dictionaries and existing general and traditional dictionaries is that the words included in these classified dictionaries are composed primarily of the most active words according to their use, and each word is given a spelling and transcription form. In addition, noun and verb phrases are mostly used to refer to formal activities in accordance with the needs of society.

In order to avoid duplication of documents, texts of different styles, the preparation of dictionaries "Synonymous horses", "Synonymous verbs" facilitates the use of language, office work. The following approach can be used to ensure the widespread use of words related to the Uzbek language in the communication process:

1. "Dictionary of famous Uzbek horses"
2. "Dictionary of Uzbek names"

3. "Dictionary of Uzbek verbs"

4. "Dictionary of Uzbek place names"

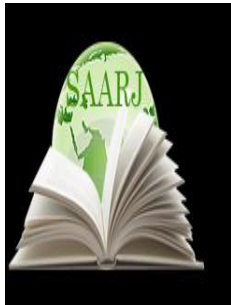
Such dictionaries are, of course, created in electronic form. Each word in this dictionary also serves to study spelling and pronunciation norms. Such dictionaries, first of all, in the system of continuing education, mainly in philological, linguistic research, as well as in the process of paperwork, document preparation, closely assist students, researchers, professionals and professionals. These types of dictionaries can serve as a convenient electronic content that can serve both the development of computer linguistics and corpus linguistics. The fate of the Uzbek language and future linguistics depends on the electronic corpus of the language.

In this regard, it is important to coordinate the state order and the activities of scientists in the country, to achieve the effectiveness of electronic record keeping, e-learning, e-communication, the main force is not the print media. In this sense, it is necessary to fully support the creation of a national corps of the Uzbek language as an important practical research to ensure the implementation of the state language policy.

REFERENCES

1. Barkhudarov S.G., Novikov L.A. (1971) What should be the life of an educational vocabulary? "Russian language abroad". No. 3; Barkhudarov S.G., Novikov L.A. (1975) Actual problems and tasks of educational lexicography. Russian language abroad. No. 6. – pp. 54-58. [Electronic resource]. (Бархударов С.Г., Новиков Л.А. Каким должен быть учебный словарь? "Русский язык за рубежом". 1971, №3; Бархударов С.Г., Новиков Л.А. Актуальные проблемы и задачи учебной лексикографии//Русский язык за рубежом.- 1975.- № 6.- С. 54-58 . [Электрон ресурс].)
2. In order to simplify the statement of opinion, instead of "Russian grammar" S. Barkhudarov, instead of "Uzbek grammar" we use the surnames O.Usmon. (In order to simplify the expression of ideas, instead of "Russian grammar" S. Barkhudarov, "Grammar of the Uzbek language" O. We use the surnames of 'Uthman.)
3. Nurislom Iskandarovich Khursanov. (2021) Linguo-cognitive Analysis of the Verbs of Behavior Expressing Human Personality (Behavior) (On The Basis of Uzbek and English Languages Materials). CURRENT RESEARCH JOURNAL OF PHILOLOGICAL SCIENCES 2(5): 85-90, May 2021 DOI: <https://doi.org/10.37547/philological-crjps-02-05-19> ISSN 2767-3758
4. Karimov S., Qarshiev A., Isroilova G. (2007) Dictionary of the language of Abdullah Qahhor's works. Frequency dictionary. – Tashkent: "National Encyclopedia of Uzbekistan" State Scientific Publishing House. – p. 420. (Каримов С., Қаршиев А., Исроилова Г. Абдулла Қаҳҳор асарлари тилининг луғати. Частотали луғат. –Т: "Ўзбекистон миллий энциклопедияси" Давлат илмий нашриёти, 2007. – 420 б.)
5. Yuldashev B. On the role of educational lexicography in the development of Uzbek linguodidactics. NavoiSPI Bulletin, 2015, issue 1. – pp. 66-72. (Йўлдошев Б. Ўзбек лингводидактикаси тараққиётида ўқув лексикографиясининг ўрни масаласига доир // НавоийДПИ ахборотномаси, 2015, 1-сон. – Б. 66-72.)

6. Yuldashev B. (2016) On the development of Uzbek linguistics in the years of independence. Foreign philology. №3. – pp. 9-15. (Йўлдошев Б. Ўзбек тилшунослигининг мустақиллик йилларидаги тараққиёти ҳақида. Хорижий филология. №3, 2016 йил. –Б. 9-15.)
7. Khursanov N.I. Creating a corpus of texts. International Journal of Education and Innovative Research. ISSN 2181-1709 (P) // ISSN 2181-1717 (E). Issue 4, August, 2021. – p. 247. (Xursanov N.I. Matnlar korpusini yaratish. Ta'lim va innovatsion tadqiqotlar xalqaro jurnali. ISSN 2181-1709 (P)// ISSN 2181-1717 (E). 4-son, Avgust, 2021. 247-bet.)
8. Mengliev B.R., Bahriddinova B.M. (2009) Curriculum: demand and need. “Ayyub Gulom and issues of Uzbek linguistics”. Scientific collection. – Tashkent. – pp. 34-41 (Менглиев Б.Р., Баҳриддинова Б.М. Ўқув луғатчилиги: талаб ва эҳтиёж / «Айюб Ғулом ва ўзбек тилшунослиги масалалари». Илмий тўплам. – Тошкент, 2009. – Б.34-41)
9. Use Of The Linguistic Corpus In Teaching The Language (The use of the linguistic corpus in language teaching)ЛП Раупова, РР Сайфуллаева, ХХ Хамраева, НМ Зарипбоева, Academy, 2019цитированиеhttps://scholar.google.com/citations?view_op=view_citation&hl=ru&user=nkh8lwoAAAAJ&citation_for_view=nkh8lwoAAAAJ:d1gkVwhDpl0C



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AN OVERVIEW OF BIG DATA

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ABSTRACT

Many businesses and government agencies may now use Big Data to get important information. Such information can aid decision-makers in improving their strategies and plans. It gives the company a competitive advantage and adds value to a variety of economic and social sectors. In fact, a number of governments have launched programs to boost Big Data research and development, with significant funding. In order to maximize profits and optimize resources, the private sector has made numerous investments. This article discusses a variety of Big Data projects, opportunities, examples, and models from a variety of industries, including healthcare, commerce, tourism, and politics. It also includes examples of technologies and solutions that have been developed to address Big Data issues. Data with a lot of fields (columns) has better statistical power, while data with a lot of characteristics or columns has a higher false discovery rate.

KEYWORDS: *Big Data, Big Data Opportunities, Big Data Applications, Big Data Technologies.*

1. INTRODUCTION

Big data is a discipline that deals with methods for analyzing, methodically extracting information from, or otherwise dealing with data volumes that are too big or complicated for conventional data-processing application software to handle[1]. Data capture, storage, analysis, search, sharing, transfer, visualization, querying, updating, information privacy, and data source are all difficulties in big data analysis. The three main ideas of big data were initially linked with

three essential concepts: volume, diversity, and velocity. Because large data analysis poses sampling difficulties, only observations and sample were previously allowed[2]. As a result, big data often contains data in quantities that conventional software cannot handle in a reasonable amount of time or for a reasonable price. The phrase "big data" is now mostly used to refer to the use of predictive analytics, user behavior analytics, or other sophisticated data analytics techniques to extract value from large amounts of data, rather than a specific data set size.

"There's no denying that the amounts of data currently accessible are massive, but that's not the most important feature of this new data environment." Data collections may be analyzed to discover new connections that can be used to "identify economic trends, prevent illnesses, fight crime, and so on." In fields such as Internet searches, fintech, healthcare analytics, geographic information systems, urban informatics, and business informatics, scientists, corporate executives, medical practitioners, advertising, and governments all face challenges with big data sets. In fields like as meteorology, genomicsconnectomics, complicated physics simulations, biology, and environmental studies, scientists face constraints. As data is collected by devices such as mobile devices, cheap and numerous information-sensing Internet of things devices, aerial (remote sensing), software logs, cameras, microphones, radio-frequency identification (RFID) readers, and wireless sensor networks, the size and number of available data sets has grown rapidly. Since the 1980s, the world's technological per-capita capacity to store information has approximately doubled every 40 months; in 2012, 2.5 exabytes (2.5260 bytes) of data were produced per day. Between 2013 and 2020, the worldwide data volume is expected to increase rapidly from 4.4 zettabytes to 44 zettabytes, according to an IDC study.

According to IDC, there will be 163 zettabytes of data in 2025[3]. One issue that huge companies have is deciding who should be in charge of big-data projects that impact the whole company. Big data is challenging to handle and analyze for relational database management systems and desktop statistical software packages used to display data[4]. "Massively parallel software operating on tens, hundreds, or even thousands of servers" may be required for big data processing and analysis. What constitutes "big data" varies according to the skills of people who analyze it and the technologies they use. Furthermore, as technology advances, large data becomes a shifting target. When confronted with hundreds of terabytes of data for the first time, some companies may need to rethink their data management choices. For others, tens or hundreds of terabytes may be required before data size becomes a major concern. Many businesses and governments are increasingly seeing the benefits of Big Data.

In reality, effective Big Data mining allows various sectors (economic, social, medical, scientific, and so on) to gain a competitive edge and create value. The 3Vs basic features of Big Data are what characterize it the most. Velocity (data grows and changes quickly), Variety (data comes in a variety of forms), and Volume (a large quantity of data is produced every second) are the three Vs. According to these three qualities must all be present in order for a source to be classified as a Big Data source[5]. We can't talk about Big Data if one of these three Vs doesn't apply. Certain actors have added additional Vs and other features to better define Big Data: Value (relevant information can be extracted for the benefit of many sectors), Complexity (it is difficult to organize and analyze Big data because of evolving data relationships), and Immutability (collected and stored Big Data can be permanent), Vision (the defined purpose of Big Data mining), Verification (processed data comply to some specifications), Validation (the purpose is fulfilled), Value (pertinent information can be extracted for the benefit of many

sectors), Complexity (it is difficult to organize and analyze Big data because of evolving data relationships).

Furthermore, others claim that any massive quantity of digital data sets that we can no longer gather and analyze properly using current infrastructures and technology is by definition Big Data. This paper discusses a variety of Big Data initiatives, possibilities, examples, and models in a variety of industries, including health, research, commerce, transportation, tourism, and politics. It also discusses some of the technologies that are utilized to build Big Data applications[6].

1.1 Big data opportunities:

Many academics have discussed the benefits of Big Data in their respective fields. The major possibilities and advantages of Big Data in the following areas are summarized in this section: health, research, commerce, transportation, tourism, and politics. The aim is to provide a broad overview of the topic[7].

- *The healthcare industry:* Big Data analysis provides important information to the health industry. Several Big Data applications have been tried to enhance the commercial and public medical services, as well as to better assist patients and doctors. As described below, Big Data analytics may change the health domain by assisting in the optimization of operational services, providing decision-support tools, and lowering the high cost of this sector.
- 1) *Health-care cost-cutting:* Big Data analytics aids health-care organizations in determining which departments need to be restructured. It assists in assessing and monitoring service quality, medical unit performance, and human resource and medical equipment requirements in real time[8].
- 2) *Better disease evolution knowledge:* Data analytics of vast sources of information on viruses and DNAs may aid in disease evolution understanding. Doctors and researchers may use this information to discover new methods to avoid hereditary and genetic illnesses[9].
- 3) *Assisting medical decision-makers:* For example, a study of past surgery outcomes based on patient profiles might be coupled with an examination of a patient's current symptoms or medical data. This connection aids in the selection of the most appropriate intervention and treatment options based on the patient's profile.
- 4) *Improved prevention:* Predictive Big Data models can evaluate healthcare data from both the commercial and public sectors to help prevent diseases from spreading. These models work by identifying worrisome signs in the population's health. Decision-makers can devise an effective preventive strategy and halt the epidemic's progress based on the afflicted areas and population symptoms. Medical services may be customized in a variety of ways. In order to enhance patient happiness, several medical initiatives gather and evaluate patient input in real time. Real-time medical data, for example, may be used to monitor patients' health in order to adjust medication dosages or provide medical suggestions based on the studied symptoms[10].
- *The commercial sector:* If properly utilized and handled, data may be a real asset for businesses. Large and diverse data sources (e.g., internal data produced by internal business operations, external data gathered from public sources, online sites, and data bought from

other organizations) may be effectively integrated and analyzed thanks to Big Data advanced technology. In the commerce industry, big data analytics allows for the extraction of useful information. It allows you to get a deeper knowledge of your consumers' habits and preferences. It's also utilized to see how effective business tactics are. Such information allows businesses to adjust and improve their goods, services, and plans (like targeted advertizing in real-time). As a result, it makes it possible to boost customer happiness, profitability, and competitiveness. According to the Big Data market will grow by 45 percent in 2014, reaching a value of \$25 billion. In general, Big Data mining provides for improved macroeconomic and microeconomic monitoring, as well as assisting decisionmakers in spotting commercial possibilities and anticipating recessions. Facebook, Google, and Amazon, for example, gather and sell data on web users' behaviors, feedback, comments, and online purchases. Credit card firms (such as Equifax and Transunion) follow suit in order to boost revenues and improve services. Furthermore, the development of various ICTs, as well as high connectivity across many organizations (e.g., corporate subsidiaries, partners, suppliers, and consumers online), has resulted in new business models based on real-time Big Data sharing and monetization. Indeed, as points out, businesses may use Big Data at several phases depending on their maturity level:

1. Rather than simply monitoring internal company operations, businesses may use Big Data analysis to better understand consumer behavior and improve their commercial strategy and goods.
 2. Businesses that have reached a particular level of maturity are more ready to improve their procedures and identify new possibilities.
 3. The company reaches the next maturity level when it is able to monetize the value of the gathered Big Data in addition to optimizing its business model. This may be accomplished by reselling data and analytical findings for extra profit. Another option is to use Big Data insights to improve goods and the consumer experience in shops and online.
- *Agriculture sector:* The use of Big Data produced in the agricultural industry may provide useful information. Such knowledge allows for the optimization of production methods, the adaptation of plans in response to climatic forecasts, the monitoring of demand by area and customer profiles, and much more. This may be accomplished by evaluating data from a variety of heterogeneous sources (e.g., weather and history, demand forecasts, and smart sensors). A Japanese initiative, for example, seeks to create an enhanced recommendation system based on Big Data analysis, according to [8]. The aim is to suggest the best product combinations, restaurants, and manufacturers that provide goods that are in accordance with the consumers' tastes to internet users (e.g., Bio products or products with no allergic substances). By just filling out the patient's symptoms, the system will also suggest appropriate goods and their providers. Its goal is to link various entities (users, restaurants, and producers) and provide granular data access based on user profiles.
 - *The tourism industry:* To enhance tourism operations and better serve visitors, many Big Data models have been created or are in the works. In reality, businesses may utilize Big Data technology to get important insights, such as a better understanding of visitors' behaviors, the identification of changing preferences and requirements, and the monitoring of tourists' geo-position, activities, and context. It is feasible, for example, to suggest hotels,

restaurants, and activities to visitors in real time based on their interests, online habits, and geolocations. Suggested a Tourist Recommendation System in this regard. This system is built on a foundation of comprehensive Big Data analysis and visualization capabilities, including: i) an examination of past visitor activity patterns. ii) Real-time analysis of current tourist activities, preferences, profile, and website visits. iii) the tourist's whereabouts is being tracked. iv) Other factors such as weather and traffic congestion are monitored. The aim is to provide customized real-time recommendations.

- *Politics Sectors:* Many governments are evaluating various sources of moving or static data in real time (for example, logs, historical events, public and private surveillance cameras, citizen comments on social media, online transactions, GPS data, and mobile communications). They also make use of data produced by a variety of government ICTs. The aim is to uncover useful information, trends, and correlations, or to develop prediction models that will allow the government to improve its policies and services to people. Another key aim is to maintain constant surveillance and monitoring in order to safeguard people and reduce the effect of crimes. For example, the government may use sophisticated Big Data algorithms to anticipate events that might jeopardize the country's security or to identify suspects, criminal organizations, and terrorists. However, monitoring individuals' communications and activities raises a slew of privacy concerns that are difficult to address. delves into these problems. Furthermore, political scientists and professionals may utilize Big Data analytics to extract useful information. This kind of knowledge allows people to get a better grasp of political problems. For example, offers a geopolitical analysis-based Big Data application. This program assesses President Barack Obama's political beliefs over a certain period of time. The program downloads Obama's speeches from the White House website, cleans them for consistency, and extracts the data sets that are relevant to the use case. The program use data mining methods to measure the president's attention on political topics, examine his emotions, and determine his mode in the face of significant political events. The suggested model may be used to identify political trends, predict the effect of elections on the country's development, verify political views, track political goals, and assess people's confidence in the present political environment, among other things.

1.2 Big Data Technologies:

- *Hadoop Ecosystem:* Hadoop Framework was created to store and process data in a distributed data processing environment using a simple programming paradigm. Data from a variety of high-speed and low-cost devices may be saved and examined. In the last year, businesses have embraced Hadoop as a Big Data Technology for their data warehouse needs. The trend seems to be continuing and accelerating in the next year. Companies that haven't looked into Hadoop yet are likely to see its benefits and applications.
- *Artificial Intelligence:* Artificial intelligence (AI) is a broad field of computer science concerned with the creation of intelligent machines capable of performing tasks that would normally require human intelligence. From Apple's Siri to self-driving cars, AI is rapidly evolving. As an interdisciplinary branch of science, it considers a variety of approaches, such as increased Machine Learning and Deep Learning, to make a significant change in the majority of tech industries. Existing Big Data Technologies are being revolutionized by AI.

- *NoSQL*: Database NoSQL Database NoSQL Database NoSQL In the database, NoSQL includes a variety of different Big Data Technologies that were created to design modern applications. It depicts a non-SQL or non-relational database with a data acquisition and recovery method. They are used in real-time Web and Big Data Analytics. It saves unstructured data and provides quicker performance and flexibility for a variety of data formats, including MongoDB, Redis, and Cassandra. In a variety of devices, it offers design integrity, simpler horizontal scalability, and control over possibilities. By default, it utilizes data structures that aren't related to databases, which speeds up NoSQL computations. Every day, Facebook, Google, Twitter, and other comparable businesses keep gigabytes of consumer data.
- *Programming in R*: R is an open-source Big Data programming language and technology. The free program is extensively used for statistical computation, visualization, and help communication in unified development environments like Eclipse and Visual Studio. According to experts, it was the most widely spoken language on the planet. Data miners and statisticians utilize the system to create statistical software and, in particular, data analysis.
- *Data Lakes*: In terms of structural and unstructured data, Data Lakes refers to a centralized repository for storing all data types at all levels. Data may be stored in its raw form without being converted into structured data during data accumulation. It allows for real-time data analysis ranging from dashboards and data visualization to Big Data transformation for improved business intelligence. Businesses that utilize Data Lakes remain ahead of the competition by doing new analytics, such as Machine Learning, using new log file sources, social media data, and click-streaming.
- *The Beam*: Apache Beam provides a simple API for building complex Parallel Data Processing pipelines using a variety of Execution Engines or Runners. In 2016, the Apache Software Foundation created these Big Data technologies.
- *Using Docker*: Docker is a Big Data technology that simplifies the creation, deployment, and operation of container applications. Containers assist developers in loading a program with all of the necessary components, such as libraries and other dependencies.
- *Flow of air*: Apache For the administration of data pipelines, Airflow is a Process Management and Scheduling System. DAGs (Directed Acyclic Graphs) tasks are used in Airflow job processes. The process code description makes it simple to handle, verify, and version huge amounts of data.
- *Block chain technology*: Block chain is a Big Data technology that has a unique data secure feature in the digital Bitcoin money that prevents data from being erased or changed once it has been published. It's a highly secure environment that's a great fit for a variety of Big Data applications in sectors like manufacturing, banking, insurance, medical care, and retail, to mention a few.

2. DISCUSSION

Big Data refers to all of the data that is being produced at an unprecedented pace across the world. This information may be organized or unstructured. An economy that is strongly knowledge-oriented owes a large portion of today's commercial companies' success. Data is what

drives contemporary businesses across the globe, therefore making sense of it and unraveling the different patterns and exposing previously unknown relationships within the enormous sea of data becomes essential and very gratifying. There is a need to turn Big Data into Business Intelligence that businesses can use right now. For businesses of whatever size, region, market share, customer segmentation, or other categorizations, better data leads to better decision making and a better method to plan. Hadoop is the platform of choice for handling massive amounts of data.

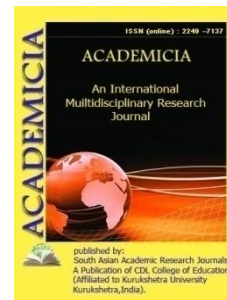
3. CONCLUSION

There are many instances of Big Data possibilities and solutions, as we've seen in this article. We can conclude that analyzing Big Data is beneficial for gaining reliable insight. Such knowledge enables decision-makers to make sound decisions, improve policies and strategies, maximize profits, and improve the competitiveness of businesses. Furthermore, by allowing advanced complex analysis across multiple sources, the Big Data revolution contributes to the enrichment of various scientific fields. New business models, such as data value monetization and business metamorphosis, have emerged as a result of Big Data analytics. In fact, organizations use Big Data to varying degrees of maturity. They can not only rely on real-time Big Data analysis to optimize strategies and processes as they grow and mature, but they can also monetize the value of Big Data. They can then focus their efforts not only on improving services and products, but also on developing their ecosystem. A single platform that links all ecosystem participants is needed to support the growth of organizations. To support the needs of various parties (e.g., governments, enterprises, customers, administrations, suppliers, social network communities, and users), this platform should rely on Big Data analysis and modeling. Entities should be able to get a better understanding, immediate feedback, and customized suggestions via such a platform. The goal is to maximize all of the entities' profits. Traditional technologies, on the other hand, are incapable of dealing with Big Data challenges (i.e., velocity, volume, variety and complexity). To ensure performance, results reliability, data availability, and scalability, Big Data modeling and mining necessitate advanced technologies and methods. Another challenge is striking a balance between various security and privacy requirements, fast, reliable processing, and granular role-based access to a number of highly connected Big Data sources. To meet such challenges, a variety of technologies have been developed. However, there are numerous drawbacks. Many areas are still open to research in order to improve the features and capabilities of Big Data applications.

REFERENCES

1. V. Marín Díaz, "Trabajar en la era digital. Tecnologías y competencias para la transformación digital," *Pixel-Bit, Rev. Medios y Educ.*, 2016.
2. "Big Data: una herramienta para la administración pública," *Ciencias la Inf.*, 2016.
3. J. van den Belt and C. Nillesen, "Kritische succesfactoren voor de inzet van Big Data: is groot wel anders?," *Maandbl. Voor Account. en Bedrijfsecon.*, 2014, doi: 10.5117/mab.88.31273.
4. Y. Taminiau, S. Heusinkveld, and J. Both, "Nevenshade of nieuwe kansen? De impact van accountancywetgeving op de professie van fiscalist," *Maandbl. Voor Account. en Bedrijfsecon.*, 2016, doi: 10.5117/mab.90.31264.

5. B. Majoor, "Kip of ei: de juiste focus in het vraagstuk van kwaliteit van accountantscontrole?," *Maandbl. Voor Account. en Bedrijfsecon.*, 2017, doi: 10.5117/mab.91.24056.
6. Q. Kunyuan, "Innovation and Corporate Debt Financing: Evidence from China's Listed Companies," *South. Financ.*, 2012.
7. W. Snoei and N. van Nieuw Amerongen, "Toepassing van (big) data-analyse in de MKB-jaarrekeningcontrole in een relatief eenvoudige omgeving," *Maandbl. Voor Account. en Bedrijfsecon.*, 2015, doi: 10.5117/mab.89.31178.
8. A. R. Kan, "Big Data in Zicht," *Natl. Denk Tank*, 2014.
9. V.-D. Tran And N. D. T. Huynh, "Exploring The Relationships Among Social Benefits, Online Social Network Dependency, Satisfaction, And Youth'S Habit Formation," *Main Issues Pedagog. Psychol.*, 2017, Doi: 10.24234/Miopap.V15i3.177.
10. H. K. L. Nguyen and B. N. Nguyen, "Mapping biomass and carbon stock of forest by remote sensing and GIS technology at Bach Ma National Park, Thua Thien Hue province," *J. Vietnamese Environ.*, 2017, doi: 10.13141/jve.vol8.no2.pp80-87.



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A REVIEW PAPER ON BIO FERTILIZERS AND ORGANIC AGRICULTURE

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ABSTRACT

Bio fertilisers play an important role in worldwide food production because they provide rapid nutrition for plants, allowing them to develop more quickly and efficiently. While there have been negative effects associated with the excessive and imbalanced usage of these synthetic inputs. Furthermore, continuing to use conventional chemical fertilisers disturbs soil ecology, decreases soil fertility, has serious health effects, and pollutes ground water. Current soil management practices largely depend on inorganic chemical-based fertilizers, which pose a serious health and environmental danger. Chemical fertilizers, on the other hand, have a number of negative consequences, including pollution, global warming, soil microbial diversity, and so on. Furthermore, because of its microbial dispersion and role in the degradation of soil environmental sustainability, it influenced the dynamics of soil plants. The function of bio fertilizers in stimulating different growth and defence genes in signalling networks of cellular pathways, which leads to cellular responses and thus crop improvement, such as plant growth and productivity, nutrient profiles, plant defence and protective characteristics, has been highlighted in this review. The information gained from the literature reviewed here will enable us to acquire a better understanding of the physiological underpinnings of bio fertilizers, reducing the challenges associated with their usage.

KEYWORDS: Agriculture, Bio Fertilizers, Plants, Soil, Sustainable Farming.

1. INTRODUCTION:

Since their evolution, agriculture and agricultural resources have been the only livelihood of mankind. Most of the world's population is relying on food, food and other key products of agriculture (fibre, wood, gums and medicinal goods) to support a healthy lifestyle. In line with increasing population trends, researchers/agricultural scientists/agro-industries must create appropriate techniques of sustainable agriculture in order to fulfil the needs of the increasing population[1]. Any civic society's major objective is to control farming methods up to levels which may ban hunger demands enough. The traditional agricultural practises include food and feed production only at household level. Only families of farmers and their small village communities can use traditional methods. The progress of scientific technology can lead to a rise in the production per acre. Sustainable farming principles are not only a means of cultivating crops up to their maximum level, but ecological conservation also determines the success of sustainability in agriculture[2]. The way farming is evolving nowadays is perplexing, since the focus is on the conservation of environmental resources and the agricultural system is only concerned with maximum agro-production. Agriculture involves the usage for enhancing crop output by different hormones, artificial fertilisers and other synthetic minerals. The impacts on soil and plant health are of Synthetic Chemicals and Minerals. Although output may rise with greater chemical use, the degradation of key minerals and other nutritional components occasionally acts as a barrier to higher production[3].

Sustainability in agriculture may be accomplished without jeopardising future generations' environmental resources and capacity to fulfil their own needs. Excess usage of chemicals causes favourable living circumstances to become less widespread, since residues that function as secondary pollutants might infiltrate the food chains and food webs and enter ultimately human beings. With the impact of health dangers, secondary pollutants can remain for a reasonably long time in the environment[4]. A new age of industrialisation may be opened up by the use of biofertilizers rather than chemicals in agriculture. Without degrading natural climate, biofertilizers might assist provide nutrients for agricultural plants. This section might be a welcoming approach to the creation and usage of biofertilizers for sustainable farming.

1.1 Biofertilizers:

Biofilters maintain a rich soil environment with a variety of micro- and macronutrients via nitrogen fixation, phosphate and polymerisation, release of plant growth regulating substances, antibiotics and soil biodegradation which improves nutrient intakes and increases tolerance for soil products [5]. Biofertilizers are neither chemical and organic fertilisers in that they do not give nutrients directly to crops and are relatively straightforward and cost-effective cultures of specially designed bacteria and fungus. Thus, at a time when agriculture faces a wide variety of environmental pressures and changes, bio-enrichment can tackle the problem of feeding a growing global population[6].

1.1.1 Characteristics Necessary for the Release of Bio fertilizer in the Market:

The usage of biofertilizers for increased crop output for farmers is one of the main limitations in the agriculture industry. While several biofertilizers are currently on the market, they are of different quantities and qualities depending on the manufacturing facility. A biofertilizer must have the following preconditional properties before release into the market.

1.1.1.1 Offer:

Bio fertilizers should be readily available on the market. Easy access minimises transportation costs and saves farmer's time.

1.1.1.2 Stability of the storage:

The formulations for bio fertilizers should be stable in various air conditions. With time length, the quality of wording should remain the same.

1.1.1.3 Effectiveness:

Bio fertilizers in minimum quantity should be required for their on-field application and should make the combination of nutrients necessary in crops efficient.

1.1.1.4 Solubility and action:

Formulations should be soluble in water as they are cost reduction and may be administered in wider field areas using the spray method.

Formulation should ensure that no adverse effects are caused to plant nutrients supplied immediately. It should be easy to use and should not affect the health of the farmer. For farmers at a reasonable cost, it should be accessible since it also influences the price of crops. It should be seasonal and available to farmers all year round.

1.1.2 Quality Control and Scale-Up:

One of the biggest obstacles for improved crop productivity is the availability of excellent biofertilizers on the market. Biofertilizer ratings vary, however, unit to unit and manner of action. The manufacturing unit must have the following criteria before the commercial production of biofertilizers:

- Determination of appropriate field design of the required inoculum.
- When production is economically understood and workable, planning should begin on facilities and organisation.
- Adequate personnel training in manufacturing and quality control technical elements.
- Provision of microbiological installations necessary.
- Uninterrupted provision of microbial consortia to support healthy strain lifecycle with maximal biomass production and access to necessary equipment.

1.1.3 Potential of Biofertilizers in crops production:

Bio fertilizers could be employed as a nutrient source or to improve soil microbiology by keeping fruit yield and quality and encouraging cheap production costs for nutritionally supplied plants[5]. Microorganisms attaching nitrogen plays a significant function in boosting production by transforming the atmospheric nitrogen into plant-usable organic forms. Rhizobia are linked symbiotically with legumes, and nitrogen fixation occurs in the root or stem nodules of the bacteria. Inoculation with rhizobium aids increase nodulation, plant development and generates 10-15 percent more grain production under cultivated conditions than non-inoculated crops.

The two main non-symbiotic N-fixing bacteria in non-leguminous cultivations are azotobacter and Azospirillum. These N-fixing bacteria may be rice plants that are free-living, or naturally. Azotobacter and Azospirillum can improve plant development and boost the yields of several key crops on various soils and climatic areas under proper conditions[7]. As Azotobacter has a range of metabolic activities, it plays an essential part in the natural nitrogen cycle. In order to synthesise and secrete substances such as thiamines and riboflavin, the nicotine acid, pantothenic acid, biotin, heteroxins, gibberellin and ammonia secretion in the rhizosphere in the presence of root exudates which can contribute to n modification, Azotobacter plays a significant role in nitrogen fixation[7].

Various soil bacteria and certain fungal species have the capacity to bring soil in soluble forms of insoluble phosphate by removing or lowering the phosphate pH and releasing accessible phosphate. PSB-produced organic acids solvent insoluble phosphates by reducing pH, cation chelating and phosphate competing in soil adsorption sites. Plant growth promoting bacteria (PGPB) represents a wide range of soil bacteria (for example, genus Azospirillum, Azotobacter, Bacillus, Pseudomonas) that play a major part in plant rhizosphere growing in conjunction with a host plant[8].

Promoting plant growth, improved yield, N intake and other components using PGPR inoculations that greatly encourage canola and sugar beet development, and increased stir and root growth. Plant growth promoters, such as Bacillus and Pseudomonas (PGPR) that are capable of producing indoleacetic acid (IAA) and gibberellins, are capable of having a positive impact on plant development and are thus utilised for farming as biofertilizers. Pseudomonas not only destroys organic nitrogen molecules, but also enhances the circulation of N and P in land. Field visual inspections showed that, despite unfavourable, very dry climatic circumstances, plant growing regulators led to strong development of greener and bigger leaves. PGPR inoculations that protect plants from soil-borne illnesses, mostly caused by pathogens, via the suppression of plant diseases-causing organisms.

1.1.4 Potential Of Bio fertilizers in Crops Production

Bio fertilizers could be employed as a nutrient source or to improve soil microbiology by keeping fruit yield and quality and encouraging cheap production costs for nutritionally supplied plants. Microorganisms attaching nitrogen plays a significant function in boosting production by transforming the atmospheric nitrogen into plant-usable organic forms. Rhizobia are linked symbiotically with legumes, and nitrogen fixation occurs in the root or stem nodules of the bacteria[9]. Inoculation with rhizobium aids increase nodulation, plant development and generates 10-15 percent more grain production under cultivated conditions than non-inoculated crops.

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1.2 Nitrogen Fixation:

Nitrogen fixation, which makes nitrogen recycling and offers a key contribution to nitrogen homeostasis in the biosphere, is regarded as one of the major biological processes and an interested microbial activity on the earth's surface after photo synthesis. Fixation of organic nitrogen is crucial in the maintenance of soil fertility. Based on the quick growth and high degree of nitrogen fixation, *Azotobacter* are employed to research nitrogen fixing and plant inoculation. They are very oxygen tolerant whereas fiber-induced nitrogen and are related to nitrogenase breathing. They have breathing protection, hydrogenase absorption, and turn off nitrogenase enzyme defence against oxygen. It is found that *Azotobacter chroococcum* has hydrogenase absorption that metabolises hydrogen. *Azotobacter* may convert nitrogen into ammonia and the plants in turn, as illustrated in Figure 1.

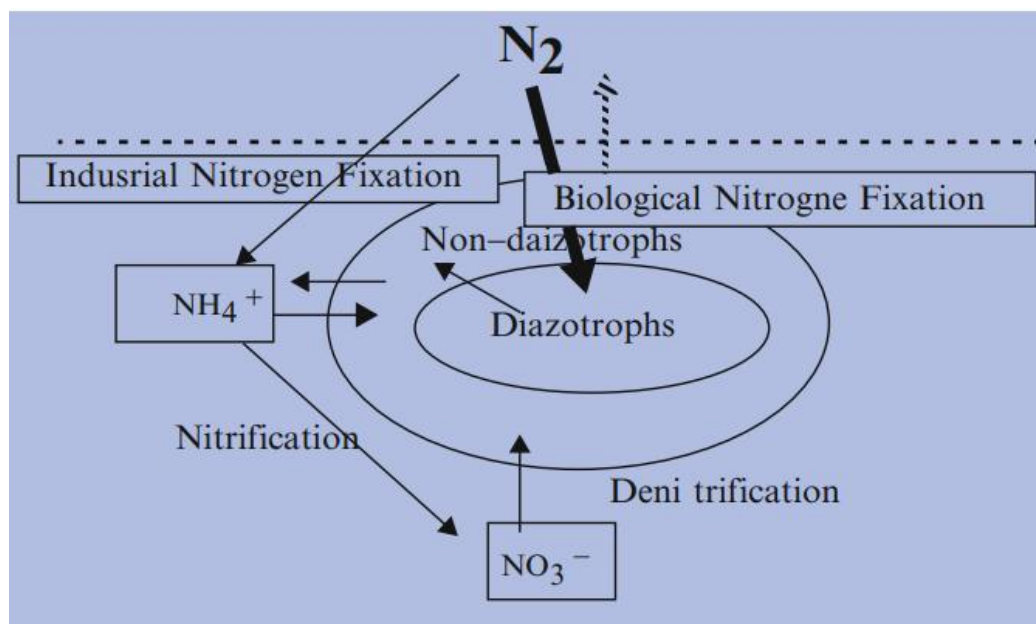


Figure 1: Nitrogen to Ammonia Cycle and Its Fixation by Diazotrophs with the Soil as Biofertilizers.

1.3 Types of Biofertilizers:

Biofertilizers are live microbe formulae (useful bacteria and fungi) readily applied, improving soil and plant species quality and health by increasing the availability of nutrients to soil and plants. The microorganisms used in microbial biofertilization may be classified into two types, which are symbiotic, non-symbiotic, and blue-green. Bio fertilizers include, thus, symbiotically Rhizobium spp. nitrogen fixers symbiotically free, Algae bio fertilizers, phosphate solubility bacteria, Mycorrhizal and Biofertilizers, blue green algae, or BGA in combination with Azolla. Microbial fertilisers such as rhizobiums and phosphate solubilizers, (PSB), make the two necessary nutrients available to plants by their synergistic action extremely helpful to enhance nitrogen content (N) and phosphorus content (P). The plant growth promoting rhizobacteria (PGPRs) are the foundation of many marketable biofertilizers that lead to plant growth through several processes, among them the biological N₂, increasing the availability of nutrients in the rhizospheres, expanding the root area, enhancing the useful host symbiosis to provide sequestered iron by bacterial siderophores, and soluble phosphate. Few of them are discussed below.

1.3.1 Rhizobium Bio fertilizer:

In underdeveloped nations, the lack of substantial nutrients in food crops poses significant challenges. Technologies with more emphasis on using microbial consortium products, particularly plant growth-fostering rhizobacteria, are needed for the solution of these tough tasks in order to support sustainable crop development and to fulfil future food requirements. Rhizobium is an endosymbiont for the nitrogen fixation belonging to the Rhizobiaceae family. It infects plant roots and causes certain root nodules to develop. Root nodules microorganisms decrease molecular nitrogen in form of a plant system of ammonia for protein, vitamin and other essential nitrogen-contaminating compound synthesis.

1.3.2 Azotobacter Bio fertilizer:

Since Azotobacter is a non-symbiont, it offers a wide variety of benefits for the crops. Azotobacter Azotobacter's connection with crop plants helps them maintain their healthy lifestyles and maximum output. Azotobacter belongs to the Azotobacteraceae family and is aerobic in nature. Several science papers propose the usage for the maximum crop output of Azotobacter in the field. The Azotobacter and associated strains are used to improve the dry matter of the plant and the synthesis of secondary metabolites. Sustainable farming practises might provide benefit for the important functional characteristics of the strains of Azotobacter, which include enhancing fertility of the soil and nitrogen fixation, boosting yield, promoting plant development, helping to withstand drought and anti-pathogenic plants.

1.3.3 Azospirillum Bio fertilizer:

Azospirillum is another bio fertilizer category that supports the growth of diverse biochemical reactions needed in the creation of food. In general, Azospirillum is a key member of the Rhodospirillales order and has occasionally been closely connected with grasses, in particular maize and rice. Nitrogen fixation, secretion of special fungicides and phytohormones are connected with their connection. In particular, indole-3-acetic acid (IAA), salicylic acid, and auxins are produced with a specific ability of Azospirillum. Azospirillum protects plants against biotic and abiotic stress and increases moisture and nutrient intake and boosts total output.

1.3.4 Phosphate-Solubilizing Microbe Bio fertilizer:

Phosphorus has its own relevance among macronutrients as it controls signals, protein synthesis, respiration and fixation of nitrogen in plants. Phosphorus is an insoluble element in soil; hence plants do not use it. It needs to be transformed from a complicated bound to a free form for frequent ingestion. Some bacterial strains can reduce phosphorus into the simplest form, so that plant roots are readily absorbed. Phosphate-solubilizing bacteria are, however, widespread in nature and may vary according to the soil types and the area from where they are isolated.

1.3.5 Arbuscular Mycorrhizal Biofertilizer:

In their many stages of growth and development, natural resources are continually faced by abiotic stress. Under stressful conditions, plants begin to produce particular categories of secondary metabolites in order to counteract reactive oxygen overproduction. The synthesis of particular components allows the plant to survive under harder conditions to a certain extent. One of the most essential aspects in maintaining good crop plant life is the symbiotic connection. AMF are a crucial symbol for the effective absorption of nutrients and diverse enzyme responses of the majority of plants.

2 DISCUSSION

Consumer views about the usage of bio fertilisers and food produced acceptability and manufacturing safety for human well-being are quite important. The consequences of chemical fertilisers on the public, the land and the ecosystem are deteriorating. However, development, marketing and their technique of application are under the authority of major businesses and genetic committees. Bio fertilize agro-industrial issues can be solved in a very specific manner. Chemical fertilisers in contemporary farming have decreased soil fertility, rendering it inadequate for the cultivation of crops. Furthermore, these inputs' extensive usage has resulted in serious health and environmental threats such as soil erosion, pollution of the water, pesticide poisoning, decreasing groundwater table, water logging and biodiversity depletion. Bio fertilisers naturally activate the soil's inexpensive, efficient and environmental friendly microorganisms and, as a result, promote plant growth and restore the natural fertility of the soil from drought or soil disease. Further research and development are needed to understand the mechanisms to act for different biofertilizer and find more competent rhizobacterial strains and carrier materials to make agriculture more sustainable and economical. The success of biofertilizer technology requires further research and development. Farmers should be instructed on the environmental and other major favourable impacts on the farming system of biofertilizers to make them more popular among farmers.

3 CONCLUSION

For the economic prosperity of a country, a thorough understanding of biofertilizer production and use is needed. In order for farmers to be aware of their core concept of sustainability, design, manner of production, use and storage conditions are crucial. In agriculture, sustainability is very useful for eliminating the real agricultural difficulties associated with crop production. In addition, the design of their agriculture system based on biotechnological and environmental issues of biofertilizers requires the training of marginal farmers in underdeveloped nations. This chapter provides a comprehensive examination of biofertilizer effectiveness in achieving sustainable agriculture.

Biofertilizers are able to address the difficulties of agro-industry and provide new chances for the improvement of farmers in agriculture, businesses, academics and other key government sectors in rural regions. Although bio fertilisers are able to significantly boost agricultural land productivity, the most decisive element in the increase in productivity is the integrated approach to the determination of the best-favored plant microbe interaction. The emerging technology can play a crucial part in the investigation of the most advantageous plant-microorganism interaction utilising a potent molecular biotechnology tool. The success of biofertilizers is therefore dependent upon innovations of novel tactics linked to functions and the appropriate administration of the many helpful bacteria to the field using sophisticated and better procedures. A major step in achieving long-term success in this growing sector is extensive study on generating effective, temperature-tailoring strains. The most essential and hard aspect of the research is to examine the real bio-fertilizer mechanism for their efficiency in sustainable development exploration, along with the discovery of numerous bio-fertilizer strains and their characteristics.

REFERENCES

1. A. Chatterjee, S. Singh, C. Agrawal, S. Yadav, R. Rai, and L. C. Rai, "Role of Algae as a Biofertilizer," in *Algal Green Chemistry: Recent Progress in Biotechnology*, Elsevier, 2017, pp. 189–200.
2. J. D. Flores-Félix *et al.*, "Plants Probiotics as a Tool to Produce Highly Functional Fruits: The Case of Phyllobacterium and Vitamin C in Strawberries," *PLoS One*, vol. 10, no. 4, p. e0122281, Apr. 2015, doi: 10.1371/JOURNAL.PONE.0122281.
3. R. P. Bartelme, S. L. McLellan, and R. J. Newton, "Freshwater recirculating aquaculture system operations drive biofilter bacterial community shifts around a stable nitrifying consortium of ammonia-oxidizing archaea and comammox Nitrospira," *Front. Microbiol.*, 2017, doi: 10.3389/fmicb.2017.00101.
4. M. A. M. Uosif, A. M. A. Mostafa, R. Elsaman, and E. Moustafa, "Natural radioactivity levels and radiological hazards indices of chemical fertilizers commonly used in Upper Egypt," *J. Radiat. Res. Appl. Sci.*, vol. 7, no. 4, pp. 430–437, Oct. 2014, doi: 10.1016/J.JRRAS.2014.07.006.
5. M. M. Joe, C. A. Jaleel, P. K. Sivakumar, C. X. Zhao, and B. Karthikeyan, "Co-aggregation in *Azospirillum brasilense* MTCC-125 with other PGPR strains: Effect of physical and chemical factors and stress endurance ability," *J. Taiwan Inst. Chem. Eng.*, vol. 40, no. 5, pp. 491–499, Sep. 2009, doi: 10.1016/J.JTICE.2009.02.006.
6. C. Yang *et al.*, "Simultaneous Removal of Multicomponent VOCs in Biofilters," *Trends in Biotechnology*, 2018, doi: 10.1016/j.tibtech.2018.02.004.
7. K. Ahmad and S. I. Ismail, "Enhanced nutritional programme: An innovative approach to controlling plant diseases in the tropics," *Plant, Soil Microbes Vol. 1 Implic. Crop Sci.*, pp. 225–251, Jan. 2016.
8. M. Ray, S. Dash, K. G. Achary, S. Nayak, and S. Singh, "Development and evaluation of polyclonal antibodies for detection of *Pythium aphanidermatum* and *Fusarium oxysporum* in ginger," <https://doi.org/10.1080/09540105.2017.1365820>, vol. 29, no. 1, pp. 204–215, Aug.

2017, doi: 10.1080/09540105.2017.1365820.

9. Bhargavi, S. Swain, A. Mishra, and A. K. Pradhan, “*In vitro* fertilization: Facts in medical sciences,” *Asian Pacific J. Reprod.*, vol. 7, no. 4, p. 145, Jul. 2018, doi: 10.4103/2305-0500.237050.
10. Tiwari and P. K. Sahu, “Plants altering hormonal milieu: A review,” *Asian Pacific J. Reprod.*, vol. 6, no. 2, p. 49, Mar. 2017, doi: 10.12980/APJR.6.20170201.



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CULTURE OF LAGOXILUS PLANT IN LABORATORY

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ABSTRACT

This paper provides information on the effects of Gibberellin A₃ (GA₃) and Auxin-indolyl-3-acetic acid (heteroauxin) stimulants on seed germination and growth for the culture of Lagochilus inebrians and the determination of lagoxilin diterpenoid by a known method in the literature.

KEYWORDS: *Lagochilus Inebrians, Lagochilus Pubescens, Gibberellin A₃, Auxin, Heteroauxin, Stimulator Infrared Spectroscopy, Lagoxillin, Thin Layer Chromatography.*

INTRODUCTION

Nowadays, the cultivation of promising plant species, the extraction of substances with high biological activity and the creation of new drugs based on them are developing rapidly around the world. Natural compounds extracted from plants have a high biological activity and have a special place in medical practice and in the national economy. Lagochilus inebrians Bunge is an intoxicating herb that is used as a sedative antihypertensive and anti-allergic agent. The main effect ingredient of the Lagoxilus plant is lagoxilin diterpenoid, a quaternary alcohol. Therefore, most lagochilus plants have hemostatic properties.

Main part:

Lagochilus is a perennial herb growing to a height of 20-60 cm. The stems are branched, ascending, the base is woody, four-sided, covered with hard glandular hairs. The leaves are

simple, cut into three or five segments, opposite the band on the stem and branches. The flowers are pink, arranged in a semicircle on the stems and branches. The fruit is 4 nuts (fig. 1) and blooms in june-september. *Lagochilus* is harvested in july-august [1-5].



Fig. 1. *Lagochilus inebrians* Bge plant and its flower

The *lagochilus* plant grows in rivers, streams and rocks in the village of Navandak, Mirdosh, Langar of Akmal Ikramov collective farm of Xatirchi district, Nurata district of Navoi region of Uzbekistan. It is also found in Bukhara and Kashkadarya regions. It is grown in the village of Darmana on the former Frunze state farm in the Chimkent region. It is grown wild in the villages of Kushrabat, Gujumsay, Bazarjay, Jush, in Samarkand region. *Lagochilus* is named after the appearance of a rabbit's lip (from the Greek "lagos" - rabbit, "cheilos" - lip). Plants belonging to the genus *Lagochilus* belong to the family of lilacs (Lamiaceae or Labiamae).

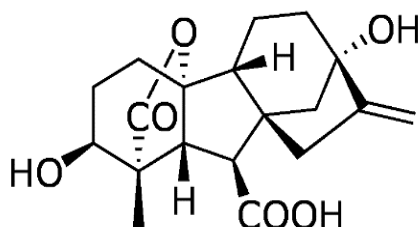
The chemical composition of *Lagoxilus* plant contains vitamin K1, 0,6-1,97 % lagoxilin, 0,67% flavonoid glycosides, 44-77 mg % ascorbic acid, 6-7 % organic acids, 5-10 mg % carotene, 9,66 -12,42 % resin, 2,58-2,78 % additives and other substances and also calcium and iron salts. *Lagoxilus* leaves contain lagoxilin, 0,03% essential oil, 11-14% additives, organic acids, 7-10 mg% carotene and 77-100 mg% vitamin C. The pharmacology of lagoxilus plant species has been studied in the pharmacology departments of Kuban, Samarkand and Andijan medical universities. In addition, aqueous and alcoholic decoctions of the species *Lagochilus inebrians* have been found to have hemostatic properties, physiologically active properties such as sedative, hypotensive, sedative, anti-shock, anti-radiation and desallergic (anti-allergic) [5-10]. As the demand for *Lagoxilus*-based preparations increased from year to year, the natural reserves of the wild-growing *Lagochilus* plant declined dramatically and are now listed in the Red book. To date, almost no practical work has been done on the cultivation of this medicinal plant in the country and the creation of cultivated plantations. Therefore, to study the effect of gibberellin A₃ (GA₃) and auxin-indolyl-3-acetic acid (heteroauxin) stimulants on seed germination and growth for culturing *Lagochilus inebrians* under laboratory conditions.

Gibberellins plant hormones regulate gibberellins plant growth and affect their developmental processes. These include stem elongation, germination, inactivity, flowering, enzyme induction, and leaf and fruit aging. Gibberellins were first discovered in 1926 by the japanese scientist Eiichi Kurasawa [12].

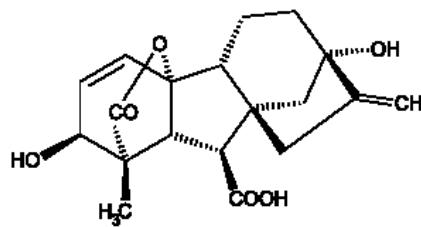
It was first isolated from fungal species by Teijiro Yabutava Sumuki in 1935 and studied by Khurasava. Yabuta named the isolated substance as Gibberelin [12].

Interest in Gibberellins began outside Japan after world war II. The first scientific study of Gibberellin in the USA was conducted by Camp Detrick in Maryland. He tested gibberellin as a stimulant in a seedling of bean *Vicia faba*. The isolation of new species of gibberellins in the UK was initiated by large chemical industries. Interest in gibberellins has spread around the world, with its use in important beneficial plants becoming more prominent. For instance, research on this topic was conducted by David in California in the middle of 1960s. Thomson led the trial of gibberellins in seedless vines grown in special areas of California in 1962 [13].

Gibberellins are made with ent-gibberellane skeletons. When gibberellins were discovered, they were named GA₁ (Gibberellin A₁) according to the gan rule. Gibberellinic acid was the first Gibberellin GA₃ with a specific structure. In 2003, 126 Gibberellic acids were isolated from plants, fungi, and bacteria [12]. Gibberellins are tetracyclic diterpenic acids. At the base of each are 2 tattoos involving 19 or 20 carbons: 19-carbon gibberellins, for example, gibberellic acid does not contain 20-carbon, and instead has a five-membered lactone bridge bound to 4- and 10-carbon. 19-carbon states are, in general, biologically active forms of gibberellins. As well as highly effective in biologically active forms of hydroxylated gibberellins. In general, the most biologically active compounds are dihydroxylated gibberellins. Hydroxyl groups were involved in both the 3 and 13 carbons in them. Gibberellic acid is considered dihydroxylated [14].



Gibberellin A₁ (GA₁)



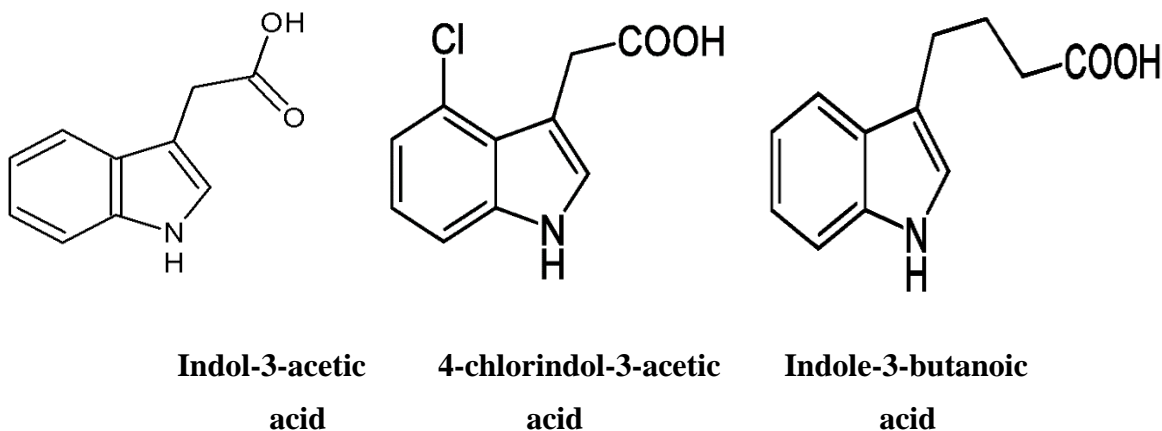
Gibberellic acid (GA₃)

The Biological functions of gibberellins include various forms of cessation of stasis and stem elongation in the natural process. Before the photosynthetic apparatus is formed, it retains sufficient nutrient reserves of starch to feed the plant growing from seed in the early stages of stem elongation. Usually during stem elongation, the breakdown of starch into glucose begins in the endosperm after the seed is soaked in water. If plants are exposed to unfavorable temperatures, they produce large amounts of gibberellins. They enhance cell elongation, breakage and germination, seedless fruiting and seed germination. Gibberellins perform fully by stopping the inactivity of the seed and act as a chemical messenger. Its hormones bind to receptors, activate proteins, bind to complex DNA, and produce enzymes that enhance growth in the embryo. The main effect of gibberellins is to reduce proteins, and then again not to participate in the interaction of phytohormones and gene control [15].

Auxins are a class of plant hormones (or plant-growing substances) that are distinguished by some morphologically similar properties. Auxins often play a key role in the normal growth of plant life processes. It also plays an important role in the development of the plant body. Auxins

and their role in plant development were first demonstrated by dutch scientist Fritz Vent. Kennes Siman isolated this phytohormone and determined that its chemical structure was Indole-3-acetic acid [16]. Vent and Siman later became the author of the book phytohormones, or plant hormones, in 1937.

Local auxins indole-3-acetic acid is the most abundant local auxin found in plants and plays the most important role. It causes most of the effects of auxin in plants and is the strongest local auxin. There are more than three local endogenous auxins. All auxins are compounds with one carboxylic acid group bound by an aromatic ring.



The name auxins is a greek word (auxein - growth). They were the first major plant hormones to be discovered. The distribution of auxin sample within the plant is the key factor for plant growth, the reaction of which is important for the environment and the development of plant organs. It transports molecules from cell to cell throughout the plant body through the active transport of a very complex and well-coordinated auxin (called polar auxin transport) [16]. Thus, the plant affects their appearance and regulates them without the need for a nervous system.

The specificity of auxins is that they interact with or counteract other plant hormones. For example, the ratio of auxin to sitochinin is determined by counting the buds in front of the root in plant tissue. At the molecular level, all auxins are compounds of the same carboxylic acid group bound by a benzene ring. The most important member of the auxin family is indole-3-acetic acid [13]. It is the strongest local auxin. Its stability as a local auxin has been tested in many ways in plants. For example, it has always been found that, under conditions, it generalizes the results obtained by reducing its molecules.

However, the molecules of indole-3-acetic acid are chemically variable in aqueous solution, so it is not used as a plant growth regulator. There are four natural (endogenous) auxins: indole-3-acetic acid, 4-chlorindol-3-acetic acid, phenyl acetic acid, and indole-3-butanoic acid. All of which have been identified separately from plants [16]. In addition to endogenous (local) auxins, scientists and manufacturers have developed many synthetic auxin compounds with auxinic activity.

Synthetic auxin analogues include 1-naphthalene acetic acid, 2,4-dichlorophenoxyacetic acid, and others. Some synthetic auxins, such as 2,4-dichlorophenoxyacetic acid and 2,4,5-trichlorophenoxyacetic acid, have been used as herbicides. As well as the sodium salt of 2,4-dichlorophenoxyacetic acid, a herbicide used to control weeds.

Broad-leaved plants (dicotyledonous), for example, rhubarb (dicotyledons), thin-leaved plants (single-leaved), for example, are more susceptible to auxins than grasses and cereals plants. Therefore, synthetic auxins are also useful as herbicides [12-16].

RESULTS AND DISCUSSIONS:

For the study of the effect of stimulants Gibberellin A₃ (GA₃) and Auxin – indolil-3-acetic acid (*heterooxine*) on the germination and growth of seeds, for the cultivation of Lagoche in inebrians plant, Gibberellin A₃ (GA₃) were extracted five different masses from gibberellin A₃ (GA₃) to prepare a solution of 10⁻⁴ M, 10⁻⁵ M, 10⁻⁶ M, 10⁻⁷ M and 10⁻⁸ m with a melted and dissolved in 2 liters of water. To prepare a solution of Gibberellin A₃ with 10⁻⁴ M li, Gibberelin A₃ (Mr=346,4 gr/ mol) was taken from 0,06928 gr or 69,28 mg, and for 10⁻⁵ M li was taken from 6,928 mg and dissolved in 2,0 liters of water. Then it was postponed for a day. The remaining solutions are prepared in the same way. For the preparation of solutions of auxin – indolil-3-acetic acid (*heterooxine*) 10⁻⁴ M, 10⁻⁵ M, 10⁻⁶ M, 10⁻⁷ M and 10⁻⁸ m, five different masses of auxin was taken and dissolved in 2 liters of water. From Auxin (Mr=175,184 gr/mol) were taken 0,350368 gr or 350,368 mg for the preparation of 10⁻⁴ M li solution of Auxin and also for 10⁻⁵ M was taken 35,0368 mg and dissolved in 2 liters of water. Then it was postponed for a day. The remaining solutions are prepared in the same way, and the seeds of the plant 10 units are soaked for 24 hours in the above solutions, and the soil:sand:manure prepared in the proportions of 2:1:1 in the pans, planted at a depth of 3-5 cm. The main indicators of the plant grown under the influence of solutions of Gibberillin A₃ and Auxin – indolil-3-acetic acid (*heterooxine*) 10⁻⁴, 10⁻⁵, 10⁻⁶, 10⁻⁷, 10⁻⁸ M are presented in Table 1.

TABLE 1 EFFECT OF GIBBERILLIN A₃ AND AUKSIN-INDOLIL-3-ACETIC ACID (HETEROAUKSIN) ON THE GERMINATION AND GROWTH PROCESS OF LAGOXILUS PLANT SEEDS

The drug concentration, mol	Time of germination of seed (day)	The length of the plant for 8 days (cm)	Number of plants grown from 10 seeds	The degree of germination of seeds (%)	Length of the root of the plant, cm
Control GKMAT	9-12	3,8	3	30	12,6
Gibberellin A₃					
10 ⁻⁴	7	5.2	4	45	13,5
10 ⁻⁵	6	5.9	5	60	13,6
10 ⁻⁶	7	5.7	4	50	13,4
10 ⁻⁷	8	5.3	4	45	13,3
10 ⁻⁸	10	4.8	4	55	13,2
Auxin-indolil-3-acetic acid					
10 ⁻⁴	7	5,2	4	45	14,6
10 ⁻⁵	6	5,6	4	50	15,0
10 ⁻⁶	7	5,8	5	55	15,5
10 ⁻⁷	8	5,1	4	60	14,8
10 ⁻⁸	10	4,9	2	50	14,3

From the indicators presented in Table 1, it can be seen that the growth rate of the lagoxilus plant and the degree of fertility of its seeds, the time of germination, the length of the plant and its root is 10^{-4} - 10^{-5} M of gibberellin A₃ and auxins, the length of the plant and leaves under the influence of concentrations it was found to have an effective effect on the increase in the number of seeds and 10^{-4} , 10^{-5} concentrations of plant seeds increased from 40% to 60%. The length of the plant was 5,6 cm, the length of the root was 14,3 cm. The seeds of plants germinated on 7-10 day. The most optimal for the growth process of the plant is the use of solutions of this concentration when planting the lagoxilus plant from seeds in field conditions. In control, the seeds of the lagoxilus plant sprouted between 9-12 days, the length of the plant was 3,8 cm, the length of the root 12,6 cm. The degree of fertility of plant seeds was observed to be from 20% to 30% in control.

In the experimental section, Gibberellin A₃ (GA₃) was taken from Gibberellin A₃ (GA₃) to prepare the solutions and dissolved in 2 liters of water. To prepare a solution of Gibberellin A₃ with 10^{-4} M li, Gibberellin A₃ (Mr=346,4 gr/ mol) was taken from 0,06928 gr or 69,28 mg, and for 10^{-5} M li was taken from 6,928 mg and dissolved in 2,0 liters of water. Then it was postponed for a day. The remaining solutions were prepared in the same way. For the preparation of solutions of Auxin – indolil-3-acetic acid (heterooxine), the mass of five different was taken from the Auxin and dissolved in 2 liters of water. From Auxin (Mr=175,184 gr/mol) were taken 0,350368 gr or 350,368 mg for the preparation of 10^{-4} M li solution of Auxin and also for 10^{-5} M was taken 35,0368 mg and dissolved in 2 liters of water. Then it was postponed for a day. The remaining solutions are prepared in the same way.

For the preparation and processing of soil, ordinary soil, sand and manure were obtained. Soil: sand: manure ratio is obtained from 2:1:1 (by mass) and mixed well with each other. Then put in special containers, prepared for planting. The small stones were placed with 3,0-3,5 cm before covering the mixture of soil:sand :manure on the bottom of special dishes. The goal of it is to grow the sprouted plant well and let the air enter from the bottom of the container. The ground was made ready for planting.

For processing Lagoxilus seeds, Lagoxilus plant seeds were taken and treated with each solution. This process was carried out as follows. The lagoxilus seeds were soaked in different concentrated solutions of each substance being tested, and a day later sown at a depth of 1,5-2,0 cm, corresponding to each container.

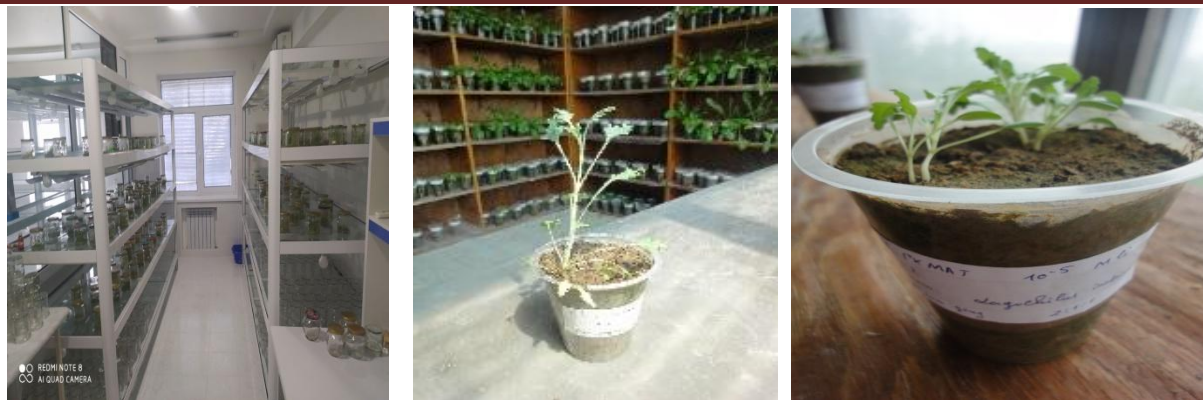


Figure 2. Growth process of *Lagochilus inebrians* Bge plant

The seeds were watered after planting. Each process was followed. Room temperature and light were given the same.

CONCLUSION

Growth and development of the *Lagochilus* plant at gibberellin A₃ and 10⁻⁵ and 10⁻⁶ molar concentrations of auxin were found to increase the root and stem length of the *lagochilus* plant. The formation and proliferation of lateral and additional roots under the influence of auxin.

REFERENCES

1. Ziyaev Sh.T., Islomov A.X. Chemical study of cultivated and wild *lagochilus* plants. Collection of materials of the scientific-practical conference of professors and young scientists dedicated to the 90th anniversary of the National University of Uzbekistan named after Mirzo Ulugbek. May 27-28, 2008. B.13.
2. Zaynutdinov U.N., Dalimov D.N., Matchanov A.D., Islomov A.X., Tlegenov R.T., Bozorova N.X., Sobirova F.A. Sravnitelnoe izuchenie dikorastushchey i kulturnoy form *Lagochilus inebrians* // *Ximiya rastitelnogo syrya*. 2011 №2 S.189-190.
3. Zaynutdinov U.N., Maulyanov S.A., Islomov A.X. // "Chemistry, biology and physiological properties of plants belonging to the genus *Lagochilus*" // Monograph. ISBN Tashkent, "University" publishing house, 2019 B.194
4. Islomov A.X., Dalimov D.N., Matchanov A.D., Zaynutdinov U.N. // K Okultiviraniyu endemichnogo rasteniya *Lagochilus inebrians* // Materialy 1 Respublikanskoy konferentsii s mezhdunarodnym uchastiem «Zelenaya khimiya». Samarkand 2012 March 26-28. S 62-63
5. Hamdamov O'I., Islomov A.X., Dalimov D.N. // Cultivation of *Lagochilus* plant // GulSU »Prospects for the use of natural compounds in agriculture» Resp. Proceedings of the scientific-practical conference 2013 4-5 May B.162
6. Dalimov D.N., Tonkix A.K., Kushiev X.X., Islamov A.X., Hamdamov O.I. // Nizkomolekulyarnye prirodne stimulyatory rosta i razvitiya rasteniy // Sbornik trudov mejd.konferentsii «Aktulnye prob. razvitiya bioorg. ximii »November 15-16 Tashkent. 2013g C. 270-307

7. Zaynutdinov U.N. Dalimov D.N. Matchanov A.D. Islomov A.X. Sobirova FA // Protection and cultivation of endemic plants of opium poppy (*Lagochilus Inebrians*) // GulSU »Prospects for the use of natural compounds in agriculture» Resp. Proceedings of the scientific-practical conference 2013 4-5 May B.161
8. Islomov A.X., Matchanov A.D., Zaynutdinov U. N., Esonov R. S., Toshpulatov F., Allaniyazova M. K.//Diterpenoids of vegetative organs of *Lagochilus Inebrians* plant // Scientific-practical conference "Life of an exemplary scientist" dedicated to the 80th anniversary of Academician Amin Bakhiev. Karakalpak branch of the Russian Academy of Sciences. April 28, 2017.B.67-69.
9. Dalimov DN, Islamov AH, Hamdamov OI, Pulatova MP // Synthesis of acetyl derivatives of lagoxilin and determination of the time of their synthesis during the growth of lagoxilus plant // UzMU news T. №3 / 2 2017 y B.403-407
10. Sobirova F.A. Islomov A.X. Toshppulatov F.N. Zaynutdinov U.N. Matchanov AS 2021 y №2 S247-255
11. Zulfanova N.S. Islomov A.X. Matchanov A.D. Matyoqubov A. // Isolation of lagoxilin diterpenoid from *Lagochilus inebrians* bge plant and study of ik spectrum.// ARES, Academic Research In Educational Sciences Volume 2. Issue 6. 2021 \ 06. ISSN: 2181-1385. Sceintific Journal impact factor (SJIF) 2021: 5.723. 2021 and B.555-561.
12. Gibberellin: A Short History, from <http://www.plant-hormones.info>, the home since 2003 of a developed by the now-closed Long Ashton Research Station. California
13. Gibberellin and Flame Seedless Grapes from a University of California, David website
14. James D.Metzger,” Gibberellin “, in Access Scisnce@ McGraw-Hall, <http://www.accessscience.com.ezproxy.torontopubliclibrary.ca>, DOI 10.1036/1097-8542.289000.
15. Daviere, Jean-Michel; De Lucas, Miguel; Prat, Salome (2008). “Transcriptional factor increaction: A central step in DELLA function”. Current Opinion in Genetics Development 18 (4): 295. Doi:10.1016/j.gde.2008.05.004.
16. Auxins page on www.plant-hormones.info- a website set up at Long Ashton Research Station an institute of the BBSRC (site is now on independent server).



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CURRENT LITERARY PROCESS AND LITERARY CRITICISM

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ABSTRACT

The problems of the theory literature and literary criticism are one of the most pressing issues today. It is important to research and analyze the development Uzbek literary criticism in objective and content marking the problems of literary process. The article raises those problems.

KEYWORDS: *Process, National, Pedagogy, Eternity, Factors, Periodization.*

INTRODUCTION

The literary process is a constant movement of literature that is constantly growing, developing, and renewing. When we talk about particular national literature, we mean the ongoing literary process, its achievements, the development of genres, its influence on the world's artistic thinking, its contribution. We refer to the period from the 90s of the XX century to the present day as the "Literature of the Independence Period." The literary process of this period is characterized by unique developments in artistic thinking, the perfection of genres and their diversity, the strengthening of individualization in the artistic representation of real reality, the expansion of opportunities to use the most advanced experiences and traditions of world literature. The history of literature, the theory of literature, and the attitude to literary criticism, the principles of its analysis and research, have changed radically. Today, the criteria of world literature measured and evaluated the level of development in the literary process. The novelties of the literary process, literary connections, and interactions in world literature are also reflected in our national literature. The specific course of the literary process in each national literature depends on the socio-political and economic life, cultural and educational conditions of each period. This feature can also be seen in today's literary process. The textbook "Fundamentals of Literary Theory" correctly describes the important internal factors of the development of literature: Inheritance in literature, adherence to traditions, The uniqueness of each national

literature guarantees that the national image is not lost. The development potential of literature based on a rich tradition is, of course, higher than others "[1, 434].

The literature of the independence period is developing with a rich experience accumulated in the history of our literature, a huge cultural and enlightenment heritage, and a deep sense of responsibility to inherit immortal national traditions. The literary process is in full swing on an unprecedented scale, with infinite possibilities and conditions. An important factor in this is, first of all, the attention and care paid to the creative people of our country, the great creative work carried out in our independent Motherland. The Writers' Alley has been built in the center of Tashkent, the Writers' Union has been provided with a new building with all amenities, creative schools are operating in the capital and regional centers, young artists are encouraged to become poets, writers, playwrights, and publicists. inspires, enriches the treasury of our literature with richly artistic works. Umarali Normatov, an old critic, commented on the positive changes in the current literary process: works based on the philosophy of existentialism, which artistically studies the strange feelings, qualities, and unconscious states beyond the subconscious, are also created, or similar interpretations take root. There are many absurd works and absurd heroes who show the absurdity of the life and work of a person who has been deceived by the vain ideas of this mortal world, with all its sharpness and tragedy, often in symbolic and figurative terms "[2, 5].

The novelty of the literary process is the birth of a work of art that has attracted the attention of the public, an important event in the development of artistic thinking. It is literary criticism to reveal the essence, aesthetic significance of this important event. Literary criticism is a barometer of the literary process. But while literary criticism should always be at the forefront of the literary process, we criticized it for lagging, failing to make accurate and aim assessments. Literary criticism is lagging in the scientific and theoretical study of qualitative changes in the literary process, emerging and emerging new principles, new principles of artistic reflection of reality. Literary criticism, in particular, lags the timely assessment of the works of artists who see reality from a different perspective and create works that are difficult for the reader to comprehend at once.

During the years of independence, most of the famous examples of world literature, hitherto unknown to Uzbek readers, were originally translated. Classical examples of modern literature have become the spiritual property of Uzbek readers. The contribution of the journal "World Literature" in the implementation of this noble work is significant. The works of J. Joyce, M. Proust, A. Camus, F. Kafka, stories, short stories, and novels translated from Japanese, Chinese, Iranian, and Arabic enriched the treasury of the Uzbek school of translation. Under the influence of these works, the Uzbek literature also increased the number of works with a new spirit, a new artistic interpretation of life and reality, which must be perceived through the subconscious. H.Dustmuhammad, N.Eshonqul, U.Hamdani, I.Sultan, A.Yuldashev, U.Yakub, and dozens of other talented writers created works with features of modern literature and presented them to readers. The stories, short stories, novels created by these writers also educate the reader, increase his level of understanding, feeling, and perception of the work of art. This is called receptive aesthetics in scientific language. But who cultivates and nurtures this receptive aesthetics? "Independence. Literature. A collection of literary-critical articles entitled "Criticism" contains many contradictory and contradictory views on this issue. Some advocate the principle of "criticism for criticism", while others argue that literary criticism should help the public to

understand the essence of the work, to cultivate its aesthetic taste. Well-known literary critic Ibrahim Gafurov expresses the following views on literary criticism, the role of literary criticism:

Criticism is not a matter of classification. Sorting is just one aspect of it. Another very important aspect is to explain based on aesthetic knowledge, to hold discussions (but not to make judgments), to make interesting comments, to make objective assessments and draw deep conclusions, to cultivate artistic taste in students”[3, 144].

The complex contains a variety of opinions about the current state of literary criticism, its struggling aspects, its weaknesses. He accuses his colleagues of bias, saying that criticism has diminished, that impartiality has been replaced by impartiality, and that critical articles written on a work do not go beyond praise and applause. Abduqayum Yuldash openly expressed his dissatisfaction with the position of today's literary criticism:

"I am not happy about today's criticism," he said. Perhaps it is difficult to find an actual work among the huge amount of literary waste that is constantly being published, or the Uzbek language is predominant, but it is becoming increasingly difficult to find serious analytical articles by our critics. 88].

The author, who is sympathetic to Dobrolyubov's views, concludes that "... criticism is, first, creativity, discovery, and naturally impartiality and truthfulness" [4].

The conversation on "The Voice of the New Generation" provided many useful insights into today's literary process and the problems of literary criticism. We can add the state of literary criticism to the sadly stated that it lags the literary process. We should also acknowledge that our leading critics are doing a lot of research on works of art that are an actual event in our literature and that objectivity and truthfulness are the principal features of many literary-critical articles. But when the quality, position, and level of literary criticism are taken into account, the amount of objection seems to be considerably greater than the amount of objection. Because, as A. Yuldashev noted, the changes in the literary process, the lack of literary criticism in the timely objective and objective assessment of works created with high talent. An in-depth analysis of the power of art and magic in *The Monkey-led Man*, *Poincaré*, and *Windy Night* will help to develop the reader's aesthetic taste. If the belief that “no, this is not the task of literary criticism” is followed, then criticism is for criticism.

Muhammad Ali's tetralogy "The Great Sultanate" is a huge monument of art created in the Uzbek literature of the independence period. Literary critic Damin Turaev has created a significant treatise on tetralogy. It explores the artistic features of tetralogical novels, the gallery of images, the artistic interpretation of historical truth, the aspects of the writer's skill. There are even cases when the artistic depiction of the historical period covered in the epic emphasizes the presence of modern styles, the appearance of subconscious currents. The scientific pamphlet helps the reader to understand the essence of the work. The literary-critical articles of many of our hard-working scholars on the changes and innovations in the literary process, the analysis of works emerging in a new way of thinking, confirm that literary criticism is steadily and constantly moving forward in fulfilling its historical mission. But it is not right to turn a blind eye to the problems of literary criticism today with this sense of satisfaction. In his conversation with Rahmon Kochkor, U.Normatov discussed the problems of literary process and literary criticism in the journals "Jahon Adabiyati", "Sharq Yulduzi", "Yoshlik", "Uzbekistan Adabiyati va Sanati", and offered to hold regular literary and creative talks. activities should be

strengthened. For the elite reader of modern literature, the idea of educating the elite reader is less accurate and well-founded. However, the conversation organized by R. Kochkor in 2015, no such serious debate has taken place since the debate. Literary criticism must always be responsive, combative, combative, and extremely intolerant of negative situations that overshadow the power of artistic thinking and magic. Then our literature, literary criticism will rise even higher.

REFERENCES:

1. Kuronov Dilmurod, Fundamentals of Literary Theory, textbook, Tashkent, Navoi University, 2018. P.434.
2. Normatov Umarali, Hopeful Trends, Tashkent, Manaviyat Publishing House, 2000. B.5.
3. Ibrahim Ghafurov's answers to the questions of the conversation "Voice of the New Generation". Independence. Literature, Criticism. Interviews based on questions from writer and literary critic Ulugbek Hamdam. Tashkent, "Turon zamin ziyo", 2015. P.144.
4. Answers to the questions of the conversation "Voice of the New Generation" Kozakboy Yuldashev. Independence. Literature, Criticism. Interviews based on questions from writer and literary critic Ulugbek Hamdam. Tashkent, "Turon zamin ziyo", 2015. P.88.



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THE ASSESSMENT OF DOMESTIC AND FAMILY VIOLENCE BETWEEN SAME-SEX COUPLES

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ABSTRACT

The causes of and interventions for intimate partner violence (IPV) have been addressed and researched throughout the last several decades. This article provides a narrative overview of IPV in same-sex couples, often known as same-sex IPV (SSIPV). Despite the popular belief that IPV is just a problem in heterosexual relationships, numerous studies have shown that IPV is just as common in lesbian and gay couples as it is in heterosexual ones. While there were parallels between heterosexual and lesbian, gay, and bisexual (LGB) IPV, LGB IPV had its own characteristics and dynamics. These characteristics are primarily linked to the detection and treatment of SSIPV in the community, as well as the necessity to examine the impact of sexual minority stresses. Our results indicate that there are few studies that address LGB people who are victims of IPV; this is mostly owing to the long-standing quiet in the LGB community about violence, a silence based on fears and misconceptions that has prevented a public debate on the issue. The major topics addressed in the published papers that we have examined have been recognized. Based on the evaluations, we believe it is critical to provide a space where this topic may be openly addressed and handled by both LGB and heterosexual individuals.

KEYWORDS: Bisexual, Gay, Intimate Partner, Lesbian, Violence.

1. INTRODUCTION

Intimate partner violence (IPV) has piqued the attention of mental health professionals in recent decades. IPV is defined as any conduct between a couple that includes acts of physical and sexual assault, emotional and psychological abuse, and controlling behaviour, according to the World Health Organization. According to a number of writers, the term "interpersonal violence" refers to a kind of violence that may be perpetrated by men and women of any age, marital

status, or sexual orientation. Numerous research has also examined the effects of IPV on mental health and overall well-being[1]. Lesbian, gay, and bisexual (LGB) people had worse results than heterosexual people “across many life dimensions, such as mental and physical health, subjective wellbeing, employment, poverty, homelessness, and social exclusion.” IPV in the LGB community has not been researched as extensively as it has in the heterosexual population: in 2015, LGB IPV research accounted for just 3% of all IPV studies. Despite the fact that there is few research on same-sex intimate partner violence (SSIPV), they show that it happens at a rate similar to or even greater than heterosexual IPV. Because of the various methods employed in the studies, determining LGB IPV prevalence rates may be challenging. However, almost one-third of sexual minority males and half of sexual minority women in the United States said they had been victims of physical or psychological abuse in a romantic relationship, according to one of the most current and representative research findings. In addition, more than half of homosexual males and over seventy percent of lesbian women said they had been victims of psychological IPV. According to studies, 4.1 million LGB individuals in the United States have been exposed to IPV at some point in their lives[2].

IPV prevalence in LGB couples seemed to be comparable to or greater than in heterosexual couples across time: IPV was experienced by 61.1 percent of bisexual women, 43.8 percent of lesbian women, 37.3 percent of bisexual men, and 26.0 percent of gay males, compared to 5.0 percent of heterosexual women and 29.0 percent of heterosexual men. When it came to severe violence episodes, the prevalence of LGB adults (bisexual women: 49.3 percent; lesbian women: 29.4 percent; homosexual men: 16.4 percent) was comparable to or higher than heterosexual adults (bisexual women: 49.3 percent; lesbian women: 29.4 percent; homosexual men: 16.4 percent) (heterosexual women: 23.6 percent; heterosexual men: 13.9 percent). Researchers found that gay and bisexual couples were more likely than heterosexual couples to experience all types of abuse. Furthermore, he theorized that a greater proportion of violence was driven by specific risk factors related to minority stress that only LGB persons face. Furthermore, the research found that lesbian women were more likely than heterosexual women, gay men, and heterosexual men to be engaged in IPV. Furthermore, bisexual individuals seemed to be the most abused group among the others; bisexual women, in particular, were more likely to be victims of all types of IPV, with the exception of psychological IPV[3].

The majority of studies on the incidence of SSIPV have focused on North American communities, with a few smaller studies focusing on Australian, Chinese, South African, and British populations, with comparable or even greater IPV rates than North American ones. Scholars used Facebook ads to recruit participants in the United States, Canada, Australia, the United Kingdom, the Republic of South Africa (RSA), Brazil, Nigeria, Kenya, and India for their transnational study. Their results revealed that the United States and the other countries had comparable rates of physical abuse, with Australia, Brazil, the Republic of South Africa, and the United Kingdom having similar or higher rates of physical abuse than the United States. Two studies on lesbian IPV were performed in Italy. The emphasis of the study was on the lack of protection legislation for lesbian women who have been victims of IPV, and academics tried to quantify the incidence of IPV among Italian lesbian women. A total of 102 lesbian women, mainly from Italy, were included in the study (88.2 percent). A questionnaire with 29 multiple-choice questions was given to the participants. The respondent confessed to being frightened of her spouse returning home in more than one out of every five cases (20.6 percent of the total). In

addition, 41.2 percent of women had hidden anything from their relationships in the past because they were scared of their partners' responses. Furthermore, 14.7 percent of lesbian women said they were always frightened about their relationships. The psychological harm caused by a pair dispute was recognized by almost half of the respondents, whereas physical injury was recorded by 5.9% of the interviewees[4].

In light of these results, it is clear that LGB IPV requires more investigation. Nonetheless, the public perceives LGB abuse as an uncommon occurrence; this perception is especially prevalent when it comes to bisexual and lesbian women, who are frequently romanticized as being in tranquil and utopian relationships, free of the violence and aggressiveness associated with "normal" male virility. Lesbian victims may find it difficult to recognize that their partner's conduct is abusive and not typical because of this stereotype. Previous study has recommended that further research be done on the subject: LGB IPV has a double-invisible character, which is why there have been so few studies on it. Health professionals have previously encountered many barriers to obtainingSSIPV research and data, a reality that has been linked to harmful effects such as discrimination and disinformation, in addition to the more apparent results[5].

1.1 Stress in Sexual Minority:

According to the researchers, LGB individuals face particular stresses as a result of their sexual minority status. These stresses, which seem to be linked to IPV, mirrored the experience of members of a stigmatized group who faced unique and extra stressors that no one outside the group could ever experience, according to Meyer's concept of Sexual Minority Stress. Internalized stressors and externalized stressors were incorporated in this paradigm. Internalized stressors were shown to be positively linked to physical, sexual, and psychological IPV in studies; externalized stressors, on the other hand, were found to be unrelated to any type of IPV, especially when combined with internalized minority stressors. As a result, research mostly focused on internalized minority stressors, such as Internalized Homophobia, demonstrating that IPV offenders directed their negative feelings onto their partners, which they had previously self-addressed as homosexuals. Partners have robbed people with internalized homophobia of pleasant feelings about their sexual orientation, reinforcing their sense of guilt for inciting the abuse. Internalized homophobia and IPV were linked in lesbian relationships, according to researchers, and were affected by the quality of the relationship. As a result, comprehending the gay IPV phenomena required consideration of both couples' characteristics and individual experiences. Although there was evidence of a link between internalized homophobia and IPV, data indicated that it was not substantial. This finding may be explained by the fact that research participants had low degrees of internalized homophobia, since LGB individuals with high levels of internalized homophobia are unlikely to participate in any LGB study. Another reason may be that the individuals in the sample were all highly educated white folks[6].

Scholars examined a sample of gay and bisexual males and found that disclosure was positively linked to the likelihood of physical and psychological IPV. Such results may be attributable to the fact that being out gay meant you were more likely to be abused by your spouse for a longer length of time, but it could also mean you were in an abusive relationship for a shorter period of time. In terms of this final point, offenders may threaten to evict the victim in front of their family, employer, landlord, previous spouse, or current guardian of their children. The Concept of Consciousness the final internalized minority stressor examined in connection to IPV was stigma. According to researchers, stigma awareness increases the risk of IPV. IPV offenders and

victims both reported high levels of stigma awareness; therefore, it can be inferred that IPV increases stigma consciousness and is positively associated with the propensity to overlook abuse in order to shield IPV victims from the homophobic judicial system.

These findings are consistent with high stigma awareness rates among individuals who are likely to face prejudice and be compelled to avoid discriminatory settings. According to what we know, there is evidence of a link between minority stresses andSSIPV in the literature. Internalized stresses and IPV were shown to be highly linked, as previously stated. According to certain research, there is a link between prior discrimination and a greater likelihood of IPV. Studies on the connection between experienced prejudice and the likelihood ofSSIPV victimization, on the other hand, are contradictory: some suggest a link, while others deny it. These results indicate that although the link between sexual orientation discrimination (based on other people's emotions and ideas) and IPV is not entirely apparent, there is a link between victimization and personal sentiments about one's own sexual orientation. It should be emphasized, however, that such considerations are based on cross-sectional research, making it impossible to establish whether a component emerged before, during, or after the incidence of IPV. This means that generalizing such results should be done with caution; instead, further study on predictors and related variables should be undertaken. Furthermore, clinicians should be aware that minority stressors are one of the most significant barriers to people who have experienced or are involved in IPV seeking help, as well as what can help them: heterosexism has been shown to exacerbate difficulties in reporting abuse to the police and accessing services for LGB people. IPV victims may be hesitant to seek legal help because they are afraid of prejudice or inadequate legal protection. According to the researchers, over 60% of lesbian women questioned chose not to leave their violent relationship due to a lack of resources, and the majority of the sample did not seek assistance at a women's shelter. Scholars point out that agencies and shelters were often unprepared to assist gay IPV victims.

The IPV Stigmatization Model was developed by researchers to explain why people are afraid to seek assistance. Three elements of the individual experience were outlined in the model: "stigma internalization," "expected stigma," and "culture stigma." Internalized negative attitudes about IPV, referred to as stigma internalization, and may affect people's help-seeking actions and psychological suffering. Surviving IPV may lead to feelings of guilt, humiliation, and self-blame, all of which can make it difficult to seek treatment for low self-efficacy. Anticipated stigma was concerned about whether others would respond with disdain or rejection toward the survivor if they learned about the IPV, influencing the choice to seek treatment[7].

1.2 Specific Treatments:

Researchers documented instances of creative initiatives created within LGB communities, even if study revealed significant gaps in current services. In comparison to heterosexual IPV protocols, they included new treatments that benefited both survivors and perpetrators. They provided batterer intervention programmes as well as advocacy programmes to assist LGB persons in navigating the judicial system. Furthermore, The Queer Asian Women's Shelter and Queer Asian and Pacific Islander Women promoted two approaches that focused on the specific needs of queer women in San Francisco: they attempted to better respond to IPV and address the complexities of being part of a small marginalized community like the LGB community, teaching how to ask service providers for help. A procedure for dealing with friends and family members of IPV victims was established by the Washington State Coalition against Domestic

Violence. According to the study, most victims of abuse sought assistance from friends and family before seeking services, providing them a key supportive role.

Services were sometimes linked to community-based efforts that included hosting seminars and forums to discuss healthy relationships. Lesbian victims seemed to enjoy talks on how to establish healthy relationships more than support groups for survivors, according to scholars. This may be owing to victims' worries about their privacy, which was safeguarded during discussions on a variety of issues related to violence. Instead of identifying who suffered violence and protecting participants' privacy, such a conversation may focus on other topics such as relationship expectations, negotiating differences, power dynamics, and warning indications of abuse. Another goal was to move from organizational interventions to community-based prevention in order to promote lesbian communities' health connections and offer knowledge and prevention. Rather of standardizing programmes, the various methods described aim to better adapt to local circumstances.

2. DISCUSSION

In the United States, a few research on therapy for LGB IPV victims were performed. Individualized mental health therapy has been shown in studies to help SSIPV sufferers. Because victims may fear consequences from the information provided during the session, couple therapy involving the victim and abuser has been shown to be less beneficial. Despite these results, research has shown that psychology graduate students and therapists are more likely to recommend couples therapy rather than individual counselling for LGB IPV victims than for victims of other genders. The person-centered approach and Gestalt therapy were suggested as two kinds of psychotherapy that would be suitable for SSIPV sufferers. These methods enabled victims to gain confidence in therapists over time, allowing them to become more conscious of their situation, the abuse they had experienced, and the repercussions that came with it. Furthermore, it urges therapists to allow victims to control the session, allowing them to learn how to successfully direct their life in this way. Researchers discovered that victims' knowledge of the abuse was considered to be longer-lasting due to the high desire to accept assistance. As a result of this reality, victims were able to acquire and utilize helpful resources in order to leave the abusive relationship and achieve independence from the spouse[8].

In the United States, it is not uncommon for abusers to complete psycho-educational programmes aimed at reducing the risk of future violence against partners. These programmes are referred to as "batterer intervention programmes", and they are based on two models: Cognitive Behavioral Therapy (CBT) is a kind of therapy that attempts to reduce aggressive tendencies and develop helpful tools for resolving relationship problems. The Duluth Model was developed to dismantle and eradicate patriarchal ideas in abusive males who were then taught to believe they had the right to dominate women[9].

The Duluth model, alone or in combination with CBT methods, was the most often utilized programme in the treatment of abusers, according to the researchers. Both methods ignore the unique characteristics of lesbian, gay, bisexual, and transgender relationships, as well as the role played by issues such as homophobia. Furthermore, the Duluth model, which is based on patriarchal ideology, was originally designed only for heterosexual couples; however, it was later applied to LGB perpetrators, despite the fact that in the United States, groups were frequently separated during treatment based on sexual orientation, even though the programmes were

largely the same for both groups. This feminist psycho-educational method focuses on re-education in order to foster more adaptable attitudes, improve communication skills, and eventually eliminate violent behaviors. To the best of our knowledge, no studies have been conducted to assess the impact of such therapy on the LGB community, and the few studies conducted on heterosexuals have shown very minor benefits. Scholars using a feminist framework to IPV believe that a one-size-fits-all treatment model for IPV offenders should be replaced with culturally appropriate and unique treatment choices for LGB abusers, according to the researchers. Treatment interventions, they believe, should address problems of sexism, homophobia, racism, and classism in order to address how society unfairly disadvantages some while favoring others[10]. In the North American Domestic Violence Intervention Program Survey, researchers examined 3,246 questionnaires submitted to directors of domestic violence perpetrator programmes in the United States and Canada. Because it is difficult for LGB individuals to freely express themselves in heterosexual groups, the findings show that the most frequent approach to LGB batterers is one-on-one treatment rather than group therapy. Two programmes were proposed for the LGB community.

Even though there is a dearth of literature on LGB IPV in general, there is a need for treatment-focused research. The findings indicated that a number of barriers hinder LGB individuals from seeking assistance in the event of IPV, the most significant of which is heterosexism. IPV sufferers may be hesitant to seek help out of fear of prejudice. Rarely was a solution given to assist LGB persons in obtaining IPV therapy, and writers advocated changes to conventional therapies or programmes. According to studies, many agencies and shelters are unprepared to help IPV gay and bisexual victims. Many emergency departments, shelters, organizations, and clinics in the United States had IPV advocacy programmes; nevertheless, most of these services had previously failed to properly react to abuse among LGB communities. The bulk of studies look solely at North American services and programmes in metropolitan regions, ignoring rural areas and foreign nations. When SSIPV treatment programmes were compared to conventional protocols, they were changed in terms of evaluating sexual identity, assisting SSIPV victims in accessing the legal system, and minimizing stigmatization. However, suggestions were included in the trials in order to concentrate on LGB-specific therapy. Despite the fact that many academics advocate for modified forms of IPV therapy, no empirical study has been done to see whether LGB individuals gain more from modified versions of treatment than conventional therapies.

It's also important to address a cultural and social context issue: the fact that we only identified papers on therapy in the North American setting suggests a paucity of study in this area in other countries; however, some studies may not have been included in international databases. According to the reviewed research, a psychological therapy tailored to particular LGB needs is needed, and it must be completed in order to ensure new usable resources and build self-determination. Intervention for LGB IPV victims and offenders should be part of a comprehensive treatment strategy that may include couples or individual therapy, but should always be tailored to each particular scenario. Appropriate training for mental health professionals, as well as established standards for evaluation and treatment, may result in more favorable results. Improvements should focus on the victims' well-being and happiness, as well as therapeutic characteristics such as the treatment's long-term consequences; furthermore, a new strategy may specify simpler access to services. IPV seems to be as frequent and severe in same-

gender relationships as it is in heterosexual couples, therefore rules and procedures should be updated to provide the same level of protection.

Due to the lack of specialized SSIPV programmes, it is critical that emerging IPV programmes provide outreach and educational services by collaborating with the community and offering a variety of services, starting with direct and physical resources like shelters, food and clothing, transportation, financial and legal assistance, 24-hour hotlines, and individual and group therapy. Although conventional battered women's shelters may serve as a model for LGB organizations, certain modifications should be made, such as more inclusive language and an emphasis on individual experiences rather than gender, which can help LGB persons feel more comfortable in reporting violence. Because IPV is still a relatively obscure problem in the LGB community, warning signals may be overlooked. As a result, education about IPV and how to identify its symptoms should be aimed particularly towards the LGB population.

3. CONCLUSION

In comparison to heterosexual IPV, the literature on LGB IPV is new and sparse. However, there is a growing corpus of empirical research that provides significant findings and concerns about LGB IPV. Previous research focused on the incidence of IPV in the gay and bisexual community, as well as LGB-specific characteristics in IPV and treatment obstacles. There are limited articles on LGB IPV treatments and therapies. Counseling interventions, especially for victims, and therapy: couple, group, and perpetrator therapy are two categories. Despite the popular belief that IPV is exclusively a problem in heterosexual relationships, it has been shown that its prevalence among LGB couples is similar to, if not greater than, that of heterosexual couples. While there were some parallels between heterosexual and LGB IPV (such as general patterns, kinds, consequences, cycle of violence, and drug use), LGB IPV had distinct characteristics and dynamics that were involved in detecting and treating IPV in the community.

REFERENCES:

1. E. Zavala, "A multi-theoretical framework to explain same-sex intimate partner violence perpetration and victimization: a test of social learning, strain, and self-control," *J. Crime Justice*, 2017, doi: 10.1080/0735648X.2016.1165135.
2. L. McRae, A. P. Daire, E. M. Abel, and G. W. Lambie, "A Social Learning Perspective on Childhood Trauma and Same-Sex Intimate Partner Violence," *J. Couns. Dev.*, 2017, doi: 10.1002/jcad.12147.
3. N. Gabbay and M. F. Lafontaine, "Understanding the Relationship between Attachment, Caregiving, and Same Sex Intimate Partner Violence," *J. Fam. Violence*, 2017, doi: 10.1007/s10896-016-9897-9.
4. N. L. Baker, J. D. Buick, S. R. Kim, S. Moniz, and K. L. Nava, "Lessons from Examining Same-Sex Intimate Partner Violence," *Sex Roles*. 2013, doi: 10.1007/s11199-012-0218-3.
5. C. E. Murray and A. K. Mobley, "Empirical research about same-sex intimate partner violence: A methodological review," *J. Homosex.*, 2009, doi: 10.1080/00918360902728848.
6. D. Hassouneh and N. Glass, "The influence of gender role stereotyping on women's experiences of female same-sex intimate partner violence," *Violence Against Women*, 2008, doi: 10.1177/1077801207313734.

7. G. Penone and C. Guarnaccia, "Intimate partner violence within same sex couples: A qualitative review of the literature from a psychodynamic perspective," *Int. J. Psychoanal. ysis Educ.*, 2018.
8. A. Frankland and J. Brown, "Coercive Control in Same-Sex Intimate Partner Violence," *J. Fam. Violence*, 2014, doi: 10.1007/s10896-013-9558-1.
9. A. F. Carvalho, R. J. Lewis, V. J. Derlega, B. A. Winstead, and C. Viggiano, "Internalized Sexual Minority Stressors and Same-Sex Intimate Partner Violence," *J. Fam. Violence*, 2011, doi: 10.1007/s10896-011-9384-2.
10. M. L. Pimentel, "A review of the syndemic components of male same-sex intimate partner violence," *J. Nurs. Educ. Pract.*, 2014, doi: 10.5430/jnep.v5n1p19.



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AN OVERVIEW OF BIG DATA IN EDUCATION

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ABSTRACT

The trendiest term in the twenty-first century is big data, which is collected by flooding data from billions of devices. Big data is data that is produced in large quantities, at a fast pace, and in a variety of formats that are complicated (veracity), necessitating analytical processes and active data management in order to extract useful insights. Similarly, big data is seen as a game-changer capable of altering the way companies function in various organizations in order to gain a lasting competitive edge. This article provides an overview of big data technologies in higher education and explores how big data analytics may provide value to Higher Education Institutions and help them maintain a competitive edge. Given the rising importance of educational institutions as a source of income that boosts the economy, the education industry is working in an increasingly complicated and competitive environment.

KEYWORDS: *Big Data, Higher Education, Innovation, Learning, Teaching.*

1. INTRODUCTION

We are living in the information era, and big data has become an integral component of most of our daily lives. As a result of the everyday explosion of data, new integrated innovative technology demands have reached an all-time high. Many organizations, including science, healthcare, engineering, business, and eventually society at large, are attempting to change their organizations using big data in order to gain a competitive edge over their counterparts in the

same setting. The term "big data" isn't defined in any manner (an efficient way of applying big data). As a result, big data may be described as a collection of data that is so complicated and vast that processing and analyzing it using on-hand database management tools is difficult. The primary aim of big data is to manage, process, and analyze its properties. Volume, Velocity, Variety, Veracity, and Value (i.e., the unknown insights of data) are the 5 Vs of data-related aspects. As a consequence, by evaluating performance and establishing competitive advantages, big data capabilities may provide long-term value.

The idea of using big data analytics in higher education is to get a more evidence-based competitive edge in terms of new teaching-learning approaches. Despite the fact that big data analytics is still a relatively new use in higher education, the technology has the potential to improve and contribute to institutions. Education institutions may use big data analytics to address some of their problems, as they face growing pressure from both national and international economic, global competitive advantage, and social and political change. Universities contain a lot of information. Although these databases are plentiful and increasing, they are often underused. As a result, the higher education industry has access to a significant quantity of data that may be utilized to make effective decisions for better educational quality. Higher and professional education is a domain that must be evaluated and transformed on a regular basis to keep up with the fast pace of changing trends in various market sectors, which in turn creates a variety of workforce needs. Technology has had a significant impact on the way education is delivered. Mobile devices and apparatuses, teleconference and remote access systems, educational platforms and services, and other technologies that students, teachers, academic faculty, evaluation specialists, researchers, and decision-makers in education interact with and use in an effort to impact and improve teaching and learning but also to realistically impact and improve teaching and learning.

The connection with these technologies produces a significant quantity of data, which may vary from a single access log file to institutional activities. The educational systems are still not fully prepared to deal with and exploit them for the purposes of continuous quality improvement. Health professions education, also known as health education, is one of the most common settings in which these technologies are used, resulting in a wide range of educational data. Furthermore, health education must always reflect the increasing corpus of medical knowledge and evidence in order to effectively integrate it in education and educate future health professionals to address the problems that healthcare systems will face in the future. The need to govern these challenges in health education is now more important than ever, and as a result, different approaches such as big data and analytics that could be useful in investigating and exploiting educational data have received attention.

1.1 Big Data Analytics in Higher Education Institutions:

As a result of the everyday explosion of data, new integrated innovative technology demands have reached an all-time high. Big data has developed as a result of this. Many studies have been conducted on the application of big data in a variety of areas, including data availability, cost, applicability, importance, and security. Despite this, just a few articles discuss the integrated use of Big Data in higher education. Higher education institutions have access to a massive quantity of data from a variety of sources, all of which are regulated by various procedures. As a result, big data has the ability to harness institutional data, which may help the education sector's future, especially in decision-making. Big data analytics may be evaluated as a complete technological

IT source in educational institutions by evaluating a set of processes that will contribute to long-term competitive advantage. The analytics of big data architectural component may be utilized to convert data from many sources and formats into useful insights in higher education using big data analytics technologies.

Big data component architecture is made up of five levels. Data, data analytics, data aggregation, information exploration, and data governance are examples of these levels. The data layer covers the data sources required to offer insights that will enable repeated operational procedures. As a result, the data layer can assist any difficulties that institutions have in making better decisions. analytics: The analytics layer assists with the analysis and visualization of data in HEIs for the purpose of improving learning and the environment in which it occurs data aggregation: The data aggregation layer assists with the analysis and visualization of data in HEIs for the purpose of improving learning and the environment in which it occurs. The processes of data management arising from different sources of data, such as data from communication channels, sizes, and formats, are referred to as the data aggregation layer (unstructured and structured). As a result, the data aggregation layer attempts to analyze data from a wide range of sources.

However, one of the major challenges in implementing Big data technology is the variability of incoming data; the information exploration layer produces outputs such as real-time or near real-time data by examining reports and visualizing them to derive meaningful insights; the data governance layer entails understanding data management, its lifecycle, and security; and the data governance layer entails understanding data management, its lifecycle, and security. The governance, standards, rules, tools, and procedures for data management are considered dominant data management. The process of managing data throughout its lifetime is known as data life-cycle management. Big data analytics offers innovativeness for data monitoring, auditing, and protection. Data security and privacy management is a concept in which big data analytics provides innovativeness for data monitoring, auditing, and protection.

As a result, each of the big data architectural components may be predicted to have the capacity of big data application inside educational institutions. As a result, the study aims to utilize the UTAUT model to grasp the anticipated capabilities of big data analytics to generate prolonged competitive advantage and business value, based on the complexity of big data analytics and sustained competitive advantage as stated by and. For example, big data may help maximize student learning success when some students are undecided about which main subject to take, leaving teachers wondering how to tailor learning pathways so that no student falls behind. Higher education is one of the areas where volume, diversity, and velocity coexist in data. In the higher educational environment, large quantities of educational data are collected and produced on a regular basis from many sources and in various forms. Educational data ranges from those generated by students' use of and interaction with learning management systems (LMSs) and platforms, to learning activities and course information, which includes learning objectives, syllabuses, learning material and activities, examination results, and course evaluation, as well as other types of data related to administrative, educational, and quality assurance.

The limited exploitation of large educational data, as well as the quantity and nature of these data in higher education, necessitates the use of specific methods to uncover new useful information that is presently buried inside data. Such methods may be developed and modified from other areas that are characterized by big data, and they can be effectively used to large educational

data. These methods may be utilized to generate insights "about student performance and learning approaches" and illustrate areas within large educational data that can be favorably affected, such as students' real performance according to taught curriculum. Big data and analytics, when used together, have recently showed potential in encouraging various activities in higher education. These actions pertain to "administrative decision-making and organizational resource allocation," "early identification of students at risk of failing," "development of effective instructional techniques," and "transforming the traditional view of the curriculum to reconsider it as a network of relations and connections between the various entities of data gathered and regularly produced from LMSs." The curriculum and its contents, as a significant component of large educational data, are one of the recognized areas in which big data and Analytics are properly relevant for inquiry and development in higher education.

1.2 Big Data Analysis Innovative Teaching-Learning:

Higher education institutions are now in the process of rethinking how they achieve their purpose in order to maintain a competitive edge. However, political and economic pressures have increased scrutiny of the quality of higher education institutions, particularly in terms of labor costs such as government funding and policy changes, access and continued growth of students, leadership changes, economic sustainable development, and updates of institutional policy are mostly the challenges the high education institutions face. Educational data analytics and mining may make previously ignored, invisible, and therefore inaccessible data apparent. The higher education industry, as may be observed, is rapidly expanding. The projection depicts how sustainability patterns are anticipated to change depending on different nation perspectives.

Most CEOs now identify data as a new digital innovation that is regarded as a need in the higher education system owing to the development and evolution of sustainable competitive advantage. The degree to which an organization integrates a concept while also producing a strategy that no existing or prospective competitors follow is referred to as competitive advantage[1]. Similarly, a company is considered to have a competitive advantage if no present rivals are adopting an innovation strategy at the same time and it has not yet been able to duplicate the advantages of the approach. As a result, when a company outperforms its rivals, it has a competitive advantage. Despite the fact that big data is still relatively new and little understood, it has the potential to provide organizations with much more development potential than conventional technology. Big data analytics integrative functions may utilize various statistical analyses and machine language to identify dangers, problems, and opportunities in the system, which can offer economic value for higher education. As a result, education may become more dynamic and less expensive, learning methods can be enhanced, and operations can be provided [2]. As a result, educational achievement may be improved. The compatibility of big data technology with sustainability, especially in the phase of multidimensional environment, intelligent distribution of sources, integrated practices, and expertise priorities, may be disputed.

1.3 Advantages Of Big Data In Education :

- *It assists you in finding solutions to difficult problems:* The greatest approach to brainstorm answers to the difficult problems confronting the education sector is to evaluate your current data. The more you understand about your past, the more you can learn from it. If you work in higher education, for example, you may see a drop in enrolment. You can use big data to get

the context cues you need to figure out where, when, and how your enrollments are changing[3].

- *It is easily accessible:* It's inconvenient and time-consuming to search through a wall-to-wall arrangement of file cabinets. It's much simpler to locate what you're searching for since big data depends on a technical infrastructure to collect, store, and manage information. Institutional silos, in addition to infrastructure, may make it difficult to exchange information. Leadership may have access to data that instructors do not, which may create obstacles to learning and development. With the proper tools and data analytics, you can create a more collaborative workplace. Because all of the data is in one place, all you need is internet connection to locate what you're looking for. You don't even need to install a program or plug-in since many software products are accessible via browsers like Google Chrome and Safari[4].
- *It may help you save money:* In higher education, proper resource allocation is critical, and your data is the key to efficiency. For one thing, your data may provide information about various class sections' enrollment figures. If just two of the five sections of ENG 102 are full, the remaining three may be merged to save resources such as classroom space, instructor time, and energy usage[5]. From an infrastructure standpoint, cloud-based solutions have the ability to reduce data storage costs while also relieving strain on your IT staff. Manual sorting and transcribing of data has historically been needed, which is time intensive and may take weeks, if not months. It may also take a long time to generate customized reports on a regular basis. Your workers' time might be better spent on more productive activities[6]. An analytics software will automate most of this time-consuming labor, and the convenience of digital data makes data access fast and simple, saving you money in the long term. Efforts to attract students for higher education are another cost-cutting advantage. Your data may reveal you which potential students are more likely to succeed at your institution, as well as who are more likely to drop out or fail, by looking at previous school performance. This may assist you in developing more effective acceptance procedures that optimize the return on investment for each student[7].
- *It is Fast:* This was briefly stated under the cost-cutting advantage, but it needs repeating. You'll save a lot of time sifting through data to locate one specific report or piece of information on a certain kid now that all of your school's information is in one place. Big data is also accessible in real time, allowing you to make faster choices than ever before. This is especially useful during enrollment times, when instructors are keeping track of statistics in order to plan for the next semester. Year-Over-Year Enrollment reports may be automated to assist you see how enrollments are doing in comparison to the same time last year[6]. Then you may make choices on the spot to enhance or maintain the consistency of your enrollments.
- *It assists you in adapting:* You may create new courses, instructional techniques, and other ways to offer students what they need and desire by detecting patterns. Take, for example, community colleges. Because these institutions are mostly inhabited by adults who are juggling job, families, and education, a flexible timetable is one of their top priorities when choosing a school. Many of these adult students now find that online courses are even more convenient than late-night or weekend sessions, thanks to the growth of online learning. Big

data will reveal the exact statistics behind this since online learning is better suited for some kinds of courses such as those that do not need a lab or hands-on learning. Perhaps on-campus biology class enrollments have remained stable while on-campus English course enrollments have decreased[8]. You may modify your course offers appropriately to guarantee that your students always have the greatest choices.

1.4 Analysis Of Data Mining In Education:

Data mining methods are gaining traction in the education industry, and the results of these approaches may offer essential decision-making assistance. making. Data mining in education is referred to as an example, educational data mining (EDM). EDM is a new genre. Data mining is a field that focuses on using data mining tools and techniques to solve problems. Methods for analyzing data in the field of education This section contains a list of for EDM, a literature review or survey articles are required. It emphasizes their most important achievements A review of current literature contains a review or survey article. This is a review of shows twenty years of e-learning data mining research[9]. From a pedagogical standpoint, surroundings are important. The creators discovered and categorized problems that need to be researched in order to be solved Performances by student learners.

Another review of the literature focuses on EDM and learning analytics in higher education and was released in 2019. This study's findings are based on a review of the literature. four major areas were covered: Computer-assisted instruction (CSLA) and the use of DM methods to obtain information that may be used depending on student engagement in the LMS (2) Predictive analytics with the help of computers (CSPA), as well as the usage of EDM and LA to predict student performance[10]. Assessment-based performance and retention in courses. In a learning activity, engagement and subject knowledge are important; (3) The use of computer-assisted behavioral analytics (CSBA) to detect student behavioral trends and use DM methods When it comes to engaging in online learning activities, I have a few preferences. and (4) visualization analytics with the aid of a computer (CSVA) as well as a mix of data visualization methods Data mining and knowledge representation have progressed as a result of these advancements. to provide a visual representation of student behavior in relation to the educational activity

2. DISCUSSION

The application of Big Data and Open Data in Education will be examined in this research. Also, how much data can be utilized and extracted to make something valuable, assisting the business in increasing revenues. As a result, defining Big Data and Open Data clarifies how these two technologies are categorized. Following that, it is critical to discuss the objectives and purposes of Big Data in education, as well as the value and impacts of Big Data in education. We investigate how Big Data's value potential has changed in recent years and what the future holds. Finally, we will examine the educational advantages of Big Data and Open Data, as well as a short explanation of how these technologies may contribute to a world-class educational system. In the field of education, assisting instructors and students in making more focused decisions. Big Data has the potential to significantly enhance education. May afford to create a contemporary, dynamic educational system from which every single student can benefit to the fullest extent possible. Furthermore, instructors now have important tools that they did not have previously, allowing them to make more precise choices and pick from a wide range of innovative learning techniques. As a result, Big Data is actively engaged in changing the way

sectors, including education, operate. Traditional problems will no longer exist in the new age of data, but excellent techniques will be maintained. New learning methods will be added to the school system, making it more efficient and focused. However, the journey into this new age has only just begun, and there are many challenges ahead, including a scarcity of skilled people in the fields of Big Data and Data analytics. Furthermore, instructors and academics must be trained and engaged in these new technologies, and students must embrace and utilize them.

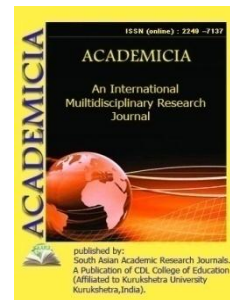
3. CONCLUSION

The explosion of data has given rise to big data, which is used to analyze large amounts of data from a number of sources. Its capabilities may be very beneficial to higher education institutions. Higher education institutions must investigate the long-term implications of using big data analytics, which may help institutions expand their teaching-learning focus. Executives could suggest that administrators and educators assist the system and gain value from practical applications, such as creating a culture of data use for educational decision making, being keen with data users by asking critical questions about market deals and suggesting the most beneficial uses and features, involving IT departments in data collection and application planning, and starting with the most basic uses and features. As a consequence, institutions may save money by integrating educational abilities and making better decisions. This framework aims to improve the development of innovative teaching-learning orientations for educational institution performance as an insightful contribution to curriculum design for instructors and learners in education in particular, as well as the education sector's overall competitive advantage.

REFERENCES

1. F. Kalota, "Applications of Big Data in Education," *Int. J. Soc. Behav. Educ. Econ. Bus. Ind. Eng.*, 2015.
2. Y. Wang, "Big Opportunities and Big Concerns of Big Data in Education," *TechTrends*, 2016, doi: 10.1007/s11528-016-0072-1.
3. A. S. Drigas and P. Leliopoulos, "The Use of Big Data in Education," *Int. J. Comput. Sci. Issues*, 2014.
4. P. Schwerdtle and J. Bonnamy, "Big Data in Nurse Education," *Nurse Education Today*, 2017, doi: 10.1016/j.nedt.2016.08.003.
5. C. F. Lynch, "Who prophets from big data in education? New insights and new challenges," *Theory Res. Educ.*, 2017, doi: 10.1177/1477878517738448.
6. A. Klačnja-Milićević, M. Ivanović, and Z. Budimac, "Data science in education: Big data and learning analytics," *Computer Applications in Engineering Education*, 2017, doi: 10.1002/cae.21844.
7. K. Sin and L. Muthu, "APPLICATION OF BIG DATA IN EDUCATION DATA MINING AND LEARNING ANALYTICS – A LITERATURE REVIEW ", *ICTACT J. Soft Comput.*, 2015, doi: 10.21917/ijsc.2015.0145.
8. E. Zeide, "The Structural Consequences of Big Data-Driven Education," *Big Data*, 2017, doi: 10.1089/big.2016.0061.

9. J. A. Johnson, "The Ethics of Big Data in Higher Education," *Int. Rev. Inf. Ethics*, 2014, doi: 10.29173/irie365.
10. F. Kalota, "Applications of big data in industries," *Int. J. Soc. Behav. Educational, Econ. Bus. Ind. Eng.*, 2015.



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ELECTROCHEMICAL DETERMINATION OF PLATINUM (IV) WITH SOLUTIONS OF DIETHYLAMINO-4-METHYL-HEXINE-2-OLA-4 IN AQUEOUS AND MIXED MEDIA

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ABSTRACT

The article shows the conditions and the possibility of amperometric titration of palladium (II) ions with solutions of diethylamino-4-methyl-hexine -2-ol-4 (DEMGO) in non-aqueous media (acetic acid, n-propanol, DMF, DMSO) and their mixtures with background electrolytes having different acid-base properties. Methods of amperometric titration of micrograms of amounts of palladium (II) ions in the presence of foreign ions containing foreign ions are proposed

KEYWORDS: *Palladium, Diethylamino-4-Methyl-Hexin-2-Ol-4, Solution, Acetic Acid, Npropanol, DMF, DMSO, Background Electrolytes.*

INTRODUCTION

Amperometric titration of metal ions in non-aqueous and mixed media with various complexants will expand their analytical capabilities and simplify the solution of many complex analytical problems. First of all, this is due to the fact that the nature of the solvent strongly affects the strength of the resulting complex, moreover, it is not the same for different cations, which determines the selectivity and rapidity of the method. In addition, the methods of non-aqueous compleximetry successfully solve the problem of accurate and selective determination of metals in objects of organic origin, as well as directly in extracts obtained during concentration.

We tried to find the optimal conditions for amperometric titration of a number of noble metals with solutions of diethylamino-4-methyl-hexin-2-ol-4 (DEMGO) in non-aqueous protolytic media, on background electrolytes of different acid-base properties.

Reagents and equipment

The initial 0.002 M solutions of Na_2PdCl_4 , K_2PtCl_6 , AuCl_3 and AgNO_3 , as well as a 0.01 M DEMGO solution, were prepared by dissolving the corresponding weighed portions of these reagents in acetic acid (n-propanol, DMF, and DMSO). The concentration of noble metals was determined amperometrically using a 0.01 M potassium iodide solution [1]. Amperometric titration was carried out on a setup with two platinum wire electrodes rotating (1000 rpm) on a common axis. The design of electrodes, piston automatic microburettes and apparatus are described in detail in [2].

Amperometric titration was carried out on a setup with two rotating (1000 rpm) electrodes on a platinum wire on a common axis. The design of electrodes, piston automatic microburettes and equipment are described in detail in [3].

In accordance with the voltammetric behavior of DEMGO and other products participating in electrochemical media, amperometric titration of noble metal ions must be carried out at a polarization voltage of 0.75-1.15 V, depending on the nature and concentration of the background electrolyte (acetates, nitrates, chlorides, alkali metal perchlorates and ammonium) [4]. In this case, the indicator current should arise beyond the equivalence point (i.e.) due to the oxidation of the free reagent and the reduction of the dissolved oxygen in the air.

The experimental data showed that in the studied media and backgrounds 0.15-0.40 M solutions of noble metal ions with DEMGO solutions are titrated quite well and quickly, and the shape of the curve coincides with the expected one with some constant current at the beginning of titration with a subsequent sharp transition (break) at the end point of titration (CTT).

Determination of ions and platinum (IV) in individual solutions.

It was found that when titrating ions of the following noble metals, the corresponding molar ratio Me: reagent is: Pd: reagent 1: 2 and Pt: reagent 1: 4, the titrated solution acquires a reddish-brown color. When passing from acetate backgrounds to perchlorate ones, containing a certain amount of perchloric acid, the shape of the titration curve of noble metal ions deteriorates significantly, which ultimately leads to a decrease in the reproducibility and accuracy of the results. This is explained by an increase in the acidity of the analyzed medium during the transition from acetates to perchlorates [5]. Some of the data obtained are shown in the table.

TABLE RESULTS OF AMPEROMETRIC TITRATION OF VARIOUS AMOUNTS OF PLATINUM (IV) IONS WITH A DEMGO SOLUTION IN DMSO AGAINST A BACKGROUND OF 0.20 M LITHIUM PERCHLORATE

Mixture composition, %	Found Me, μg ($P=0,95; x \pm \Delta X$)	N	S	S _r
Pd 15,44	15,423 \pm 0,16	3	0,061	0,004
Pd 30,88	30,854 \pm 0,12	4	0,052	0,002
Pd 61,75	61,782 \pm 0,18	3	0,033	0,001
Pd 123,50	123,494 \pm 0,20	4	0,102	0,001
Pd 247,00	246.951 \pm 0,41	4	0,213	0,001
Pd 493,10	493,793 \pm 0,52	3	0,624	0,001

The results of the determination of various concentrations of noble metal ions with a DEMGO solution in 10.0 ml of the test solution under optimal conditions testify to the good accuracy of the developed technique. The effect of additives to acetic acid, n-propanol, DMF, DMSO, such as chloroform, tetrachloromethane, benzene, toluene, hexane, methyl ethyl ketone, dioxane, etc. as in the titration of noble metal ions in their individual solutions, with the only difference that the content of protolytic solvent in the analyzed sample was controlled in strict accordance with the volume of the added inert solvent. Due to the decrease in the solubility of the background electrolyte under these conditions to values less than 0.2 M under the influence of large additions of an inert solvent, the background concentration (from 40-50 vol.% Of an inert solvent) must be continuously reduced close to values of the order of 0.05 M. Addition of any of the above solvents in the amount of 10-20 vol.% (depending on the nature of the solvent) practically does not interfere with the shape of the titration curve becomes less steeply inclined to the axis of the volumes. For the same reason, at solvent contents above 50-60 vol.%, The reproducibility and accuracy of determinations of noble metal ions deteriorate.

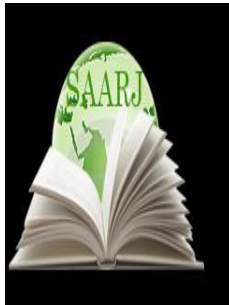
The revealed nature of the influence of inert solvents on the form of the titration curve is explained by the mode of a decrease in the electrical conductivity of the titrated solution at a high content of an inert solvent in the protolytic medium, which leads to a significant and continuously increasing ohmic voltage drop in the analyzed solution with an increase in the indicator current.

Consequently, amperometric methods for the determination of platinum (IV) ions with a DEMGO solution are distinguished by high selectivity and reproducibility with a relative standard deviation not exceeding 0.133.

LITERATURE

1. Songina O.A., Paschenko A.I., Maslova P.I. // Factory. laboratory. 1965 T. 31.No. 1.P.66-68.
2. Gevorgyan A.M., RakhmatovKh.B., Allambergenov B.A., Tsagaraev E.T. Amperometric titration of palladium (II) with solutions of 1-morpholino-4-methyl-hexin-2-ol-4 and 2,4,6-trimethylpyrimidine // Uzbek Chemical Journal. 1995. No. 5-6.S.8-11.
3. Gevorgyan A.M., TalipovSh.T.,Khadeev V.A., Kostylev V.S., Mukhamedzhanova D.V. //Journal of Analytical Chemistry. 1980. Vol. 35. No. 10.S.2026-2028.

4. RakhmatovKh.B., KolliievSh.Kh., KurbanovA.Sh., Rustamov S.R. Amperometric titration of palladium (II) with solutions of vinylmorpholine and vinylpyrimidine // Scientific Bulletin of SamSU. 2017. No. 5 (105).S.103-107.
5. Denesh I. // Titration in non-aqueous media. M: Peace. 1971.413
6. Отабек Абдукаримович Мирзаев, Шавкат Серабович Турсунов // Теоретическая обоснования деформированного состояния оболочки питающего цилиндра прядильных машин // Oriental renaissance: Innovative, educational, natural and social sciences // 2021. 1092-1103 <https://cyberleninka.ru/article/n/teoreticheskaya-obosnovaniya-deformirovannogo-sostoyaniya-obolochki-pitayuschego-tsilindra-pryadilnyh-mashin>
7. T Khankelov, S Tursunov, Z Maksudov // Domestic Solid Waste Crusher // International Journal of Psychological Rehabilitation 24 (issue 07), 8090-8096 psychosocial.com/article-category/issue <https://www.psychosocial.com/article/PR270784/18957/>
8. Tavbay Khankelov¹, Zokir Maksudov^{1*}, Nafisa Mukhamedova¹ and Shavkat Tursunov² // Crushing and screening complex for the production of compost from organic components of municipal solid waste // Interaction of Materials Resistance Science With Other General-Military Disciplines In Engineering Specialties // 2021. https://www.e3s-conferences.org/articles/e3sconf/abs/2021/40/e3sconf_conmechhydro2021_01026/e3sconf_conmechhydro2021_01026.html
9. OliyaNurova Salomovna¹, AsrorNazarov Allanazarovich², TursunovShavkatSerabovich // Interaction of Materials Resistance Science With Other General-Military Disciplines In Engineering Specialties // <https://www.annalsofrscb.ro/index.php/journal/article/view/5911>
10. TursunovShavkatSerabovich // Analysis of existing designs of crushers for crushing municipal solid waste// International Journal for Innovative Engineering and Management Research(IJEMR) // <https://scopedatabase.com/documents/00000181/00000-84600.pdf> // 2021



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DEVELOPING THE CRITICAL THINKING OF PRIMARY SCHOOL STUDENTS

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ABSTRACT

The study of the development of creative abilities requires the identification of the conditions under which this process takes place, i.e. the developing environment. Some aspects of this problem have been studied. However, the opportunities for creative development of students included in modern programs are not fully used by primary school teachers.

KEYWORDS: *Primary School Teachers, Modern Programs, Some Aspects Of This Problem, Conditions Under Which This Process*

INTRODUCTION

Young school age is a period of rapid development of the child's psychological development, all mental functions, the formation of complex activities, the formation of the foundations of creative abilities, motives and needs, ethical norms, self-esteem, voluntary regulation of behavior is an important stage. Creativity is a complex mental process related to a person's character, interests, and abilities. Imagination is the focus of his attention. A new product that a person receives in his work can be objectively new (a socially significant discovery) and subjectively new (a discovery for himself). The development of the creative process, in turn, enriches the imagination, expands the child's knowledge, experience and interests. Creative activity develops children's emotions, contributes to a more acceptable and intensive development of higher mental functions such as memory, thinking, perception, attention. The second, in turn, determines a child's academic success. Creative activity develops a child's personality, helping him or her to master moral and ethical norms. In creating a work of creativity, the child reflects in them his understanding of his life values, personal qualities. Primary school age children love

to engage in the arts. They sing and dance passionately, sculpt and draw, write fairy tales, and engage in folk crafts. Creativity enriches and delights a child's life. Children can be creative, regardless of their personal complexes. Often adults who criticize his creative abilities are ashamed to show them off. Each child has unique characteristics that can be recognized early.

The study of the development of creative abilities requires the identification of the conditions under which this process takes place, i.e. the developing environment. Some aspects of this problem have been studied. However, the opportunities for creative development of students included in modern programs are not fully used by primary school teachers.

The aim is to theoretically substantiate and define the pedagogical conditions for the development of creative abilities in the process of labor education.

Functions:

1. Theoretical analysis of the problem of developing creative abilities in students.
2. Emphasize the developmental characteristics of creative abilities in primary school students.

Implement the selection of content and methods for the development of creative abilities of primary school students in labor education classes

Develop a system of creative tasks as a means of developing creative skills in labor lessons in primary school students.

The object of study is the development of creative skills in primary school students.

The topic is the pedagogical conditions for the development of creative abilities in young students in the process of labor training.

Research methods:

Tracking

Conversation,

Free conversations

Games to develop creative skills

The analysis of the problem of developing creative abilities is determined by the content included in this concept. Often in the everyday mind, creative ability is defined by different types of artistic activities, beautiful drawing, writing poetry, writing music. However, the creative abilities to be disclosed, their structure and characteristic features, determine the consideration of the concepts of 'creativity' and 'ability'.

To date, there are different approaches to the definition of creativity in the philosophical, psychological, pedagogical literature. The main difficulty is primarily related to the lack of a direct operational, psychological content of this concept; it can only explain the use of the definition of creativity so far by creating its product - a new one. Philosophers define creativity as a necessary condition for the development of matter, the formation of new forms of it, the emergence of many forms of creation. The Philosophical Encyclopedia describes creativity as follows: "Creativity is an activity that never before attracts new things."

From the point of view of psychology and pedagogy, it is especially important to study the creative work itself, the process of preparation for creativity, to identify forms, methods and means of developing creativity. Creativity is purposeful, determined, intense work. It requires mental activity, intellectual abilities, willpower, emotional qualities, and high performance.

L.S. Vygotsky argues that the highest expression of creativity still exists in a few selected geniuses of humanity, but in the daily life that surrounds us, creativity is a necessary condition for existence. Some of the out-of-the-ordinary and new lies must also come from the human creative process.

The phenomenology of creativity can be divided into three main types that correspond to the types of creativity:

Stimulus-effective - activity can be effective, but this activity is determined by the action of certain external stimuli each time.

Heuristic - the activity is creative in nature. A person with a reliable solution method will continue to analyze the structure and structure of their activities, comparing individual tasks with each other, which will lead him to find new original, more rational solutions from the outside. Every legitimacy found is experienced as a new "own" way of discovering, creative finding, solving tasks;

Creative - The empirical regularity found independently is not used as a solution, but works as a new problem. The patterns found were proven by analyzing their original genetic basis. Here the action of the person becomes generative in nature and gradually loses the form of response: its result is broader than the original goal. Thus, creativity begins in the narrow sense of the word, not just the answer, but the solution of the task at hand. At the same time, it remains both a decision and an answer, but at the same time there is something "outside" it, and that defines his creative state.

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REFERENCE

1. President Of The Republic Of Uzbekistan ShavkatMirziyoyev Received The Address To The Meeting. <https://uza.uz/oz/politics/zbekiston-respublikasi-prezidenti> Mirziyoyevning-the Republic of Uzbekistan Supreme-25-01-2020.
2. PF-5953 of the president of the Republic of Uzbekistan on March 2, 2020 "Five priorities of development of the Republic of Uzbekistan in 2017-2021 strategy of action on the direction "science, enlightenment and digital state program on implementation in the "year of economic development" on " decree.
3. Abdurakhmonov Q.X. Labor economics: theory and practice. The textbook. Again and filled 3rd edition. T.: "", 2019.Fan 552-p.
4. Zakirova N.K., Abdurakhmanova G., Sagidullin F.R. Transformational for International scientific review innovation v. 2020. №LXX. - 24-28.
5. Frey C. B., Osborne M. A. the future of employment: how responsive are jobs to somputerisation. - Oxford Martin Working Papers. – 2018. https://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employm



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AN ANALYSIS OF PLANT TISSUE CULTURE

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ABSTRACT

Forestry, Agriculture, horticulture and plant breeding have all made extensive use of plant tissue culture. It's a kind of applied biotechnology that's utilized for things like plant mass propagation, viral eradication, secondary metabolite synthesis, and in-vitro cloning. Plant tissue culture has recently been utilized for short and medium term conservation, also known as slow growth, and cryopreservation, also known as long term conservation, of endangered plant species. These techniques had been effectively employed to preserve plant species with refractory seeds or dormant seeds, and they outperformed traditional conservation approaches. Plant tissue cultures are a useful tool for studying cell wall production in live cells. Tissue cultures also offer cells and culture media, which may be readily separated to isolate enzymes and cell wall polymers for future research. Tissue cultures with treachery element differentiation or extracellular lignin production have yielded valuable data on a variety of xylem and lignin-related topics. This paper also discusses several aspects of Plant Tissue Culture.

KEYWORDS: Agriculture, Conservation, Cytokinin, Plant, Tissue Culture.

1. INTRODUCTION

Natural resource conservation refers to humanity's judicious use of the planet's resources. Conservation is defined as the preservation of genetic, biological, and ecological variety in their natural abundance. Conservation is the exchange of current gratification for later gratification. As the world's human population reaches eight billion, concerns concerning the pace of extinction of other species on our planet are increasing. Humans are the direct or indirect cause of the majority of contemporary extinctions, according to compelling evidence. Residential and commercial development, overexploitation through fishing, hunting, or gathering, disruption by people during work and leisure activities, pollution, and the introduction of alien species are the main threats to these species[1].

Ex-situ and in-situ conservation are the two primary strategies for preserving biodiversity. Ex-situ conservation is the process of protecting or preserving an endangered plant or animal outside of its natural habitat, either by removing the entire population or a portion of it from the threatened habitat and relocating it to a new environment, which could be a wild area or a human-controlled environment. Biological Gardens, Seed banks, Gene banks, Germplasm banks, and In-vitro storage are examples of ex-situ conservation methods. In-situ conservation, on the other hand, is concerned with the protection and preservation of species in their native environment, in areas where they normally exist. The whole ecosystem is preserved and maintained using this approach, ensuring the conservation of all known and undiscovered component species. Strict nature reserve (SNR), Games Reserve, and National Park are the most common in-situ conservation techniques. Large wild regions have vanished as a consequence of natural catastrophes, pests, diseases, and threats from shifting government policies and urban expansion, making in-situ conservation almost difficult. Ex-situ conservation is extremely difficult to carry out due to the following issues: an adequate sample must be taken for the conservation of genetic diversity, land space is extremely important, particularly in the case of very large forest trees, whereas land availability is drastically reduced, labor costs and trained personnel are extremely difficult to come by[2].

1.1 Plant tissue culture:

Plant tissue culture is a cutting-edge technique for propagating and conserving plant species. Plant tissue culture methods have recently gained industrial significance in the areas of plant propagation, disease eradication, plant enhancement, and secondary metabolite synthesis, in addition to its use as a research tool. Explants are little bits of tissue that may be used to grow hundreds of thousands of plants in a continuous process. Under regulated circumstances, a single explant may be reproduced into thousands of plants in a very short time and space, regardless of the season or weather, on a year-round basis[3].

Plant tissue culture is the in vitro aseptic cultivation of cells, tissues, organs, or entire plants under regulated nutritional and environmental conditions to generate plant clones. The clones that arise are true to type for the genotype that was chosen. The regulated circumstances offer a favorable environment for the culture's development and multiplication. These conditions include sufficient food supply, a pH medium, an appropriate temperature, and a suitable gaseous and liquid environment. For large-scale plant multiplication, plant tissue culture technique is extensively utilized. Plant tissue culture methods have been more important in the fields of plant propagation, disease eradication, plant improvement, and secondary metabolite synthesis in recent years, in addition to its usage as a research tool[4].

Plant tissue culture media includes all of the nutrients necessary for normal plant growth and development. In the case of solid medium, it is mostly comprised of macronutrients, micronutrients, vitamins, other organic components, plant growth regulators, carbon source, and certain gelling agents. Murashige and Skoog media (MS medium) is the most widely used medium for in vitro vegetative growth of numerous plant species. The pH of the medium is also significant, since it influences both plant development and the action of plant growth regulators. It's been tweaked to a range of 5.4 to 5.8. Culturing may be done in both solid and liquid media. The composition of the medium, especially the plant hormones and nitrogen supply, has a significant impact on the first explant's reaction. Plant growth regulators (PGRs) are crucial in regulating how plant cells and tissues develop in culture media. Plant growth regulators such as

auxins, cytokinins, and gibberellins are the most frequently utilized. The hormones employed, as well as their kind and dosage, are largely determined by the plant species, the tissue or organ cultivated, and the experiment's goal. In plant tissue culture, auxins and cytokinins are the most often utilized plant growth regulators, and the quantity of each determines the kind of culture that is created or regenerated. A high concentration of auxins encourages the development of roots, while a high concentration of cytokinins favors the regeneration of shoots[5].

1.2 Somatic embryogenesis:

Somatic embryogenesis is an in vitro plant regeneration technique that is extensively utilized as a biotechnological tool for long-term clonal replication. It is the transformation of somatic cells or tissues into differentiated embryos. Somatic embryos may grow into full plants without going through the sexual fertilization process that zygotic embryos go through. Somatic embryogenesis may begin directly from explants or indirectly via the formation of a mass of disorganized cells known as a callus. Plant regeneration through somatic embryogenesis is accomplished by inducing embryogenic cultures from zygotic seeds, leaves, or stem segments, and multiplying the embryos. After that, mature embryos are cultivated for germination and plantlet development before being transplanted to soil[6].

Many plants, including trees and ornamental plants from many families, have been shown to have somatic embryogenesis. Some cactus species have been reported to exhibit this behavior. The generation and development of somatic embryos in cultured cells is influenced by a number of variables. When the tissues were grown in liquid medium, a very effective procedure for somatic embryogenesis on grapevine was discovered, which resulted in greater plant regeneration. In the regeneration and proliferation of somatic embryos, plant growth regulators play a critical role. Culturing nodal stem segments of rose hybrids on medium enriched with different PGRs alone or in combination resulted in the highest efficiency of embryonic callus. When cultured on abscisic acid (ABA) alone, this embryonic callus exhibited a high germination rate of somatic embryos. Somatic embryogenesis is considered as a useful tool for genetic modification as well as a method for regenerating plants for mass multiplication. The method may also be used to create plants that are resistant to a variety of stressors and to introduce genes through genetic transformation. A successful procedure for the regeneration of cotton cultivars resistant to *Fusarium* and *Verticillium* wilts has been established[7].

1.3 Organogenesis:

Organogenesis is the process of producing plant organs such as roots, shoots, and leaves, which may come directly from the meristem or indirectly from undifferentiated cell masses (callus). Plant regeneration through organogenesis includes changing the concentration of plant growth hormones in the nutritional medium to induce callus formation and organ differentiation of adventitious meristems. Skoog and Muller (Skoog and Miller, 1957) were the first to show that a high cytokinin to auxin ratio promoted shoot development in tobacco callus, whereas a high auxin to cytokinin ratio caused root regeneration[8].

1.4 Slow growth of cultured plants:

Slow growth is typically accomplished by lowering the culture temperature, adding osmotic agents and growth inhibitors to the culture medium, or eliminating growth promoters to decrease the material's cellular metabolism, with the goal of extending the time between subcultures.

Osmotic regulators, such as sucrose and mannitol, serve as growth inhibitors by putting the material under conservation under osmotic stress. When these carbohydrates are introduced to the culture medium, they lower the hydric potential and limit the amount of water available to the explants. Growth regulators, in addition to temperature and osmotic regulators, are often employed for in vitro germplasm conservation, with abscisic acid (ABA) being one of the most commonly used[9].

1.5 Cryopreservation of cultured plants:

Cryopreservation is a technique of storing plant genetic resources at very low temperatures, such as liquid nitrogen (LN; -196 °C). It's a technique of preserving plant genetic resources that's both safe and cost-effective. It is critical to prevent intracellular freezing and promote the vitrification state of plant cells during chilling in LN for effective cryopreservation. Furthermore, the cryopreservation technique should be a straightforward protocol that anybody can follow. Cryopreservation methods have been studied utilizing various plant organs, tissues, and cells since the 1970s. As a consequence, several cryopreservation techniques have been developed (for example, slow-prefreezing method, vitrification method, dehydration method).

1.6 In-situ conservation:

On-site conservation or conservation of genetic resources in natural populations of plant or animal species, such as forest genetic resources in natural populations of tree species, is known as in-situ conservation. In-situ conservation, according to Wikipedia, following technique are included:

1.6.1 Biosphere reserves:

Reserves of the biosphere Biosphere reserves cover vast swaths of land, often exceeding 5000 km². For a long time, they have been used to protect species.

1.6.2 National parks:

A national park is a protected area dedicated to the preservation of wildlife and the environment. It is usually a small reserve with a surface area of 100 to 500 square kilometers. One or more national parks may exist within biosphere reserves.

1.6.3 Wildlife sanctuaries:

A wildlife sanctuary is a protected area dedicated solely to animal conservation.

1.6.4 Biodiversity hotspots:

A region must meet two strict criteria, according to Conservation International, to qualify as a hotspot:

- It must have at least 1,500 endemic vascular plant species (or 0.5 percent of the world's total).
- It must have lost at least 70% of its original habitat.

1.7 Gene sanctuary:

Plants are preserved in a gene sanctuary. Biosphere reserves and national parks are also included.

1.8 Community reserves:

Community reserves are a kind of protected area established by the Wildlife Protection Amendment Act of 2002 to give legal backing to community or privately held reserves that are not classified as national parks or wildlife refuges.

1.9 Sacred groves:

Sacred groves are areas of woodland that have been set aside for the veneration and preservation of all the trees and animals that live there.

1.10 Ex situ conservation:

Ex situ conservation means "off-site conservation". It refers to the process of preserving an endangered plant or animal species, variation, or breed outside of its native environment. For Ex situ conservation, the following technique is used:

1.10.1 Field gene banks:

It is a grouping of several plant species and their genetic diversity in a certain region. The plant components are kept safe and may be used for breeding, reintroduction, research, and other reasons. Long-lived perennials, trees, and shrubs may benefit from this approach. Field gene banks are often found in botanical gardens. Some endangered flora may be found in these gardens as well.

1.10.2 Seed banks:

For sexually reproducing seeds in long-term storage, seed banks are the most efficient and successful technique of ex situ conservation. It is a useful and compact storage technique, but it is reliant on a reliable power source, careful monitoring and testing of seed viability, and regeneration in instances when viability falls below a specific threshold. There are several seed banks throughout the globe that specialize in the nature of their collections, geographical region, taxonomic groupings, wild plants, forestry trees, and other topics.

1.11 In vitro storage:

In vitro storage refers to the preservation of germplasm in test tubes using meristem tissues. These techniques are well adapted to the long-term preservation of propagules of species that would otherwise be impossible to keep in seed banks.

1.12 Uses and values of Plants biodiversity:

Plants produce a wide range of goods, including food, medicines, and raw materials. Plant extracts are used in the production of glue, soaps, cosmetics, dyes, lubricants, and polishes, among other things. The plants are also a valuable source of renewable energy. Plant species are used for the following purposes:

1.12.1 Food plants:

Providing food for humans, domesticated and wild animals, and other creatures is one of the most basic benefits of plant biodiversity. Only approximately 3000 of the estimated 250,000 species of flowering plants on the planet are considered food sources, and only 200 of them have been domesticated. Newly domesticated plant kinds and primitive cultivars evolved from their wild parents in traditional agro-ecosystems. Occasional crossings between the crops and their wild cousins continued to occur, increasing genetic variety for future selection and development.

Without the exchange of genes between wild relatives and cultivated crops, many cultivated species may not have survived domestication.

1.12.2 Crop genetic resources:

Characters of crops and wild relatives that are genetically transmitted, such as fast growth and large yields, food quality, and stress (biotic and abiotic) tolerance in relation to environmental adaptations, have potential value for hybridization and breeding a desired kind of plant. In our crop development programmes, the differences exhibited by ancient land races are very important. Genetic erosion, or the loss of genetic variety, is a significant problem in terms of ensuring long-term global food security.

1.12.3 Medicinal plants:

Man has depended on medicinal plants for health and nutritional requirements since the beginning of time. Traditional applications of medicinal plants for treating and preventing diseases, as well as promoting physical and spiritual well-being in humans, have become more important. Herbal medicines are used all around the globe. Because of their gentle characteristics and minimal side effects, medicinal herbs are increasingly being used to alleviate and cure a variety of human illnesses throughout the globe. According to a World Health Organization study, approximately 70-80 percent of the world's population uses non-conventional medicine, mostly herbal sources, for basic health care. This study discovered that medicinal plants and trace elements have a significant role in illness therapy.

1.12.4 Environmental value:

Biological resources contribute to society's welfare and stability in an indirect way. Environmental functions assist economic activity by recycling essential components such as carbon, oxygen, and nitrogen, as well as serving as a buffer against extreme changes in weather, climate, and other natural phenomena beyond human control. The biological processes slow down as natural habitat diminishes. The abundance of biodiversity aids in the long-term viability/stability of life, as well as risk avoidance. As a result, ecologists and nature conservationists are acutely aware of the need of total biodiversity protection for long-term viability. Rangeland biodiversity variations under different types of use, from hay harvest protection to in situ grazing, offer clues to reversing the degradation process and bringing in the rehabilitation and stability of rangelands productive systems.

2. LITERATURE REVIEW

Oseni O et al. discussed Plant Tissue Culture in which they explained how Agriculture, horticulture, forestry, and plant breeding have all benefited from plant tissue culture. It's a kind of applied biotechnology that's utilised for things like bulk propagation, viral eradication, secondary metabolite synthesis, and plant in-vitro cloning. Plant tissue culture has recently been utilised for short and medium term conservation, also known as slow growth, and cryopreservation, also known as long term conservation, of endangered plant species. These techniques had been effectively employed to preserve plant species with refractory seeds or dormant seeds, and they outperformed traditional conservation approaches[10].

Sharma Get al. discussed General Techniques of Plant Tissue Culture in which they explained how Plant tissue culture is an important part of the plant biotechnology process. It also allows for

the widespread multiplication of elites as well as the reproduction and regeneration of new plants from genetically modified cells. The promising plant that results from this process may be easily replicated in aseptic cultures[3].

Singh CdiscussedProblems and it's Remedy in Plant Tissue Culture in which he explained how Plant tissue culture is the most effective way to reproduce rare, endangered, and essential plant species on a wide scale while also protecting them. Focusing on the protection of rare, endangered medicinal and economically significant plant species is critical. However, the success rate of propagation using this technique is low, especially for a few therapeutic plants. Researchers are also having difficulty propagating plant tissues and acclimating in vitro grown plants to their natural environment. There are many causes for these issues. This review addressed all of the challenges, from laboratory setup to field adaption of tissue grown plants, as well as solutions to all of the problems encountered in this method[2].

3. DISCUSSION

Many kinds of academic research, as well as many practical areas of plant science, require the use of plant tissue culture methods. Academic studies of totipotency and the functions of hormones in cytodifferentiation and organogenesis have hitherto relied on plant tissue culture methods. Currently, genetically modified tissue-cultured plants offer knowledge into plant molecular biology and gene control. Plant tissue culture methods are also important in cutting-edge fields of applied plant science, such as agriculture and plant biotechnology. Select plants, for example, may be cloned and grown as suspended cells, from which plant components can be extracted. Tissue culture techniques are also needed in the creation of somatic haploid embryos from which homozygous plants may be produced, as well as the management of genetically modified cells to make transgenic entire plants. Tissue culture methods have therefore been and continue to be popular in both academic and practical plant research. This paper also discusses several aspects of Plant Tissue Culture.

4. CONCLUSION

Plant tissue culture refers to the aseptic and regulated growth and multiplication of plant cells, tissues, and organs on specified solid or liquid medium. Micro propagation, in which fast proliferation is accomplished from in system cuts, axillary buds, and to a lesser degree from somatic embryos, cell clumps in suspension cultures, and bioreactors, is the most common commercial technique. The use of plant tissue in the protection of vulnerable and rare plant species aided in natural resource conservation and protection against natural catastrophes that may result in the extinction of the species, reducing biodiversity and harming the ecosystem. Tissue culturing is a critical component of applied biotechnology. The world's population will continue to grow in the next decades, requiring additional housing space and agricultural areas. Global climate change is also a factor to consider. Keeping this in mind, we must guarantee a peaceful, healthy, and hunger-free future for our children and grandchildren. There is no alternative to plant tissue culture for this.

REFERENCES:

1. R. D. Illg, "Plant tissue culture techniques," Mem. Inst. Oswaldo Cruz, 1991, doi: 10.1590/s0074-02761991000600008.

2. C. R. Singh, "Review on Problems and its Remedy in Plant Tissue Culture," Asian J. Biol. Sci., 2018, doi: 10.3923/ajbs.2018.165.172.
3. G. K. Sharma, S. Jagetiya, and R. Dashora, "General Techniques of Plant Tissue Culture," Book, 2015.
4. S. Bhatia, "Plant Tissue Culture," in Modern Applications of Plant Biotechnology in Pharmaceutical Sciences, 2015.
5. R. García-González, K. Quiroz, B. Carrasco, and P. Caligari, "Plant tissue culture: Current status, opportunities and challenges," Cienc. e Investig. Agrar., 2010, doi: 10.4067/s0718-16202010000300001.
6. M. Dorris, "What is Plant Tissue Culture?," J. Bromel. Soc., 2010.
7. K. Yadav, N. Singh, and S. Verma, "Plant tissue culture: a biotechnological tool for solving the problem of propagation of multipurpose endangered medicinal plants in India," J. Agric. Technol., 2012.
8. M. K. Rai et al., "The role of abscisic acid in plant tissue culture: A review of recent progress," Plant Cell, Tissue and Organ Culture. 2011, doi: 10.1007/s11240-011-9923-9.
9. H. R. Dagla, "Plant tissue culture: Historical developments and applied aspects," Resonance, 2012, doi: 10.1007/s12045-012-0086-8.
10. O. M. Oseni, V. Pande, and T. K. Nailwal, "A Review on Plant Tissue Culture, A Technique for Propagation and Conservation of Endangered Plant Species," Int. J. Curr. Microbiol. Appl. Sci., 2018, doi: 10.20546/ijcmas.2018.707.438.



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SPOUSE OR PARTNER CONFLICT IN SAME-SEX GUY MARRIAGE

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ABSTRACT

Violence is a poorly understood phenomena in homosexual interactions. While there is an increasing number of literatures on violence in women of the same sex, few published research explores violence in men of the same sex. Despite evidence of a high frequency of violence in Males same-sex relationships, very little known about the nature of this violence. The nature of male same-sex interpersonal violence was examined in this research. In an interview on their intimate relationships, 69 homosexual and bisexual males were picked at random from a community sample and told about at least one violent incident. The recorded interviews were used to classify the men's accounts of the most serious event in their most recent violent relationship. Intimate violence patterns ranged from moderate to severe, including unidirectional and bidirectional violent scenarios. In the overwhelming majority of instances, violence was an outburst of an ongoing dispute that included bidirectional emotional abuse and became more expressive than instrumental. Conflict resolution difficulties and attachment concerns seemed to explain violence more than the desire to dominate one's spouse.

KEYWORDS: *Homosexual, Intimate, Reciprocity, Same-Sex Relationships, Violence.*

1. INTRODUCTION

The limited research available indicate that violence is reported in 21-5% of homosexual males, which is similar to rates found in lesbian and heterosexual pairs. In one research, for example, which estimated the prevalence rates of violence in male homosexual interactions using a randomly chosen sample, 41% of males reported receiving violence from romantic partners; 35% reported committing romanticized violence against romantic partners. Sadly, despite the seeming frequency of interpersonal violence in homosexual male relationships, there is little information

about homosexual violence patterns. Theoretical discussion on the origins of intimate violence in male homosexual partnerships and therapeutic attempts to support the afflicted may be erroneous without a more comprehensive understanding. This research examined the overall nature of homosexual intimate violence against men. Several scholars have suggested that the view that acts of violence and who initiated a physical confrontation are inadequate and potentially deceptive, without addressing contextual variables. We studied the pattern of violence, the surroundings, the ensuing repercussions, the underlying reasons and recurring subjects in violent interactions in order to better understand the nature of physical and emotional aggressiveness in men's same sex encounters[1].

1.1 Intimate Molestation:

Researchers describe physical violence as "actions performed with the purpose or purpose perceived to cause bodily suffering or injuries to someone else." Whereas physics is relatively simple to describe and recognize, it is harder to quantify and measure emotional and psychological aggressiveness. Despite this difficulty, it is essential to include psychological aggressiveness. Studies of physical violence in same-sex couples found emotional abuse at rates greater than physical abuse by the majority of the participants. For example, researchers found that 83 percent of homosexuals in their samples suffered emotional abuse and 95 percent of their samples of lesbians and gays recognized verbally abusive techniques. Moreover, a qualitative research of homosexual men's experiences of intra-mate violence showed that both physical and psychological hostility were part of participants' definitions of domestic abuse. Physical and emotional violence in male homosexual relationships were investigated in this research[2].

1.2 Violence Reciprocity:

Victims and perpetrators of violence are referred to throughout the literature on domestic violence. The prior results, however, do not show this obvious difference between victim and perpetrator. Rather, interpersonal violence frequently seems to be bidirectional. Researchers have shown that prior violence is the greatest predictor of violence in heterosexual relationships between men and women. In addition, 2/3 of the women reported both being victims of violence and being aggressors in an earlier lesbian relationship. Strong correlations between partner accounts of same-sex aggression also provide indications of reciprocity. Finally, homosexual males were frequently referred to as both victim and offender in a qualitative research, making it difficult to classify them as victims or perpetrators.

Although numerous results show reciprocal violence in heterosexual and homosexual interactions, many studies have not addressed reciprocity, possibly because researchers have assumed that the role of victims and perpetrators is different. Iceland claims, for example, that mutual homosexual male intimate violence is not shared aggression; instead, a partner is a main aggressor continuously. Whilst they argue that homosexuals may respond violently to hostile actions against them, they are against the mutual fighting label. Island findings are based on their experience dealing with abused gay men and therefore inadequate generalizations in relations of violence from clinical samples to the entire community of homosexual men. This research will look at the direction of violence among homosexual male relationships in order to answer this issue.

1.3 Motives:

Research suggests that the form of interpersonal violence is not determined by the actual conduct, but rather by the reasons behind such behaviour. Violence used for self-defense or retribution is, in particular, fundamentally distinct from violence intended to dominate or retain authority over another. In line with this point of view, scholars argue that the desire to dominate a partner decides who the offender is rather than just who starts the violence. Researchers believe that the purpose for controlling the partner affects the form of the violence and offers a typology based on reciprocity and motivation differences. Common Couple Violence (CCV) defines the partnerships in which one or both spouses were aggressive, violent and controlling. This violence is usually modest and rare and occurs during a few of fights. Patriarchal Terrorism defines the interactions between a partner and his or her spouse in order to control and dominate.

This violence is unidirectional, persistent and often harsh and severe with the offender and the victim. Researchers suggest that CCV is frequently reported in surveys of domestic violence, whereas patriarchal terrorism is usually recorded in clinical samples. He also argues that the desire of males to control women stems from patriarchal terrorism. On the other hand, when both parties are aggressive and troll, mutual violence happens and violent resistance depicts links, when both partners are violent, but only one controls. In the latter group, women are suggested to resist violence and try to regulate violence by themselves. Although Johnson explains the origins of violence in the patriarchal dominance of males over women, this typology may apply to same-sex relationships only when definitions are taken into consideration and not the theoretical reasons.

Speculation about motivations falls along gender lines in most of family violence literature. As Johnson's typology reflects, men's violence is usually considered to be instrumental in nature and aims to gain dominance over women. A study of the relationships between high-school students showed that although both men and women reported the most wrath as the cause of violence, males were more likely than women to describe using violence to gain control over their partners. Researchers indicate that aggression by women against males may have comparable coercive or instrumental motivations to violence by men against women. Based on a sample of pairs in treatment, researchers discovered that although men's violence was more likely than women to be considered to be partly instrumental in nature, the violence of both men and women has frequently been driven by a mix of instrumental and expressive purposes. Given that motivating factors may explain the dynamics of intimate violence, and that violence against men and women may serve many purposes, the reasons behind the intimate violence of homosexual males need study.

1.4 Context:

Violent events may provide important information about the nature of violence. Researchers found that interpersonal violence is an out-of-conflict growth for around half of their pairs in treatment. These results contrast sharply with the notion that domestic violence is an unforeseen occurrence. In addition, the degree of tension in relationships is closely linked to both data violence and dating violence. We thus evaluated whether the alleged violence stemmed from an escalation of dispute.

1.5 Consequences:

The inability to link acts of physical violence to the repercussions of these actions is a recurrent critique of family violence studies. Since a slap varies from a lighthearted touch to an open blow with the entire weight of the offender, the resultant damage provides more information than just describing the act. Scholars argue that batterers differ from victims in choosing to hurt. The psychological effect of interpersonal violence may also vary significantly depending on the nature of the act of aggression. For example, when accompanied with a death threat, a slap is more frightening. We thus investigated the physical and mental repercussions of a certain incidence of violence to enable a comprehensive knowledge of interpersonal violence.

1.6 This Study:

The purpose of this research was to give an overview of interpersonal violence in homosexual ships. In a certain incident and throughout the partnership, we analyzed the direction of both emotional and physical violence. We also examined the reasons behind the violent conduct, if the continuing dispute was escalating and whether the violent event had the psychological and physical effects. As little is known about violence in homosexual ships among men, we also looked at themes and patterns in the accounts of their violent relationships by participants.

This research has been intended to enhance our capacity in homosexual relationships to reflect violence. We investigated homosexual intimate violence in a semi-structured interview style that provided flexibility and responsiveness needed to explore and comprehend the reactions of the participants. Our research focuses on the most serious violent incident in recent violent relations. These authors indicate that discussion of the worst incident of interpersonal violence is the most accurate reminder, since unpleasant experiences generate deeper cognitive treatment. Although concentrating on one particular incident provides more comprehensive information on the context and effects of violence, it is possible that a particular event does not represent the overall pattern of violence in connection. Violence was thus also studied inside the relationship as a whole.

The few prior research on violence among homosexual males focused on convenience samples such as news media reporters and community contacts. Consequently, the results of these research cannot be generalized to the broader homosexual and bisexual population. In contrast, participants in this research were selected via a random selection of participants in the West End Relationships Project (WERP).

2. LITERATURE REVIEW

The description of their relationship dynamics by participants was compared to the typology of violent partnerships by Johnson. 47 of the 69 relations explain the grouping of common couple violence (CCV), in which one or both members of a marriage are violent but neither controls (68 percent). CCV appeared to be an invasion group, since neither offenders nor beneficiaries tended to characterize violence or their interactions in terms of control. As previously stated, studies on motivational variables show that violence is driven not by utilitarian or control goals but by expressive purposes. Violence in the CCV group varied considerably and connections did not seem to be as consistent as possible. In the CCV group, for example, there were between 1 and over 40 violent events and the degree of violence varied from no injuries to serious injuries. Of the 47 CCV-classified partnerships, 20 had unidirectional violence and 27 had bidirectional violence. Furthermore, just 25 featured one violent event, often characterized as "one-time explosion." These participants considered violence to be an isolated occurrence that is typically

the consequence of frustrated communication and inadequate dispute resolution. One participant said, "I've experienced a violent moment when my rage was out of control, but this isn't a matter when this pattern is frequent"[3].

Domestic violence is often indicated by a desire to dominate one's spouse. But for just 6 of the 69 interactions, the idea of control and dominance seemed essential. In terms of Johnson's typology, only two ties were characterized with the category of patriarchal terrorism, including relations with one violent and dominant partner (3 percent). Both included fairly serious violence, as evidenced by injuries, although violence did not occur often in either relationship. Three relations characterized violent resistance, partnerships where both parties are aggressive but only one control (4 percent). The frequency of violent events varied from 1 to more than 20 among this group, with reports of moderate to severe bodily injuries. The description of reciprocal violence is one relationship: there was regular aggression by both spouses and both parties appeared to control or dominate conduct[4].

Several difficulties were identified with the application of Johnson's typology to this sample. First, there was significant diversity within the typology groups. Additionally, 16 participants' descriptions (23%) of their relationships cannot be categorized using the typology of Johnson. Six of these instances characterized the main beneficiary of violence as controlling. One participant for example characterized the emotional instigation of violent episodes as part of an overall pattern of manipulation and control of his spouse. Control-based groups provided minimal discrimination. There were only six links among the three groups including a controlling violent spouse, equal to the number of connections involving a controlling victim of violence[5].

A subject that became apparent in 36% (n 25) of participants' tales was that a demand/withdrawal interaction occurred in the dispute that was physical or typical of the communication style of the connection. This dynamic shows a pattern of engagement in which one party retires, while the other is requesting or demanding and engaged in interaction more openly. Those with a demanding job want closer relationships and may be more engaged, whereas retired people seek less intimacy and more detachment and thus seem to be less emotionally committed. The first offender was in the demanding position and the receiver was in the retirement role in 18 encounters. For instance, a participant was "weary to be emotionally ignored and pushed away" during a conversation by his withdrawing partner, so he attempted to have his partner listen, keeping him at one place. Another participant, who moved to another room to avoid confrontation, was pursued by and strangled by his companion. The men in the demanding position usually felt that their efforts to communicate and satisfy their emotional needs were hindered by the lack of availability of their partners[6].

The other seven males, who described the interaction between request and withdrawal, said that the receiver was the victim of the first violent act and that the offender was in the retreat. For instance, after his spouse retired to another room, a participant claimed to knock down a door and repeatedly asked, "What are you doing? Why are you not going to speak to me?" His companion shouted loudly, "Get away!" and responded aggressively at last. Another guy attempted to go when his companion remarked, "Oh yes, just like your dad did, desert me." This guy stated, "I believe it occurred because I felt completely trapped," regarding his aggressive acts. In these instances, retreating offenders were commonplace because they had "pushed button," were stuck and became violent when their efforts to get out of the conflict scenario

failed. Thus these guys characterized their aggression as caused by emotional maltreatment, or as a response when they felt that there was no alternative course of action. In these circumstances, the demanding victims often reported continuous efforts to communicate and unceasingly pursue their spouses during conflict. For instance, a participant said, "I [emotionally] pushed him. I wanted him to react. I wanted him to answer. I kept coming to him." I continued coming to him[7].

90 males (28 percent) characterized the relationship being one in which a partner is more emotionally involved than his partner and the more engaged spouse tends to be the starter of violence. For example, a guy who behaved aggressively was irritated and furious by his partner's reluctance to engage and would not spend as much time with him as he wanted. Several guys have stated that their spouses desire an open and thus less committed relationship while they seek a one-off connection[8]. Another frequent topic identified in 14 (20%) of the interviews was infidelity. Several violent instances happened when one partner met the other in a sexual encounter. Others described fighting over unfaithfulness when the argument escalated into physical violence. For these male same-sex partnerships, negotiation of a mutually pleasant relationship structure that specifies the degree of monogamy or openness was particularly essential[9]. The last topic was that violence happened frequently for the first time when the relationship ended. Sixteen men (23 percent) have reported violence after it became apparent that the relationship had taken its course during the disintegration or soon after the disintegration, when the men still had a certain level of connection. For instance, many males justified the start of physical violence by their partners because of their displeasure at the participants' efforts to leave the relationship[10].

3. DISCUSSION

The findings paint a picture of violence among male same-sex relationships in general. The majority of males said that violence in their relationships happened rarely, with 44 percent saying it happened just once. The physical and mental repercussions of the violence were, for the most part, minor. A significant minority of individuals, on the other hand, reported serious and regular violence. In all of the violent events, physical violence co-occurred with emotional abuse, and as reports of emotional abuse rose, so did the degree of physical and emotional damage. We wonder whether physical and emotional abuse should be regarded different entities, despite the fact that they entail distinct actions. Emotionally abusive methods may have an effect on the impact of physical aggression; for example, threats of bodily damage to oneself or others can cause receivers to worry for their physical safety regardless of whether actual violence is used.

In majority of the relationships reported, there was significant evidence of some degree of reciprocity of violence. Both members of the marriage behaved violently in a high percentage of violent episodes and throughout the relationship as a whole. In several of the cases, the males seemed to be committing about equal amounts of violence, while others were committing similar amounts of violence in distinct instances of unidirectional aggression. Emotional abuse reciprocity was particularly high, with reciprocal emotional abuse being reported in nearly every violent event. These results support experts' observations that aggressive couples often seem to mentally and physically attack one another, ultimately confining their disputes to violence-prone paths. As the participants' interpersonal disputes became more emotional and physical, their capacity to resolve them constructively appeared to deteriorate. It should be emphasized,

however, that a significant minority of individuals reported instances and relationships in which the abuse was mainly unidirectional.

Anger and dissatisfaction were often cited as motivators for participants' aggression. The idea that violence is used to create and retain power and control over a relationship is contradicted by these results. Participants who committed violence, on the other hand, often reported a loss of control in their relationships, as well as rage and dissatisfaction about the present state of their relationships. When we looked into these relationships further, we discovered that the overwhelming majority of them did not have a dominating spouse. Furthermore, there were just as many peaceful controlling partners as there were violent controlling partners. Our inability to apply the concept of control exemplifies the difficulty of characterizing violent relationships using broad generalizations. Because the nature of same-sex intimate violence may vary greatly, many elements of the violence and the relationship must be assessed in order to properly represent the various types of intimate violence. When we tried to put the tales of participants into a tightly defined typology, we discovered that the stories within each category varied significantly, and that 23% of the stories did not fit into any of the groups. Given these challenges, we came to the conclusion that no one relationship type could properly explain intimate violence in our sample. We discovered that documenting the various kinds of interpersonal violence by taking into account numerous continuous factors and analyzing patterns of relationship dynamics was more helpful.

We were able to represent the variety of violence we saw by using continuous variables such as emotional and physical repercussions, the number of episodes, and the degree to which the violence fulfilled instrumental and expressive purposes. We discovered underlying patterns by detecting motifs in participants' tales, which may assist to understand why disagreement develops into violence in certain relationships. Unmet or threatened emotional demands were the most common themes in participants' stories: conflicting requirements for intimacy vs autonomy, disappointed wishes for commitment and monogamy, and relationship loss. As a result, attachment theory may be a helpful lens through which to examine these results. Relationship violence, according to experts, may be an adult version of protest behavior—a maladaptive attempt to retain connection to a loved one when a relationship is endangered. Relationship violence has been repeatedly linked to attachment, especially the underpinning component of fear about desertion. Intimate violence was shown to be more probable when a person who was anxious about abandonment was paired with someone who avoided intimacy, a pattern that was comparable to the demand-withdrawal dynamic observed in our group. The authors' notion that violence may be employed as a pursuing or distancing strategy is consistent with our results that violence was committed by both demanding and withdrawing partners. Attachment anxiety and attachment protest actions may be triggered by being aware of a spouse's infidelity, seeing one's partner as less emotionally engaged, or being threatened with the loss of a relationship.

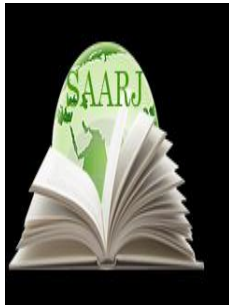
4. CONCLUSION

Finally, the homosexual and bisexual males in our sample reported a wide range of interpersonal violent encounters as well as responses to violence. The bulk of the reported violence was minor and rare, but there were some instances of serious violence. Violence was most common during interpersonal conflict, and participants often spoke about it in terms of endangered emotional needs. Furthermore, the majority of violence was expressive, and negative conflict strategies including shouting, criticism, and retreat were used in almost every violent event. As a result,

therapeutic and research efforts should be focused on understanding the conflict that leads to violence. The development of constructive communication skills that enable both the expressing and fulfilment of emotional demands should be given special emphasis. Our results also show how abusive interaction habits emerge in the setting of a relationship.

REFERENCES

1. E. Wu *et al.*, "The Association Between Substance Use and Intimate Partner Violence Within Black Male Same-Sex Relationships," *J. Interpers. Violence*, 2015, doi: 10.1177/0886260514536277.
2. M. Kay and S. Jeffries, "Homophobia, heteronormativism and hegemonic masculinity: Male same-sex intimate violence from the perspective of Brisbane service providers," *Psychiatry, Psychol. Law*, 2010, doi: 10.1080/13218710903566953.
3. J. Oringher and K. W. Samuelson, "Intimate partner violence and the role of masculinity in male same-sex relationships," *Traumatology (Tallahass. Fla.)*, 2011, doi: 10.1177/1534765610395620.
4. R. Freeland, T. Goldenberg, and R. Stephenson, "Perceptions of Informal and Formal Coping Strategies for Intimate Partner Violence Among Gay and Bisexual Men," *Am. J. Mens. Health*, 2018, doi: 10.1177/1557988316631965.
5. K. V. Regan, K. Bartholomew, D. Oram, and M. A. Landolt, "Measuring physical violence in male same-sex relationships: An item response theory analysis of the conflict tactics scales," *J. Interpers. Violence*, 2002, doi: 10.1177/0886260502017003001.
6. K. V. Regan, K. Bartholomew, D. Oram, and M. A. Landolt, "Measuring Physical Violence in Male Same-Sex Relationships," *J. Interpers. Violence*, 2002, doi: 10.1177/0886260502017003001.
7. T. Goldenberg, R. Stephenson, R. Freeland, C. Finneran, and C. Hadley, "'Struggling to be the alpha': sources of tension and intimate partner violence in same-sex relationships between men," *Cult. Heal. Sex.*, 2016, doi: 10.1080/13691058.2016.1144791.
8. C. R. Woodyatt and R. Stephenson, "Emotional intimate partner violence experienced by men in same-sex relationships," *Cult. Heal. Sex.*, 2016, doi: 10.1080/13691058.2016.1175027.
9. R. Stephenson, C. Rentsch, L. F. Salazar, and P. S. Sullivan, "Dyadic characteristics and intimate partner violence among men who have sex with men," *West. J. Emerg. Med.*, 2011.
10. J. Oringher and K. W. Samuelson, "Intimate partner violence and the role of masculinity in male same-sex relationships," *Eur. Phys. Educ. Rev.*, 2011.



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ETIOLOGICAL FACTORS CAUSING PURULENT DISEASES OF CATTLE HOOVES, AND THEIR CLINICAL SIGNS

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ABSTRACT

A total of 2,100 head of cattle of livestock farms in the regions of the Republic of Karakalpakstan and the Samarkand region revealed 167 heads of 7.9% of cows with hoof pathology, of which 38 animals had circular hoof phlegmon and this accounted for 22.7% of this total hoof pathology, in 54 heads (32.3%), hoof phlegmon was detected and a maximum of 75 heads (45%) of the animals had primary and clinical manifestations of the lamellar layer of the hooves, and in all animals with the processes of hoof pathology, the hoof part of one foot is injured, the hooves swell during phlegmonous processes, there is a strong pain, animals at rest keep injured legs slightly bent, severe lameness is observed when walking.

KEYWORDS: *Phlegmon Of The Hoof Circumference, Soft Phlegmon Of The Hoof, Lamellar Layer Of The Hoof, Capsular Phlegmon, Regeneration, Erosion And Deformation Of The Hooves, Tendonitis And Tendavaginitis, Pododermatitis, Phlegmon, Panaritium, Deformity Of The Hooves, Purulent Inflammation Of The Hoof Joints.*

INTRODUCTION

It is noted that the main cause of a number of diseases arises as a result of keeping, feeding, caring for and using new species of animals at the disposal of the newly created livestock farms of the country. In addition, in recent years, the disturbance of the ecological balance in our region, the deterioration of the composition of soil, water and plants also leads to the emergence of various diseases, including diseases of the fingers.

In recent years, many highly productive heifers from European countries have been brought to our country and distributed to farms specializing in animal husbandry. It should be noted that in order to provide healthy care for imported pedigree livestock, to obtain high-quality and environmentally friendly dairy and meat products from them, livestock premises must comply with zoological standards, have pastures and access zones must comply with veterinary and sanitary requirements.

The Holstein-Friesian breed is a large number of highly productive heifers imported from abroad. Almost in all regions of the country, feed complexes have been built for them without special screeds. These cows have a high milk yield and increase milk yield. Diseases of the distal part of the foot, i.e. the toes, have become a serious problem for many farmers and limited liability companies. Therefore, the prevalence of this pathology, the study of its etiopathogenesis is one of the urgent problems.

Foot diseases account for 20% of all non-communicable diseases of dairy cows on dairy farms [1].

In LLC "The Red Star" in the Ulyanovsk region of the Russian Federation, the incidence of cow fingers was 23.8%, and the highest incidence of animal diseases was recorded from April to June [4,5,6].

Improper flooring in lactating cows can lead to leg injuries, tendinitis and tendavaginitis, pododermatitis, phlegmon, panaritium, hoof deformities, purulent inflammation of the hoof joints and other diseases [2,3].

On farms, especially on livestock farms of cattle, purulent inflammation of the ankle joints is common among animals, which causes great economic damage to farms. For example, the frequency of purulent arthritis in cows is 6%, with a milk yield of 50%, and in fattening cattle - an increase in body weight by 20-30 kg per head and a decrease in the growth rate by 28-30% [7, 9].

The process of adaptation of imported cows to the conditions of our region is difficult, especially in winter and spring, when the complexes have high humidity, lack of pastures, poor conditions on pastures, lack of macro- and microelements in the diet and untimely clipping of hooves leads to the development of various diseases of fingers and hooves. A study of the hooves of sick cows showed that softening of the cornea was especially pronounced on the hind limbs: 84% of infected animals had injuries to the hind limbs and 16% had injuries to the front limbs [8].

Place, object and research methods. The cows of the "Panayiv Farmis" farms of the Republic of Karakalpakstan and "Pure milk", "Siab Shavkat Orzu" and "Tolkin Shizhoati" in the Akdarya district of the Samarkand region underwent clinical examination. At the same time, mainly dairy cows were examined using general and special methods. In clinical studies, the body temperature

of animals, the number of breaths and heart rate per minute, general condition, the location of the pathological lesion and the mechanism of the disease were studied.

The results obtained and their analysis. As a result of scientific research and experiments to determine the etiopathogenesis of suppurative inflammation of the distal part of the foot in livestock farms in the country, it has been established that the factors causing purulent inflammation of the hoof are different, that is, the mechanical factors arising in the hoof. For example, when the body is weakened, especially in winter, some physiological impressions, body secretions can also cause inflammation. Another factor causing the development of purulent inflammation in the distal part of the hooves of cattle was the ingress of microorganisms into the interstitial gland through the wound as a result of the action of various mechanical factors leading to the development of purulent inflammation, as a result of which the development of purulent pathological processes in the hoof area was revealed.

Studies have shown that the deeper the hoof injuries, the more severe the complications. In particular, the gassipol toxin in nutrients obtained during the processing of cotton, which is added to their diet in winter, is a substance that disrupts metabolic processes in the body and causes a toxic-allergic state, which leads to a decrease in immunobiological properties.

Studying the etiopathogenesis of purulent inflammation of the distal parts of the toes in cattle, among cattle present in livestock farms in our country, they are more common in pathology of the distal foot in the hoof, round leg and wrist joints. Due to the peculiarities of pedigree cattle hooves in our country, the development of modern methods of treatment and prevention of purulent inflammation of the hooves is of great scientific and practical importance.

When a surgical clinical examination of 2,100 cows was carried out at the "Panayiv Farmis" dispensary of the Republic of Karakalpakstan and "Pure milk", "Siab Shavkat Orzu" and "Tolkin Shizhoati" in the Akdarya district of the Samarkand region, 7.9% of cows have 167 heads in their hooves identified phlegmon around the circumference of the hooves, soft hoof phlegmon and diseases of the hoof laminate.

During a clinical examination of 200 animals from "Panayiv Farmis" farms in the Republic of Karakalpakstan, 14 heads (7%) were diagnosed with hoof pathology, including 3 heads (21.4%) of cows with hoof phlegmon, 4 heads (28.6 %) of animals the hoof is soft phlegmon and in 7 heads (50%) of cows hoofed laminitis was noted. Clinical examination of 1100 animals from the "Pure milk" farms in Akdarya district of Samarkand region revealed hoof pathology in 82 heads (7.5%), including 21 heads (25.6%) of cows with hoof phlegmon, in 27 heads (32.9%) animals were diagnosed with soft hoof phlegmon, 34 heads (41.5%) cows had hoof laminitis.

During the medical examination of 800 animals from the farm "Siyob Shavkat Orzu" of Akdarya district of Samarkand region, 64 (8%) were diagnosed with hoof pathology, including 14 heads (21.9%) of cows with hoof phlegmon, 20 heads (31, 2%) animals showed soft hoof phlegmon and 30 heads (46.9%) cows had hoof laminitis.

Clinical examination of 76 animals from 7 farms (9.2%) of the "Tolkin Shizhoati" livestock farm in Akdarya district of Samarkand region revealed hoof pathology in 7 heads (9.2%), including 3 heads (42.8%) of animals hoof phlegmon and in 4 heads (57.2%) of cows hoof laminitis.

It was noted that when inspections were carried out throughout the year, they were mainly observed during the winter and spring months. The main reason for this is the high humidity in the places where animals are kept and the lack of certain minerals and vitamins in the diet.

When a surgical clinical examination of 2,100 cows was carried out at the "Panayiv Farmis" dispensary of the Republic of Karakalpakstan and "Pure milk", "Siab Shavkat Orzu" and "Tolkin Shizhoati" in the Akdarya district of the Samarkand region, 7.9% of cows have 167 heads in their hooves identified phlegmon around the circumference of the hooves, soft hoof phlegmon and diseases of the hoof laminate. Of these, 38 heads of animals were diagnosed with circular phlegmon of the hooves, which accounted for 22.7% of the general pathology of the hooves, soft phlegmon of hooves was recorded in 54 heads (32.3%) of animals, and a maximum of 75 heads (45%) of animals were diagnosed with laminitis. hoofs, it was initially noted that there are clearly visible processes.

In animals with hoof pathologies, general weakness, increased body temperature, an increase in the contour of the hoof, contraction of cutaneous diverticula of the hoof, and severe pain on movement are manifested. Redness and local increase in temperature were noted on palpation of the injured hoof, limitation of hoof movement. The animal carefully steps on the ground with an injured hoof. The area around the hoof was swollen and reddened, with open wounds in some parts. A cyanotic purulent exudate flows from the puncture site of the wound.

TABLE 1 THE INCIDENCE OF PURULENT DISEASES OF COW HOOVES IN LIVESTOCK FARMS

s/n	The name of a farm specializing in animal husbandry.	Number of heads of reared cows on the farm	Sick animals		Phlegmon of the hoof circle		Phlegmon of soft hoof		Hoof laminitis	
			num ber	%	num ber	%	num ber	%	num ber	%
1	Livestock farm "Pure milk" in Akdarya region	1100	82	7,5	21	25,6	27	32,9	34	41,5
2	Livestock farm "Panayiv Farmis" of the Republic of Karakalpakstan.	200	14	7	3	21,4	4	28,6	7	50
3	Livestock farm "Siab Shavkat Orzu" in Akdarya region	800	64	8	14	21,9	20	31,2	30	46,9
4	Livestock farm "Tolkin Shizhoati" in Akdarya region	76	7	9,2	-	-	3	42,8	4	57,2
5	Total:	2100	167	7,9	38	22,7	54	32,3	75	45

In all animals that underwent the processes of phlegmon of the circumference of the hooves and soft hooves, the hoof part of one foot was injured, and the hooves that underwent phlegmon were swollen and severely painful. When the animal is at rest, the hoof rests on a slightly bent injured leg. When walking, severe lameness is observed, animals throw their injured legs to the ground, and the support is limp.

In animals, weakness, an average increase in body temperature of 0.5-1.0, the injured hoof is enlarged relative to the opposite foot and the loss of skin elasticity, as a result of the accumulation of pus in the hoof, it increases and contracts, the bulges of the hooves are difficult to feel, the arms are thickened, elasticity is passive movement of the lowered, injured hooves are limited and there is severe pain when the hoof is moved along the ground.

With soft hoof phlegmon, the size of the hoof increases and the inflammatory swelling spreads from the hoof capsule to the joint. The hoof span widened and hoof asymmetry was observed. The injured area is hot, tense and very painful to palpation. The animals' body temperature increased and their general condition worsened, and a strong limp appeared when moving. Some animals have discharge from the roundness of the hooves and soft hooves, and a bluish pus is secreted.

CONCLUSIONS

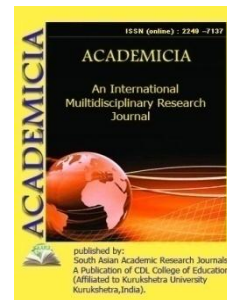
1. As a result of inspections, it was found that a total of 2,100 cows belonging to livestock farms in the regions of the Republic of Karakalpakstan and Samarkand region were infected with hoof pathology during surgical examination of 167 heads of 7.9% of cows, of which 38 animals had phlegmon hoofs and this amounted to 22.7% from the general pathology of the hooves, 54 heads (32.3%) of the animals underwent soft phlegmon of the hooves and a maximum of 75 heads (45%) of the animals underwent processes in which the initial and clinical manifestations of layered hoof laminitis were evident.

2. In all animals with hoof girth and soft processes of hoof phlegmon, hooves of one foot are injured, hooves with phlegmon processes are edematous, severe pain is observed, when standing, animals hold injured legs with slightly bent legs, severe lameness is observed when walking.

LIST OF USED LITERATURE

1. Batrakov A.Ya. Treatment and prevention of non-communicable diseases on dairy farms. - L. Kolos. Leningrad branch, 1980. - 136 p.
2. Bashkirov V.A., Lebedev A.V., Semenov B.S. and others. Increasing the resistance of the organism of animals by methods of pathogenetic therapy // Journal of Veterinary Medicine. - 1983. - No. 9. - p.50-51.
3. Burdenyuk A.F. Diseases of the extremities in productive animals. - K. Harvest, 1976. - 132 p.
4. Ermolaev V.A. Biologically active draining sorbents for purulent pododermatitis in cows / V.A. Ermolaev, E.M. Maryin, V.V. Idogov, A.V. Sapozhnikov // International Veterinary Bulletin. - 2009. - No. 4. - p. 13 - 16.
5. Ermolaev V.A. Hoof diseases in cows / V.A. Ermolaev, E.M. Maryin, V.V. Idogov Yu.V. Savelyeva // Scientific notes of the Kazan State Academy of Veterinary Medicine named after N.E. Bauman. - 2010. - T. 203. - p. 113 - 117.
6. Idogov V.V. Symptoms of purulent pododermatitis in cows / V.V. Idogov Yu.S. Nikonov, R.V. Gadzhiev // Materials of the 4th International Scientific and Practical Conference of Young Researchers. - Volgograd: Volgograd SACA, 2010. - T. 1. - P. 63 - 66.

7. Kudryavtsev A.P. Prevention of limb diseases in cows // Veterinary medicine. - 1983. - No. 3. - p.63-64.
8. Niyozov Kh.B., Eshkuvvatov Kh., Rakhimov D., Sharopov M. Diseases of the joints of fingers and hooves, their etiopathogenesis and clinical signs in productive livestock imported from abroad. // Zoo veterinary medicine. Tashkent 2012 No. 5-6. 16 p.
9. Shakalov K.I. Prevention of traumatism of farm animals in industrial complexes - Leningrad Kolos, 1981. - 184 p.



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ON THE PUBLICATION OF THE MONOGRAPH DEVOTED TO NATURAL GEOGRAPHY

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ABSTRACT

In this article, we look at some of the concerns surrounding the scientific and practical use of monographies in the history of natural geography. The monograph's author divided the work into two halves, recognizing that natural geographical knowledge served as the foundation for general geography prior to the shift of natural geography to independent development. The scientific effort of the ancient Greek scholars Eratosthenes, Strabo, and Ptolemy resulted in the creation of geography as a separate science. There was a six-century era of decline in science following Ptolemy's geographical work. In order to get an idea of the integrity of an object, it must be examined comprehensively and in different ways. If the object of natural geography can meet the concept of a system, the science that studies it must also have a systemic structure.

KEYWORDS: *K.K.Markov, AG.Isachenko, N.K.Mukitanov, A.N.Nigmatov, Sh.S.Zokirov, Kh.R.Toshov, history of geography, system, geosystem, principle, landscape*

INTRODUCTION

Associate professor of Bukhara State University H.R. Toshov staged an exhibition "Natural geography": History and certain theoretical concerns" (Bukhara. - "Durdona" publishing house. 2021. - p.520) on the eve of the Republic of Uzbekistan's 30th anniversary of independence festivities. Professor S.B. Abbasov and Doctor of Geographical Sciences M.T. Mirakmalov, Sh.S.Zokirov - editor, doctor of geographical sciences, prof. S.B. Abbasov and doctor of geographical sciences M.T. Mirakmalov were assessed by one of the foremost experts in the field of natural geography. There are 340 titles of used literature in the monograph.

The author's textbooks and monographs "Landscape" (2015, 2016), "History of Geography" (2015, 2018), co-authored with Sh.S.Zokirov in 2015 and 2018[1;2], can be considered a natural continuation of those works.

We felt compelled to comment on the value of the monograph in tackling complicated challenges facing our discipline after analyzing the substance of the monograph, namely the history of natural geography and some of its theoretical issues.

At the beginning of the pamphlet, well-known scientists in the field of geography X.R. Toshov, K.K. Markov, A.G. Isachenko, and N.K. Mukitanov stated that there has been extensive historical material in geography for centuries, but it has not yet been logically (theoretically) analyzed, and Professor A.N. Nigmatov stated that the development of history as an independent science and its introduction as a subject of study.

In the prologue, the author also claimed that his major goal was to shed light on the history of natural geography's birth and growth as a science, as well as to voice his views on various theoretical concerns in the field.

The monograph's author divided the work into two halves, recognizing that natural geographical knowledge served as the foundation for general geography prior to the shift of natural geography to independent development. It begins with a look at the history of general geography. G.R. Toshov focused on the history of the establishment and evolution of natural geography, as well as some theoretical concerns associated to it, primarily of methodological importance, in the second section. [4].

He taught research methods and practical aspects of natural geography as a separate topic. The author supplements the monograph's content with a number of works on scientists who have actively engaged in the modern state of geography, particularly natural geography, by contributing their ideas, thoughts, and opinions to the formulation of theoretical difficulties.

The monograph's first section is organized into 16 major themes and is titled "From the History of the Emergence and Development of Natural Geography as a Science." The second section, titled "History of Natural Geography and Some Theoretical Issues," is broken down into 26 major and minor sections.

We felt it was crucial to acknowledge the author's important implications for the history of science in the monograph's conclusion section.

1. The scientific effort of the ancient Greek scholars Eratosthenes, Strabo, and Ptolemy resulted in the creation of geography as a separate science. There was a six-century era of decline in science following Ptolemy's geographical work. In the Middle East, known as the Arab Caliphate, a renaissance of the sciences occurred in the mid-13th century.

2. Geography began to develop alongside mathematics, astronomy, history, and philosophy. Its apex occurred at the same time as the East's Cultural-Enlightenment Renaissance (IX-XII centuries). Our experts respect Central Asian scientists' strong engagement and leadership in the growth of science, particularly geography, throughout this time period. Here arose paths based on the process of description, but not found in ancient Greek science, such as "al-masolik and mamolik," "travelogue" (sayokhatnoma), and "lexicography." The global maps were produced in a circular shape, which is typical of Eastern geography.

3. Only in the 15th century, when Ptolemy's and Strabo's geographical writings were published in Latin, did Western European intellectuals' geographical ideas become scientific. Great geographical discoveries, on the other hand, expanded Europeans' understanding of the world. The earth's spherical shape was also established.

4. The work "General Geography" (Vareniy, 1650), published in the middle of the seventeenth century, signaled the start of a new period in the history of geography. Geography was regarded as natural geography in this play. Later, in the early half of the nineteenth century, A. Khumboldt shared this viewpoint.

5. A. Khumboldt's groundbreaking insights also served as the foundation for the development of a new scientific type of natural geography. V.V. Dokuchaev advanced his innovative concepts about the "integrity of the universe," "the interplay of live and inanimate nature," and "natural zones" in the last quarter of the nineteenth century, bringing them to a new level. As a result, a new natural product, soil, was discovered. Soil science is a new field of study.

6. V. V. Dokuchaev's works developed the idea that "a new science is being formed that studies the constant and legitimate relationships and interactions that occur between the components of nature". Notions of the natural-geographical complex and landscape were formed and developed.

7. The concept of the Earth's outer crust was also added to the concepts that emerged in the first two decades of the twentieth century. The theory of natural geography began to take shape. In its development great merits are given by famous Russian geographers A. A. Grigoriev, L. S. Berg, S. V. Kalesnik, K. K. Markov, A. G. Isachenko, N. A. Gvozdetzky, N. I. Mikhailov, F. N. Milkov, N. A. Solntsev, V. B. Sochava. In addition to the theoretical foundations of natural geography and landscape, their scientific works cover methodological and practical aspects of the study of natural and geographical zoning, landscape mapping, their morphological structure, dynamics, development and existence. A number of new scientific trends, new branches of science have emerged. Natural geography itself has developed into a system of sciences as one of the major divisions of geography.

It is natural for the reader of the monograph to pay attention to the more than 10 terms in it, such as complex, system, geosystem, principle. Unsurprisingly, the author gave these words in his own words, as he thought it appropriate to keep their content (e.g. car, vehicle) in their own words.

Toshov paid particular attention to the question "The structural system of the natural and geographical sciences". In particular, he believes that the classification of natural geographical sciences should be based on the characteristics of the object of study, as in the classifications of other natural sciences. "If an object is a single product, the science that studies it must be a whole science. In order to get an idea of the integrity of an object, it must be examined comprehensively and in different ways. If the object of natural geography can meet the concept of a system, the science that studies it must also have a systemic structure. From this point of view, it is obvious to show natural geography as a subsystem within the system of geographical sciences [5]. In his monograph, he gave his classification scheme entitled "The Structural System of the Natural and Geographical Sciences" (Figure 15).

In conclusion, the monograph "Natural Geography: History and Some Theoretical Issues" by Kh. R. Toshov, Associate Professor at Bukhara State University, can be an important resource for students, young researchers and readers studying geography as well as the natural sciences.

REFERENCES

1. Zokirov Sh.S., Toshov Kh.R. Landscape.. T., 2016.
2. Zokirov Sh.S., Toshov Kh.R. History of geography. Bukhara, 2018.
3. Nigmatov A.N. Theory of natural geography and geoecology. T .: “Navruz” Publishing House, 2018. – p.220.
4. Ergasheva M.K., Toshov Kh., R. Rakhimov O. K Landscape doctrine and its importance in the scientific and practical study of natural resources of regions. Journal of Contemporary Issues in Business and Government Vol.27, No. 2,2021 <https://cibg.org.au/P-ISSN: 2204-1990; E-ISSN: 1323-6903 DOI: 10.47750/cibg.2021.27.02.560 5533-5540>
5. Toshov X.R. Natural geography: history and some theoretical issues. Monograph. Bukhara. – “Durdona” Publishing House. 2021. – p.520.



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AN OVERVIEW OF MACHINE LEARNING FROM THEORY TO ALGORITHMS

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ABSTRACT

The present SMAC (Social, Mobile, Analytical, and Cloud) technological trend points to a future in which intelligent machines, networked processes, and big data are all combined. The enormous quantity of data produced by this virtual environment is hastening the adoption of machine learning solutions and techniques. Computers can mimic and modify human-like behaviour thanks to machine learning. Each interaction, each action done, becomes something the system may learn and utilize as experience for the next time using machine learning. This paper provides an introduction of a data analytics technique that allows computers to learn and do what people do naturally, namely, learn from experience. It covers the fundamentals of machine learning, including definitions, terminology, and applications that explain what, how, and why it works. Machine learning's technological roadmap is explored in order to better comprehend and validate its potential as a market and industrial practice. The main goal of this paper is to explain why machine learning is the way of the future.

KEYWORDS: Algorithms, Ensemble Learning, Instant Learning, Machine Learning, Supervised Learning, Unsupervised Learning.

4. INTRODUCTION

Learning is the process of learning new behaviours, beliefs, information, abilities, or preferences, or altering old ones. The philosophy of personal learning, or how humans learn, is defined by behaviourism, cognitivism, constructivism, experientialism, and social learning. Machines, in contrast to humans, rely on data instead of learning through experience[1]. Machine learning (ML) is a type of artificial intelligence that allows computers to think and learn on their own, at its most basic level. It's all about getting computers to change their activities in order to increase their accuracy, with accuracy being defined as the number of times the chosen actions result in

right behaviours[2]. ML has been explicitly defined by researchers in the relevant literature. Arthur Samuel created the phrase in 1959, defining it as an area of research that allows computers to learn without having to be explicitly programmed. Tom Mitchell recently provided a "well-posed" term that has shown to be more effective in engineering set-up: If a computer program's performance on a task increases with experience, it is said to learn from experience with regard to that task and that performance metric.

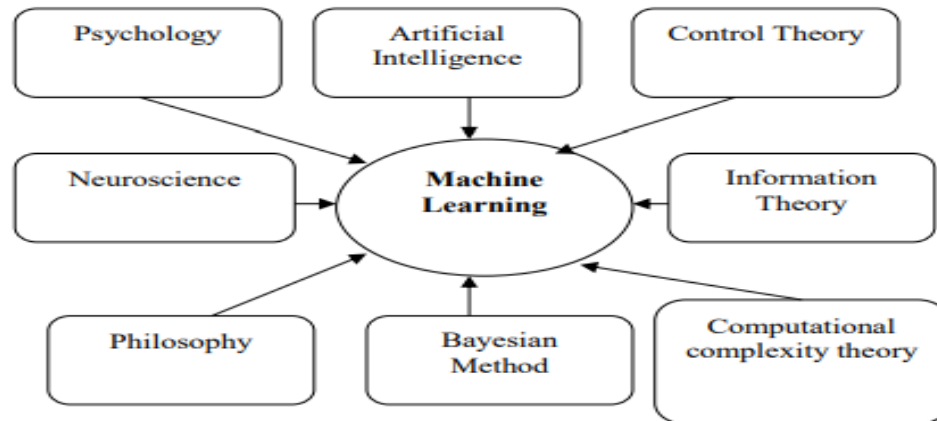


Fig. 1: The Multi-disciplinary Machine Learning (ML) fields[3].

Machine learning is a multidisciplinary area with a diverse set of study fields supporting it. As illustrated in Fig. 1, there are the following. Computational Statistics, whose major goal is to make predictions using computers, is closely connected to the simulation of ML models. It's also linked to Mathematical Optimization, a branch of statistics that deals with models, applications, and frameworks. The enormous complexity of real-world issues makes them ideal candidates for machine learning. Machine learning can be used to design and program explicit algorithms with high performance output in a variety of areas of computing, such as email spam filtering, social network fraud detection, online stock trading, face & shape detection, medical diagnosis, traffic prediction, character recognition, and product recommendation, to name a few. Machine learning is used in real-world applications such as self-driving Google cars, Netflix recommending movies and shows a person might like, online recommendation engines such as Facebook friend suggestions, Amazon's "more items to consider" and "get yourself a little something," and credit card fraud detection. The major goal of this paper is to provide an overview of Machine Learning's evolution to the current day, as well as numerous machine learning methods, applications, and problems. This paper provides an overview of machine learning, including its history, origins, and evolution over the decades to the current day. The research discusses the challenges in data science that machine learning techniques may solve, as well as the progress of machine learning to the present day. It also includes a description of the general model of machine learning, as well as an explanation of the machine learning process. It also goes through the major machine learning paradigms and methods, as well as a quick rundown of the ML difficulties.

5. DISCUSSION

5.1. Data Science Problems and Machine Learning:

Machine learning is necessary to make computers smart enough to do tasks without human involvement, based on learning and continuously expanding experience to comprehend the issue complexity and requirement for flexibility[4].

5.1.1. Tasks Performed by Human Beings:

Human people execute a variety of activities on a daily basis, but the key issue is to complete the duties flawlessly and according to a well-defined schedule. Cooking, driving, and speech recognition are among examples.

5.1.2. Tasks Beyond Human Capabilities:

Another group of activities that machine learning can effectively do is the analysis of big and complicated data sets, such as remote sensing, weather forecasting, ecommerce, and web search. It becomes extremely difficult for humans to forecast relevant data when there is a vast volume of data. Machine learning has demonstrated its ability to tackle data science issues on its own. Data science, according to Hayashi and Chikio, is a concept that combines statistics, data analysis, machine learning, and related methodologies in order to comprehend and analyze real-world events using data [5]. Before beginning to solve an issue, it must be properly classified so that the most appropriate machine learning method may be used. As illustrated in Fig. 2, any data science challenge may be classified into one of the five categories.

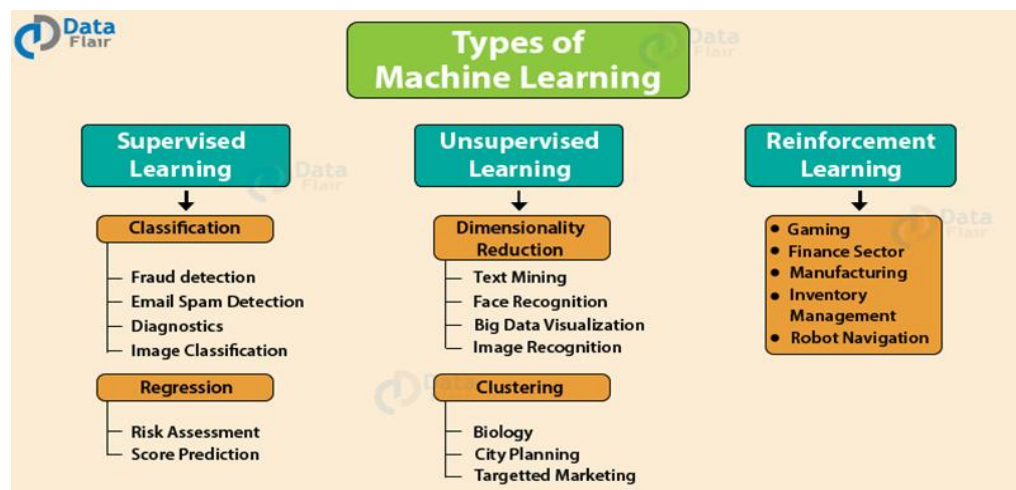


Fig. 2: Types of Machine Learning techniques along with the types of problems they are suitable for[6].

As a result, depending on the kind of challenge, a machine learning technique can be used. The following are the various categories:

- *Classification Problem:*

A classification issue is one in which the output can only be one of a set number of output classes known a priori, such as Yes/No or True/False. The problem might be a binary or multi-class classification problem, depending on the number of output classes.

- *Anomaly Detection Problem:*

This category includes problems that examine a pattern and discover changes or abnormalities in the pattern. Credit card firms, for example, employ anomaly detection algorithms to detect deviations from their clients' typical transaction behaviour and issue warnings whenever there is an unexpected transaction. Finding outliers is one of these challenges.

- *Regression Problem:*

When dealing with situations that have both continuous and numeric output, regression methods are utilized. These are typically used for situations involving queries such as "how much" or "how many."

- *Clustering Problem:*

Clustering is classified as an unsupervised learning technique. These algorithms attempt to learn structures inside the data and create clusters based on data structure similarities[1]. After that, the various classes or clusters are labelled. When the algorithm is trained, it adds fresh, previously unseen data to one of the clusters.

- *Reinforcement Problem:*

When a choice must be made based on previous learning experiences, reinforcement algorithms are utilized. The machine agent learns its behaviour by interacting with the constantly changing environment in a trial and error manner. It allows agents to be programmed utilizing the idea of rewards and punishments without having to explain how the job should be completed. Reinforcement learning is used in a variety of applications, including game play and temperature management.

5.2. Development of Machine Learning:

TABLE 1: ILLUSTRATES DEVELOPMENT OF MACHINE LEARNING (ML)[3].

Year	Development
1950	Alan Turing created "Turing Test" to check a machine's intelligence. In order to pass the Turing Test, the machine should be able to convince humans that there they are actually talking to a human and not a machine.
1952	Samuel created a highly capable learning algorithm than can play the game of Checkers with itself and get self-trained.
1956	Martin Minsky and John McCarthy with Claude Shannon and Nathan Rochester organized a conference in Dartmouth in 1956 where actually Artificial Intelligence was born.
1958	Frank Rosenblatt created Perceptron, which laid the foundation stone for the development of Artificial Neural Network (ANN).
1967	The Nearest Neighbours Algorithm was proposed which could be used for "Pattern Recognition".
1979	Stanford University students developed "Stanford Cart", a sophisticated robot that could navigate around a room and avoid obstacles in its path.
1981	Explanation Based Learning (EBL) was proposed by Gerald Dejong, whereby, a computer can analyze the training data and create rules for discarding useless data.
1985	NetTalk was invented by Terry Sejnowski, which learnt to pronounce English words in the same manner that children learn.
1990	The focus of Machine Learning shifted from Knowledge-driven to Data Driven. Machine Learning was implemented to analyse large chunks of data and derive conclusions from it.
2006	The term "Deep Learning" was coined by Geoffery Hinton which referred to a new architecture of neural networks that used multiple layers of neurons for learning.
2011	IBM's Watson, built to answer questions posed in a natural language, defeats a Human Competitor at Jeopardy Game.
2012	Jeff Dean from Google, developed GoogleBrain, which is a Deep Neural Network to detect patterns in Videos and Images.
2014	Facebook invented the "DeepFace" algorithm based on Deep Neural Networks capable of recognizing human faces in photos.
2015	Amazon proposed its own Machine Learning Platform. Microsoft created "Distributed Machine Learning Toolkit" for efficient distribution of machine learning problems to multiple computers to work parallel to find a solution. Elon Musk and Sam Altman, created a non-profit organization- OpenAI, with the objective of using Artificial Intelligence to serve human beings.
2016	Google proposed DeepMind which is regarded as the most complex Board Game. Google AlphaGo program becomes the first Computer Go program to beat a professional human player. It is based on the combination of machine learning and tree searching techniques.
2017	Google proposed Google Lens, Google Clicks, Google Home Mini and Google Nexus based phones which use Machine Learning and Deep Learning Algorithms. Nvidia proposed NVIDIA

Artificial Intelligence (AI) and Machine Learning (ML) are not new terms. For more than 60 years, computer scientists, engineers, researchers, students, and industry experts have

investigated, used, used, and re-invented them[7]. Algebra, statistics, and probability are the mathematical foundations of machine learning. Researchers such as Alan Turing, John McCarthy, Arthur Samuels, Alan Newell, and Frank Rosenblatt contributed to the serious development of Machine Learning and Artificial Intelligence in the 1950s and 1960s. On the Optimizing Checkers Program, Samuel proposed the first practical machine learning model. Rosenblatt invented the Perceptron, a widely used machine learning method based on biological neurons that lay the groundwork for Artificial Neural Networks. The illustrious, expansive, and practical growth of machine learning is depicted in Table 1.

5.3. The Generic Model of Machine Learning:

Computer learning is used to tackle a variety of issues that need the machine to learn. There are three characteristics of a learning problem:

- The process of gaining experience.
- Performance measure to be improved.
- Task classes.

5.4. Machine Learning Paradigms:

5.4.1. Supervised Learning:

Prediction based on historical data may benefit from supervised learning. For example, a recognition system that identifies whether an item is a galaxy, a quasar, or a star given a coloured picture of an object via a telescope, or given a person's e-commerce browsing history, product suggestion by e-commerce websites.

5.4.2. Unsupervised Learning:

The goal of unsupervised learning is to recognize previously undiscovered patterns in data in order to generate rules from them. In situations when the data categories are uncertain, this approach is suitable. The training data is not labelled in this case. Unsupervised learning is a statistic-based learning method that addresses the issue of uncovering latent structure in unlabelled data.

5.4.3. Reinforcement Learning:

Because the algorithm is simply given a response that indicates whether the output is accurate or not, reinforcement learning is considered an intermediate kind of learning[8]. To arrive at the right result, the algorithm must investigate and reject out different alternatives. Because the algorithm makes no recommendations or answers to the issue, it is referred to as learning with a critic.

5.4.4. Evolutionary Learning:

Biological creatures that adapt to their surroundings are the source of inspiration. The algorithm learns from the behaviour and adjusts to the inputs, excluding solutions that are improbable. It proposes the optimal solution to the issue based on the concept of fitness.

5.4.5. Semi-Supervised Learning:

These algorithms provide a method for combining the benefits of both supervised and unsupervised learning. In the preceding two kinds of output labels, either all of the observations are labelled or none are labelled. Some observations may be labelled, but the bulk of observations remain unlabelled owing to the high expense of labelling and a lack of competent human knowledge. Semi-supervised algorithms are ideally suited for model development in such circumstances. Semi-supervised learning may be used to classification, regression, and prediction issues.

5.4.6. Ensemble Learning:

It's a machine learning model in which a large number of students (individual models) are taught to answer a common issue[9]. Unlike other machine learning techniques, which try to learn by constructing a set of hypotheses from the training data and combining them to make a prediction model in order to reduce bias, variance, or improve predictions, ensemble learning acquires knowledge by constructing a set of hypotheses from the training data and incorporating them to make a statistical method in order to reduce bias, variability, or improve predictions.

5.5. Machine Learning Algorithms:

In this part, we'll look at some of the most prominent machine learning algorithms from the various paradigms discussed before. Despite the fact that each paradigm has a large number of algorithms that have been published in the literature, we only look at a few of them in this research[10]. A handful of these algorithms are briefly explained in Table 2. These algorithms have a broad range of applications, some of which are discussed below. Table 3 illustrates machine learning applications.

TABLE 2: ILLUSTRATES MACHINE LEARNING (ML) ALGORITHMS[3].

Paradigm	Algorithm	Description
Supervised Learning	Decision Tree	The learned function is represented in the form of a decision tree in the Decision Tree method for approximating discrete valued target functions. On the basis of feature values, a decision tree classifies instances by sorting them from root to leaf nodes. Every branch indicates a potential value for that feature, whereas each node represents a choice on a property of the instance. The decision node, which is the root node, is where an instance's classification begins. The tree traverses down along the edge that corresponds to the value of the result of feature test based on the value of node. In the sub-tree led by the new node at the end of the preceding edge, this process continues. Finally, the categorization categories or the final choice are represented by the leaf node. When utilizing a decision tree, the emphasis is on determining which characteristic at each node level is the best classifier. For each node, statistical measures like as information gain, Gini index, Chi-square, and entropy are computed to determine its value. Decision trees are implemented using a variety of algorithms.

	Naïve Bayes	Bayes' theorem of probability is used by Nave Bayes to classify. The Bayes theorem determines the posterior probability of an event (A) given a prior probability of event B denoted by $P(A/B)$.
	Support Vector Machines	SVMs are useful for both classification and regression issues. It's a learning algorithm that's supervised. It is based on the idea of calculating margins. Each data item is plotted as a point in n-dimensional space in this method (where n is the number of features we have in our dataset). Each feature's value is the associated coordinate's value. It divides the data into classes by identifying a line that divides the training datasets into categories. It operates by maximizing the margin between the closest data point and the hyper plane.
	Regression Analysis	Regression analysis is a kind of predictive modelling that looks at the connection between a dependent and an independent variable. It is a crucial tool for data analysis and modelling. We attempt to fit the line or curve to the data points in this technique to minimize the disparities in data point distances from the curve or line. Regression analysis is divided into three types: linear, logistic, and polynomial.
Unsupervised Learning	K-Means Clustering	For cluster analysis, K-means is a common unsupervised machine learning method. Its aim is to divide 'n' observations into 'k' clusters, with each observation belonging to the cluster with the closest mean, which serves as the cluster's prototype. The cluster's centre is determined by the mean of the observations in that cluster.
Instance based Learning	K-nearest Neighbours	It is a non-parametric classification and regression technique. The KNN method finds the k-nearest neighbours of an unknown feature vector whose class has to be determined given N training vectors.
Ensemble Learning	Random Forest	It's a classification and regression technique that uses ensemble learning. It creates a lot of decision trees using a random selection of data using a bagging technique. To create the final decision trees, the output of all decision trees in the random forest is merged.
Dimensionality Reduction	Principal Component Algorithm	It is mainly used to reduce the number of dimensions in a data collection. It aids in the reduction of the number of characteristics in the data collection as well as the number of independent variables. It converts correlated data into a collection of linearly uncorrelated variables called principle components via orthogonal transformation.

5.6. Applications of Machine Learning:

TABLE 3: ILLUSTRATES MACHINE LEARNING APPLICATIONS.

Application	Description
Playing Checkers Game	A computer program learns to play checkers game, improvises its performance as determined by its ability to win at various class of tasks involving the game, through experience obtained by playing games against itself.
Speech Recognition	The most sophisticated speech recognition systems these days deploy machine learning algorithms in some forms. Example: SPHINX system [20] learns speaker-specific sounds and words from speech signals. Various Neural Network learning methodologies for interpreting hidden Markov Models are highly effective for automatically customizing speakers, dictionary, noise etc.
Autonomous Vehicles	Machine learning models are these days being applied to drive autonomous vehicles like Cars, Drones etc. Example: Google Driver Less Cars, Tesla Cars. Machine learning techniques are also highly effective in controlling sensor-based applications.
Filtering Emails (Spam Emails)	Machine learning can be applied to filter spam emails. The machine learning based model will simply memorize all the emails classified as spam emails by user. When new email arrives in inbox, the machine learning based model will search, compare and based on the previous spam emails. If new email matches any one of them, it will be marked as spam; else it will be moved to user's inbox.
Robotics and Artificial Intelligence	Machine learning is regarded as improved approach to problem solving. Using base knowledge and training data with machine learning models, learning can be improved which will take robotics and AI to next generation levels.
Web and Social Media	<ul style="list-style-type: none"> • Naïve Bayes classifiers have been successfully applied in the field of text mining, may it be spam filtering or classifying the web page, an email or any document. • Facebook uses Naïve Bayes' to analyze status update expressing positive and negative emotions. • Document Categorization: Google uses Naïve Bayes algorithm for document categorization. • K-means clustering is used by search engines like Google, Yahoo to cluster web pages by similarity. • Apriori is used by websites such as Amazon or Flipkart to recommend which items are purchased together frequently. • Another common application of Apriori is the Google auto-complete. When a person types a word, Google search engine looks for other associated words that go together with the word earlier typed word. • Sentiment analysis on social networking sites is a typical text classification problem solved using application of variety of ML algorithms [21, 22, 23,24]
Medical Field	TRISS: Trauma & Injury Severity Score, which is widely used to predict mortality in injured patients, was originally developed by Boyd et al. using logistic regression. Many other medical scales used to assess severity of a patient have been developed using logistic regression.

6. CONCLUSION

Digitalization and the Internet revolution have led to a mounting volume of structured and unstructured data which needs to be utilized for analytics. Machine learning as a key technology driver encompasses the intelligent power to harness the knowledge from the available data. Moreover, the adoption of machine learning solutions for complex real-life problems by both researchers & practitioners has made this field a dynamic area of research with an active participation across industries & countries. In this paper, a comprehensive review of Machine Learning process and algorithms is presented. The purpose is clearly to understand the role, advantage and scope of Machine learning as a technology-based solution. In near future machine learning is expected to be a part of almost every software application. There are some of the future predictions of machine learning applications: As machine learning helps computers understand the context and semantics of sentences using Natural Language Processing, so we do not have to wait long for a time when computers will learn to talk like humans. In the near future we can expect machine learning tools and techniques to connect to the internet and continuously

retain on the most relevant information. This will help algorithms in constant retaining of algorithms and there will be no need to train the systems time and again. Personalization could be enhanced and recommendations could be improved leading to more beneficial and successful experiences.

REFERENCES

1. A. Dey, "Machine Learning Algorithms: A Review," *Int. J. Comput. Sci. Inf. Technol.*, 2016.
2. S. Ding, H. Zhao, Y. Zhang, X. Xu, and R. Nie, "Extreme learning machine: algorithm, theory and applications," *Artif. Intell. Rev.*, 2015, doi: 10.1007/s10462-013-9405-z.
3. J. Alzubi, A. Nayyar, and A. Kumar, "Machine Learning from Theory to Algorithms: An Overview," 2018, doi: 10.1088/1742-6596/1142/1/012012.
4. K. Gibson, "The Value of Data Science and Machine Learning.," *Risk Manag.*, 2018.
5. C. Hayashi, "What is Data Science ? Fundamental Concepts and a Heuristic Example," 1998.
6. "Machine Learning." <https://data-flair.training/blogs/types-of-machine-learning-algorithms/> (accessed Sep. 07, 2018).
7. Gilpress, "Visually Linking AI, Machine Learning, Deep Learning, Big Data and Data Science," *What's the Big Data?* 2016.
8. J. García and F. Fernández, "A comprehensive survey on safe reinforcement learning," *Journal of Machine Learning Research*. 2015.
9. V. Smolyakov, "Ensemble Learning to Improve Machine Learning Results," *Stats Bots*, 2017.
10. J. Deepika, T. Senthil, C. Rajan, and A. Surendar, "Machine learning algorithms: A background artifact," *Int. J. Eng. Technol.*, 2018, doi: 10.14419/ijet.v7i1.1.9214.



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AN OVERVIEW ON ISSUES AND ENABLING TECHNOLOGIES IN IOT MIDDLEWARE

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ABSTRACT

The Internet of Things (IoT) enables humans and computers to learn from and interact with billions of items such as sensors, actuators, services, and other Internet-connected gadgets. The implementation of IoT technologies will allow for seamless integration of the cyber and physical worlds, radically altering and empowering human interaction with the planet. Middleware, which is generally defined as a software system intended to be the intermediate between IoT devices and applications, is a crucial technology in the implementation of IoT systems. In this article, we first demonstrate the necessity for an IoT middleware by demonstrating an IoT application for real-time blood alcohol level prediction utilizing wristwatch sensor data. After that, a survey of the capabilities of current IoT middleware is conducted. We also undertake a comprehensive examination of the difficulties and enabling technologies in creating IoT middleware that embraces the heterogeneity of IoT devices while still supporting the key components of composition, flexibility, and security in an IoT system.

KEYWORDS: *Internet of Things, Middleware, Privacy, Service Discovery, Security.*

1. INTRODUCTION

The Internet of Things (IoT) is an area that, after the Internet, represents the next most exciting technological revolution. IoT will open up a world of possibilities and influence in every part of the globe. We can create smart cities with IoT, where parking, urban noise, traffic congestion, street lighting, irrigation, and trash can all be monitored in real time and controlled more efficiently. We can construct secure and energy-efficient smart houses. We can create smart ecosystems that monitor air and water pollution automatically and allow for early detection of earthquakes, forest fires, and other catastrophic catastrophes [1]. Manufacturing can be transformed by IoT, making it leaner and smarter. According to CBS News, over 600 bridges

have failed in the United States since 1989. Every state has a significant number of bridges that pose a serious threat to motorists. Sensors enabled by the Internet of Things can monitor vibrations and material conditions in bridges (as well as buildings and historical sites) and give early warning, potentially saving many lives.

In almost every business sector conceivable, the SQ.Z. Shang works at the University of Adelaide's School of Computer Science, SA 5005, and Australia timely manage objects to create seamless integration of the physical and cyber worlds. There are many IoT middleware and connection protocols under development, and the number is growing by the day. Popular connection protocols developed especially for IoT devices include Message Oriented Telemetry Transport (MQTT), Constrained Application Protocol (CoAP), and BLE (Bluetooth Low Energy) [2]. However, the variety of IoT connection protocols and middleware are making it difficult to connect IoT devices and understand the data they gather. The fact that each IoT middleware promotes a distinct programming abstraction and architecture for accessing and connecting to IoT devices adds to the confusion. The idea of virtual sensor, which is defined in XML and implemented with a matching wrapper, is given as the primary abstraction for creating and connecting a new IoT device in the Global Sensor Network (GSN) project, for example. The primary abstraction of the TerraSwarm project is an accessory design pattern implemented in Javascript. There is no high-level abstraction for encapsulating a new device type in the Google Fit project [3]. The system is pre-programmed to support a certain range of IoT devices that may be accessed through REST APIs. Extending Google Fit's `FitnessSensorService` class to accommodate an IoT device that isn't currently supported needs professional Java programming expertise. According to Zachariah et al. in their paper "The Internet of Things Has a Gateway Problem," the current state-of-the-art support for IoT application development is application specific, which is equivalent to the scenario where each IoT device requires a different web browser to connect to the Internet. In this article, we examine the most cutting-edge middleware options for implementing IoT applications. are some of the surveys on IoT middleware that have been published. To our knowledge, these studies only look at IoT middleware from a few angles, and none of them address the more recent trend of light-weight plug-and-play or cloud-based IoT middleware.

The goal of this study is to get a better knowledge of current IoT middleware research and difficulties. The following are the paper's major contributions. The rest of this paper is laid out as follows. We first argue for the necessity for an IoT middleware based on our experience developing a real-time BAC predictor utilizing data from wristwatch sensors. We next go through our observations on the three main software designs for IoT middleware and provide a comparison and contrast of the three architectures [4]. We survey eight existing IoT middleware systems to see how well they fulfill the key functionalities required by BAC-like IoT applications, such as device abstraction for data collection, composition for visualization and analysis, service discovery for opportunistic integration, security and privacy. We compare these three kinds of IoT middleware by showing how to use GSN, Google Fit, and Ptolemy Accessor Host to gather data from a Phidgets sensor. The main research difficulties in creating an IoT middleware that allows a scientist or a health professional to configure/compose a BAC-like IoT program that is flexible, open, and secure are then discussed [5]. Figure 1 shows infrastructure for data collection and analysis.

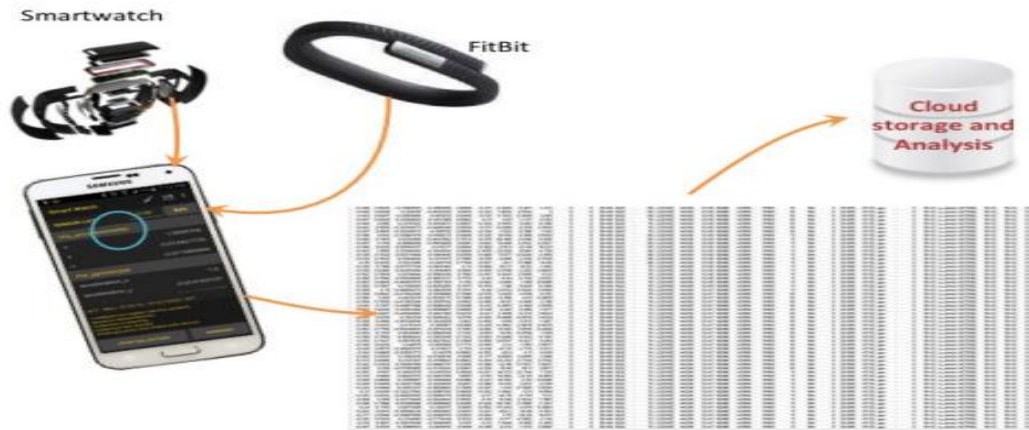


Figure 1: Infrastructure for Data Collection and Analysis.

Ambient data gathering and analytics, as well as real-time reactive applications, are two types of IoT applications. The first kind of application collects sensor data from a range of sensors (e.g., wearable devices), processes it offline to produce actionable information (e.g., a model), and then uses the model to forecast fresh data received from the sensor in the future. Real-time reactive systems, such as autonomous vehicles or industrial processes, fall under the second group of applications. These systems make real-time choices based on observed sensor readings. The first group of applications is quickly expanding, particularly in the healthcare sector, where customized health tracking and monitoring has become critical to providing better and more economical treatment.

Based on our experience developing an ambient data collecting and analytics IoT application that can predict Blood Alcohol Content (BAC) utilizing wristwatch sensor data, we justify the need for an open, lightweight, secure IoT middleware in this section. We'll go through the rationale for developing this IoT application, as well as how it, and all other IoT apps in this category, may benefit from an IoT middleware, in the sections below. Drunk driving is a serious issue that affects people all around the globe. This issue is a danger not just too intoxicated drivers, but also to pedestrians and other motorists. It may be difficult to assess one's own alcoholism at hazardous levels of drinking. It would be preferable to get a definite BAC measurement, or just a binary response: "drunk" or "not drunk". Infrastructure for Data Collection and Analysis is already available, however it is not discrete and requires the user to take intentional steps.

The second method is to manually calculate BAC using a Smartphone application, although this requires more effort from the user (remembering how many drinks they've had in a social environment). To be practical, some kind of non-invasive and accurate monitoring device that would alert users if they get too drunk would be beneficial. By connecting with the vehicle's ignition mechanism, this technology may also be used to alert friends and relatives, as well as prohibit the drinker's car from starting. We built a safe IoT application from the ground up to explore the prediction of intoxication ambient data gathering and analytics, as well as real-time reactive applications, are two types of IoT applications [6]. The first kind of application collects sensor data from a range of sensors (e.g., wearable devices), processes it offline to produce actionable information (e.g., a model), and then uses the model to forecast fresh data received

from the sensor in the future. Real-time reactive systems, such as autonomous vehicles or industrial processes, fall under the second group of applications.

These systems make real-time choices based on observed sensor readings. The first group of applications is quickly expanding, particularly in the healthcare sector, where customized health tracking and monitoring has become critical to providing better and more economical treatment. Based on our experience developing an ambient data collecting and analytics IoT application that can predict Blood Alcohol Content (BAC) utilizing wristwatch sensor data, we justify the need for an open, lightweight, secure IoT middleware in this section. We'll go through the rationale for developing this IoT application, as well as how it, and all other IoT apps in this category, may benefit from an IoT middleware, in the sections below. Drunk driving is a serious issue that affects people all around the globe. This issue is a danger not just to intoxicated drivers, but also to pedestrians and other motorists. It may be difficult to assess one's own alcoholism at hazardous levels of drinking. It would be preferable to get a definite BAC measurement, or just a binary response: "drunk" or "not drunk", compact breathalyzers are probably the best choice. Infrastructure for Data Collection and Analysis is already available, however it is not discrete and requires the user to take intentional steps.

The second method is to manually calculate BAC using a Smartphone application, although this requires more effort from the user (remembering how many drinks they've had in a social environment). To be practical, some kind of non-invasive and accurate monitoring device that would alert users if they get too drunk would be beneficial. By connecting with the vehicle's ignition mechanism, this technology may also be used to alert friends and relatives, as well as prohibit the drinker's car from starting. We built a safe IoT application from the ground up to explore the prediction of intoxication level using wristwatch sensor data. The gathered data must be able to be kept locally as well as sent to a cloud storage system for analysis. It's critical to have local storage to prevent the unexpected latencies that come with wireless data transfer to the cloud. Data must be protected not just while it is in storage, both locally and in the cloud, but also while it is in transit. From the periphery to the cloud data center, end-to-end security is required. Following data collection, the data is analyzed in the cloud to see whether there is any correlation between the sensor readings and the recorded BAC levels. To do this, the data must first be pre-processed and displayed. The gathered sensor data is then subjected to a variety of machine learning algorithms in order to provide the best accurate prediction [7]

The basic infrastructure for a generic data gathering and processing system is shown in Figure 1. The data collection application on the Smartphone (also known as the gateway) uses a set of Java classes to handle the low-level details of the data collection process, such as managing the various threads for collecting sensor values from the Microsoft Band smart watch (also known as the edge device) or other devices like Fit bit. Before transferring the gathered data to the cloud for archiving, the data collecting program does some aggregation. The data analyses is done completely in the cloud, which is equipped with a high-performance computing engine as well as a variety of big data analytics and visualization tools. Once a model has been created using data analytics, it is stored and used as a predictor in the BAC application. The gathered data must be able to be kept locally as well as sent to a cloud storage system for analysis. It's critical to have local storage to prevent the unexpected latencies that come with wireless data transfer to the cloud. Data must be protected not just while it is in storage, both

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2. DISCUSSION

In order to connect and receive data from all possible sensors on the Microsoft Band wristwatch, it must first be virtualized as a software component to the BAC Smartphone application. In order to shield users from the low-level implementation details of networking protocols and communication capabilities of various physical sensors, a device abstraction component is required. The BAC application and the physical device must be able to communicate in real time. Data is often supplied from devices in endless streams in time-stamped order. As a result, a stream, event processing, or aggregation service is a critical component. Stream processing detects complicated events and converts the gathered data (which is typically in huge quantities) into usable information. Aggregation may help you get more useful data for your research. When gathering accelerometer data, for example, the three most recent values were averaged using linear weighting rather than simply taking the most recent value.

Users will require a monitoring or visualization service to monitor/control the status of the physical devices, as well as to regulate when and how frequently the gathered data should be archived to the cloud for future analysis or processing. This component should also offer notification and subscription services to customers in order to provide IoT status, in this instance an alarm for being drunk, on a timely basis. The security and privacy component is required to ensure the integrity of the collected data (stream) and to ensure that the user's privacy is not violated. An IoT application can generate large amounts of data that must be processed and archived, so a ubiquitous connection to a cloud infrastructure is required for data analytic and archiving. Users should be able to save gathered data to their preferred storage media and should only be able to connect to authenticated/certified IoT devices. A composition engine (also known as a rule engine in certain systems) is required to allow users to mix analytics services from the cloud, data services from other gateways (PhidgetInterfaceKit, Aduino), or other IoT devices (car's ignition device) without having to do any low-level programming data collecting and analytics system for monitoring environmental pollution in a building would use a similar set of computing units as the BAC prediction application, with the exception that the edge sensors would be Mica mote, and the gateway will be a desktop or laptop.

The information gathered will be sent to cloud storage or a backend database. For analytics, a comparable collection of analytical and visualization tools is required. In conclusion, the logical requirements for both environment and BAC monitoring are the identical. Having to build two distinct apps for each of the aforementioned applications with dedicated resources not only increases development costs and time, but also hinders the creation of new IoT applications for safe and privacy-preserving data and IoT device sharing. IoT Middleware on the Cloud for a Variety of Applications. As a result, an open, lightweight, flexible, and secure IoT middleware that acts as a bridge between various IoT devices and applications is required. Without any low-level programming, a scientist or a health professional may configure/compose a new secure IoT application for conducting data gathering and analysis appropriate to his or her context.

2.1. Application:

By creating a pluggable actor or downloading it from a common repository, you may create IoT middleware. Both service and actor-based IoT middleware designs do not impose a specific standard for interoperability across IoT devices, such as Restful API or BLE. By supporting a specific programming paradigm or device abstraction, they both welcome the variety of IoT devices. Interoperability in cloud-based architecture, on the other hand, is accomplished via the adoption of particular standards. When a cloud provider's service is terminated, cloud-based middleware may cease to function entirely. A good example of this is Google Nest. While all three designs enable security and privacy to some extent, cloud-based architecture necessitates users' confidence in the cloud provider to protect their data's privacy and integrity. Users aren't offered any other options beyond those recommended by the cloud. Users in service and actor-based architectures have control over how and where data is kept. Because the middleware cannot be integrated inside the physical device and data transferred between physical devices and the middleware may be hacked, there is a weak security connection between physical devices and the middleware in both service and cloud-based architectures. IoT applications are often used in a changing and unpredictable environment. IoT devices, for example, may run out of battery power and cease to function, and connection between devices and gateways may be severed at any moment. The middleware must have a service discovery component so that new services can be made accessible on demand and failing services may be dynamically replaced to ensure a particular level of service quality (QoS). If the present gateway is likely to lose connectivity, the physical devices may connect to a new gateway of comparable quality. Currently, only service-based middleware provides a restricted version of service discovery.

2.2. Advantage:

Web-based service Wrapping IoT devices as Web services with the SDK tool kit and training may restrict the kinds of IoT devices that can be deployed and controlled in this platform, since Web service is a heavy protocol to operate on energy and capabilities limited IoT devices. For processing and preservation, all gathered data is sent to the Hydra middleware. On IoT devices, no local processing or aggregation of acquired data is available. This is problematic for certain BAC-like applications that need real-time analysis of acquired data to identify crucial events (e.g., an old person's fall). Hydra IoT applications must be built by a programmer, and it is not a platform that allows users to easily find, build, and deploy BAC-style data gathering and analysis applications. Hydra is therefore more suited to enterprise-level IoT applications that establish a long-term and tight connection with a fixed set of IoT devices that the platform currently supports. The virtual sensor abstraction is the core idea, which allows users/developers to

declaratively define XML-based deployment descriptors for deploying a sensor. This is comparable to the deployment descriptors idea used in the J2EE server to deploy enterprise beans.

The GSN design is similar to that of J2EE, in that each container may host many virtual sensors, and the container offers functionality for sensor lifecycle management, such as persistency, security, notification, resource pooling, and event processing. One or more data streams are sent into the virtual sensor, which are then processed according to the XML standard. The sampling rate of the data, the kind and location of the data stream, the data's persistency, the data's output format, and the SQL processing logic for the data stream are all factors to consider. A wrapper is assigned to each input stream. When the physical sensor is initially started, the wrapper software defines i) the network protocol to use to connect, interact, and communicate with it, ii) what to do in order to read data from the sensor, and iii) what to do with the data after it is received from the sensor. If the virtual sensor's permanent storage property is set to "true" in the XML specification, GSN offers a SQL-based database that saves all raw sensor data. Furthermore, each virtual sensor has a key-value pair that may be found and registered in GSN.

The flexibility to build a platform-specific wrapper allows the system to work with a variety of sensors. To add a new kind of sensor to the platform, the user must first understand how to create an XML descriptor for the physical sensor and, if one is not already available, offer a Java wrapper implementation. To show the capabilities offered by GSN's device abstraction, we demonstrate the construction of Phidgets sensors in the next paragraph. Because we had prototype implementations of Phidgets sensors in all three kinds of middleware that we saw, we choose to present Phidgets sensors implementation for the remainder of the article. The light and sound sensor data we gathered in Phidgets are similar to sensor data acquired from a smart watch in terms of properties.

Adding a Phidgets sensor (IoT device) as a new virtual sensor in GSN requires the development of a deployment file (see Figure 6) and a wrapper class that can operate as a thread and consume stream data according to the settings provided in the XML deployment file. The storage media for the gathered data is specified by the virtual-sensor-name tag in the deployment file. The processing-class tag defines the virtual sensor's Java class, which in this instance is Phidget Virtual Sensor. The output-structure tag defines the data collection's structure. It's the music and the light in this instance, and they're both of the double kind. The stream tag defines how the program must enable real-time interaction between the physical device and the application. The sampling rate and the processing logic on the gathered data, for example, are defined using the attributes sampling-rate and query tag.

While GSN offers scalable servers for sensor data collecting and storage, it does not provide tools for composing or interpreting the data beyond displaying it on a Web application provided by GSN. It also doesn't allow multi-vendor device composition through the XML descriptor. The expanded GSN, which is part of the OpenIoT project, does, however, provide a limited composition capability. When data from different IoT devices has to be gathered and merged, a programmer must build a domain specific application in GSN. External applications may use Restful or Web service APIs to access virtual sensors stored on GSN. There is support for a rudimWeb-based service Wrapping IoT devices as Web services with the SDK tool kit and training may restrict the kinds of IoT devices that can be deployed and controlled in this

platform, since Web service is a heavy protocol to operate on energy and capabilities limited IoT devices.

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One or more data streams are sent into the virtual sensor, which are then processed according to the XML standard. The sampling rate of the data, the kind and location of the data stream, the data's persistency, the data's output format, and the SQL processing logic for the data stream are all factors to consider. A wrapper is assigned to each input stream. When the physical sensor is initially started, the wrapper software defines i) the network protocol to use to connect, interact, and communicate with it, ii) what to do in order to read data from the sensor, and iii) what to do with the data after it is received from the sensor. If the virtual sensor's permanent storage property is set to "true" in the XML specification, GSN offers a SQL-based database that saves all raw sensor data. Furthermore, each virtual sensor has a key-value pair that may be found and registered in GSN.

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sampling-rate and query tag., which extends GSN's AbstractWrapper class and uses this XML descriptor as input [9].

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It's a cloud-based IoT middleware that allows customers to manage their fitness data and create fitness applications all from one place. It aims to achieve the same objective as Apple's Health Kit. The system includes a fitness store, which is a cloud storage service that saves data from a number of devices and applications (similar to Firebase, a JSON-based document server). A sensor framework is a collection of APIs that allow third-party IoT devices to connect to its store. It offers APIs for subscribing to a certain fitness data type or source (e.g., Fitbit or Smartwatch), as well as APIs for accessing past data and permanent recording of the information. A login account protects user information. All captured data is sent to the middleware for processing and archiving, much as Hydra. GSN isn't intended to run on low-power, low-processing-power IoT gateways like Smartphone or Raspberry Pi, thus no local data processing or aggregation is done. Declarative sensor capability definition through XML descriptor file is a step in the right direction for fast development of BAC-like applications via automated wrapper class generation from the descriptor file. It's a cloud-based IoT middleware that allows customers to manage their fitness data and create fitness applications all from one place. It aims to achieve the same objective as Apple's HealthKit. The system includes a fitness store, which is a cloud storage service that saves data from a number of devices and applications (similar to Firebase, a JSON-based document server). A sensor framework is a collection of APIs that allow third-party IoT devices to connect to its store. It offers APIs for subscribing to a certain fitness data type or source (e.g., Fit bit or Smartwatch), as well as APIs for accessing past data and permanent recording of the information [10].

2.3. Working:

service on the web Wrapping IoT devices as Web services with the SDK tool kit and training may restrict the kinds of IoT devices that can be deployed and controlled under this platform, since Web services are a heavy protocol to operate on power and capabilities limited IoT devices. To be processed and archived, all gathered data is sent to the Hydra middleware. On IoT devices, there is no way to analyze or aggregate the data gathered locally. This is problematic for certain BAC-like applications that need real-time analysis of gathered data to identify crucial

events (such as an old person's fall). The Hydra IoT application must be handmade by a programmer, and it is not a platform that allows users to easily find, build, and deploy BAC-like data collecting and analysis applications. Hydra is therefore more suited to enterprise-level IoT applications that have a long-term and tight connection with a fixed set of IoT devices that the platform currently supports. GSN, is a service-based Internet of Things that seeks to offer a consistent platform for flexible integration, sharing, and deployment of heterogeneous IoT devices.

The virtual sensor abstraction is the core idea, which allows users/developers to define XML-based deployment descriptors declaratively to deploy a sensor. This is analogous to the notion of deployment descriptors in J2EE server, which are used to deploy enterprise beans. GSN's design is similar to that of J2EE in that each container may host many virtual sensors and the container offers functionality for sensor lifecycle management, such as persistency, security, notification, resource pooling, and event processing. One or more data streams are sent into the virtual sensor, which are then processed according to the XML standard. The data sampling rate, the kind and location of the data stream, the data's persistency, the data's output format, and the SQL processing logic for the data stream are all factors to consider. Wrappers are assigned to each input stream. When the physical sensor is initially started, the wrapper software defines (i) the network protocol to use to connect, interact, and communicate with it, ii) what to do to read data from the sensor, and iii) what to do with the data after it has been received from the sensor.

If the permanent storage property of the virtual sensor is set as "yes" in the XML specification, GSN offers a SQL-based database that saves all raw sensor data. Each virtual sensor also has a key-value pair that may be found and registered in GSN. The system can connect with sensors of various kinds thanks to the flexibility to install a platform-specific wrapper. To add a new kind of sensor to the platform, the user must first understand how to create an XML descriptor for the physical sensor, as well as offer a Java wrapper implementation if one is not already available. To showcase the capabilities offered by GSN's device abstraction, we'll show how to create Phidgets sensors in the next paragraph. Because we had prototype implementations of Phidgets sensors in all three kinds of middleware that we saw, we chose to present them for the remainder of the article. 2016 IEEE, 2327-4662 Personal use is allowed, but reprinting or dissemination needs IEEE approval. The light and sound sensor data we gathered in Phidgets are similar to sensor data acquired from a smart watch in terms of features. Adding a Phidgets sensor (IoT device) as a new virtual sensor in GSN necessitates the development of a deployment file, as illustrated as well as the construction of a wrapper class that can operate as a thread and consume stream data according to the settings provided in the XML deployment file. The storage media for the gathered data is defined by the virtual-sensor-name tag in the deployment file. The processing-class tag defines the virtual sensor's Java class, which is Phidget VirtualSensor in this instance. The output-structure tag describes the data collection's structure. It's the music and light in this instance, and they're both of the double kind. The stream tag describes how the physical device and the program must communicate in real time.

The sample rate and processing logic on the gathered data, for example, are defined using the sampling-rate property and the query tag. Figure 7 shows a portion of the wrapper class, which extends GSN's Abstract Wrapper class and takes input from this XML descriptor. While GSN offers scalable servers for sensor data collecting and storage, it does not provide tools for composing or interpreting the data beyond displaying it on a Web application. It also doesn't

allow for the XML descriptor to be used to compose multi-vendor devices. The Open IoT project's expanded GSN does, however, provide limited composition capabilities. When data has to be gathered and merged from a variety of IoT devices, a programmer must build a domain specific application in GSN. Restful or Web service APIs allow other applications to connect to virtual sensors stored on GSN. Service discovery based on dictionary lookup is supported to a limited extent.

A login account keeps user information safe. All collected data is sent to the middleware, which processes and archives it, much as Hydra. Because GSN is not intended for use in IoT gateways with limited power and processing capabilities, such as Smartphone or Raspberry Pi, no local data processing or aggregation is done. The automated development of the wrapper class from the descriptor file is a step in the right direction for fast building of BAC-like applications. IoT Middleware on the Cloud Google Fit is an open Internet of Things ecosystem. It's a cloud-based IoT middleware that allows customers to manage their fitness data and develop fitness applications all from one place. Apple's Health Kit has a similar objective. A fitness store is included in the system, which is a cloud storage service (similar to Firebase, a JSON-based document server) that saves data from various devices and applications. A sensor framework is a collection of APIs that allow third-party IoT devices to connect to a company's shop. APIs for subscribing to a certain fitness data type or source (e.g., Fit bit or Smartwatch), APIs for accessing previous data, and APIs for permanent recording of the s are just a few examples.

3. CONCLUSION

The World Wide Web has gone through many transformations, from traditional linking and sharing of computers and documents, to a platform for conducting businesses and connecting people via social media, and now the emerging paradigm of connecting billions of physical objects (Internet of Things) to empower human interaction with both the physical and virtual worlds in an unprecedented way. In this survey paper, we have analyzed three key IoT middleware architectures ranging from consumer centric cloud-based architectures, light-weight actor-based architectures, and heavy weight service-based architectures. We outlined four key challenges in developing an IoT middleware which are: 1) a light-weight middleware platform that can provide similar services when deployed on power constrained IoT devices as well as in desktop computers and cloud infrastructure; 2) a composition engine that is intuitive and not application specific; 3) a security mechanism that can operate in a resource constrained environment and yet can achieve similar guarantee as Internet security; and 4) a semantic-based IoT device/service discovery that goes beyond discovery of domain names and IP addresses. We elaborate on two non-ontological solutions for addressing key challenges in IoT service discovery. The first approach is adapted from existing works in Web service search engines and the second approach is based on machine learning and recommendation techniques. Finally, in the IoT security domain, we believe emerging techniques such as privacy by design, differential privacy, and light weight public key cryptography will form the building blocks for security in IoT middleware.

REFERENCES:

1. M. A. Khan and K. Salah, "IoT security: Review, blockchain solutions, and open challenges," *Futur. Gener. Comput. Syst.*, 2018.
2. R. S. Sinha, Y. Wei, and S. H. Hwang, "A survey on LPWA technology: LoRa and NB-IoT,"

ICT Express. 2017.

3. A. Panarello, N. Tapas, G. Merlino, F. Longo, and A. Puliafito, "Blockchain and iot integration: A systematic survey," *Sensors (Switzerland)*. 2018.
4. O. Elijah, T. A. Rahman, I. Orikumhi, C. Y. Leow, and M. N. Hindia, "An Overview of Internet of Things (IoT) and Data Analytics in Agriculture: Benefits and Challenges," *IEEE Internet Things J.*, 2018.
5. A. Reyna, C. Martín, J. Chen, E. Soler, and M. Díaz, "On blockchain and its integration with IoT. Challenges and opportunities," *Futur. Gener. Comput. Syst.*, 2018.
6. M. Mohammadi, A. Al-Fuqaha, S. Sorour, and M. Guizani, "Deep learning for IoT big data and streaming analytics: A survey," *IEEE Communications Surveys and Tutorials*. 2018.
7. M. Frustaci, P. Pace, G. Aloï, and G. Fortino, "Evaluating critical security issues of the IoT world: Present and future challenges," *IEEE Internet Things J.*, 2018.
8. A. Oussous, F. Z. Benjelloun, A. Ait Lahcen, and S. Belfkih, "Big Data technologies: A survey," *Journal of King Saud University - Computer and Information Sciences*. 2018.
9. J. Martín-Gutiérrez, C. E. Mora, B. Añorbe-Díaz, and A. González-Marrero, "Virtual technologies trends in education," *Eurasia J. Math. Sci. Technol. Educ.*, 2017.
10. J. Rybicka, A. Tiwari, and G. A. Leeke, "Technology readiness level assessment of composites recycling technologies," *J. Clean. Prod.*, 2016.



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EXPRESSION OF THE MEANING OF INDEFINITENESS IN ENGLISH AND UZBEK LANGUAGES BY THE MODAL MEANS

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ABSTRACT

This article is devoted to the expression of indefiniteness in English and Uzbek languages by the modal means. We studied the representation of the modal means first, unlike other word groups, modality, first of all, shows the indefiniteness of the process; secondly, this categorical concept is not limited to the description of the process, but also of the subject.

KEYWORDS: *Modal Means, Indefiniteness. Expression, Parts Of Speech, Person, Object, Location, Direction, Cause, Object Symbol, Object Quality.*

INTRODUCTION

Modality is interesting from the following point of view: first, unlike other word groups, modality, first of all, shows the indefiniteness of the process; secondly, this categorical concept is not limited to the description of the process, but also of the subject: Maybe it is a walf (BARS), od adjective: It seems to me be green at night (BARS), of amount: Maybe they brought fifty books (BARS) and represents the indefiniteness of others:

It should be noted that modality is present in all levels of prism and in all languages, and its typological commonality in all languages is its characteristic feature.

In the context of the languages being compared, we observe the following methods or variations of the meaning of modality:

1) Modal words; 2) modal verbs; 3) modal forms.

Main part. In terms of their compatibility with the levels of the language hierarchy, they can be modified as follows: as lexical means (modal words, modal verbs); as morphological means (synthetic and analytical forms of conditional inclination); as synthetic means (modal expressions, intonation, phraseological units, etc.).

Maybe it is right (J.Fowles, Daniel Martin, 27). You don't believe me, perhaps (F.J.Cronin, Citadel, 254). They had probably noticed all the police of the big cities and ... (T.Dreiser, Sister Carrie, 267).

Chamasi Yo'ldosh ham tashqaridan kirib ularga qo'shildi (S.Anorboev, Qissalar, 35). Ajabmas, Sirojiddin ham kirib kelsa (R.Fayziy, Hazrati inson, 230). Ehtimol bir kuni borib yarashardik (A.Muxtor, Chinor, 170 – 171). Balki Mahkam to'g'ri aytar (P.Qodirov, Uch ildiz, 140). Ularning ham gapiga quloq solish kerak ekan, shekilli (A.Muxtor, Chinor, 176). – Menga qarang aka, - dedi yigit Azimjonga qarab, - siz nima oydan tushganmisiz? Shundoq bo'lsa ham Hazrat Navoiyni bilsangiz kerak hoynahoy (A.Muxtor, Chinor, 126). Bosmachilar yana bir qancha sho'ring qurg'urlarning yostig'ini quritdi, chog'i (K.Yashin, Tor – mor, 43). Aftidan, raisning jumagacha sabri chidamadi shekilli, ertasiga yana chaqirtirdi (J.Abdullaxonov, borsa kelmas, 232).

Modal words express the speaker's assumptions, probabilities, hesitations, and beliefs about the content of the sentence.

In both English and Uzbek languages, modal words that express some ambiguity can serve as words. This can be seen in the following examples:

Didn't you like it last Sunday? "Perhaps" (J.Fowles, Daniel Martin, 398). Zora yangi xushxabar eshitsa. Ehtimol (R.Fayziy, Hazrati inson, 47).

Fan nomzodi bo'lib olardingiz shu choqqacha. Balki (J.Abdullaxonov, borsa kelmas, 198).

In English the following modal verbs express the meaning of indefiniteness: can (could), may (might), shall (should), will (would), ought.

In Uzbek: kelmoqchi, yubormoqchi va hokazo.

He can be rather a clown, actually (J.Fowles, Daniel Martin, 309). – Would you marry me? – I might (J.Fowles, Daniel Martin, 398). Po'lat xo'jaev Ettinchi polkni chiqarib yubormoqchi (SH.Xolmirzaev, Qil ko'prik, 273).

In English: once upon a time, one day, one morning;

In the Uzbek language, when there is no, one day and other modal expressions represent indefiniteness

Once upon a time an artist who had painted a small and a very beautiful picture placed it so that he could see it in the mirror (American Satire, 48).

One day the following February he was sent on an errand to a large coal company's office (T.Dreiser, Sister Carrie, 435).

Kunlardan bir kun stansiyadagi do'konga non olgani borsa, o'sha kungi bukri shilpiqni qovoqxonada ko'rib qoldi (A.Muxtor, Chinor, 318).

Bor ekanda yo`q ekan, och ekan, to`q ekan, bo`ri bakovul ekan, tulki yasovul ekan, hakka hakimchi ekan, chumchuq chaqimchi ekan, qarg`a qaqimchi ekan (Ertakdan).

Modal forms also represent indefiniteness. In English, conditional mood and expected action is expressed by simple words: be, were, know, etc., analytical forms: should come, would know, might have taken, and so on.

I should have warned you about the baggers (J.Fowles, Daniel Martin, 496).

His hands felt as if they must have something to do (T. Dreiser, Sister Carrie, 267).

O`zbek tilida esa bunday ma`noni o`qisa (biladi), kelsangiz (ko`rasiz), borsak (olamiz) va boshqa so`zlar, ya`ni “ – sa” affiksi orqali ifodalanadi:

Toshxo`janing hovlisi ichkari – tashqarili ertakda keng chorbog` yo`llar bilan boshqa hovlilarga tutashib ketgan bolalarining xonadonlari bo`lsa kerak (A.Muxtor, Chinor, 248). Necha ming yillardan beri dehqon ahli o`zining jamoa kuchini bu qadar bevosita his etmagan bo`lsa kerak (A.Muxtor, Chinor, 256 – 257).

Comparative expression of modal means schedule

Modal means	in English	in Uzbek
Modal words	+	+
Modal verbs	+	+
Modal expressions	+	+
Modal forms	+	+

Comparative modality is considered in separate works. Z.M.Saidova's dissertation is devoted to the expression of unreality in the English and Uzbek languages through forms of desire. The use of the structure of the functional-semantic field of possibility of modality, was studied in Z.M. Saidova's dissertation.

Problems of changing the methodological direction of the typological law of modality are studied in the dissertation of A. Parpiev.

CONCLUSION

Thus, in modern Uzbek and English, the meaning of indefiniteness is expressed in this way by modal means.

REFERENCES:

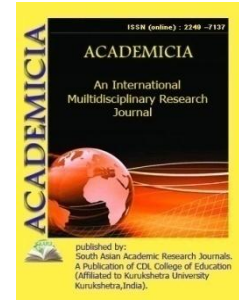
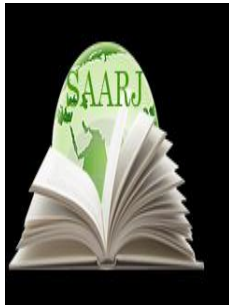
1. Rasulov, Z.I. (2011). Syntactic ellipsis as a manifestation of the economy of language): abstract of dissertation .. candidate of philological sciences / Rasulov Zubaidullo Izomovich.- Samarkand, 2011.-27 p.

https://scholar.google.com/citations?view_op=view_citation&hl=ru&user=BMFYyZIAAAAJ&citation_for_view=BMFYyZIAAAAJ:UeHWp8X0CEIC

2. Haydarov Anvar Askarovich, and Nigina Hamidovna Navruzova. "STYLISTIC FEATURES OF INTONATION." Scientific reports of Bukhara State University 5.1 (2021): 18-29. <https://uzjournals.edu.uz/buxdu/vol5/iss1/2/>

3. Gadoeva, Mavluda Ibragimovna; Umurova, Xushvaxt Hakimovna; and Vaxidova, Fotima Saidovna (2019) "The Expression Of The Meaning Of The Category Of Indefiniteness In Nouns And Pronouns In The English And Uzbek Languages.," Scientific Bulletin of Namangan State University: Vol. 1 : Iss. 10 , Article 43. Available at: <https://uzjournals.edu.uz/namdu/vol1/iss10/43>
4. Gadoyeva, M. (2021). Analysis of body part idioms in the system of non-related languages. ЦЕНТР НАУЧНЫХ ПУБЛИКАЦИЙ (buxdu. uz), 5(5).
5. Gadoyeva, M. (2021). Features of connotative meaning of somatizms as part of phraseological units. ЦЕНТР НАУЧНЫХ ПУБЛИКАЦИЙ (buxdu. uz), 5(5). http://scholar.googleusercontent.com/scholar?q=cache:ji9Fsy4oIMAJ:scholar.google.com/+Gadoyeva&hl=ru&as_sdt=0,5
6. Haydarov Anvar Askarovich, and Nigina Hamidovna Navruzova. "CONNOTATIVE MEANINGS RELATED TO SOUND CHANGES." International Journal for Innovative Engineering and Management Research. Vol 10. Issue 03. (2021.02): 340-347. <https://ijiemr.org/downloads/Volume-10/Special>
7. Bakhriddinovna, K. A. (2020). Features of the use of the periphrases of the Uzbek and English languages in journalistic texts. International Journal of Psychosocial Rehabilitation, 24(7), 8162-8168. <https://www.elibrary.ru/item.asp?id=43267947>
8. Kobilova, A., & Karimova, K. (2017). THE TOTAL PHYSICAL RESPONSE AS AN IMPORTANT TOOL IN LANGUAGE TEACHING. Интернаука, 7(11 Часть 3), 11.
9. Akramov, I. (2021). ОСОБЫЕ ЗНАКИ, СВОЙСТВА И ХАРАКТЕРИСТИКИ АФОРИЗМОВ. ЦЕНТР НАУЧНЫХ ПУБЛИКАЦИЙ (buxdu.Uz), 5(5). извлечено от http://journal.buxdu.uz/index.php/journals_buxdu/article/view/2386
10. Mastura, E. (2017). DEPICTION OF THE NATURALISM PRESENTED IN THE CALL OF THE WILD. Интернаука, (7-3), 6-9. <https://www.elibrary.ru/item.asp?id=29041086>
11. Elmanova, M. (2017). PHILOSOPHICAL ANALYSIS OF RW EMERSON'S "NATURE" AND "SELF-RELIANCE". Интернаука, 7(11 Часть 3), 9. <https://www.elibrary.ru/item.asp?id=29041087>
12. Khayrullayeva, N. (2015). COMMUNICATIVE PECULIARITIES OF PHRASEOLOGICAL UNITS IN POLITICAL DISCOURSE. Научная дискуссия: вопросы филологии, искусствоведения и культурологии, (7), 137-141. <https://elibrary.ru/item.asp?id=23760006>
13. Khaydarov, Anvar Askarovich (2020) "EXPRESSION OF CONNOTATIVE MEANING IN ONOMATOPOEIA," Scientific reports of Bukhara State University: Vol. 4 : Iss. 5 , Article 5. DOI: 10.52297/2181-1466/2020/4/5/5 <https://uzjournals.edu.uz/buxdu/vol4/iss5/5>
14. Haydarov, A. A. (2019). Methodological Features Of Imitation Words. Theoretical & Applied Science, (10), 688-690. <https://www.elibrary.ru/item.asp?id=41328966>
15. Akramov, I. (2021). ОСОБЫЕ ЗНАКИ, СВОЙСТВА И ХАРАКТЕРИСТИКИ АФОРИЗМОВ. ЦЕНТР НАУЧНЫХ ПУБЛИКАЦИЙ (buxdu.Uz), http://journal.buxdu.uz/index.php/journals_buxdu/article/view/2386

16. Usmonova, Z. H. (2017). Stiven King romanlarining badiiy xususiyati va uning o'zbek ilmiy fantastikasiga ta'siri. Міжнародний науковий журнал Інтернаука, (1 (1)), 170-172. <http://www.irbis-nbuv.gov.ua/cgi>
17. Zarina Habibovna Usmonova. (2021). The Peculiarity Of Fantastic Works (On The Example Of The Works Of Ray Bradbury, Isaac Asimov And Stephen King). European Scholar Journal, 2(4), 499-503. Retrieved from <https://scholarzest.com/index.php/esj/article/view/684>
18. Naimova, A. M. (2018). Analysis Of Nouns According To Their Types And Functions In The Novel "The Quiet American" By Graham Greene. Экономика и социум, (5), 43-45. https://scholar.google.com/citations?view_op=view_citation&hl=ru&user=8WBMXJkAAAJ&citation_for_view=8WBMXJkAAAJ:u-x6o8ySG0sC
19. Umedilloevna, S. M. UDC: 1751 Lexicographic Analysis Of The Concise Oxford Dictionary Of Literary Terms By K. Boldik And Some Uzbek Literary Dictionaries. Scientific Reports Of Bukhara State University, 115.
https://scholar.google.ru/citations?view_op=view_citation&hl=ru&user=w-pR1LIAAAAJ&citation_for_view=w-pR1LIAAAAJ:kuK5TVdYjLIC



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METHODS OF CHECKING FOR BRUCELLOSIS IN SHEEP AND PREVENTION MEASURES

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ABSTRACT

In this article, the authors present the results of research work on the epizootological method for the diagnosis of brucellosis diseases. Static studies have been carried out to infect the population with brucellosis pathogens. Analysis of diseases in soil and plants used as animal feed. The conclusion consisting of the event is given.

KEYWORDS: Pathogen, Source Of Disease, Epizootiology, Diagnosis, Serological Studies, Epidymitis, Orchitis, Vaginitis, Bursitis, Inflammation, Disinfection.

INTRODUCTION

Importance of the topic. In this article, information on methods of Disease Control, prevention measures, occurrence of brucellosis pathogen in species, infectious diseases, advantages of serological methods of Investigation, Measures for the improvement of unhealthy Farms is given.

Sampling location for the study: In Khujaabad District of Payariq district, the population received blood from sheep number 20 and blood samples were placed in special sterilized probirks and sent to serology laboratory.

The location of the research. Samarkand region Payariq District State Center for the diagnosis of animal diseases and safety of food products, serology laboratory.

Laboratory diagnostics of disease serological, bacteriological, allergic and polymerase-chain reaction (PCR) tests are used.

Thrown into the laboratory are sent to the fetus, its veil, placenta or umbilical cord, slices from the liver, spleen, testicles, lymph nodes, milk. They are quickly sent to the laboratory without being consulted by a ticket letter. If there is no possibility to send the pathological material on the same day, it is required to conserve them (except for the fetus) on 40% li glycerin.

Serological research. Serological examination is based on the search for antibiotics from the composition of the blood serum with the help of a certain antigen.

AR - agglutination reaction for this purpose this method is for sheep, 1- test tube is injected 0.04 ml of blood serum, 2- test tube 0.02ml of blood serum is injected 1:20 from a special antigen is injected into a special probe 1ml and rinsed in tripod and put on 37c0-38c0 into the thermostat for 20 hours, after removal from the thermostat + + if the positive result and the liquid at the bottom of the test tube is in the tip-clear position, then the Against at the bottom will appear in the curving position. If the result is negative, then there will be no changes in the testicle.

Roz—Bengal reaction. 0.015 ml of blood serum of sheep on top, 0.015 ml of antigen is poured, 4 minutes are rotated in the converter, if there is a positive result, then Red small-large grains are added to each other, if there is a negative result, then there will be no changes in the plate recess.

As a result of the examination, 20 blood samples were examined in sheep and the result in AR and RBP was observed in a negative state and disease pathogens were not found.

Sheep owners were given specific information on brucellosis with notes and skills.

Prevention of the disease and fight against it. To prevent the disease, it is mandatory to carry out the following work on farms:

- * to ensure that animals from other farms are not included in the farm without the permission of a veterinarian specialist, as well as transfer animals from one place to another in the farm;
- animals brought to the farm are taken for 30 days of preventative quarantine and they are serologically checked;
- do not include animals belonging to the farm and the population, even with other animals in the slope, in the place of general irrigation.

For the vaccination of sheep and goats against the disease, a vaccine made of the Rev-1 strain is used. Vaccine Br. it is made from a weak virulent strain of melitensis. With it, 4-month-old and older female sheep are vaccinated 2 months before their abduction. Vaccination thawed before use in a special solution or in a sterilized physiologic solution. After 30 minutes, 2 ml is sent under the skin. After 3 weeks, the immune system appears. This vaccine can also be used against epididymitis of Rams.

In case of detection of disease in the farm, by the decision of the governor on the basis of the act of the chief veterinarian of the district (city), this area is declared unhealthy on brucellosis and quarantine is installed in it.

In accordance with the required rules of quarantine, the following are prohibited:

- introduction of all species of animals, except for bulls;

* Separation, grouping of herds, flock groups without the permission of the veterinarian serving in the farm;

- in the farm, the organization of an insulator for long storage, temporary storage of sick animals;

For disinfection recommended 5% li active chlorine lime, 2-3% li corrosive sodium solution, 2% li formaldehyde. Gong neutralized by biotermic method.

Healthy development of an unhealthy farm. If brucellosis disease is noted, then immediately a quarantine is declared on the farm. The recovery of the farm is confirmed by drawing up a calendar work plan. Recovery is carried out using a vaccine or without a vaccine with the permission of the Department of Veterinary and Livestock Development.

In accordance with the requirements of quarantine, the following are prohibited:

Bringing and releasing animals from outside.

Division of sheep into groups without the permission of the veterinarian.

Milk withdrawal, nursery kindergarten, distribute it to schools, sell it on the market. Such milk must be pasteurized for 70 minutes at 30° C in the farm, milk from the unhealthy farm must be taken in special containers.

In dairy plants is a reference book in which the epizootological status of farms of the district chief veterinary physician is described.

After two months of storage, the poppy, which is surrounded by an unhealthy farm territory, is allowed to use.

Sheep can not be milked, it is forbidden to take a bag of the embryo, it is not allowed to prepare a rennet.

For disinfection, it is recommended to use chlorinated lime with 2% active chlorine, alkali solution with 2%, chlorinated lime with 20%, formaldehyde with 2%, etc. Gong neutralized by biotermic method.

There is a special method of recovery, in which a vaccine is not used. Healthy sheep are examined every 15-35 days by AR Rozbengal probe reactions. Serological examination is continued until a double negative result is obtained on the four groups. After obtaining a negative result, the sheep are put under veterinary control for 6 months. During this period, every 3 months, a serological examination is performed by the above method. If the result is negative, the farm is considered healthy.

Among agricultural animals, if the disease of brucellosis is caused, the following activities are carried out to save people from this disease:

Serving in sheep is allowed only to people who have been vaccinated against brucellosis. All employees of the farm are provided with special clothes. It is necessary to ensure that there are hand washers, towels, soap, medicine cans in each livestock building. Livestock workers must undergo a special medical examination.

CONCLUSION

1. Currently, with brucellosis, pets, wild animals, rodents, are infected with the disease. Therefore, as a result of conducting serological examinations of agricultural animals for the prophylactic purpose every three months in order to protect all animals from the disease, we will also preserve the health of animals and humans by timely identifying the disease and making the right diagnosis to it.
2. Through timely detection of brucellosis, correct diagnosis on it, separation of animals, through which we maintain economic efficiency.
3. By putting research on brucellosis, we protect the health of animals and humans by identifying the causative agent of the disease, conducting quarantine activities.
4. In the case of prevention of brucellosis it is necessary to conduct epizootic activities on time every 2 months, by conducting clinical examinations of Animals, sending pathological samples to laboratories and making the correct diagnosis, which is determined by special reactions.

USED LITERATURES:

1. Parmanov M.P. and others. Epizootology. Tashkent. 2006.
2. Parmanov M.P. and others. Epizootology. Tashkent. 2007.
3. Parmonov M.P. and Farmonov N.O. Private epizootolia textbook. Samarkand .2010.
4. Epizootology. book. X.S.Salimov, A.A.Kambarov. Tashkent 2016.
5. 5.Internet data.
6. www.ziyo.net.uz



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AN ANALYSIS OF CHATBOT DESIGN TECHNIQUES

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ABSTRACT

Conversational systems as a medium of communication between humans and computers have made significant progress recently. This interplay between humans and computers has paved the way for massive natural language processing methods. A chatbot is a computer program that enables people to communicate with computers using natural language. Chatbots are extensively utilized in a variety of fields, including business, education, healthcare, and many more. Chatbot design and development entails a wide range of methods. As a result, we provide an overview of the methods used to build Chatbots in this article. A few examples of chatbot design are also covered in order to provide a better knowledge of how chatbots operate and what kind of methods are available for developing chatbots. With the fast advancement of chatbot technology, it is anticipated that it would be able to supplement human limitations and increase productivity.

KEYWORDS: Artificial Intelligence, Chatbots, Natural Language Processing, Robot, Technology.

1. INTRODUCTION

In general, a bot is a computer system that can execute automated tasks. Bots may also be used in chat platforms and are referred to as Chatbots. Chatbots are identical to regular messaging apps, with the exception that one of the message recipients is a robot. To put it another way, the scenario is similar to when a person is talking with a robot (computer). Voice commands, test conversations, graphical interfaces, and graphical widgets may all be used to deliver the discussion message[1]. Chatbots are a popular technology these days, and they can help humans with a variety of tasks. There are many benefits to utilizing Chatbots, including the ability to aid human inquiry and provide feedback 24 hours a day, as well as the ability to increase efficiency by taking over activities for which people are not required. The capacity to reach a large audience via a messaging system and the ability to automate customized messages are the two

main benefits of Chatbots. Chatbots have been employed in a variety of sectors to provide information or execute activities such as forecasting the weather, making airline bookings, answering educational-related questions, and completing purchases. Telegram, Cortana, Slack, WeChat, Facebook Messenger, Google Assistant, and Siri are just a few of the popular apps that utilize these technologies[2].

In terms of Chatbots system development, many distinct design approaches are used to establish a medium of voice communication between a person and a machine. According to pattern matching, clever script, chat script, Artificial Intelligence Markup Linguistic (AIML), and language trickery are some of the most common design approaches used by developers. The most common method, however, is pattern matching, in which the bot matches sentences to terms in a pre-defined vocabulary. As a result, the purpose of this article is to examine several kinds of Chatbot design. In this article, there are additional examples of Chatbots systems. At the conclusion, the results are reviewed and conclusions are made[3].

Chatbots are intelligent systems that use artificial intelligence (AI) and natural language processing (NLP) techniques to communicate with users. It effectively interacts with people and responds to their questions. Organizations, government associations, and non-profit organizations are the most common users of dialogue/conversation operators. They are often communicated by financial institutions, such as banks and credit card companies, as well as organizations such as online retail outlets and new enterprises. These conversational experts are used in a wide range of businesses, from tiny start-ups to large partnerships. There are many code-based and interface-based chatbot development solutions on the market. However, they lack the flexibility and agility needed to develop genuine conversations. "Amazon's Alexa, Microsoft's Cortana, and Google's Google Assistant" are among the most popular intelligent personal assistants. These experts' components are limited. Currently, chatbots are built using rule-based methods, basic machine learning algorithms, or retrieval-based techniques, however they do not provide satisfactory results. This article offers a critical examination of chatbots, with current methods thoroughly examined and debated.

1.1 Background:

1.1.1 Chatbot System:

Chatbots, often known as Chatterbots or Chatter Robots, are computer systems that can interact with humans through messaging apps. They are capable of comprehending various questions posed by humans. They can also detect the difference between words with various meanings, such as emoticons. They must have a broad vocabulary of discussion among individuals in order to obtain the highest quality of Chatbots interaction[4]. Chatbots may seem to be ordinary chat apps, but they also include an application layer, a database, and APIs (Application Programming Interfaces) running in the background. The user interface is the interface that allows for simple communication with the user. While Chatbot is simple to use, it is difficult to accomplish in the background. The majority of chatbots save conversation logs, which are used by developers to better comprehend user demands. The logs are then utilized to enhance the discussion with the Chatbot. With the assistance of machine learning, the chatbot matches the query from the user. For example, if the user asks, "Show me the university program list" or "I need the program list," both imply the same thing. By providing the identical result, the developer may teach the Chatbot to comprehend both queries. The Chatbot is being taught, according to by analysing

hundreds of records from human conversations. The program will get more intelligent as more logs are added.

1.1.2 The Use of Chatbots:

The chatbot system is extensively utilized in a variety of fields. Chatbots are utilized in the education, healthcare, and business sectors, especially for marketing purposes, because to their versatility. For example, Facebook (Facebook Messenger), Google (Google Assistance), Apple (Siri), and Microsoft have all integrated Chatbots into their system environments (Cortana). Facebook, for example, has developed Facebook Messenger with the help of the Chatbot system. The Chatbot may help the business by acting as an automated client responder.

Aside from that, the chatbot system is also utilized in the area of education. According to a chatbot may serve as an intelligent teacher for online students. The Chatbot has the capacity to analyze natural language, which contributes to dialogue accuracy. When the discussion flow is correct, Chatbot becomes a useful educational tool. Chatbot, for example, may simultaneously answer problems and provide assistance to 100 students on an individual basis. In the healthcare sector, Chatbot are utilized to help healthcare professionals in providing assistance to patients through computer and application media. For example, the AI-Chatbot [9] acts as a conversational assistant to help people stick to health-promoting behaviours over time. In this instance, the bot acts as a bi-directional conduit between the healthcare professional and the user, advising the user on good eating habits, physical activity, food preparation, and buying to prevent the user from gaining weight.

However, recent study indicates that chatbot systems are widely used in industry, particularly for marketing purposes. Collect. Chat, for example, is an interactive chatbot designed to collect consumer data on a company's website. This chatbot may be used to gather information about product orders, surveys, client inquiries, registration, and reservations, among other things.

1.2 Review of chatbots design:

1.2.1 Chat.io:

This Chatbot technology aids companies in communicating with customers via various services in one system. It may also be linked to Facebook Messenger, allowing administrators to communicate with Facebook users. The Chatbot has a modular architecture that allows it to be connected with a website, app, native mobile app, or web-based application. The Chatbot was created using an artificial intelligence technology, which allows it to anticipate text suggestions and then give intelligent responses based on the conversation history.

1.2.2 Collect. chat:

This chatbot is used to provide marketing services. Collect. chat is a chatbot system in which the operations are focused on widget interactions with user inquiries rather than artificial intelligence. One of the benefits of utilizing a Chatbot is that it may convert a visitor into a client and engage them in a discussion without requiring them to fill out many forms. It made advantage of widget interactivity, in which visitors choose one of their goals by clicking on one of the many choices.

1.2.3 Cleverbot :

Cleverbot is an online chatbot that is similar to the one seen above. Cleverbot is a Cleverbot, an artificially intelligent chatbot. Rollo Carpenter, a British AI scientist, created it in 1997 as a chatterbot online application. Cleverbot's responses aren't hard-coded in any way. Instead, it learns from human input gathered throughout the discussion. When a user enters text, the system searches for all instances of that same phrase that match the input. It reacts to user input by determining how the user reacted to that input. This Cleverbot is also accessible on the Android and iOS platforms for mobile devices.

Cleverbot, in essence, responds to human questions by learning from past human replies. The user will enter their inquiry into the text field, and the system will search for any keywords or precise phrases that fit the query. Cleverbot will react to human after searching through its stored dialogues to see how human has previously responded to that input. Cleverbot has been updated to utilize GPU (Graphics Processing Unit) serving methods. A graphics processing unit (GPU) is a specialized electrical circuit designed to operate and change memory quickly in order to generate pictures and frame buffers for display. The portion of the engine that powers Cleverbot, as well as its API, is now accessible in the market for all developers.

1.3 Chatbots Design Techniques:

1.3.1 AIML

It is a fundamental method for utilizing markup language developed by Dr. Richard S. Wallace, which is widely utilized by developers. The primary goal of the AIML language is to convert conversational modeling into a stimulus response mechanism. This method is also known as frequent tagging. Because AIML does not require professional knowledge of a particular programming language, it greatly simplifies the creation of chatbots.

1.3.2 Pattern matching:

It is a method that many chatbots use. Essentially, this method used a matching pattern to produce suitable responses to user queries based on matching categories such as basic statements, natural language, or semantic meaning of the questions. Model of personal history, prefabricated answers, no logical conclusion, typing mistakes, and exciting key strokes are four common linguistic tactics. This approach in Chatbots utilized sentences, phrases, or paragraphs to provide diversity to the knowledge base, making it more believable.

1.3.3 Chatscript:

It is an authoring script, similar to cleverscript that helps developers create chatbots. When there are no matches in AIML, this method is employed. The focus of this approach is on providing the optimal syntax for constructing a reasonable default response[5].

1.3.4 Parsing:

It is a method of analyzing text or a string of symbols using either natural language or computer language. In addition, parsing is a method used in computational linguistics to break down a phrase or another collection of strings into its constituent components, which may include semantic or other information. This method made advantage of Phyton NLTK's NLP capabilities, such as trees.

1.3.5 SQL and relational databases:

These are a relatively new approach in chatbots for ensuring that bots remember past interactions. The SQL-based chatbot method was utilized to improve the capabilities of the chatbot's keyword and pattern matching by offering more storage options and increasing process speed[6].

1.3.6 Markov Chain:

This is a method for creating answers that are more relevant and, as a result, better. This method works by calculating the probability of letters or words appearing in a textual data collection.

1.4 How Chatbots Works:

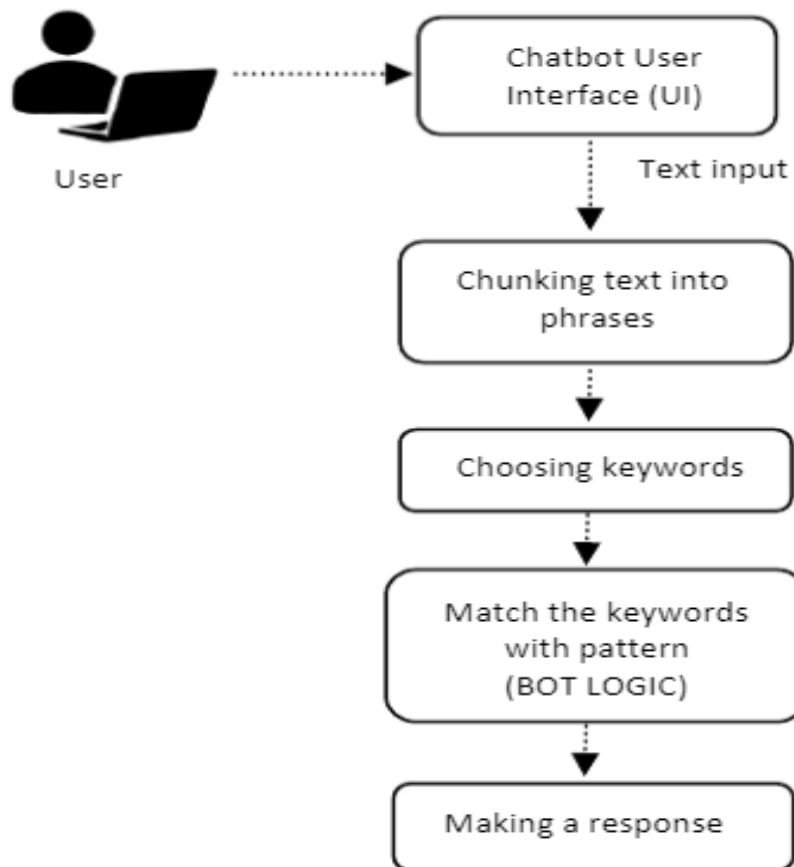


Figure 1: representation of several processes included in functioning of chatbot.

Figure 1 represents several processes included in functioning of chatbot. To begin, the user needs have access to a computer in order to utilize the chatbot user interface (UI). On the chatbot's UI, a text console will emerge, allowing users to enter text into the console. Second, the text supplied by the user in the form of a phrase will be chunked. The practice of dividing text into distinct words for tagging is referred to as chunking. The chunking procedure produces a number of significant phrases that will be utilized in the matching process later on. In the matching process, these sentences will serve as keywords. Finally, the chunking process' keywords are matched with the chatbot system's pattern. BOT LOGIC refers to the process of matching keywords to

patterns. The chatbot system's output is the programmed answer, which may be any other text or a template online form.

2. LITERATURE REVIEW

Dahiya M. presented review of chatbot in which he discussed how nowadays, chatbots are quite popular and gaining popularity as a computer communication tool. Some programs are clever enough to react in a human-like manner. A Chatbot is a kind of software like this. The design and construction of a Chatbot system are the topics of this article. We'll also look at another scenario in which Chatbots may be helpful, as well as the methods utilized to create one[7]. Atwell E et al. discussed Trials and outputs of ALICE chatbot in which they discussed how a chatbot is a conversational agent that uses natural language to communicate with users. There are many chatbots accessible to service in various areas. Chatbots, on the other hand, have a manually-coded knowledge base in their brains. This article gives an introduction of the ALICE chatbot, its AIML format, and our experiences using a corpus method to create various ALICE prototypes automatically. Along with detailing the various corpora we utilized, a description of created software that transforms readable text (corpus) into AIML format is provided. Our tests showed that viable prototypes may be created without the use of advanced natural language processing or sophisticated machine learning methods. These prototypes were used as aids for learning new languages, visualizing corpora, and answering queries[8].

Marimuthu K et al. discussed Comparative study of cloud platforms to develop a chatbot in which they discussed how There were bots before there were chatbots: The development of a chatbot ushered in a new age of technology: the conversation service era. A chatbot is a virtual person that, with the aid of interactive textual conversion skills, can successfully communicate with any human being. There are many cloud-based platforms available today for developing and deploying chatbots, including Microsoft bot framework, IBM Watson, Kore, AWS lambda, Microsoft Azure bot service, Chatfuel, Heroku, and many others, but each technique has its own set of drawbacks, such as built-in AI, NLP, conversion service, programming, and so on. This study compares all cloud-based chatbot systems, taking into account factors such as built-in AI, setup time, completion time, complexity, and so on. Finally, the comparison will reveal which cloud platform is the most efficient and appropriate for creating chatbots[9].

Miner a et al. discussed Psychological, relational, and emotional effects of self-disclosure after conversations with a chatbot in which they discussed how Abstract Giving another individual personal knowledge has positive emotional, relational, and psychological consequences. When people think they're talking with a machine rather than a person, such as a chatbot that can mimic human-to-human interaction, the results may be harmed, improved, or equal. In discussions with a fictitious chatbot or human, we looked at the downstream consequences of emotional vs factual disclosures. Whether participants believed they were revealing to a chatbot or a human, the consequences of emotional disclosure were the same. This research adds to our knowledge of disclosure and how technology affects it, bolstering the case for media equivalency as a key mechanism for the repercussions of revealing to a chatbots[10].

3. DISCUSSION

A chatbot is a dialog-exchanging system that generates a meaningful and empathic dialogue between a person and a machine by processing natural language input, which may be in the form of voice or text, and responding in the same language and expression as the human. These inputs

of speech from users may be analysed and intelligent answers from such system engines can be obtained to build up a human-like interaction utilizing various Natural Language Processing (NLP) methods using the python library, Natural Language Tool Kit (NLTK). The chatbot utilizes a fantastic algorithm to mimic a genuine human while having a restricted vocabulary. The chatbot can help you discover an entertaining companion and assist you in times of need. If a user asks a question to the chatbot, it will respond with a recommendation based on that query. The responses are relevant to the user's questions; nevertheless, if the user finds his answer to be incorrect, it will display a default message and alert the administrator. The method employed here has sophisticated reasoning built in and is intended to improve user interaction. This paper discusses several aspects of chatbots.

4. CONCLUSION

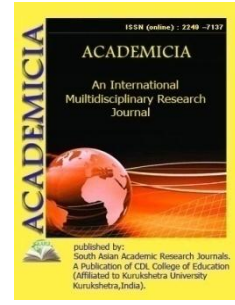
The majority of individuals are drawn to human-like systems. Many users are unaware that Chatbots may provide feedback in the form of text and voice commands, but that they can also provide interactive information via graphical interaction or graphical widgets. The primary advantage of utilizing chatbots is that they may reach a large audience even from a far distance using just messaging applications. Aside from that, these automated human-computer conversational platforms are beneficial in that they offer efficient service in a variety of fields, allowing humans to be served in a variety of ways. The reviews in this article have addressed a number of publications that have focused on chatbot design. Initially, we discussed the chatbot system and its applications in a variety of areas, including education, healthcare, and business.

Following that, we explain how certain chatbots are designed in today's market. The evaluation is based on the design effort, features, user interaction, and user interface. Finally, we demonstrate how the chatbot system works in general by presenting the chatbot system operations. Chatbots are a novel way to automate the delivery of personalized messages to users. If chatbots are properly developed and deployed, they may be used to increase user engagement and offer a positive user experience between humans and the field they serve. Designing and deploying chatbots, on the other hand, is not as simple as it may seem. Chatbot technology is rapidly evolving, with many enhancements and new functionality being introduced on a regular basis. The creation of chatbots should be meticulously planned, and selecting the right platform tools is critical since it may improve the chatbots' efficacy and efficiency.

REFERENCES:

1. B. Zarouali, E. Van Den Broeck, M. Walrave, and K. Poels, "Predicting Consumer Responses to a Chatbot on Facebook," *Cyberpsychology, Behav. Soc. Netw.*, 2018, doi: 10.1089/cyber.2017.0518.
2. S. Reshmi and K. Balakrishnan, "Implementation of an inquisitive chatbot for database supported knowledge bases," *Sadhana - Acad. Proc. Eng. Sci.*, 2016, doi: 10.1007/s12046-016-0544-1.
3. J. Cahn, "Chatbot: architecture, design & development," *Sci. Rep.*, 2017.
4. D. Peras, "Chatbot evaluation metrics," *Econ. Soc. Dev. B. Proc.*, 2018.
5. R. H. Amir-reza Asadi, "Design and implementation of a chatbot for e-commerce," *Information Communication Technology and* 2018.

6. D. Peras, "Chatbot Evaluation Metrics: Review Paper," *Build. Resilient Soc.*, 2018.
7. M. Dahiya, "A Tool of Conversation: Chatbot," *Int. J. Comput. Sci. Engenieering*, 2017.
8. B. A. Shawar and E. Atwell, "ALICE chatbot: Trials and outputs," *Comput. y Sist.*, 2015, doi: 10.13053/CyS-19-4-2326.
9. A. Patil, K. Marimuthu, A. Nagaraja Rao, and R. Niranchana, "Comparative study of cloud platforms to develop a chatbot," *Int. J. Eng. Technol.*, 2017, doi: 10.14419/ijet.v6i3.7628.
10. A. Ho, J. Hancock, and A. S. Miner, "Psychological, relational, and emotional effects of self-disclosure after conversations with a chatbot," *J. Commun.*, 2018, doi: 10.1093/joc/jqy026.



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AN ANALYSIS OF EMBEDDED SYSTEM DESIGN ASPECTS

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ABSTRACT

The use of embedded systems has increased at an exponential rate in virtually every area, from cars to household appliances to ICT (Information Communication Technology). Embedded systems and embedded computer processors have received a lot of attention in recent years, even in desktop application environments. The inherent advantages of embedded systems over conventional desktop computers, as well as the rapid growth in the computing capacity of embedded processors, are driving this trend. Rural application platforms are designed to run applications that are needed to provide various e-services and self-help services in rural regions. In terms of power outages, irregular grid power circumstances, high temperature ranges, changing humidity, dusty atmosphere, and so on, the eco system existing in rural regions, particularly in developing nations, is mainly difficult. Although embedded systems have many benefits, they can have significant drawbacks, especially in the context of application platforms. We explore and evaluate many elements and difficulties related to the design of embedded systems for rural application platforms in this article. We also talk about how to deal with the difficulties that come with designing an embedded system for a rural application platform.

KEYWORDS: Application Platform Embedded System, Hardware, Network, Software.

1. INTRODUCTION

In virtually all aspects of ICT (Information Communication Technology), there has been extraordinary development and growth in the past few of decades. Many public and commercial organizations have launched e-services projects throughout the globe, and many of them have been successful. After a closer examination, it becomes clear that the bulk of these effective efforts are limited to metropolitan regions, with success rates in rural areas being much lower. This is due to a variety of technological and commercial constraints. Designing an effective

application platform that is appropriate for the rural eco-system is one of the main technological difficulties to overcome for a successful e-service project. A relevantly optimized embedded system may be developed to meet the needs of rural application platforms[1].

1.1 Embedded system:

An incorporated system is a computer-hardware system with software embedded as one of its most significant components. It's a computer-based system devoted to a certain application or product. It may be a stand-alone system or a component of a bigger system. It does not need secondary memory like a computer since its software is typically stored in ROM (Read Only Memory). Embedded systems are categorized depending on their complexity, functions, and other factors. Small scale (or low end) embedded systems, medium size embedded systems, and high end embedded systems are the three main categories of embedded systems. Small scale systems are built around a single 8- or 16-bit microcontroller, with simpler hardware and software, internal memory (both ROM and RAM), and no operating system. They run on a single thread. These are usually low-power, and some are even battery-powered. A single or a few 16- or 32-bit microcontrollers, DSPs, or microprocessors are often used in medium-scale embedded systems. These are complicated in terms of both hardware and software. The majority of them feature some kind of external memory. High-end embedded systems contain a lot of hardware and software complexity, thus they may require a cluster of processors or customizable processors and programmable logic arrays.

These are used for complicated applications that need co-designing and integrating hardware and software in the final system. These high-end computers will feature several Megabytes of external high-speed RAM (such as DDRs) and solid-state storage memory. To achieve better speed performance, some functionalities such as cryptographic algorithms, graphic processing algorithms, video decoders, discrete cosine transformation and inverse transformation algorithms, network protocols, and network drivers functions are implemented in hardware (via specialized co-processing units). These run a full-fledged operating system (in certain instances, Real Time OS) and, in many situations, can link to high-end display subsystems. As applications become increasingly computationally complex and sophisticated, there has been a lot of emphasis and research interest in this type of embedded system in recent years[2].

1.2 Application platform:

An application platform, by definition, offers services to apps. The application platform makes accessible everything needed to run/execute a program effectively. This usually comprises hardware, device drives, and operating systems, among other things. The services provided by the application platform vary depending on the application. Display support, network connection, graphic and video capabilities are all required by certain applications, such as e-services. The appropriateness of an application platform for a particular collection of apps in a certain eco system or deployment scenario is also critical to a system's success. Because an application platform has so many characteristics and so many competing needs, optimization is a big problem[3].

1.3 Requirement specifications of rural application platform:

There are a number of criteria that a system must meet in order to be used as a rural application platform. The rural eco system scenarios are very demanding, which makes the application

platform requirements highly stiff and, in many instances, contradictory. If we attempt to improve one parameter, it's possible that other values may drift out of the optimum range. As a result, in order to optimize the system as a whole, all of the parameters must be balanced in such a manner that overall system peak performance may be reached. This scenario may be accomplished by weighting and balancing the parameters properly; however, this does not necessarily imply that all of the individual parameters are at their optimal levels when examined separately. Table 1 lists the general criteria that the application platform must meet. In order to meet the overall system performance, all of these criteria are stated in broad terms. When needs are stated at a greater level of granularity, there are more scenarios that conflict, and overall performance goals suffer. Computing power is often stated in terms of MIPS (Million Instructions Per Second) or MFLOPS (Million Floating Point Operations Per Second), however these low-level metrics do not guarantee that the necessary functional requirements are fulfilled.

This is because the embedded system in question may include a SoC (System on Chip) and other components with specialized video decoding engines and Ethernet MAC engines. Even if the CPU row horse power is low, this would be able to play YouTube videos in such situations. On the other hand, if the embedded system does not have specialized video decoding and Ethernet MAC engines, a higher CPU MIPS will not sufficient, and the high-level functional requirements will not be fulfilled. Some of the criteria listed in Table 1 are incompatible with others. Higher processing capacity, for example, is directly related to electricity consumption. CPUs with high computational power use more energy than CPUs with lower computational power (Pentium4 is around 60W vs Atom D510 is around 13 W)[4]. Point 8 (Software compatibility / Porting effort) in table 1 clashes with 4,5. Point 8 is readily satisfied by x86 architecture based CPUs (usually desktops), however points 4,5 are not. 1&8 are satisfied by an Atom D510 system, however some of the other criteria are not.

1.4 Evolution of embedded system from past to the present:

Even if there are an unlimited number of embedded systems, the principles of functioning of system components and design methods are basically the same in all of them.

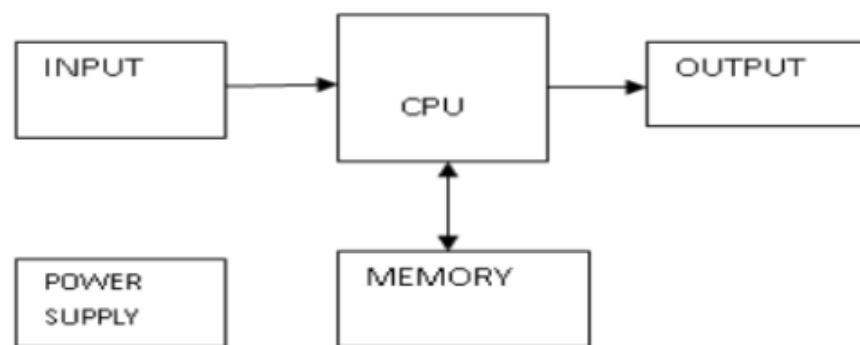


Figure 1: Representation of Generic Block Diagram of Embedded System.

Figure 1 represents generic block diagram of embedded system. Every embedded system, for example, includes a CPU and software that runs on the processor [2]. A microcontroller or a microprocessor may be used as the processor. Additionally, in order to have software, there must be a location to store the executable code as well as temporary storage for run-time data manipulations, which will be in the form of ROM and RAM, respectively. Small memory may

be housed on the same chip as the CPU in certain cases. Such configurations are common in microcontrollers. If this is not the case, one or both kinds of memory will be stored on external memory chips. Additionally, all embedded systems have some kind of inputs and outputs. Sensors and probes, communication signals, and control knobs and buttons are common inputs to the system. Displays, communication signals, and changes to the physical environment are all examples of outputs[5].

1.4.1. Evolution:

Embedded systems are made up of a CPU (which may be a microprocessor, microcontroller, DSP, or a mix of these), memory, and input/output subsystems. Every component of the embedded system has undergone a massive update. The Apollo Guidance Computer, developed by Charles Stark Draper at the MIT Instrumentation Laboratory in 1966, was one of the earliest widely acknowledged embedded systems. The Intel 4004 microprocessor was the first to be utilized in calculators. There has been a lot of change since then[6].

1.5 Design challenges:

Higher processing capacity is almost always inversely related to increased energy usage. High-performance computational CPUs use more electricity than low-performance computational CPUs. The Pentium 4 consumes approximately 60 watts and provides 9700 MIPS. The Atom D510 consumes approximately 13 W and provides 8400 MIPS, whereas the ARM Cortex A8 consumes less than a watt and provides 2000 MIPS. Desktop computers aren't built to withstand the elements mechanically or electrically. It has moving components in the hard drive and upgradeable RAM slots, among other things. Such components and designs are unacceptable in an embedded system. RAM slots are given in desktop computers in order to enable future memory upgrades, however this cannot be done in an embedded system since placing the RAM in slots is not a mechanically robust configuration and therefore lowers the mechanical strength of the system. As a result, the memory needs of an embedded system must be determined ahead of time, as field upgrades are not feasible. There is almost no realistic system that meets all of the criteria in their entirety. As a result, it is critical that the parameters/requirements be properly weighted. The importance of each metric is determined by the application and product/project contexts. Power consumption may not be as important as cost or program compatibility in certain situations. As a result, no set weighting factors exist, and they are context-dependent. The difficulty is in correctly balancing the factors and making engineering compromises as a result[7].

1.6 Dependency on eco system:

Building a sophisticated embedded system, especially for a rural application, is a difficult job in terms of both hardware and software architecture. The main design challenge here is to create an incredibly powerful system (in terms of functionality offered by the system to make it easy to use for rural people) with very low power consumption (less than 10 watts), minimal NRE cost, and while fulfilling all of the criteria stated in Table 1. In reality, in every embedded system, both the hardware and software must be co-designed. The main variables that influence the SoC selection are the total system cost, power consumption, performance, size, component availability, adaptability, software tools, and time-to-market, among others. Eco-system support, as well as SoC vendor support for both hardware and software components, are also essential for building a highly efficient system and play a critical part in the system design and development life cycle.

One of the most essential elements in designing a successful rural application platform that meets the difficult and, at times, contradictory criteria is environmental support. The following sections address the eco system's contribution to the design of an embedded system for a rural application platform[8]:

- *Dependency on eco system for Hardware design aspects:*

Various embedded system components, such as the processor or microcontroller, memory (ROM and RAM), and hardware and software interfaces (or environment peripherals), are key aspects that influence the overall design approach. In the embedded sector, the current tendency is for processors to evolve toward fully featured system on chips (SoC) that may be customized for a particular application situation. These SoCs are tailored to particular needs in order to create complicated systems with the necessary interface components. The design of an embedded system based on these SoCs requires extensive assistance from the eco system, most notably from the SoC vendor. The peripherals that are compatible with these SoCs are critical to the design's success. The vendor must supply all hardware interface information, routing instructions for high-speed important signals, packaging specifications, and assembly directions in sufficient detail. Because modern SoCs have such a high degree of integration, these principles are critical in ensuring the design of a fault-free system. Additionally, the PCB design tools needed to support SoCs are critical and play a key part in the entire hardware design cycle for an embedded system. It is necessary to confirm the availability of hardware interfaces that are particularly needed for an application platform[9].

- *Dependency on eco system for OS/Device Drivers/ BSP:*

Embedded system components affect and define how embedded software or firmware is planned and developed, regardless of whether the system is CPU or SOC based [6-8]. One essential feature of the Kernel in an embedded system environment is that it handles the board's startup and setup, memory and I/O resource management, and required drivers for both on-board hardware devices and external peripherals. For the whole embedded system, the Root File-system supplies all of the necessary run-time user-space as well as kernel-space libraries, system binaries, start-up scripts (including DDR initialization), and feature-specific configuration files. Most silicon manufacturers offer board support packages (BSPs) for their SoCs, which include boot-loaders, kernels, and rootfs. In an embedded system, these BSPs must be modified and ported in accordance with their unique hardware design in order to satisfy their specific needs. The Linux kernel, an open source operating system, supports the majority of processor architectures (x86, PowerPC, MIPS, ARM, SPARC, SuperH, and others) used in the industry for a variety of applications, with the ARM architecture having a large presence in the embedded sector. For improved system performance while using less power, Linux kernel sources provide architecture-independent, highly optimized device drivers, resource, and power management modules. Reusing the aforementioned software components is very helpful for building an optimized system since Linux offers eco system support. Only the architectural and board-specific codes must be changed to meet their design requirements. Proprietary drivers must be incorporated into the firmware; proprietary vendor support is essential and, in most instances, supplied by the vendor[10].

1.7 Approaches towards meeting the design challenges:

There are many obstacles to overcome while designing a rural application platform. There are a variety of ways to addressing the issues, however most of the time an engineering compromise is needed. The computer module (microprocessor/SoC) must be carefully chosen. By architectural design, RISC-based SoC/microprocessors are power efficient. The architecture choices are ARM and PowerPC, with ARM being the most popular in terms of penetration and eco system compatibility. The availability of necessary built-in interfaces also influences the computer module selection. Display interfaces are required for the rural application platform. As a result, SoCs with built-in display interfaces (VGA/HDMI) are an obvious option. The processing capacity of the microprocessor/SoC, on the other hand, must be adequately validated. The processing power of the row CPU in terms of MIPS/MFLOPS is not necessarily a reliable indication of performance and does not guarantee that the performance criteria will be met. The built-in hardware modules (for example, video decoders) have a significant influence in the overall performance. As a result, while choosing a microprocessor/SoC, the presence of built-in hardware engines/co-processing modules must be checked against the necessary capabilities.

It's also crucial to make sure that the necessary driver support for such co-processing modules is accessible and simple to incorporate. The memory section's design is similarly important. Because speedier RAMs (SRAM) are more expensive and power demanding, their use in designs must be restricted. For optimal performance and power consumption, low power DDR is an excellent option. The design of the power section has a significant impact on the system's total power efficiency. The use of more efficient regulators increases the system's overall power efficiency. Systems that allow sleep modes/power saving modes provide benefits in terms of power usage, however system reaction times must be checked and guaranteed to be within the necessary requirements in such designs. In an embedded system, there are also design difficulties with operating systems. In terms of the capabilities it offers and the architectures it supports, the Linux kernel has progressed considerably.

Despite the fact that Linux is monolithic in terms of architecture, all drivers may be dynamically loaded. The program sources are portable between platforms thanks to its system call interface (kernel-to-user space API). As a result, in order to use the linux kernel in any embedded system design, the kernel must be heavily customized in terms of the functionality it offers in order to eliminate resources for superfluous processes that may slow down the system. Kernel must be trimmed/customized by adjusting the whole Software interface and its modules both within and outside the SoC while keeping the HW design in mind. The necessary driver or resource management modules inside the kernel must be replaced with proprietary modules or open-source modules must be adapted for the target SoC and capabilities, according to the HW design requirements.

All modules, such as interrupt handlers, GPIO, and board-specific initialization sources for busses and peripheral interfaces like USB, I2C, SPI, and device drivers, must be modified, which presents a major barrier in effective driver and low-level software porting. The efficiency of these modules has a significant impact on the overall performance of the embedded system. There are architecture-dependent memory management and CPU-related codes; these are critical components that determine the system's functionality and performance. User-space programs and even libraries must be modified and developed for the necessary target in accordance with the HW environment. To minimize communication overhead, suitable protocols and networks/bus-

types must be carefully selected, as stated in. This allows the system to meet speed requirements while simultaneously limiting power consumption.

2. DISCUSSION

A programmed controlling and operating system with a specific purpose inside a larger mechanical or electrical system, typically with real-time processing limitations, is known as an embedded system. It's typically found as part of a larger gadget that includes physical and mechanical components. Many modern gadgets are controlled by embedded systems. Ninety-eight percent of all microprocessors are made as embedded system components. Cheap power consumption, compact size, robust working ranges, and low per-unit cost are some of the characteristics of common embedded computers as compared to general-purpose equivalents. This comes at the cost of restricted processing resources, which makes programming and interacting with them much more challenging. By building intelligence mechanisms on top of the hardware, taking advantage of possible existing sensors and the existence of a network of embedded units, one can both optimize available resources at the unit and network levels, as well as provide augmented functions far beyond what is currently available.

Intelligent methods may be used to control the power consumption of embedded systems, for example. Microcontrollers (i.e. CPUs with integrated memory or peripheral interfaces) are popular in modern embedded systems, although conventional microprocessors (using separate chips for memory and peripheral interface circuits) are also widespread, particularly in more sophisticated systems. The processor(s) utilized in each instance may be general-purpose, specialized in a certain class of calculations, or even custom-designed for the application at hand. The digital signal processor is a popular kind of specialized processor (DSP). Because the embedded system is devoted to a single job, design engineers may optimize it to decrease the product's size and cost while increasing its dependability and performance. Embedded systems are sometimes mass-produced to take advantage of economies of scale. Embedded systems include anything from small portable gadgets like digital watches and MP3 players to huge permanent installations like traffic lights and industrial controls, as well as more sophisticated systems like hybrid cars, MRI, and avionics.

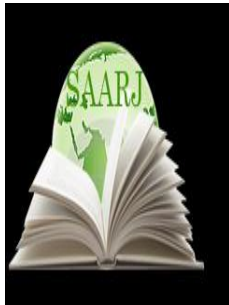
3. CONCLUSION

Embedded system design presents a number of difficulties, particularly for rural application platforms. We addressed the criteria that the rural application platform must satisfy, the difficulties that must be overcome in order to meet those needs, and future trends in embedded system design in this article. According to our findings, needs are inherently contradictory, and it is thus preferable to represent them at a higher degree of functional abstraction rather than at a highly granular level. This will be helpful in the design of embedded systems as well as in narrowing down optimization methods and analysis in the context of rural application platforms. In the future, we want to use statistical techniques and feature selection methods such as Principal Component Analysis to conduct quantitative analysis of optimization approaches for embedded systems.

REFERENCES:

1. M. Rashid, M. W. Anwar, and A. M. Khan, "Toward the tools selection in model based system engineering for embedded systems - A systematic literature review," *J. Syst. Softw.*,

- 2015, doi: 10.1016/j.jss.2015.04.089.
2. M. Seo and R. Lysecky, "Non-intrusive in-situ requirements monitoring of embedded system," *ACM Trans. Des. Autom. Electron. Syst.*, 2018, doi: 10.1145/3206213.
 3. G. Martin, L. Lavagno, H. Hansson, M. Nolin, T. Nolte, and K. Thramboulidis, "Embedded systems," in *Systems, Controls, Embedded Systems, Energy, and Machines*, 2017.
 4. C. Manifavas, K. Fysarakis, A. Papanikolaou, and I. Papaefstathiou, "Embedded Systems Security: A Survey of EU Research Efforts," *Secur. Commun. Networks*, 2015, doi: 10.1002/sec.1151.
 5. A. Malinowski and H. Yu, "Comparison of embedded system design for industrial applications," *IEEE Trans. Ind. Informatics*, 2011, doi: 10.1109/TII.2011.2124466.
 6. H. Mao, S. Yao, T. Tang, B. Li, J. Yao, and Y. Wang, "Towards Real-Time Object Detection on Embedded Systems," *IEEE Trans. Emerg. Top. Comput.*, 2018, doi: 10.1109/TETC.2016.2593643.
 7. S. Parameswaran and T. Wolf, "Embedded systems security-an overview," *Des. Autom. Embed. Syst.*, 2008, doi: 10.1007/s10617-008-9027-x.
 8. J. A. Back, L. P. Tedesco, R. F. Molz, and E. O. B. Nara, "An embedded system approach for energy monitoring and analysis in industrial processes," *Energy*, 2016, doi: 10.1016/j.energy.2016.09.045.
 9. P. Axer *et al.*, "Building timing predictable embedded systems," *ACM Trans. Embed. Comput. Syst.*, 2014, doi: 10.1145/2560033.
 10. B. H. Sababha, Y. A. Alqudah, A. Abualbasal, and E. A. Q. Al, "Project-based learning to enhance teaching embedded systems," *Eurasia J. Math. Sci. Technol. Educ.*, 2016, doi: 10.12973/eurasia.2016.1267a.



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THE EFFECT OF PROBIOTICS ON VETERINARY AND SANITARY ASSESSMENT OF BROILER CHICKENS MEAT

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ABSTRACT

This scientific article provides information about effect of the “Aktivil-3” probiotic on growth indicators, product quality, productivity, bloods hematological and morphological indicators of broiler chickens.

KEYWORDS: Probiotic, “Aktivil-3”, Hematology, “Dekavit”, Vitamins, BIOBASE BK6190 Analyzer, Mindray BA-88A Analyzer, Erythrocyte, Hemoglobin, ESR, Hematocrit, Leukocytes.

INTRODUCTION

Actuality. In order carry out the state requirements on “food safety” and to fulfill the tasks set for us in the provision of food, it is necessary to obtain high quality products from farm animals and poultry. To provide the population of our country with livestock products, we must pay great attention to the health, productivity and protect livestock and poultry from various diseases.

Today, our country produces a lot of mixed feeds for farm animals and poultry. It is important that their composition and nutrition, quality, safety and other parameters are responding to the state standards requirements.

We know that in addition to the growth and development of poultry based on physiological norms uses not only highly nutritious and safe feed to obtain quality meat products but also uses various vaccinations and antibiotics to prevent infectious and invasive diseases. This leads to change the quality of the products obtained from them, which has a specific effect on the body of chickens. Another example of this is that pharmaceutical preparations used in poultry primarily affect the gastrointestinal microflora, which leads to the death of beneficial bacteria involved in the digestive process.

Relevance of the topic. A lot of pharmaceutical preparations, biological additives and others used in poultry farming should prevent adverse effects on poultry and also obtain safe and quality products from them. The influence of probiotics on the complete assimilation of a variety of mixed feeds, vitamins and protein supplements to broiler chickens makes us pay special attention. As such a drug, the Ukrainian pharmaceutical company "Vetsintez" produced a probiotic in powder form "Aktivil-3".

The lack of scientifically based data on veterinary-sanitary assessment regarding to use new probiotic "Aktivil-3" in ration indicates the importance of learning effects of this probiotic on broiler chicken meat and veterinary-sanitary properties.

Scientific novelty of research. The experiment results of probiotic "Aktivil-3" on the quality and safety of broiler chicken meat are obtained, and on the basis of organoleptic, physicochemical, microbiological and biochemical indicators of broiler chicken meat scientifically assessed by veterinary-sanitary.

The effect of probiotic Aktivil-3 (produced by the Ukrainian pharmaceutical company "Vetsintez") on broiler chickens' meat and its veterinary sanitary assessment studied for the first time.

The purpose of the research. -To determine the positive effect of probiotics on general parameters of the broiler chicken's body used in veterinary practice of the Republic of Uzbekistan;

-Determination the effect of probiotic "Aktivil-3" on intensive growth of broiler chickens' weight.

Materials and methods of research

The research was conducted at "Mironqul Agrozoovetservis Scientific and Practical Center" of Samarkand city Kavsar street. For our research 90 Ross-308 broiler chickens were selected. The experimental chickens were divided into 3 groups of 30 heads each. Our research was started from the time the chicks were 7 days old.

The chickens were kept in the same conditions in accordance with all the requirements of optimal animal hygiene. Before the beginning of our experiments all chickens were clinically inspected and found healthy.

All 3 groups fed with farm ration produced at the enterprise "Afrosiyobparranda" in Samarkand on the basis of State standards 18221-2018. But irrigation was different. First group performed the control function. The second and third groups were experimental. The first group irrigated with water, without any additions. The second group irrigated with water and "Aktivil-3"

probiotic (10 L water/ 1 gr). And the last third group irrigated with water, “Aktivil-3” probiotic (10 L water/ 1 gr) and “Dekavit” vitamin (10 L water / 10 ml).

Morphological parameters of blood were determined using the hematological analyzer BIOBASE BK6190.



The results of research. The weekly weight, body temperature, and blood morphology of broiler chickens were routinely studied. The body temperature of broiler chickens in the experimental and control groups remained normal during the study. (40,5-42 ° C).

Dynamics of broiler chickens' weight

TABLE 1

Day	weight		
	1 st Control group	2 nd Experimental group	3 rd Experimental group
7	206±15,80	206±5,37	206±5,37
14	494±21,81	505±15,81	540±12,54
21	916±13,43	985±12,54	1040±21,81
28	1328±16,18	1485±20,12	1560±16,18
35	1718±20,12	1880±21,81	2010±10,43

The daily weight of broiler chickens increased by 8.1% compared to the control group of chickens when the probiotic Aktivil-3 was added to the main diet, and by 14% when the vitamin complex Decavit was given together with the probiotic.



It is known that blood parameters are the main indicators of metabolism in animals and birds. Many scientists considered that the composition of the blood depends not only on physiological state of the whole organism, but also on the condition of organs and tissues. Therefore, we performed a general blood test to compare blood parameters between control and experimental broiler chickens' groups. The number and composition of blood cells, the amount of hemoglobin and hematocrit in the erythrocyte, ESR (erythrocyte sedimentation rate) and others were determined.

The 2nd table shows information about hematological examination of broiler chickens' blood while using the probiotic "Aktivil-3" and vitamin complex "Decavit".

Morphological parameters of chicken blood

Indicators	1 st Control group	2 nd Experimental group	3 rd Experimental group
Erythrocytes, mln/mm ³	3,54±0,23	3.60±0,36	3,76±0,082
Leukocytes r, 10 ⁹ /l	22,16±0,33	21,74±0,85	21,68±0,6Z
Hemoglobin, g/l	109,16±2,97	111,12±1.79	112,05±5,10
Hematocrit	31,01±1,50	31,67±0,89	32,41±0,89
The amount of hemoglobin in erythrocyte, %	57.76±1,52	58,60±0,05	60,56±1,52
ESR, mm/soat	2,71	2,49	2,37

The table shows that the used combination of probiotics "Aktivil-3" and vitamin complex "Decavit" for broiler chickens had a significant effect on morphological parameters of the blood. However, we can note increasing amount of erythrocyte and hemoglobin concentration, reducing the number of leukocyte and ES Rindicated that the probiotics have a positive effect on metabolic processes and the clinical condition of broiler chickens.

According to our research, using of probiotics "Aktivil-3" increased the number of erythrocytes in the blood of broiler chickens by 1.69%, and the using of vitamin complex "Decavit" with probiotics increased by 6.21%. By the way, hemoglobin levels were 1.79% and 2.64% higher, than in control group. Number of leukocytes decreased by 1.90% in thesecond experimental group and by 2.17% in the third experimental broiler chickens group compared to controls. In experimental groups the ESR decreased till 0.22 to 0.34 mm /s. During theexperimental research no cases with disease or death have been reported. So, it means that probiotic "Aktivil-3" has no any bad effects to chicken's organism.

CONCLUSION

During the experiment we determined that using of Aktivil-3 probiotics by adding to broiler chickens' water increased their weight up to 8.1% compared to the control group, and also using vitamin complex "Dekavit" in combination with probiotics "Aktivil-3" increased their weight up to 14.8%.

REFERENCE

1. Ganin L.V. Veterinary sanitary expert's satellite. - Saratov: Volga Publishing House, 1997.

2. Veterinary and sanitary examination of animal products. Directory. - M.: Agropromizdat, 1989.
3. Kuznetsov S.G. "Trace elements in animal feeding"/ A. Kuznetsov. Animal husbandry of Russia. - 2003.
4. Belova S.M., Mysik A.T., "Quality Handbook livestock products"- M.: Agropromizdat.
5. Vasiliev Yu. G, Troshin E. I., Lyubimov A. I. "Veterinary clinical hematology "2015.
6. Gushchin V.V., Kulishev B.V., Afanasenko N.I. "Poultry processing industry" / V.V. Gushchin, B.V. Kulishev, N.I. Afanasenko // Food Industry of Russia. 2002.
7. Egorov I.A. "Modern approaches to poultry feeding" /I.A. Egorov // Poultry. - 2014.



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LINGUISTIC-PARADIGMATIC FEATURES OF POLITICAL IDEOLOGY

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ABSTRACT

This article studies and analyses political reality, which is of great importance, showing not only the basis of political ideology, but also the aspects of its formation. This requires, on the one hand, the study of the ideological processes taking place in the world, their content, and, on the other hand, the study of the linguistic paradigmatic features of political ideology. The role and importance of ideology in the life of society is important, it performs many functions in socio-political life. Indeed, ideology is important from an epistemological point of view in knowing society, human life, the essence of reality.

KEYWORDS: *Political Ideology, Political Language, Political Text, Discourse, Socio-Political Events*

INTRODUCTION AND LITERATURE REVIEW

The study of ideology from a historical point of view, through different perspectives, serves to shed light on the problem in all its aspects. Naturally, ideologies and political ideology have played an important role in the history of mankind. In the history of all the peoples of the world, there has been a struggle for religious or political beliefs to be replaced by knowledge derived from human life experiences. We know that geniuses such as Beruni, Khorezmi, Ibn Sina lived in Central Asia during the Renaissance or Enlightenment. But in our country, the Renaissance was limited to science, culture, and ethics, and this process, which began later in Western Europe, applied to all spheres of society. In the political sphere, it was manifested in such ideas as the emancipation of man, the equality of all men before the law. Each social group had the opportunity to propose their own philosophy and practice of building a social life based on their perceptions of the world, man, society. This was also largely due to the fact that politics came out of the shell of religion and acquired a secular meaning. As a result, various ideologies began

to struggle for the high position of religion in society and to determine the fate of people, communities, countries. While religions, by their very nature, sought truth and formed beliefs about it, ideologies sought ways to protect the interests of the classes or groups on which they relied.

There have been cases of separation of ideology and science, skepticism of the cognitive functions of ideology, their denial. In the early 20th century, Weber, M. (1916) introduced ideology and other ideological, religious structures into the realm of blind faith. In so doing, he denies the question of the scientificity of ideology. Mannheim, K. (1929) sees any ideology as a false, one-sided reflection of reality, a collection of ideas that consciously conceal the true state of events. Leaving aside the socio-historical sources of ideology, it is also common to interpret it as a weapon that unites the community (Lemberg, O., Parsons, T.). There are also cases when political ideology is represented by the psychology of individual groups and individuals (Paynes, R., Brown, D.).

The various approaches mentioned above suggest that ideology is a complex mental phenomenon. Political ideology is a peculiar form of political consciousness. It differs from political psychology in terms of its reflection on political existence. In political psychology, spontaneously formed, incomplete, unstructured feelings, passions, and in political ideology, theoretical elements, ideas, concepts of political consciousness predominate. In political ideology, the political entity is theoretically processed, specific programs are developed. Political ideology, by its very nature, is a rounded, systematized, logically coherent form of political consciousness that theoretically reflects political existence. In this sense, ideology seeks to recognize a particular model of society and political system, to theoretically justify certain types of ways and means of forming this model. In other words, along with wars and revolutions, ideas and ideologies also determine the development of humanity and culture. The fact that the twentieth century, which witnessed the most horrific wars and the bloodiest revolutions, is called the "age of ideologies" is a recognition that these wars were founded by ideological struggles that divided the world into two opposing poles.

In general, political ideology is a set of structured, logically coherent ideological views that represent and protect the interests of a particular social group, requiring the submission of people's thoughts and actions to specific goals and objectives of the use of power. In short, political ideology is a holistic ideological system that justifies the aspiration or use of power by a particular social group and envisages a specific strategy of political action.¹

Process and Development

Ideology not only reflects a new political reality through language, but also diagnoses it. Such an approach is an integral part of the ideological process, helping to express or understand reality through language, which is relevant to all spheres of socio-political life. This is the theoretical basis of political philosophy. The process of complex reflexes belonging to the theoretical field of political philosophy, and the construction of the meaning of individual words and phrases, is manifested in a peculiar way in the political linguistic paradigm. Today, the content of political philosophy is considered in the framework of the political-linguistic paradigm not only on the basis of a methodological device, but also with special attention to its paradigmatic aspects. In this regard, Bart, R. (1989) explains that in the expression of today's political reality, the paradigmatic object is seen in a similar and different relationship with another object within its

group.² I believe, reality as a human subject becomes an object of several spaces. That is why Bart, R. calls them "unit" because they are important in revealing the complex aspects of political life. This does not happen without a construction process that represents the meaning of the object. Because language plays a big role in political speech. Ferdinand De Saussure (1998), who developed the philosophy of language, describes this process as the "res-verba" based modeling. The model structure also emphasizes that the meaning of an object is comprehensive (ambiguous and plural).³ In my view, such an approach does not fully reflect the political reality. Because the political reality is fully manifested where the meaning arises, according to the "law of reproduction" inherent in the philosophy of language. Such a situation is revealed through a dialectical approach, such as the classifiers of political reality. Therefore, in the political linguistic paradigm, several objects can be divided into groups. For example, there are the following classifications of socio-political life:

- Political objects (president, government, party, specific political system);
- Social objects (social group, society, and situation);
- Cultural objects (theater, opera, ballet, literature, folklore);
- Economic objects (money, goods, price, demand, supply, capital, oligarch, small business, cooperative).

In the modern humanities, especially in political philosophy, it is accepted to divide principled ideas into two major general scientific paradigms. These are called modern (modernity) and postmodern (study of the past). In turn, their structure also differs chronologically. The modern period corresponds to the historical framework, and the concept of understanding the methodological apparatus is accepted as "ideology". Its chronological date dates back to the 19th century, when it entered the political arena with the concept of "adult" ideology, socialism, liberalism, communism, conservatism and similar conceptual ideas. Their work was based on an approach such as not mixing semantic sources with respect to the subject. Such an approach is expressed in the works of Tocqueville, Burke E., Millon the example of changes in socio-political reality.

The language of political ideology was strictly followed at that time, which is why T. Marcuse (2003) called it "open language".⁴ Its openness depends on the development of lexemes in the noun phrase in different ways and is explained by the fact that "the cut expresses a meaning contrary to its meaning". Here, it is about the classic word - ideology, used by the bourgeoisie and the proletariat, which was the dominant language in the XIX century. For the bourgeois conceptual conservatives and liberals, their sociality (the bourgeoisie explains "the subject of the technical process, the naming of nature, the creation of social wealth"), but for the socialists it led to the disruption of the social structure and general achievement tools.

Such openness is manifested in the ideological field in relation to the nature of language. Therefore, it can be understood only in terms of "other and others", unchanged. According to M. Bakhtin (1996), "in the theory of dialogue, those who have spoken before expect the right response."⁵ In this process, the character participates as an important component of the speech text. Because they regulate, modify, and transform social rhythm and value in the context of non-constant movement. Social value and their adequate connotation will change. Therefore, the linguistic field remains a source of interest in conflicts with heterogeneous education. Such

controversial points reflect the field of ideological struggles. Characters, on the other hand, are direct mediators of ideology, and without values and ideals, they remain a dead structure without a "guide to life".

All of Voloshinov's (1995) research on the philosophy of language leads to the conclusion that the word is an ideological phenomenon ("par excellence").⁶In everyday life, the word is combined with thought, forms a speech, but this is a socius language, not an individual language. According to V.Voloshinov (1995), the socio-political reality appears to be "common, accurate ideological phenomenon". A speaker's worldview, emotions and evaluation is determined, on the one hand by language structure, and on the other hand by the subject of speech. That is why M.Bakhtin (1996) and V.Voloshinov (1995) explained the language and opinion as the basis of "abstract subjectivism", the basis of the object of research, as ideological problem. In this case, they effectively use sociological laws. In particular, V.Voloshinov develops language theory in the sociological perspectives, M.Bakhtin puts the word on the first plan.

So today, it is of great importance to claim hegemony, to bring many realities to the scale of a polycentric political world, and to express political language in a multifaceted way. This not only encourages the development of diverse views, but also provides ample opportunity to fully express the political object defined from a modern perspective. This situation is recognized in science as a product of views within postmodern philosophy. That is why it is important to use the achievements of postmodern science in illuminating the linguistic paradigmatic features of political ideology.

Politics, language and time: future challenges and tasks

People communicate through a system of languages that helps to build a world of dominant social structures and interacting concepts. Personal thought is an action, a historical event. Determining the importance of the text, understanding what the author means, allows us to determine the discourse at the time the text is created. Any discourse involves the structure of linguistic conventions within constraints (a set of suspending cases) in which policy can be institutionalized and constitutionalized. Comparing the number of languages known to researchers in earlier and later times, J. Pocock describes himself as a discourse historian. At the heart of this work is not Foucault's method, but speech, literature (political), public appearance (mass method of self-expression). J. Pocock's early works are devoted to the ancient British constitution.

Pocock's major work was *The Machiavellian Moment*, which influenced modern political theory for many years, as it taught a different type of original language, the language of civic humanism or the language of classical Republicanism. The language originated in Florence in the 17th century and entered England through Harrington and Oceana. During the eighteenth century, civic humanism became the most acceptable language for opposition groups. Such language defined freedom as a factor of participation in civic life. A prosperous life is conceived in terms of general well-being. In this way, the language demanded the establishment of a republic with the help of honest people as a barrier against chaos and corruption.

J. Pocock identified several languages formed on the basis of modern political theory. Machiavelli pointed out that the language of civic individualism clashed with the languages that were being formed in the future. The language of civic humanism is manifested in the context of modern democratic ideology. In this case, the democratic system becomes the main model, the

political mentality of the peoples living in a democratic society is formed through the media, as most international legal documents (for example, the UN Declaration, the EU Declaration and the Charter) are written in the language of civic humanism (back to Pokok). In the logic of political science and the analysis of political processes, perceptions, all procedures are compared to democracy. In the 1920s, democratic figures were criticized, but this did not lead to a decline in the democratic goal. J. Pocock proved that the language of civic humanism, freedom in civil life, responsibility for the fate of self-sufficient citizens is determined on the basis of civil independence.

In conclusion, political text and discourse is a combination of perceiving the life from the viewpoint of conceptual-discourse methods, standards of scientific researches and activities. The primary form of analyzing a text identifies hidden factors of its political and ideological objectives as they reflect socio-political changes turning to setting the target for investigating, evaluating and selecting.

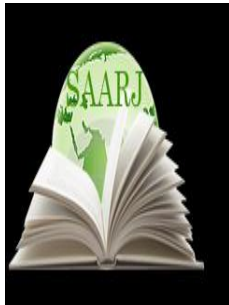
Currently, the prosperity of Uzbekistan has its reflection on the development of the Uzbek language and its application in people's lives. Language is the basis of political life, hence, political thinking remains unchanged unless national language develops. In this view, it's essential to investigate argumentative issues of the essence of political linguistics, the interrelation, the main idea that determines the notion of political discourse in terms of political-philosophical aspects. For this reason, the article mainly focuses on political language and its peculiar features. It clearly defines epistemic-linguistic problems and the frame of the tasks in developing national idea.

Political language constitutes different spheres of a culture, interpretation of the lexis delivered during propaganda and political events within various strata of population, as well as timeliness to strengthen the link with population.

REFERENCES

1. Yusupova G.H., Jabborov H.J., Kosimova H.H. Siyosatnazariyasi. UzMU, 2002
2. Bart R. Strukturalizm kek deyatelnost, Bart R., Izbranniyeraboti: Semiotika. Poetika. Progress, 1989
3. Saussure de F. Kurs obsheylingvistiki. Logos, 1998
4. Marcuse G. Odnomernnychelovek. ACT, Ermak, 2003
5. Bakhtin M.M. Problemarechevogojanra, Sobr. soch. 7 t. Russkiyeslovari, 1996
6. Altunyan A.G., Analysis of political texts. University Book, Logos, 2006
7. Bakhtin M.M., Aesthetics in Written Works. 1979
8. Barthes R., Selected works: Semiotics. Poetry. 1989
9. Wittgenstein L., Philosophical works. 1994.
10. Gadamer H., Truth and Method. 1988; Davidson D., Truth and Meaning // News in foreign linguistics. 1986; Dales J., Logics of meaning. 1995
11. Quine W., Word and Object // News in foreign linguistics. 1986

12. Lacan J., The Function and Field of Speech and Language in Psychoanalysis. 1995
13. Lotman Y.M., Lectures on structural poetics // Lotman Y.M. and Tartu-Moscow *Semiotic School*. 1994; Ricoeur P., The Conflict of Interpretations. 1995
14. Sapir E., Selected publications on language studies and culture studies. 1993
15. Heidegger M., Language. – SP., 1991; G.Frager, Thought // Logics. Philosophy. Language. 1987



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A SYSTEMATIC REVIEW OF INTERNET OF THINGS APPLICATIONS

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ABSTRACT

The Internet of Things (IoT) is a network of smart devices containing sensors, networking, and computing technologies that integrate and operate together to create an environment where smart services may be delivered to end users. The Internet of Things is bringing a slew of advantages to people's lives by creating an environment where smart services are available to use for any activity, anywhere and at any time. All of these features and services are delivered via a variety of IoT-based apps. Monitoring and, as a result, rapid decision making for effective management are the most essential services provided by IoT applications. In this article, we use the Systematic Literature Review (SLR) technique to survey several IoT application areas in order to understand the various methods in IoT applications that have recently been presented. The goal of this article is to classify and evaluate current research methods on IoT application approaches published between 2011 and 2018, both analytically and quantitatively. A technological taxonomy for IoT application methods is provided based on the content of current research chosen using the SLR process in this study, which include health care, environmental monitoring, smart cities, commercial, industrial, and general features in IoT applications. IoT applications are compared based on technical characteristics such as Quality of Service (QoS), suggested case studies, and assessment settings. Each study's accomplishments and drawbacks are addressed, as well as some suggestions for resolving their flaws and identifying future research difficulties and unresolved problems in IoT applications.

KEYWORDS: *Internet of Things, Quality of Service, Sensors, Systematic Literature Review, Smart Objects.*

1. INTRODUCTION

The Internet of Things (IoT) has pervaded most aspects of human life in recent years, including cities, homes, universities, industrial factories, organizations, agriculture environments, hospitals, and health-care centers. Through the IoT context, numerous capabilities such as produce/consume data and online services improve daily life and activities all over the world. The different applications that are conducted in the IoT environment carry out the facilities and smart services. Innovative apps for monitoring, controlling, and automating human activities are being developed as consumers' demands increase [1]. In addition, IoT applications use cloud service computing to create appropriate composite services for service-based applications in the IoT environment by composing existing atomic services. IoT scenarios are applied to smart device apps that consumers utilize in their everyday activities in a variety of areas. IoT applications also provide some advantages for users, such as the ability to choose the best option in any situation, as well as decision-making, management, and monitoring of environmental cloud resources. Regardless of the motives of the many application areas, they all have a similar goal: providing smart services to improve the quality of human life[2].

The satisfaction of Quality of Service (QoS) criteria is the primary focus of IoT applications. Smart services in IoT applications should support user requirements by covering QoS metrics such as security, cost, service time, energy consumption, reliability, and availability. There are several technical surveys and review articles that do not systematically focus on IoT applications. The primary goal of this study is to conduct a survey of various IoT applications in order to better understand the variety of methods that have recently been offered in IoT applications. Health-care, environmental monitoring, smart city, commercial, industrial, and general methods are among the main approaches of IoT applications that have been emphasized in chosen research[3]. We propose a technique for doing a Systematic Literature Review (SLR) and provide an overview of IoT application possibilities. This section provides a quick overview of the relevant work studies in IoT applications[4]. Existing networking standards in the IoT context should explain how they may meet the QoS requirements of objects to create a smarter IoT ecosystem.

In addition, a study of various applications and the danger of a lack of cross-domain integration in the IoT environment was given in order to achieve the interoperability and QoS criteria for delivering IoT services, such as availability, dependability, scalability, and security. The study's strength is in presenting a categorization of different current standards in the network layer and application layer in various sectors such as construction, transportation, smart city, business, and grid systems. The study's main flaws are the lack of statistical information about the discussed standards' application in various stated domains, as well as the lack of a statistic chart for the risk analysis of lack of interoperability between IoT objects and transport protocols to illustrate the judgments briefly[5]. Environmental and industrial agricultural uses of the Internet of Things Four areas are addressed in this review paper: prediction, monitoring, control, and logistics. Fig. 1, illustrates the taxonomy of internet of things, which present the proper working and implementation.

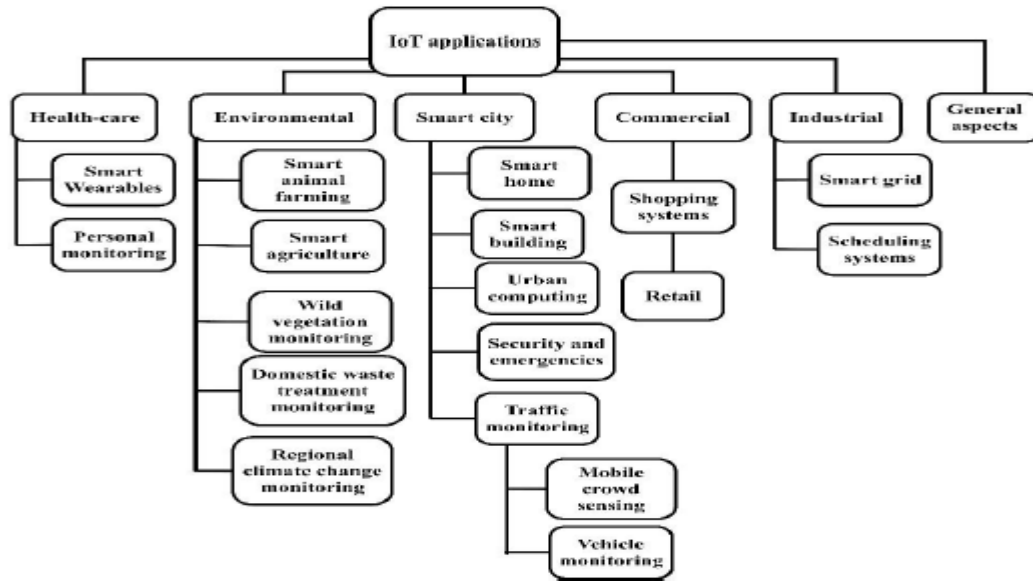


Fig. 1: Illustrates the taxonomy of internet of things, which present the proper working and implementation[6].

In this research, two significant topics are discussed and answered. The first is about the foundational technical efforts in IoT-based applications for agricultural, industrial, and environmental problems, and the second is about the infrastructures and technologies utilized in the solutions stated[7]. The majority of the articles were focused on monitoring (62 percent), followed by control (25 percent), logistics (7 percent), and prediction (7 percent) (6 percent).

In addition, according to the survey's second question, the majority of technologies and infrastructures used in IoT agroindustrial and environmental applications are divided into seven categories: visualization approaches, storage approaches, edge computing technologies, communication techniques, power sources, actuators, and sensing variables. The following problems are highlighted as outstanding issues in this review: robust standards, reduced power consumption, security, reusability of software and hardware components, cost reduction, suitable interoperability with current infrastructures, and scaling difficulties[8].

The authors proposed an architecture for IoT applications in agriculture, industry, and the environment. There are four layers in the model: application, service, communication, and physical layer. The benefit of this research is that it provides useful and complete data on studies and efforts in agroindustrial and environmental applications in the context of the Internet of Things. The paper's flaw is that it doesn't go into enough detail on the linked studies[9]. A look at the issue of service composition in smart Internet of Things (IoT) devices using the Internet Protocol (IP). The authors conducted a thorough study of smart IoT object systems, service modeling, target applications, target platforms, and service composition methods for IPs in the IoT. The survey's major flaw is that the assessment elements of availability, response time, cost, and scalability, all of which are significant quality criteria, were not examined. A survey on the Internet of Things was provided[10].

2. DISCUSSION

This research looks at issues including Service Oriented Architecture (SOA), Wireless Sensor Networks (WSN), health-care systems, and social computing. The study's major flaw is that it doesn't analyze assessment criteria like availability, energy consumption, cost, reaction time, and dependability as quality elements in this field. This part provides a thorough taxonomy on IoT applications that includes health-care, environmental, smart city, commercial, industrial, and general elements, as well as a technical evaluation of the chosen IoT applications for current research according to the applicable SLR procedure. We review papers that attempt to address some issues to support IoT applications in a specific domain, because in each type of IoT application, some problems may arise that should be focused on finding effective solutions to make IoT applications more efficient and applicable in real IoT environments. For example, important topics in smart city IoT applications include semantic-aware mobile crowd-sensing, vehicular monitoring, location finding, context-aware or QoS-aware service composition, scalable IoT platforms, handling scaled heterogeneous data streams, and many more.

As a result, the taxonomy provided in this article is based on several kinds of IoT applications in which certain subjectives were explored and addressed in the research papers chosen. In terms of difficulties and concerns in various categories of IoT applications, we first focus on the kind of IoT applications, and then attempt to analyze the primary context highlighted in the chosen articles. Because certain issues in IoT applications are universal, we add a category called "generic aspects" to our taxonomy to categorize articles that offer a solution to a particular difficulty for supporting any kind of IoT application. Of course, the suggested taxonomy's general features apply to all IoT application areas, such as applied and systematical software, assessment procedures, and IoT application performance prediction. To put it another way, the illustrated studies of the general features provided a new conceptual framework that could be used to build any kind of IoT application. A roadmap for IoT health-care service providers that was based on the consumers' perspective. Some key provided characteristics have additional effects on consumers' confirmation of such services, according to this research.

To qualify the services, a study was conducted to assess recommended criteria such as trust and risk sensitivity. The findings of this research, which focused on lifestyle illness, show that individuals in South Korea choose trustworthy and safe health-care services. The benefit of this study is that it provides a straightforward and innovative guidance for IoT health-care service providers, as well as increasing the dependability. The study's flaw is that the retrieved data is based on a fictional service description rather than a commercial service used by a health-care customer. The reaction time is also not assessed, which is another flaw a platform for developing a monitoring system in a residential setting to identify and prevent chronic medical problems such as diabetes, obesity, and depression. The problem of energy constraints is addressed in this study as a consequence of the associated expenses of recharging or replacing the batteries of wearable devices. Only solutions that are battery driven are considered in this article. The energy efficiency of wearable devices is enhanced as a result of implementing asymmetry of network resources. The suggested system is based on Bluetooth low power and is also a part of a home platform that is equipped with video cameras on the body and environmental sensors for detecting and making decisions using machine learning methods.

A prototype wearable gear and three prototype receiver units were used to test the proposed framework. The benefits of this article are that it improves the energy feeding of wearable

devices while also increasing the system's dependability. In addition, the RSSI accuracy and transmission power are assessed. The reaction time is not measured in this study, which is a flaw. In today's living in a home setting, a platform to build a monitoring system to identify and prevent chronic medical problems such as diabetes, obesity, and depression. The problem of energy constraints is addressed in this study as a consequence of the associated expenses of recharging or replacing the batteries of wearable devices. Only methods that concentrate on battery-powered devices are considered in this article. The energy efficiency of wearable devices is enhanced as a result of implementing asymmetry of network resources. The suggested system is based on Bluetooth low power and is also a component of a home platform that is equipped with video cameras on the body and environmental sensors for detecting and making decisions using machine learning methods.

A prototyped wearable gear and three prototyped receiver units were used to test the suggested framework. The benefits of this article are that it improves the energy feeding of wearable devices while also increasing the system's dependability. In addition, the RSSI accuracy and transmission power are assessed. The reaction time is not measured in this study, which is a flaw. A prototype for an IoT health-care monitoring system that may be used for a longer period of time. The system was created using low-cost sensors and an existing IoT platform that is frequently found in houses. During the system execution period, the provided ad-hoc monitoring system analyzes the patient's biological variables and adds environmental data such as humidity and temperature detected by either existing sensors or new sensors. Smart phones are used as gateways in this study to gather the aforementioned data from sensors in the patient's surroundings. The proposed health-care monitoring system is used to gather business requirements in real-world scenarios in order to assess the prototype's performance and scalability.

The benefit of this study is that it makes use of low-cost sensors and low-energy-consumption devices that are often found in houses. The system's flaw is that it only provides the bare minimum of service in accordance with the gathered business needs. An Internet-of-Things (IoT) system for remote mobile medical monitoring. Using intelligent nodes, the authors proposed a model of human interaction and physiological characteristics. The provided solution is used to create effective emergency alert systems by storing important emergency data in a hospital database. The benefits of this study include increased speed and accuracy in physiological factor measurement, as well as the use of low-power devices. The work's flaw is that the expense was not taken into account. A high-level adaptive security management method in terms of security metrics. The security objectives of E-health IoT applications, especially for the health of the elderly and the treatment of chronic illnesses, are examined in order to illustrate this concept.

In addition, the requirements of adaptive security management and decision-making are addressed in this article, which are required to establish security demands and implement adequate security controls in the face of changing security threats in such systems. Several security variables, such as security accuracy, effectiveness, efficiency, privacy level, and secrecy, are taken into account by the proposed method for adaptive security management. The major benefit of this research is that it will help to improve the security intents of E-health IoT apps. The lack of a thorough study of security metrics and adaptive decision-making algorithms in such E-health IoT applications is a flaw in this work. For IoT health-care applications, a layered context-aware data combination method is used. Context attainment, condition structure,

and implication are all part of the suggested method. Body Sensor Networks (BSN) or Wireless Body Area Networks (WBAN) that are usually positioned to the patient's body to collect physiological data for IoT health-care applications are described in this article. Because the data is gathered from various heterogeneous sources, a method known as "data fusion" is required to combine these datasets. In this article, a new method for displaying gathered data in a manner that aids in making timely precise decisions is given.

This research has the benefit of resolving issues such as sensor inadequacy, limited coverage, irregularity, and ambiguity. The paper's shortcoming is that it does not provide any particular method for evaluating the proposed solution for least error adjusted IEEE 802.15.4 transceiver for health-care applications in the Internet of Things. In this work, an improved frequency offset evaluator for IEEE 802.15.4 is proposed, with superior error modification performance than existing assessors. In comparison to the conventional design, the benefit of this research is a significant improvement in bit error amount and packet error frequency of the provided transceiver. Another accomplishment of this study is lower power consumption as a consequence of fewer retransmissions in each packet for successful packet broadcast an energy-efficient routing method for WSNs based on congestion and interference awareness. Because multiple IoT devices send their data to the same target, which is a common scenario in IoT monitoring applications, the suggested method was designed to function in networks with high traffic and interference on the connection between nodes.

The proposed algorithm employs a function for selecting the next party node that takes into account three factors: (1) the connection's signal to interference and noise ratio (SNIR), (2) the route's survivability parameter from the next party node to the endpoint, and (3) the congestion degree at the next party node. The simulation results indicate an increase in network throughput, packet broadcasting ratio, node energy consumption, and a decrease in the number of lost packets. a wireless sensor network-based online IoT monitoring system for henhouses to manage environmental variables such as temperature, humidity, CO₂, and NH₃. In this article, it is stated that in previous studies, the majority of the focus has been on building systems without considering the dependability of wireless data transfer. To address this problem, a wireless transport protocol based on the loss recovery method is proposed in this article. In order to estimate node data and increase the integrity of the proposed system, online lost data filling and duplicated data auto filtering are conducted. Furthermore, in order to meet the remote monitoring requirement, a web-based remote monitoring system was created to enable users to access the acquired information through smart phones or personal computers in order to manage the henhouse environment via an efficient interactive user interface. The primary benefit of this study is the novelty in providing an IoT-henhouse monitoring system that focuses on increasing wireless data transmission dependability. Other enhancements made as a result of this effort include increased data collecting accuracy and system integrity, as well as lower maintenance costs and upgrading. The major flaw in this study is that it does not assess energy usage.

3. CONCLUSION AND IMPLICATION

An SLR-based technique for IoT application is described in this study. This research provided a thorough knowledge of IoT applications as well as thoughts on outstanding problems. We demonstrated the SLR-based method in this literature by utilizing the exploration query on 185 articles published between 2011 and 2018. Finally, we looked at 72 articles that focused on Internet of Things applications. By 29 percent of quotas in the literature, the smart city strategy

has the greatest proportion of application methods. Of course, health-care applications account for 20%, commercial applications for 14%, environmental applications for 12%, general features of IoT applications for 12%, and industrial applications for 10% of all IoT applications, according to AQ1. According to AQ2, QoS-aware methods have the highest proportion of research (21), followed by intelligent monitoring (17). In addition, we discovered that 24 percent of the research projects using the AQ3 have used the suggested method to build an IoT application. To compare the assessment factors, the reaction time factor has the highest percentage in the evaluation of the composition methods at 27%, followed by cost (18%), energy (18%), availability (14%), reliability (14%), throughput (5%), and security (4%). We may not have looked at all of the papers that are available for the SLR-based approach. Non-English, non-peer reviewed, and editorial papers, book chapters, and survey pieces were thus excluded. We conducted a thorough investigation of IoT application methods in this study, based on the results of more than 100 writers and various studies.

REFERENCES

1. Y. Chen *et al.*, "An Optimizing and Differentially Private Clustering Algorithm for Mixed Data in SDN-Based Smart Grid," *IEEE Access*, 2018.
2. Next Generation Mobile Networks Alliance, "5G White Paper," *A Deliv. by NGMN Alliance*, 2015.
3. L. Atzori, A. Iera, and G. Morabito, "The Internet of Things: A survey," *Comput. Networks*, 2010, doi: 10.1016/j.comnet.2010.05.010.
4. M. H. Miraz, M. Ali, P. S. Excell, and R. Picking, "Internet of Nano-Things, things and everything: Future growth trends," *Future Internet*. 2018, doi: 10.3390/fi10080068.
5. R. M. Dijkman, B. Sprenkels, T. Peeters, and A. Janssen, "Business models for the Internet of Things," *Int. J. Inf. Manage.*, 2015, doi: 10.1016/j.ijinfomgt.2015.07.008.
6. R. Want, B. N. Schilit, and S. Jenson, "Enabling the internet of things," *Computer (Long Beach. Calif.)*, 2015, doi: 10.1109/MC.2015.12.
7. J. H. Ziegeldorf, O. G. Morchon, and K. Wehrle, "Privacy in the internet of things: Threats and challenges," *Secur. Commun. Networks*, 2014, doi: 10.1002/sec.795.
8. D. Miorandi, S. Sicari, F. De Pellegrini, and I. Chlamtac, "Internet of things: Vision, applications and research challenges," *Ad Hoc Networks*. 2012, doi: 10.1016/j.adhoc.2012.02.016.
9. K. Christidis and M. Devetsikiotis, "Blockchains and Smart Contracts for the Internet of Things," *IEEE Access*. 2016, doi: 10.1109/ACCESS.2016.2566339.
10. R. Roman, P. Najera, and J. Lopez, "Securing the Internet of things," *Computer (Long Beach. Calif.)*, 2011, doi: 10.1109/MC.2011.291.



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SOIL STABILIZERS MADE OUT OF DIFFERENT PLASTIC WASTES

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ABSTRACT

The procedure known as soil stabilization for improving the physical characteristics of soil, through controlled compaction, the addition of appropriate admixtures, such as geo textiles, geo synthetics, and other materials, and other techniques. The modern soil stabilization strategy can be used to help address societal problems, such as reducing waste and extracting usable various types and other items were rapidly increasing, due to environmental concerns, using a cost-effective method to reduce the issue of plastic disposal while simultaneously boosting California Bearing Ratio (CBR). The current research is aimed at addressing problems in Amaravathi, the contemporary capital of the ancient state of Andhra Pradesh. The management of plastic trash without generating environmental risks is getting increasingly complex. As a consequence, utilizing plastic strips is cost-effective and efficient. There has been a positive impact on soil characteristics since adding plastic into the mix. Soil stabilizers may be manufactured out of plastic. An experimental programme was carried out for the Black Cotton Soils stabilization in Amaravathi, employing percentages of plastic strips (varying from 0 percent to 8 percent by weight) determined using the California Bearing Ratio Test.

KEYWORDS: *Bearing, Moisture Content, Plastic Waste, Properties, Shear Strength, Soil Stabilization, Water.*

1. INTRODUCTION

Soil is the most vital component of nature, since it supplies for all of life's basic requirements such as food, shelter, and clothes. Soil is a thin layer of soil formed by the weathering of rocks that covers the earth's surface. Soil is made up of organic matter, crystals, gases, liquids, and animals, all of which work together to support life. The Pedosphere is the Earth's soil body, and it performs four important functions: it is a tool for plant growth, a source of water preservation,

transport, and purification, a modulator of the Earth's environment, and a sanctuary for species. Soil is the result of the interplay between temperature relief, plants, and parent materials over time. It occurs throughout time as a consequence of a number of physical, chemical, and biological processes, including weathering and erosion. The soil is the most essential component of this ecosystem since it includes all of life's fundamental requirements, including food, shelter, and clothing. India's largest soil deposit is black cotton soil, which has a strong propensity for development. Soil stabilization is the technique of utilizing geo textiles, geo synthetics, and other materials characteristics[1].

Laterite soils include fine-grained light-textured residual soils with red, orange, and yellow colors, as well as nodular gravels and cemented soils. They can be as small as a clump of dirt or as big as a giant rock. The presence of iron and aluminum oxides or hydroxides, especially iron oxides, which give the soils their hues, differentiates them. In engineering, the word laterite refers to coarse-grained vermicular concrete materials such as major laterite. The novel soil stabilization method may be utilized to help address social problems including waste reduction and material extraction. The exploitation of plastic in many activities and other goods is accumulative, and its disposal has long been an issue owing to environmental concerns. The current study is aimed at addressing problems with Amaravathi, the capital of Andhra Pradesh's newly formed state[2]. Laterite soils mimic fine-grained sands, gravels, and soft rocks in their behavior. Laterite is usually transparent or vesicular in appearance. Under impact, some laterite particles seem to crush rapidly, disintegrating into a plastic-like soil material. When subjected to drying, laterite soils may self-harden, or they may include large amounts of hardened laterite rock or laterite gravel if they are not self-hardening. The present research used plastic garbage as a soil stabilizer to conduct an experimental project for the stabilization of Black Cotton Soils in Andhra Pradesh's newly formed Capital Region, namely Amaravathi. Plastic strips were added to the Black Cotton Soil in different amounts (from 0 percent to 8 percent by weight) [3]. The Eastern Ghat of Orissa, the Southern part of the Western Ghats, the Malabar Coastal Plain and Rathnagiri of Maharashtra, and certain regions of Andhra Pradesh, Tamilnadu, and Karnataka are also home to laterite soil. Laterite soil makes up approximately one-sixth of all soil on the globe, and it spans 2.48 million square kilometers in India[4],[5].

1.1.Needs of Stabilization:

- Enhanced tensile strength as well as stiffness of the material.
- Decline in pavement thickness.
- Enhanced resistance to the effect as well as durability of water.
- Decline in swelling potential.

1.2.Advantages of Soil Stabilization:

- It improves the strength of soil, thus, increasing the soil bearing capacity.
- Stabilization improves the workability and durability of soil.
- Reduce dust in work environment.
- Conserves aggregate materials.

- Reduce cost and conserves energy.
- It is also used to provide more stability to the soil in slope or other such places.

1.3. Disadvantages of Soil Stabilization:

- It does not destroy or remove the contaminants.
- It can be difficult to predict long term behavior.

1.4. Application of Soil Stabilization:

- The soil stabilization procedure can be used for the following purposes: • Reducing the permeability of the soil.
- Increasing the foundation soil's bearing capability.
- Increasing the soil's shear strength.
- Improving the durability of the product in high-moisture and high-stress environments.
- Improving natural soils in order to build motorways and airports.
- Controlling the grading of soils and aggregates in the building of roadway and airport bases and subbases.

1.5. Methods of Soil Stabilization:

- Mechanical stabilization
- Soil-cement stabilization
- Soil-lime stabilization
- Chemical stabilization
- Electrical stabilization
- Stabilization by grouting
- Stabilization by geotextile and fabrics
- Reinforced earth
- Using bio enzymes

1.6. Types of Stabilizers:

- Plastic
- Lime Cement-Fly Ash(LCF-A)
- Lime-Fly Ash
- Portland Cement
- Bitumen
- Lime

Plastic is a flexible organic substance that may be molded into solid structures and a range of synthetic compounds. Plastics are high-molecular-mass chemical polymers that also include other chemicals. Since plastic is utilized in a number of goods such as chairs, mugs, polythene containers, and polythene sheets, utilizing it as a soil stabilizer would alleviate the problem of disposing of the plastic while also improving the cost-effective way.

1.7.Importance of Plastic:

- It improves the soil's shear strength, tensile strength, and CBR.
- It may significantly enhance the characteristics of the soil used in road infrastructure construction.

It is becoming increasingly difficult to handle plastic trash without harming the environment. As a consequence, utilizing plastic strips is both cheap and dependable. Since putting plastic into the mix, the characteristics of the soil have improved. Plastic is able to be used to produce soil stabilizers. The addition of trash from plastic improves the laterite rock's unconfined compressive power. The CBR values rise when plastic trash is introduced. Plastics of a range of forms and sizes may be utilized. Stabilizers are available in a broad variety of forms and sizes. Limited concentrations of plastic may be detected. Plastics may be investigated in a number of soil types[6].The enhanced CBR advantage is designed to boost the natural ground subgrade and base courses beneath the new carriage building's load bearing capacity. Although recycling may help decrease trash that ends up in landfills, wetlands, and the environment, most local governments can only recycle a few kinds of plastic[7].

A permeable combination of soil particles is referred to as soil. Pores may hold both water and air. Voids are a word used to characterize pores. If the wet, and if the spaces are clear, the soil is termed dry. To evaluate moisture content, soil samples are dried to the point where only pore water evaporates. Calculate the liquid limit of a soil sample using the cone penetration technique. The water content is measured using the cone penetration method, while the depth of penetration of a typical 20 mm cone is acquired using the cone penetration technique. In five seconds, the depths to which a typical metal cone penetrates samples of soil paste produced with different water concentrations are evaluated. Normal and modified compact tests were conducted out on natural laterite soil. 3000g of oven-dried dirt was sieved at 20mm and compacted with a rammer in full. Weigh the mound and the sample, then enter the results on the data sheet. To evaluate the moisture content of the soil, a tiny sample was collected[8].

2. LITERATURE SURVEY

S. V. Singh *et al.* presented in the article that infrastructure is a major driver of the Indian economy's overall development. The cornerstone of any system is essential. The soil surrounding the foundation is important to its strength. Expansive soils, such as black cotton dirt, are infamous for creating foundation problems. Swelling, shrinking, and unjust settlement are the problems. Plastic pollution has been one of the world's most significant problems. Year after year, the usage of throwaway containers, bottles, and other plastic products increases rapidly. As a consequence, individuals are facing a range of environmental problems. The objective of this analytical study is to focus on soil stabilization utilizing waste plastic goods. To evaluate the changing properties, tests such as the liquid limit, plastic limit, regular proctor compaction measure, CBR test, and unconfined compressive strength (UCS) were conducted out[9].

S. Saravanan *et al.* articulated in the article describes a technique for characteristics of soil, through the use the addition of lime, as well as waste materials such as fly ash, phosphogypsum, and other minerals. This contemporary soil stabilization technique may be utilized to assist solve societal problems such as trash reduction and the extraction of useable polythene containers, bottles, and other similar things. The usage of polythene containers, bottles, and other similar products is on the increase, resulting in a plethora of environmental problems. As a consequence, disposing of plastic trash without harming the environment has become a serious issue. Since good quality soil for embankments is rare, utilizing plastic bottles as a soil stabilizer is a cost-effective option. This study includes a comprehensive examination of the use of discarded plastic bottles for soil stabilization. Plate load studies on soil reinforced laden bottles divided in half at one-third locations of the tank were utilized to conduct the research. When the test results were compared, it was found that applied pressure was the source of the issue. The proper percentage of plastic strips in the soil was calculated, and plate load tests were carried out using this proportion. The bottle strips have a direct effect on increasing soil strength[10].

3. DISCUSSION

The increased CBR rating reflects the natural ground subgrade and base courses beneath the existing carriage building's intended capabilities. While recycling may help to reduce the quantity of trash that gets up in land fields, rivers, and the environment, most local governments can only recycle a few types of plastic. The IS: 2720 defines a method for measuring the specific gravity of soils, which may be used to estimate the degree of saturation and unit weight of soils. In soil engineering, unit weights are needed for pressure, settlement, and stability issues. The Figure 1 illustrates Pycnometer is a gadget that is used to measure specific gravity.

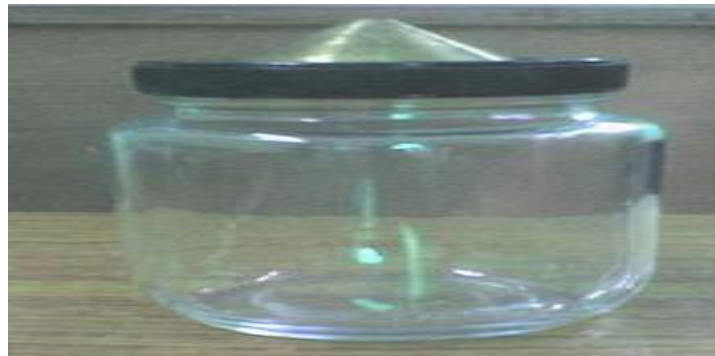


Figure 1: Pycnometer Which Is Used To Determine Specific Gravity.

Boulder > 300 mm, Cobble < 300mm and > 80mm, Gravel (G) < 80mm and > 4.75mili-meter, Coarse gravel = 80mili-meter to 20mili-meter, Fine gravels = 20mili-meter to 4.75mili-meter.

Sand (S) < 4.75mili-meter and > 0.075mili-meter.

Coarse sand = 4.75mili-meter to 2mili-meter, Medium sand = 2mili-meter to 425 μ , Fine sand = 425 μ to 75 μ .

Silt > 75 μ and < 2 μ and Clay < 2 μ .

A porous mixture of soil particles is referred to as "soil." Pores may hold both water and air. Voids are a word used to characterize pores. If the gaps are filled with water, the soil is regarded saturated, and if the spaces are empty, the soil is considered dry. To assess moisture content, soil

samples are dried to the point where only pore water evaporates. Calculate the given soil sample using the cone penetration technique. The cone penetration technique is used to determine the water content of a soil sample when the extent is assessed. The depths at which a regular may be recognized in five seconds.

For natural laterite rock, both conventional and modified compact tests were conducted. A total of 3000g of oven-dried dirt was sieved at 20mm and compacted using a rammer. Weigh the mould with the sample and write down the findings on the data sheet. A tiny sample of soil was collected to assess the moisture content.

$$V_b = \frac{W_1 - W_2}{\gamma_b}$$

Where, W_1 is equal to the Weight of mould with

w is equal to the moisture content

W_2 is equal to the Weight of empty mould.

V is equal to the Volume of mould.

The dry density of the soil is calculated as follows

$$\gamma_d = \frac{\gamma_b}{1+w}$$

Where, γ_b is equal to the wet density of the compacted soil

The Optimum moisture content (OMC) as well as the maximum dry density (MDD) of natural soil are calculated, and the quantity of soil required for CBR is measured using the matching dry density. The soil specimen was put in the mould, and the surcharge weight was placed on top of it. The samples are loaded and examined in both unsoaked and wet circumstances. The load for 2.5mm and 5mm penetration is recorded, as well as the CBR for 2.5mm penetration. The main aim of this, according to the Indian Standards (IS) standard on techniques of test for soils. The IS: 2720 provides a formula for calculating the basic gravity of soils, which may be used to calculate the degree of saturation and unit weight of soils. In soil engineering, unit weights are required for strain, settling, and stability issues. The Table 1 displays Pycnometer which is used to measure specific gravity. In this current case study, the technique researchers have utilized is Mechanical stabilization method for soil stabilization.

$$\text{Specific gravity of soil} = \frac{\text{Density of Water at 27 c}}{\text{Weight of water of equal volume}}$$

The relative proportions of different grain sizes in the soil are determined using the standard grain size measuring test. Plotting the Figure 2 shows the percentages of grit, sand, silt, and mud. The results were disputed.

TABLE 1: CASAGRANDES METHOD UNDER CONSISTANCY LIMITS. FOR PRESSURE, SETTLING, AND STABILISATION PROBLEMS IN SOIL ENGINEERING, UNIT WEIGHTS ARE NEEDED.

No of blows	43	41	36	30	26	18
Moisture content determination	26%	28%	30%	32%	34%	36%
Weight of container	10	10	10	10	10	10

(W1)						
Weight of container + wet soil (W2)	20	20	20	20	20	20
Weight of container + dry soil (W3)	17.42	17.56	18.01	18.38	19.02	19.42
Moisture content (w) $w = \frac{W_w}{W_d}$	34.77	32.28	24.84	19.33	10.87	6.16

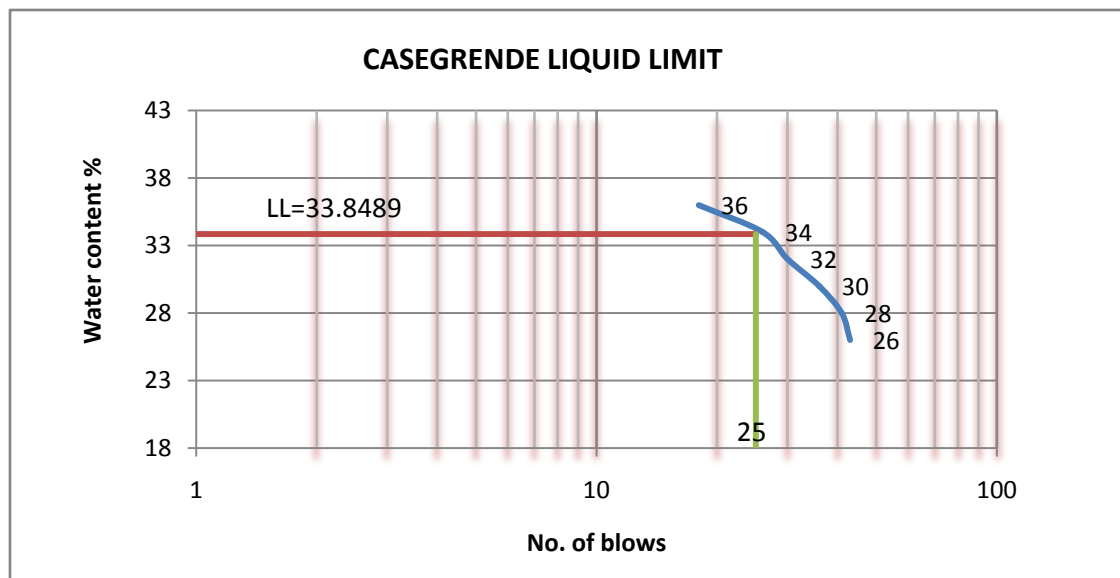


Figure2: Casagrende's Liquid Limits. The Basic Grain Size Estimation Test Determines The Relative Proportions Of Different Grain Sizes In The Soil.

Result achieved for the technique used and formulas performed is stated as Liquid limit of the soil = 33.8489 percent

The soil is the most crucial component of this ecosystem, since it supplies for all of life's basic requirements such as food, shelter, and clothing. One of India's major soil deposits is black cotton soil, which has a high tendency changes. Plastic is a pliable organic chemical combining of components into stable structures. Since plastic is utilized in a variety of products such as benches, mugs, polythene bags, and polythene sheets, utilizing it may solve while also raising a cost-effective manner.

1. Types of Plastic:

- Polystyrene (PS)
- Polypropylene (PP)
- Low-density polyethylene (LDPE)
- Polyvinyl chloride (PVC)
- High-density polyethylene (HDPE)
- Polyethylene terephthalate (PET or PETE)

- Other types of plastic

Out of these plastics people have used Polyethylene sheet of plastic as a soil stabilizer.

Advantages of Plastics are Durability, it does not get rust or corrode, Good insulators, Resistance to chemicals, Can be formed into complex shapes whereas Disadvantages of Plastics are Expensive, Not friendly to the environment, Energy needed to produce them, don't break down or degrade easily.

2. *Plastic Characteristics:*

- Plastics have a lengthy life span.
- Plastic is a reusable and recyclable material.
- Plastics are less expensive than tin glass and steel.
- Plastic has a high degree of mechanical strength.
- Plastic may be formed into a wide range of forms and sizes.
- Plastic has great optical properties
- Plastic is strong, light, flexible, and durable.

3. *Applications of Plastics:*

- Good chemical resistance.
- Good dimensional stability.
- Good electrical insulation.
- Good for friction and wear.
- Good weathering and bearing.
- Easy to weld, bond and fabricate.
- Auto-clavable and Heat Sealing.

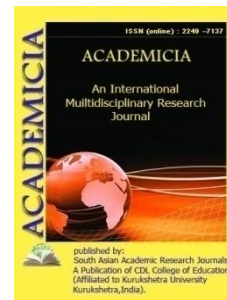
4. **CONCLUSION**

The soil is the most important component of this ecosystem since it holds all of life's needs, including food, shelter, and clothing. Black cotton soil, which has a strong propensity for swelling and shrinking owing to changes. Soil stabilization is a method for improving bearing capacity, through the use of geo synthetics, geo fabrics, and other materials. Soil stabilization approach is utilized to help solve societal issues including waste reduction and the extraction of valuable materials different tables, cups, and other products has been exponentially growing, always due to environmental issues, using would lessen the issue of plastic dumping while increasing a cost-effective manner. The management of plastic trash without generating environmental risks is getting increasingly complex. As a consequence, utilizing plastic strips is cost-effective and efficient. There has been a positive impact on soil characteristics since adding plastic into the mix. Soil stabilizers may be manufactured out of plastic. The inclusion of plastic trash improves the unconfined compressive strength of laterite rock. With the buildup of trash from plastic, the CBR values increase. Plastics of different kinds may be utilized. Stabilizers

come in a range of forms and sizes. Plastic may be found in tiny quantities and it can be evaluated for usage in different kinds of soil.

REFERENCES

1. P. Singh and S. Malhotra, "Review on improvement of engineering properties of soil using waste plastic bottles strips (Polyethylene terephthalate)," *International Journal on Emerging Technologies*. 2018.
2. V. Kumar Patidar and S. Kaur, "A Review Literature on the Use of Waste Plastic to Improve Geotechnical Properties of Soil," *Int. Res. J. Eng. Technol.*, 2016.
3. A. Kumar and V. H.P, "Effect of Discarded Plastic Waste as Stabilizer on Engineering Properties of Effect of Discarded Plastic Waste as Stabilizer on Engineering Properties of Cohesive Soil," *Int. J. Eng. Technol. Sci. Res.*, 2017.
4. A. Patil, G. Waghare, N. Inamdar, P. Gavali, R. Dhore, and S. Shah, "Experimental Review for Utilisation of Waste Plastic Bottles in Soil Improvement Techniques," *Int. J. Eng. Res.*, 2016.
5. M. Sai and V. Srinivas, "Soil Stabilization by Using Plastic Waste Granules Materials," *IOSR J. Comput. Eng.*, 2017.
6. S. V Biradar and M. K. Moniuddin, "Soil Stabilization using Waste Pet Fiber Material," *IJSRD -International J. Sci. Res. Dev.*, 2015.
7. C. Harish and H. . Ashwini, "Stabilization of Soil By Using Plastic Bottle Strips As a Stabilizer," *Int. Res. J. Eng. Technol.*, 2016.
8. A. Modarres and Y. M. Nosoudy, "Clay stabilization using coal waste and lime - Technical and environmental impacts," *Appl. Clay Sci.*, 2015, doi: 10.1016/j.clay.2015.03.026.
9. S. V. Singh and M. Dixit, "Stabilization of Soil by Using Waste Plastic Material: A Review," *Int. J. Innov. Res. Sci.*, 2017.
10. S. Saravanan and B. J. Ravindraraj, "Soil stabilisation using raw plastic bottles," *Int. J. Civ. Eng. Technol.*, 2018.



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LEXICO-SEMANTIC FIELDS OF “EYE” IN ENGLISH AND UZBEK LANGUAGES

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ABSTRACT

The article deals with the structural and semantic features of the constituent lexemes of the lexical-semantic fields of “eye” in modern English and Uzbek. The semes adjacent to it will be considered its variants. Elements in this system are in a hierarchical relationship to each other.

KEYWORDS: *Lexical-Semantic Field, Archaism, Lexeme, Dominant, Center, Periphery, Surface Structure, Deep Structure, Thematic Groups*

INTRODUCTION

Modern linguistics is characterized by an enhanced interest in the problems of the comparative study of linguo-pragmatic and cognitive features of the languages of the various morphological systems.

This article makes an attempt to illuminate this issue in terms of semantic analysis of the structure of the concept “eye” in English and “ko’z” in Uzbek. The importance of the study of this scientific article is determined by the progress of intercultural interactions.

Particular importance is the fascination of the material of the English and Uzbek languages belonging to different linguistic groups to the comparative semantic research, the identification of both common features - universals and distinctive features essential in any language.

The interaction of the languages of the Germanic and Turkic groups has been little studied, and therefore it is most attractive and relevant in the context of expanding the boundaries of communication and searching for new ways of dialogue between various world cultures.

The lexico-semantic field of “eye” performs an important information function in the process of communication, since it has an extensive network of semantic fields. At present, “linguistics” has appeared and is purchasing the rights of citizenship all over the world – “pragmatic linguistics”.

The term “pragmatic linguistics” could be very suitable in order to draw attention to one of the branches of our science, until now remained overlooked and not revealed in any of the dissimilar and different old and new “linguistics” [2, 27] one of the unexplained complications of pragmatic linguistics is the problem of correlating semantics and pragmatics.

By the lexical-semantic field of “eye” we mean a system of linguistic units integrated around the invariant of archaism “eye”, having their semantic function in this field, differing in morphological and syntactic structure, being in semantic connection with each other, to varying degrees or polyfunctional, being in paradigmatic or syntagmatic connection with each other, active and passive in function, having different emotional and expressive colours in terms of expression [3, 20].

Like any linguistic field, the lexico semantic field of “eye” has a plane of expression and a plane of meaning.

By the plan of the meaning of the field, we mean the general archaism “eye”, as well as, in varying degrees of understanding, the complex of senses.

By the plan of expression of the field, we mean different lexical units formed within the structure of the phonetic, lexical, grammatical rules of the language, essentials of oral and written speech, having visual and auditory forms and united in the opposite direction of the common meaning of “eye” [4,5].

The study of the linguistic properties of the linguistic units, constituting separate paradigmatic series and combined in one of the field based on the common meaning of “eyes” has both theoretical and practical significance.

The analysis of lexemes given in the explanatory dictionaries of English and Uzbek, illustrated that the lexeme “eye/ko`z” in all the languages is polysemantic and, moreover, as in a single case and as part of phrases and phraseological units, consumptions different meanings[9,11].

In this case, it is necessary to determine from a number of meanings, associated with the lexeme “eye”, an invariant which has a common meaning in the languages being compared.

Taking this circumstance into consideration, we have analyzed the lexical unit “eye” in the form in which it is verified in the dictionaries, and also analyzed the units that have morphological and syntactic structures associated with the given lexeme [10,5].

It is noted in the Webster's Third New International English Dictionary that “eye”, being a noun, is related to the lexemes “eage” in old English, “eie” in medieval English, “ouga” in Old German, “oculus” in Latin, “oscs” (two eyes) in Greek and “aksi” in Sanskrit, its direct and main meaning is “an organ of sight”.

By translating, we have established other meanings of the word “eye” in the categorization in which they are given in the dictionary:

1) “Eye” is both protective, supporting, close-located eyelids, eyelashes, eyebrows; the inner space of the eye and the place surrounding it.

- 2) The lens of the eye (a girl with blue eyes);
- 3) See with the eye or distinguish (imagine, anticipate), as if seen by the eye (a keen eye for a significant detail), see with the power of physical and mental perception (a good eye for what is essential), the ability to see through the imagination (on eye for beauty, He has on artists eye).
- 4) look (in the public eye);
- 5) look closely, observe at close range (under the eye of the employers);
- 6) point of view: an opinion about something (in the eye of the law);
- 7) a thing that looks like an eye:
 - a) a hole in the needle (eyelet);
 - b) a hole for a rope, a hook, in particular, in a tool of labour:
a hole for a hammer, an ax;
 - c) the tip of the plant (beans, soybeans).

So, the lexeme “eye” in English has more than 20 meanings. In the explanatory dictionary of the Uzbek “eye” has 4 meanings.

The word “eye” is enumerated the following basic meanings as a noun: [4 ,4]

The organ of vision of a living being:

Кўз косаси (eye socket) Қарға қарғанинг кўзини чўқимайди (A raven will not peck out a raven's eyes);

Look and gaze: Мансур ҳамон индамас, кўзларини бир нуктадан узмас эди. (Mansour was still silent, without taking his eyes off from one point);

The ability to see: Cloudy eye. Blind. “I used to sew skull-caps, now it is beyond the power of my eyes”.

”Some locations of things, objects (in a figurative meaning). Window glass. The place where the spring comes from.

In all of the above dictionaries, the lexeme “eye” in the basic meaning is understood as “organ of vision of a living being” Other distant principles head-to-head to it are given in sequence.

In addition, in the process of an analysis conducted among informants (specialists in the English and Uzbek languages, as well as young people belonging to different social strata were involved as informants), when asked what the word “eye” means, 90–95% of respondents answered that the “eye” is an organ of vision, then they enumerated other meanings [7,340].

Based on the above, we have chosen the meaning of “the organ of vision” as the archaic of the lexeme “eye”. The semes adjacent to it will be considered its variants. Elements in this system are in a hierarchical relationship to each other.

This relationship can be considered a stepped relationship. The variant values are connecting to the archsite “eye”. Close variants express the meaning of “eye” and associated meanings corresponding to its tasks [8.812].

For example, in the English language - sight, vision (look, glance, gaze, point of view), scrutiny (close), point of view, something having on appearance suggestive of on eye.

In the Uzbek language:

ko`z qismoq (to blink an eye, that is, to give any sign or signal to close one eye);

ko`z oldi, ko`z o`ngi (before the eyes),

ko`z tashlamoq (cast a glance; look, take a look),

ko`zdan qolmoq (to lose the ability to see),

ko`zi xira (cloudy eye - poorly seeing).

For example,

in English, an eye for an eye (as far as causing suffering, so punish;

an eye for an eye, blood for blood);

to see eye to see (with) (completely agree, have a similar point of view);

to give an eye to (to patronize, look after), my eye (expresses surprise and discontent);

in Uzbek:

uzukning ko`zi (eye of the ring);

ko`z ostiga olmoq (to take into account);

ko`zi yorimoq (to give birth);

ko`zini yog` bosmoq (do not admit other people, even those they know; be arrogant);

If in lexemes with a distant meaning the archaism “eye” is weakly expressed, in lexemes with a similar meaning it finds its expression with varying degrees of accuracy.

For example, the idiom “look out of the corner of the eye” means looking from one side of the eye.

This circumstance is also observed in English: Keep an eye on him. The archiseme “eye” and its variant meanings can be manifested through lexical units that have different morphological structures: simple, complex, paired compositional combinations, phrases, phraseological units.

We have established that in English the meaning of lexeme “eye” (noun), “eye” (verb) is expressed:

1. through consequent words:

eyeglass, eyewitness (noun, verb),

complex eyed (adjective),

eyedness (noun),

eyeful (noun),

eyeless (adjective),

eye some (adjective),

2. by compound words:

eye mindedness (noun),

eye – popper (noun),

eye – server (noun),

3. through word combinations:

to close ones eyes;

in public eyes,

to keep one's eyes on;

4. by phraseological units:

all the eye,

to cut on eye,

up to one's eyes;

5. through slang:

“in a pigs eye”.

In the Uzbek language, the main meaning of the lexeme “eye” and its variants are expressed through morphologically simple words:

ko`z - eye (noun);

ko`z ostiga olmoq - to mark (verb);

ko`znanak - deepening (noun);

derived words:

ko`zmunchiq - beads (noun);

ko`zoynak - glasses (noun);

ko`zboylogich - a magician, trickster (noun);

ko`z bo`yamachi - an eyewash (noun);

ko`zli - with an eye;

ko`zsiz - without an eye;

ko`z-ko`z - to show others;

word combination:

ko`z quloq - to look out, to be a watchdog;

ko`zdan kechirmoq – to inspect;

ko`z qiri bilan qaramoq - look out of the corner of your eye, to inspect out of the corner of the eye;

ko`z olaytirmoq - to stare at the eyes;

ko`z-ko`z qilmoq - showing off, showing to others, show others;

ko`zi ochilmoq - sober up, reveal the true state of affairs, etc.

We divided the lexemes of the field based on the “eye” archaism into semantic groups:

1) The lexemes expressing the movement of the eye as an organ of vision: catch, cry, shed a tear, blink, quit, throw, run, take a look, stare, look back, to cry, to win, to gaze, to look, to store, to have a look at, to sere wanes eyes, to peep, to blinn.

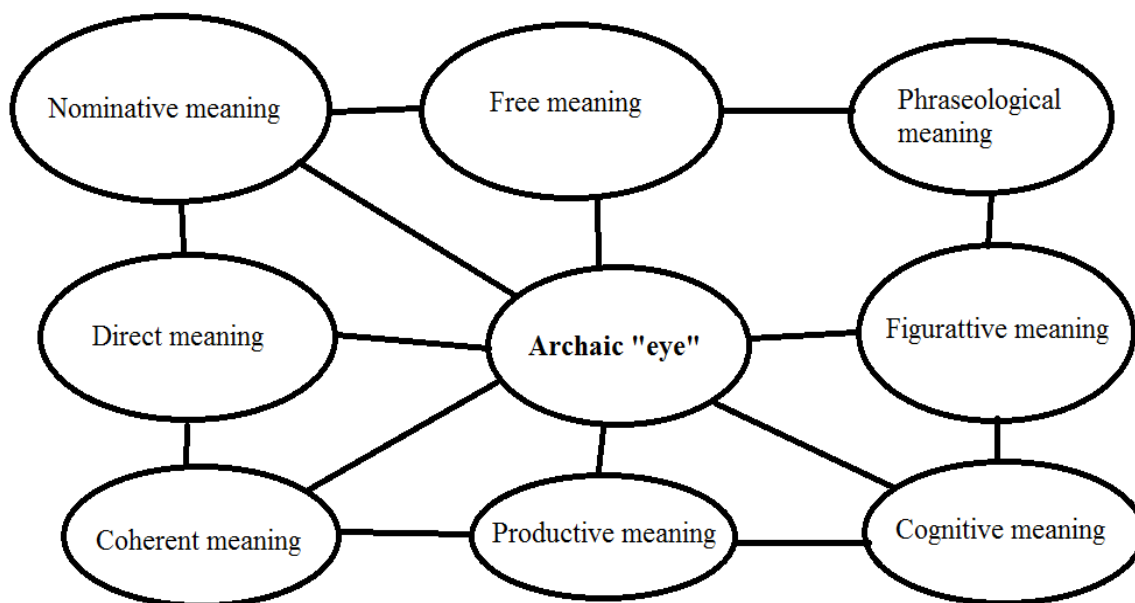
2) Lexemes expressing the colour of the eye as an organ of vision: black, green, blue, red, turned blue, reddened.

3) Lexemes expressing the shape and size of the “eye” as an organ of vision: large, small, beautiful, narrow, oblique, deer, bulging, languid, screw, round, big, wide, narrow.

4) Lexemes not directly related to the tasks of the “eye” as an organ of vision: look, tip, ulcer, spring, board, wood, ring, hungry, not satiated, give birth, leave life with open eyes, notice, stare, close, gawk, needle eye, the opening of a spring well.

5) Lexemes expressing the state of the eye as an organ of vision, as well as the ability to see in general: blind, open, closed, sharp, good, bad, weak, invisible, distant, further, clear, dull, narrow-minded, shadowy, obscure, big cross-eyed, strabismus (знание), lop-sided — eyed, cross — eyed, long — sighted, far — sighted, presbyopia (medical), weak, short — sighted, near — sighted, myopic (medical), shortsightedness.

6) Anatomy of the eye as an organ of vision and related medical terminology: glasses, ophthalmologist, cut, remove, place, microscope, lens, retina, pupil, cataract, apple, ciliary body, orbit, protein, eye pit, eyehole, oculist, eye piece, (ocular), iris, eye ball, ophthalmologist. On the basis of the conducted scientific analysis, we have established the following meanings of the “eye” archiseme, which are presented below [6,5].

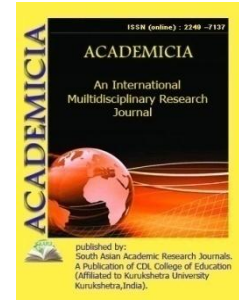
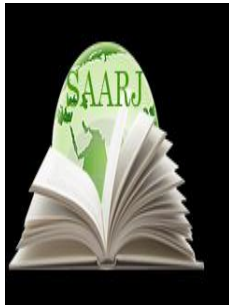


Analysis of the linguistic material shows that the semantic field of the “eye” consists of three parts:

1. The lexeme with the archaism “eye” is its dominant;
2. Lexemes with similar meanings make up its core;
3. Lexemes with distant meanings form its margin.

THE LIST OF USED LITERATURE:

1. Akhmanova OS, Magidova IM Pragmatic linguistics, pragmalinguistics and linguistic pragmatics. - Question. linguistics, 1978, no. 3.
2. Rasulov, Z.I. (2011). Syntactic ellipsis as a manifestation of the economy of language): abstract of dissertation .. candidate of philological sciences / Rasulov Zubaidullo Izomovich.- Samarkand, 2011.-27 p.
https://scholar.google.com/citations?view_op=view_citation&hl=ru&user=BMFYyZIAAAAJ&citation_for_view=BMFYyZIAAAAJ:UeHWp8X0CEIC
3. Haydarov Anvar Askarovich, and Nigina Hamidovna Navruzova. "STYLISTIC FEATURES OF INTONATION." Scientific reports of Bukhara State University 5.1 (2021): 18-29. <https://uzjournals.edu.uz/buxdu/vol5/iss1/2/>
4. Gadoeva, Mavluda Ibragimovna; Umurova, Xushvaxt Xakimovna; and Vaxidova, Fotima Saidovna (2019) "The Expression Of The Meaning Of The Category Of Indefiniteness In Nouns And Pronouns In The English And Uzbek Languages.," Scientific Bulletin of Namangan State University: Vol. 1 : Iss. 10 , Article 43. Available at: <https://uzjournals.edu.uz/namdu/vol1/iss10/43>
5. Gadoyeva, M. (2021). Analysis of body part idioms in the system of non-related languages. ЦЕНТР НАУЧНЫХ ПУБЛИКАЦИЙ (buxdu. uz), 5(5).
6. Gadoyeva, M. (2021). Features of connotative meaning of somatizms as part of phraseological units. ЦЕНТР НАУЧНЫХ ПУБЛИКАЦИЙ (buxdu. uz), 5(5). http://scholar.googleusercontent.com/scholar?q=cache:ji9Fsy4oIMAJ:scholar.google.com/+Gadoyeva&hl=ru&as_sdt=0,5
7. Haydarov Anvar Askarovich, and Nigina Hamidovna Navruzova. "CONNOTATIVE MEANINGS RELATED TO SOUND CHANGES." International Journal for Innovative Engineering and Management Research. Vol 10. Issue 03. (2021.02): 340-347. <https://ijiemr.org/downloads/Volume-10/Special>
8. Bakhriddinova, K. A. (2020). Features of the use of the periphrases of the Uzbek and English languages in journalistic texts. International Journal of Psychosocial Rehabilitation, 24(7), 8162-8168. <https://www.elibrary.ru/item.asp?id=43267947>
9. Kobilova, A., & Karimova, K. (2017). The Total Physical Response As An Important Tool In Language Teaching. Интернаука, 7(11 Часть 3), 11.
10. Akramov, I. (2021). Special Signs, Properties And Characteristics Of Aphorisms. Center For Scientific Publications (Buxdu.Uz), 5 (5). Retrieved From http://Journal.Buxdu.Uz/Index.Php/Journals_Buxdu/Article/View/2386



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DISTRIBUTION OF HELMINTOSIS DISEASES OF ONE-HOIED ANIMALS

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ABSTRACT

The article presents the results of the study of the level of helminthiasis in ungulates in Samarkand, Jizzakh, Kashkadarya, Surkhandarya, Navoi, Bukhara regions and the Republic of Karakalpakstan. and intestinal stenosis (delaphondiosis, alfortiosis, steniliosis, and trichonematosi) accounted for an average of 64%, with cestodes 7.86%, parascaris 14.6%, and strongylates (41.6%).

KEYWORDS: *Cestode, Oncosphere, Egg, Nematode, Strongylata, Strongylus (Delafondia) Vulgaris, Strongylus (Alfortia) Edentates, Strongylus (Strongylus) Equines, Trichonema, Larvae, Eggs, Larvae, Geohelminths, Palliative, Helminths.*

INTRODUCTION

In recent years, the agrarian system of the Republic of Uzbekistan pays special attention to animal husbandry. The first President of the Republic I.A. Karimov's PP-308 of March 23, 2006 "On measures to encourage the increase of livestock in personal assistants, farmers and farms" and April 21, 2008 "On personal assistants, farmers and farmers" Resolutions PQ-842 "On additional measures to increase incentives for livestock breeding and increase the production of livestock products" are an important factor in the development of animal husbandry. The Decree of the President of the Republic of Uzbekistan "On the Strategy of Actions for the Further

Development of the Republic of Uzbekistan" has become an important basis for ensuring the rule of law, human rights and freedoms, an atmosphere of interethnic harmony and religious tolerance in society, the conditions for a decent life of our people, the realization of the creative potential of our citizens - five priorities for 2017-2021 The Strategy of Action in the direction of However, helminthiasis of ungulates, especially anoplocephalidosis, parascaridosis, and intestinal ciliatosis (delaphondiosis, alfortiosis, strongylosis, trexonematosi), among other diseases, are somewhat hindering the increase in the number of livestock. Diseases of horses anoplotcephalidosis, parascaridosis and intestinal strongylatosis (delafondiosis, alfortiosis, strongylosis, trexonematosi) occur in all districts and regions of the Republic. In particular, in Samarkand, Jizzakh, Kashkadarya, Surkhandarya, Navoi, Bukhara regions and the Republic of Karakalpakstan, an average of 46-50% of horses examined suffered from parascaridosis, 58-65% from intestinal strongylatosis and 12-15% from anoplocephalidosis. detected.

With this in mind, we set ourselves the goal of studying the prevalence of intestinal cestodes, parascaridosis and intestinal stenosis in horses in Samarkand, Jizzakh, Kashkadarya, Surkhandarya, Navoi, Bukhara regions and the Republic of Karakalpakstan.

Materials and methods

Our research examined feces of horses from the population of Samarkand, Jizzakh, Kashkadarya, Surkhandarya, Navoi, Bukhara regions and the Republic of Karakalpakstan by Fulleborn and Berman-Orlov methods, and identified and analyzed the level of damage to horses. A total of 89 samples from the above regions were tested.

Results and their analysis

The results of the study of the incidence of anoplotcephalidosis, parascaridosis and intestinal styliatosis (delaphondiosis, alfortiosis, strongylosis, trexonematosi) in horses are given in Table 1.

When we examined the feces of 13 horses in the Samarkand region, we found helminth eggs in 9 of them, which is 69.3% of the damage. Anoplocephala eggs were found in 1 head of horse manure, and parascarid eggs were found in 3 heads. Intestinal strongilyat eggs were found in the feces sample of 5 head horses. In order to determine which of the eggs found were stubborn eggs, the eggs in the fecal sample were incubated in a thermostat at 37–38°C for 48 h and then accurately diagnosed based on the number of intestinal cells of the larvae formed. The larvae of Strongylus (Delafondia) vulgaris were found in one head of horse manure, the larvae of Strongylus (Alfortia) edentates in one head of horse manure, the larvae of Strongylus (Strongylus) equines in one head of horse manure and the larvae of Trichonema intensivas of 2 head horse manure. made 5-7 copies in one viewing area.

The helminths of the tested horses degree of infestation with

T/r	Provinces	Number of horses tested	Number of head of Infected horses	That's it							Degree of damage %
				Anoplotcephaly	Paranoplotcephaly	Parascaridosis	Delafondioz	Alfortioz	Strongylosis	Trichonematosi	
1.	Samarkand	13	9	1	-	3	1	1	1	2	69,2
2.	Jizzakh	12	7	-	-	2	1	-	-	4	58,3
3.	Kashkadarya	16	12	1	-	2	2	1	2	4	75,0
4.	Surkhandarya	14	11	1	1	2	2	1	1	3	78,6
5.	Navoi	9	5	-	-	1	1	1	-	2	55,5
6.	Bukhara	10	6	1	1	-	1	1	-	2	60,0
7.	The Republic Karakalpakstan	15	7	1	-	3	2	-	-	1	46,7
	Total:	89	57	5/5,6	2/2,2	13/14,6	10/11,2	5/5,61	4/4,49	18/20,2	64,0

When we examined the feces of 12 horses in the Jizzakh region, we found helminth eggs in 7 of them, with a damage rate of 58.3%. Including parascarid eggs in a sample of 2 head horse manure found in the feces of 6 head of horses. The intensity of the invasion was 3-5 copies in each field of view of the microscope.

Examination of faeces from 16 horses in Kashkadarya region revealed helminth eggs from 12 horses, with an infestation rate of 75.0%. Anoplocephala perfoliata eggs were found in 1 horse dung sample, Parascaris equorum eggs were found in 2 horse dung samples, and intestinal strongilyat eggs were found in 9 horse dung samples. The intensity of the invasion ranged from 2 to 5 copies in each field of view of the microscope.

When we examined the feces of 14 horses in the Surkhandarya region, we found helminth eggs in 11 of them, with an infestation rate of 78.6%. Anoplocephala magna was found in 1 horse manure, Anoplocephala perfoliata eggs were found in 1 horse manure, Parascaris equorum eggs were found in 2 horse manure samples, and intestinal strongilyat eggs were found in 7 horse manure samples. The intensity of the invasion was 4-7 copies in each field of view of the microscope. When we examined the feces of 9 horses in the Navoi region, we found helminth eggs in 5 of them, with an infestation rate of 55.5%. In particular, parascarid eggs were found in the beginning of the 1st. Intestinal strongilyat eggs were found in the feces sample of 4 head horses. The intensity of the invasion was 3-5 copies in each field of view of the microscope. When we examined the feces of 10 head of horses in the Bukhara region, we found helminth eggs in 6 heads, ie the infestation rate was 60.0%? formed. In particular, Anoplocephala magna

was found in 1 head of horse manure, *Anoplocephala perfoliata* eggs, *Parascaris equorum* eggs were not found in one head of horse manure, intestinal strongilyat eggs were found in 4 head of horse manure. The intensity of the invasion ranged from 1 to 3 copies in each field of view of the microscope. When we examined the feces of 15 head of horses in the territory of the Republic of Karakalpakstan, we found helminth eggs in 7 of them, the infestation rate was 46.7%. *Anoplocephala magna* was found in 1 horse dung sample, *Parascaris equorum* eggs were found in 3 horse dung samples, and intestinal strongilyat eggs were found in 6 horse dung samples. The intensity of the invasion was 3-5 copies in each field of view of the microscope. Thus, 57 of the 89 horses tested had helminth eggs found, with a lesion rate of 64.0%. In particular, *Anoplocephala magna* was found in the feces of 5 horses (5.6%), *Anoplocephala perfoliata* eggs were found in the feces of two horses (2.2%), and *Parascaris equorum* eggs were found in the feces of 13 horses (14.6%). *Strongylus* (*Strongylus*) equines eggs in 5 head specimens, *Strongylus* (*Alfortia*) edentates eggs in 5 heads (5.61%), *Strongylus* (*Strongylus*) equines eggs in 4 heads (4.49%) and 18 heads (20.2%) *Trichonema* eggs were found. The intensity of the invasion averaged 5-7 copies per microscope field of view.

CONCLUSION

As a result of our research, we came to the following conclusions:

- Parasitic diseases of horses are one of the most common invasive and parasitic diseases in the country, causing great economic damage in the field of horse breeding;
- The incidence of anoplocephalidosis in horses examined was 12.3%, parascaridosis 22.8% and intestinal strongylatosis 64.9%.
- In our study, the proportion of equine anoplocephalidosis, parascaridosis, and intestinal strongylatosis was significantly higher (64.0%), with trichonemias (20.2%) leading the way.

REFERENCES

1. K.I.Abuladze Parasitology and invasive diseases of agricultural animals / Moscow VO Agropromizdat, 1990.
2. Haqberdiev P.S. etc. / Guidelines for laboratory assignments on the subject "Parasitology" / Samarkand, 2009.
3. Haqberdiev P.S. Methodical manual on practical training on the subject "Parasitology", Samarkand, 2010.
4. Haqberdiev P.S., Qurbonov SH.X. Practical and laboratory classes in parasitology. Textbook, Tashkent, 2015.



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DETERMINATION OF ADULTERANTS IN HONEY

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ABSTRACT

In this article, an analysis is done based on different studies conducted across the globe on the topic of the use of adulterants in honey. The adulterant of choice for my sample is sugar cane and corn syrup, which is one of the most common adulterants utilized in a variety of honey products. Honey adulteration is a complicated problem in the globe in general and in our nation in particular, according to most studies, and it has a significant economic effect. It may be caused by the introduction of different inexpensive foreign elements. Contamination of honey alters the physiochemical besides rheology of honey, decreasing its nutritional and medicinal properties. As a consequence, methods of adulterate identification and accurate measurement of adulterants would have been utilized to create high grade honey devoid of any foreign addition. Numerous approaches used for honey adulteration detection by maximum researchers, such as, Liquid Chromatography (LC) and Gas Chromatography (GC) analysis, protein characterization, Near Infra-Red (NIR) spectroscopy, Fourier Transform Infrared (FTIR) spectroscopy with Attenuated Total Reflectance (ATR), High Performance Anion Exchange Chromatography with Pulsed Aerometric Detection (HPAEC-PAD), High Performance Liquid Chromatography Coupled to Isotope Ratio Mass Spectrometry (HPLCIRMS), calorimetric methods, Stable Carbon Isotope Ratio Analysis (SCIRA), Fourier Transform (FT), Raman spectroscopy and microscopic detection techniques are appropriate as well as deliver valuable knowledge. However, to get a complete besides dependable result, individuals must not concentrate only on each method, but rather utilize a mix of them.

KEYWORDS: Adulteration, Analysis, Food, Honey, Methods, Sugar, Syrup.

INTRODUCTION

Bees and other insects create honey, which is a sticky, viscous food substance. Honey bees store honey in wax structures called honeycombs in which the honey from the Honey bee is the most well-known, owing to its extensive agricultural output and human usage. Bee keeping, or apiculture, is the skill of gathering honey. Honey's taste originates from the mono saccharides fructose and glucose, and it's equally as delicious as sucrose. When used as a sweetener, attractive biochemical characteristics for baking and a unique flavor[1]. Honey does not mature most germs, thus sealed honey does not deteriorate, even after thousands of years. Honey is produced by bees that collect nectar to utilize as carbohydrates to maintain muscular metabolism during scavenge or to be digested as a lasting food supply. Part of the nectar collected by bees is utilized to boost metabolic operation of flying physiques while foraging, with the rest of nectar together meant for spewing, digesting, plus storage as honey. Mature and larval bees use stored honey as nourishment in cold environment or when other food sources remain scarce. People have been able to semi-domesticate bee swarms and harvest excess honey by persuading them to dwell in man-made hives[2].

Honey is classified into groups depending on the floral source and the manufacturing and processing techniques employed. Honeys from various regions of the nation are also mentioned. Honey is also categorized in the United States according to standards for colour and optical density. In general, honey is classified according on the floral base of the syrup used to produce it. Honeys may be produced from specified types of floret nectars or blended together once they've been gathered. Pollen in honey may be traced back to a floral source, and therefore to a particular location[3].

Honey is made up of sugar (approximately seventy-six percent), water (eighteen percent), and other components (about 6 percent). (Roughly 6 percent). Honey's main characteristic (sweetness) is supplied by sugar, which is followed by water (the liquid), and small quantities of other components determine the differences between various kinds of honey. Color, smell, and taste are examples of these differences. Honey includes three kinds of sugar, rather than a single species. Fruit sugar (fructose) has one of the greatest amounts (41 percent) followed by glucose, which has approximately thirty-four percentage, and sucrose, which has between one and two percentage. The proportion of one type of sugar to another is controlled by the floral pasture, supply, and to a smaller degree by the enzyme inverses, which breaks down normal sugar in grapes and fruits as well as in the body of the worker[4].

The following are the constituents:

- Undetermined matter
- Acids
- Proteins
- Minerals

The proportions vary the next. Minerals contribute for 3.68 percent of the total. Minerals in honey grow, despite the fact that the honey does not make up an essential quantity. The elements potassium, arsenic, Sulphur, calcium, sodium, phosphorus, magnesium, silicon, iron, manganese, and copper are all present in honey. Dark honey has a greater mineral content than lighter honey,

based on the measured mean quantity. It was previously believed that bees injected bee venom into honeycomb cells from their stomachs, maintaining the honeycomb. It was believed that honey included formic acid since formic acid is one of the major components of bee spite. Because of this, some individuals encouraged others not to use honey. According to research, honey is made up of a range of acids, the majority of which being apple and lemon acids[5].

Vitamins in honey are in extremely tiny quantities, insufficient for the organism's requirements. Vitamin C and a few B complex vitamins make up the gaps (riboflavin, pantothenic acid, pyridoxine, biotin, nicotinic acid) (riboflavin, pantothenic acid, pyridoxine, biotin, nicotinic acid). Honey has a unique smell that is generated by essential oils. These chemicals are unstable and evaporate quickly when honey is heated. Proteins are present in honey as a consequence of nectar and pollen, which are also natural components of plants. Honey proteins may accept structures or basic chemicals, such as amino acids[6].

Honey fraud is achieved by mixing corn syrup, rice syrup, and cane sugar, each of which can be recognized. Chromatography and mass spectroscopy are employed to monitor the syrup combination. In this situation, infrared and near-infrared measurements are considerably simpler. It is feasible to anticipate that NIR may be utilized to verify the authenticity of high-value single pollen honey, such as Manuka honey, in single pollen honey detection. Principle component analysis, or PCA, may be used in this instance to estimate the honey's origin and species quickly and without the requirement for sample preparation. This has been utilized for a number of food kinds, but not for a thorough study of honey[7].

LITERATURE SURVEY

F. Ulberth presented that honey is a natural product with a long history of medical usage and has been appreciated for its sweetening properties since ancient times. Honey can only be slightly processed to satisfy internationally accepted standards by centrifugation, mild heating, and, if required to avoid foreign matter, filtration. Honey may be adulterated (extended) by adding syrups (e.g., high fructose corn syrup) that mimic honey's natural sugar content, or it may be mislabeled as to its botanical or floral origins. To identify contaminated honey, detection techniques based on different measuring concepts, such as spectroscopic and chromatographic approaches, as well as combinations thereof, have been developed. To evaluate if honey corresponds to its label statement, multivariate statistics are usually applied to the obtained results[8].

S. Soares *et al.* honey is a popular natural food, not only because of its taste and because of the health advantages it offers. Honey may be classified as a premium product due of characteristics unique region or local climate and flora. Honey is generally regarded as a desirable commodity because of its appealing smell and flavor. As a consequence of improper or fraudulent production techniques and mislabeling sources, honey has become a victim of adulteration. Honey authentication is split into two categories: processing, which involves problems. Both of these issues are addressed in this research, with a focus on techniques for detecting different types of honey adulteration. Honey authenticity has been challenging owing to its dynamic nature and numerous types of adulteration, spurring the development of several advanced analytical methods. As a consequence, a fresh, critical, and thorough evaluation of current or authenticity is given, as well as non-target fingerprint methods. The most current advances in

chemistry, reviewed, with a focus on the benefits and drawbacks of each for identifying botanical and geographical roots[9].

1. Uses of Honey

- Many of the ancient applications of honey are being verified by contemporary study.
- Honey has been utilized to heal wounds and burns because of its supposed fitness welfares. Honey has been proven to have therapeutic benefits in the treatment of wounds in many instances. Honey may be able to help heal wounds, according to a research released.
- Honey has been proven to decrease the frequency and extent of diarrhea. Honey also stimulates you to consume more water and potassium, which is helpful when you have diarrhea.
- Honey has been proven to reduce the increasing inflow of abdominal acid then undigested food by coating the oesophagus besides stomach, according to current research.
- In 2010, experts from the University of Amsterdam's Academic Medical Center claimed in the magazine that honey's capacity to kill germs is attributable to a protein called defensin-1. Study released showed that Manuka honey, a type of honey, may be helpful in treating infections.
- Honey is suggested by the World Health Organization (WHO) as a safe cough treatment for reducing cold and cough symptoms. Honey is also suggested by the Pediatrics as a cough treatment.
- Honey's mild flavor makes it an ideal complement for sugar in the meal. Sugar in the meal adds extra calories to the diet with no health benefit. This will lead to a gain in body mass, which raises the risk of hypertension and diabetes.

2. Adulteration in Honey

A legal word for a food substance failing to satisfy federal or state standards is adulteration. Sugar syrups and molasses inverted by acids or enzymes from rice, sugar cane, sugar beet, and syrups of natural origin such as maple syrup have been discovered in falsified honeys. Honey is indirectly contaminated by feeding artificial sugars to honeybees at the time when broods become spontaneously apparent. Indirect adulteration is one of the most frequent forms of adulteration. Adulteration techniques are constantly developing, and most honey adulteration methods are undetected by the official (legislative) evaluation of honey consistency criteria. Furthermore, while honey's popularity among consumers continues to grow, its worldwide supply is uncertain. Honey is indirectly contaminated by giving synthetic carbohydrates to honey bees when their broods become naturally apparent. It's difficult to detect such accidental adulteration[10].

This page offers an overview focusing on many research performed across the globe on the use of adulterants in honey. Cane sugar and corn syrup, which is one of the most frequent adulterants utilized in a range of honey products, are the adulterants of choice for my research. According to most sources, honey adulteration is a complex issue in the globe in general and in our nation in particular, and it has a major economic effect; it is produced by the addition of different inexpensive foreign ingredients. Honey that has been contaminated loses its physiochemical and

rheological characteristics, decreasing its nutritional and therapeutic potential. As a consequence, adulterate discrimination techniques and precise adulterant quantification may have been utilized to produce high-quality honey that was devoid of any foreign addition. These techniques are helpful and provide significant information on each aspect of honey authenticity; furthermore, in order to obtain a comprehensive and accurate result, individuals should utilize a blend of them rather than relying solely on one.

The Honey Formulation and Development Directive offers standard principles for the formulation and processing of honey. DSC has been explored for application in identifying alteration or adulteration, as well as regulating food hygiene. This technique is used to examine thermal behavior, which is essential for choosing its purity alongside detecting manipulated or contaminated honey. Corn syrup, rice syrup, and cane sugar, each of which can be identified, are used to produce honey scam. The syrup mixture is identified using chromatography and mass spectroscopy, although infrared and near infrared measurements are considerably simpler in this instance.

DISCUSSION

1. Detection Techniques for Adulterated Honey:

Adulteration techniques are constantly developing, and most honey adulteration methods are undetected by the official (legislative) evaluation of honey consistency criteria. Furthermore, while honey's popularity among consumers continues to grow, its worldwide supply is uncertain. Honey is indirectly contaminated by giving synthetic carbohydrates to honey bees when their broods become naturally apparent. It's difficult to detect such accidental adulteration.

Internal norm $^{12}\text{C}/^{13}\text{C}$ isotope fractionation mass spectrometry was used to analyze twenty Australian honeys and their associated protein extracts, each from a different floral source. An artificial honey is also confirmed then used for successive dilution of an unadulterated honey to examine how much adulteration might be discovered, resulting in measured apparent adulterations of 2 to 5 percent. The samples are not deemed contaminated because the variances are smaller than the globally accepted threshold of 1 (7 percent adulteration).

Although the lesson established baseline values for specific Australian honeys and showed the applicability of this method, National Residue Survey (NRS) is unable to continue additional study in this area. NRS, on the other hand, will be able to provide scientific resource performing honey study to determine the degree analogue honey reliant on C_4 plant sugars. The Australian Honey Bee Industry Council (AHBIC) contacted NSR in February 1999 with the request to undertake finding analogue honey. AHBIC funded the project costs, which were anticipated by NRS to be approximately \$1000. The original NRS plan also anticipated that testing each honey sample using $\text{C}_{13}\text{-C}_{12}$ isotope ratio mass spectrometry would be required to identify adulteration.

The natural differences that utilize C_3 as well as C_4 photosynthetic processes are used to identify tainted honey using the isotope method. $\text{C}_{13}\text{-C}_{12}$ isotope levels, commonly known as isotope C_{13} values, vary from 8 percent to 13 percent in C_4 plants, such as maize, whereas C_3 species, such as nector plants, ranges from 22 percent to 30 percent.

The approved institution contacted to perform the honey protein extractions. However, because the C_{13} values of honey from different floral sources may vary considerably, there is a broad

range of C13 values within which no definite conclusion about the pureness of the honey can be made devoid of further testing. To solve the problem, C13/C12 isotope ratio method for detecting honey adulteration with c4plant was developed. As a consequence, NRS concluded that this method was suitable in order to detect honey contamination with cane sugar or corn syrup.

As a consequence, when it was discovered that isotope ratio method, it was decided to investigate a range of deliberately contaminated honey samples to determine if similar levels of adulteration could be detected in this study.

2. Advances in the Detection of Honey Adulterations:

Aside from the Codex Alimentarius (1981) definition of honey, several nations' and the European Union's (EU) laws have other interpretations. Honey comes in a range of physical forms and formulas. Acidity, water-insoluble particles, moisture, mineral content, 5-hydroxymethylfurfural (HMF) concentration, and apparent reducing sugar alongside apparent sucrose are among the compositional criteria specified in the current honey directive.

Honey adulteration initially appeared on the worldwide market in the 1970s, when the firm introduced high-fructose corn syrup. Since mono saccharides fructose and glucose (85-95 percent) are the most prevalent, the provided honey is largely dictated by the nectar source. To identify adulteration of honey, a variety of analytical methods have been developed, including isotopic, thermal analysis, trace element approaches, spectroscopic, as well as chromatographic. Any of these methods stand time overwhelming, while others are expensive.

Differential Scanning Calorimetry (DSC) is a tool with a broad variety of applications. It's a fantastic method to characterize of them. DSC processing is fast and simple, requires a limited (less than 100 mg), while did not need the usage of solvents. It was used to measure thermal activity in a range of nourishments, even in circumstances wherein heat alteration does not take place. DSC is a useful tool to employ in combination with chemical analytical methods to highlight the limitations of physicochemical findings. DSC has been investigated for identifying alteration or adulteration, as well as for food quality monitoring. Thermal behavior, energy variance during phase transition, transition temperatures, and the water content relationship in honey were all investigated using this technique. For evaluating honey quality and identifying adulteration or alteration, a comprehensive knowledge of its thermal characteristics is required.

The lower glass transition temperatures and greater fusion enthalpies. Honey and syrups have unique Tg locations and intensities, which may be utilized to distinguish them. Pure compounds have a unique owing to their complicated structure. Aside from the Codex Alimentarius (1981) definition of honey, several nations' and the European Union's laws have additional meanings (EU) (EU). Honey comes in a range of physical forms and formulations (crystallized). A proposal to amend Council Directive 74/409/EEC on honey has been approved by the European Commission (EC). This Directive sets broad criteria for the formulation and manufacturing of honey. Honey and honey products have become increasingly popular during the past several decades.

In recent years, honey from the Far East has lately been exposed to a significant adulteration problem. The potential to be deliberately tampered with, expensive besides cultivated under severe, such as honey, are particularly susceptible.

3. Infra-Red Spectroscopy of Honey Adulterations:

While many people are aware of the risks of accidental contamination in the food supply chain, purposeful food adulteration for economic gain has only lately come to light. The melamine pandemic in China in 2007/08 showed this, when a rise in the frequency of kidney failures in dogs and cats alerted authorities to a problem in the pet food supply chain. People now know that the reason was a mixture of melamine and cyanuric acid contained in the pet food. However, the story is not new; fraud and adulteration have been detected as far back as ancient Rome, with wine supposedly contaminated with water. Globalization of supply chains has increased volatility and reduced risk for different parts of the chain in recent years, aggravating the problem. The following are the most common types of honey scam. Corn or rice syrup may be added. For low grade ingredients, single pollen honeys are faked. There aren't current instances, like other types of food theft. Honey was the most contaminated product in the world, according to Dr. Harvey W. Wiley, the first head chemist of the United States Department of Agriculture, in 1889. Wiley brought a bottle of contaminated honey before the United States Congress in favor of the Pure Food and Drug Act, along with a dead bee on top of the thick jelly. He explained that the bee was there to mislead consumers into thinking the honey was 100 percent delicious. Instead, the sweet liquid concealed a variety of harmful chemicals from consumers, according to Wiley. As a consequence, in recent years, considerable focus has been placed on detecting whether honey includes high fructose corn syrup and whether high-value honeys, such as Manuka, are pure and authentic.

Chromatography and mass spectrometry are excellent at detecting adulterants in various types of fraud. Infrared and near-infrared systems, on the other hand, are easier to handle, operate, and speed up, as well as being less expensive, making them an ideal option for honey processing. NIR Spectra of the following pure samples were examined to show the capacity of NIR spectroscopy to detect sugar contamination into various honey kinds. Honey from clover, wildflowers, orange blossoms, organic honey, corn syrup, and rice syrup. It is feasible to anticipate that NIR may be utilized to verify the authenticity of high-value single pollen honey, such as Manuka honey, in addition to identifying corn syrup adulteration. While many people are aware of the risks of accidental contamination in the food supply chain, purposeful food adulteration for economic gain has only lately come to light. Honey fraud is achieved by mixing corn syrup, rice syrup, and cane sugar, each of which can be recognized. Chromatography and mass spectroscopy are employed to monitor the syrup combination. In this situation, infrared and near-infrared measurements are considerably simpler. It is feasible to anticipate that NIR may be utilized to verify the authenticity of high-value single pollen honey, such as Manuka honey, in single pollen honey detection. Principle component analysis, or PCA, may be used in this instance to estimate the honey's origin and species quickly and without the requirement for sample preparation. This has been utilized for a number of food kinds, but not for a thorough study of honey.

CONCLUSION

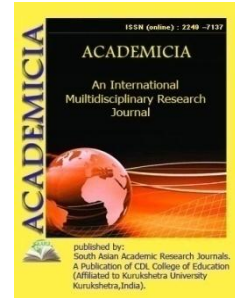
After the conclusion of all tests, on honey adulteration, it was found that Honey is not always pure, it may be tampered with in a number of ways and identified in a variety of ways. People have a simplistic idea that pure honey can never deteriorate spontaneously, and this is a common truth. But, when honey is poisoned, it merely shows that it was entirely adulterated. Since the isotope method for identifying contaminated honey depends on natural changes in isotopic ratios between C13 and C12 isotope ratios, the approved institution was first called to perform honey

protein extractions. As a consequence, the internal standard isotope ratio method may be used to identify honey that has been contaminated with C4 plant sugars.

A proposal to modify the council regulation on honey has been approved by the European Commission. This directive sets standard criteria for the formulation and manufacturing of honey. DSC has been investigated for identifying alteration or adulteration, as well as for food quality monitoring. Thermal behavior (crystallization), were all investigated using this method. Understanding the thermal characteristics of honey is important for evaluating its consistency and detecting adulterated or manipulated honey. Honey fraud is achieved by mixing corn syrup, rice syrup, and cane sugar, each of which can be recognized. Chromatography and mass spectroscopy are employed to identify the syrup mixture, however infrared and near infrared techniques are considerably easier in this scenario.

REFERENCES

1. O. Abbas *et al.*, "Analytical methods used for the authentication of food of animal origin," *Food Chemistry*. 2018, doi: 10.1016/j.foodchem.2017.11.007.
2. C. Beltramo *et al.*, "Validation of a DNA biochip for species identification in food forensic science," *Food Control*, 2017, doi: 10.1016/j.foodcont.2017.03.006.
3. E. Hong *et al.*, "Modern analytical methods for the detection of food fraud and adulteration by food category," *Journal of the Science of Food and Agriculture*. 2017, doi: 10.1002/jsfa.8364.
4. J. Sherma and F. Rabel, "A review of thin layer chromatography methods for determination of authenticity of foods and dietary supplements," *J. Liq. Chromatogr. Relat. Technol.*, 2018, doi: 10.1080/10826076.2018.1505637.
5. T. Cajka, M. R. Showalter, K. Ridellova, and O. Fiehn, "Advances in mass spectrometry for food authenticity testing: An omics perspective," in *Advances in Food Authenticity Testing*, 2016.
6. C. Fanali, L. Dugo, and L. Mondello, "Advances in chromatographic techniques for food authenticity testing," in *Advances in Food Authenticity Testing*, 2016.
7. A. C. A. Veloso, M. E. B. C. Sousa, L. Estevinho, L. G. Dias, and A. M. Peres, "Honey evaluation using electronic tongues: An overview," *Chemosensors*. 2018, doi: 10.3390/chemosensors6030028.
8. F. Ulberth, "Advances in testing for adulteration in honey," in *Advances in Food Authenticity Testing*, 2016.
9. S. Soares, J. S. Amaral, M. B. P. P. Oliveira, and I. Mafra, "A Comprehensive Review on the Main Honey Authentication Issues: Production and Origin," *Compr. Rev. Food Sci. Food Saf.*, 2017, doi: 10.1111/1541-4337.12278.
10. A. P. Sobolev, S. Circi, and L. Mannina, "Advances in nuclear magnetic resonance spectroscopy for food authenticity testing," in *Advances in Food Authenticity Testing*, 2016.



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MOBILE AD-HOC NETWORK (MANET) ROUTING PROTOCOLS: A COMPARATIVE ANALYSIS

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ABSTRACT

Routing in a Mobile Ad-hoc Network (MANET) is a dynamic and difficult problem that has gotten a lot of attention from academics all over the world. To address this issue, a variety of routing classes have been developed, and the number continues to grow exponentially day by day. It's difficult to predict which protocols or routing classes would perform well in a variety of network situations, such as network volume and topology. We provide an overview of a vast number of current routing classes in this paper, with an emphasis on their uniqueness and usefulness. In addition, the judgment is based on the routing capability, and data is utilized to construct routing decisions. There is also a discussion of all of the routing protocols or classes. Furthermore, this research will aid academics in compiling a list of current classes and recommending which protocols would perform better in certain network situations.

KEYWORDS: *Ad-hoc Network, Delay, MANET, Mobile Ad-hoc Network, Routing protocol.*

7. INTRODUCTION

In the modern era, one of the most notable fields for study and growth of the wireless network is mobile ad-hoc networks (MANETs). As the MANET popularity grows, so does its use. In the wireless network, it has now become one of the most energetic and athletic communication areas. MANETs are self-configuring, decentralized networks with minimal infrastructure[1]. There are no requirements for these nodes to join the network or depart. Nodes may move around freely and often alter their connections with other devices or nodes. Because of the wireless networking environment, MANET offers a routable method for transferring packets from one node to another. Mobile Ad-Hoc networks are characterized by the absence of physical infrastructure and are highly dynamic[2]. Mobile Ad-Hoc Network's functionality uses routers to discover and maintain routes. Nodes in such networks may move and communicate with one

other. MANET nodes function as both hosts and routers, forwarding packets to intermediate nodes, and have the unique ability to self-configure and self-club, allowing it to quickly create a new network. Because such networks are quick and simple to set up, they may be used in military applications, disaster recovery, and other situations when physical infrastructure is lacking.

MANETS are used for a variety of applications, ranging from commercial to private sector to military and emergency response. Business applications, military applications, emergency operations, home, office, educational applications, and wireless sensor networks are just a few of the significant MANET applications[3], [4]. The main problems with Ad-hoc routing protocols are the routing method to be employed, which is either unicast or multicast routing, dynamic network topology, which changes when mobile nodes travel from one BSS to another, and mobile node speed. Quality of Service (QoS) is another critical MANET performance characteristic for traffic flow management. Other issues with MANETs include frequency of updates or network overhead, scalability, and security. Routing based on mobile agents, energy efficient/power-aware routing, and secure routing.

Section 1 is an introduction to MANET, Section 2 is a literature review, Section 3 is a discussion of MANET features as well as a comparison of various routing protocols in MANET, and Section 4 is the conclusion.

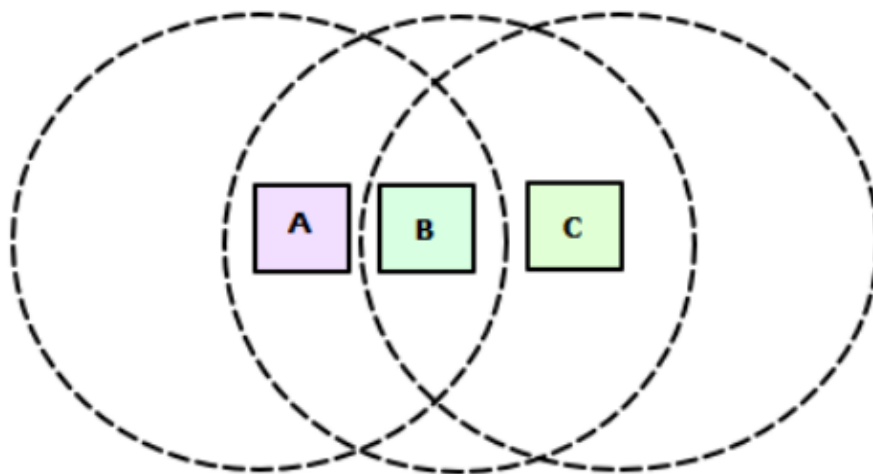


Fig. 1: A Mobile Ad-hoc Network (MANET)

8. LITRATURE REVIEW

The present concept in the area has been evaluated using several pieces of important literature in the subject of MANET routing protocols. Maghsoudlou et al. investigated unlike face routing algorithms, dissimilar face routing strategies, and greedy routing algorithms in the context of the MANET geographical routing protocol[5]. The geographic routing protocols, according to the authors, are based on greedy forwarding, in which data is delivered to the target's closest node, although the data may be tainted at times. If there isn't an immigrant node in close proximity to the target. The authors also suggested ways to enhance recovery strategies, concluding that the most frequent method for recovering from the void state is the faced routing algorithm, which employs planner graphs.

AODV, DSR (reactive), and DSDV (proactive) routing protocols were evaluated by Arora et al[6]. These are calculated using the Packet Delivery Ratio, a typical end-to-end latency under various mobility models with variable mobile speeds. These routing methods are efficient and quantifiable. Network Simulator-2 (NS-2) is used for simulation. When it comes to mobility, AODV outperforms DSR and DSDV. AODV has a high packet delivery ratio in both random walk and random direction. However, the AODV protocol had a very long end-to-end latency. As a result, DSR outperforms AODV and DSDV in both the random walk and random direction mobility models.

In this paper, Khan J. et al. not only review the efficiency of ad-hoc routing protocols in order to determine their accuracy, effectiveness, traffic load, and end-to-end delay in an energetic intermediate nodes scenario, but they also use the OPNET simulator to test the AODV and DSR routing classes[7]. Instead of separate presentations of both AODV and DSR routing classes and also in intermediate nodes data transport rate from source to target, the author proposes using the Opnet simulator to observe performance with respect to different parameters that changes mobility models have a significant effect on the overall performance of both AODV and DSR routing class could be the most excellent solution in MANET.

Sllameet al. used the simulation program OPNET modeler 14.5, to compare MANET routing protocols such as GRP, AODV, OLSR, and DSR on the basis of end-to-end latency, network load, retransmission attempts, and throughput[8]. The authors discovered that AODV and DSR work better than other protocols. When AODV and DSR are compared to other protocols, the throughput of AODV and DSR is higher, and the latency of AODV is lower.

Menon et al. looked at how various geographic routing methods performed in high mobility situations[9]. The performance of various geographic routing protocols was compared using performance measures, and the advantages and demerits of these protocols were stated using these performance criteria. The various parameters involved in designing and selecting a routing protocol were addressed by the authors.

Using the simulation tool NS2, Aggarwal et al. compared different geographic routing protocols such as Location-aided routing, Greedy perimeter stateless routing, and Energy-aware geographic routing on performance metrics such as system lifetime, end-to-end delay, packet delivery ratio, and energy utilization[10]. When the topology varies dynamically and mobility is high, the authors found that geographic routing provides a higher packet delivery ratio, better energy usage, and longer network lifespan than other protocols.

9. DISCUSSION

9.1. Characteristics of MANETs:

Because of the many network constraints, designing a routing protocol for MANET is difficult. MANET has had to deal with a variety of network resource constraints, including as energy, bandwidth, processing, and storage. The following are the major elements of difficulties in sensor networks.

9.1.1. Dynamic Topology:

The topology of the network changes unexpectedly since nodes are free to migrate in any direction.

9.1.2. Limited Bandwidth:

Wireless network bandwidth is often lower than that accessible on wired networks. Due to different disturbances and fading effects, the throughput of these networks is usually poor.

9.1.3. Energy Constrained Operation:

The nodes are battery-powered gadgets that may be carried around. This is the MANET's most significant design factor.

9.1.4. Security:

Threats are more common on wireless networks than on wired networks. The heightened risk of different security threats such as eavesdropping and Denial of Service (DoS) must be properly managed. MANET performance is determined by the routing protocol and the node's battery usage. Various quality of service characteristics, such as bandwidth delay, jitter, and throughput, have an impact on performance. Because the bandwidth supplied to the nodes at one moment in time becomes unavailable if the nodes migrate from one location to another, dynamic topology routing is a significant challenge for these networks. Routing also has an impact on the performance of these networks. As a result, an effective routing protocol must be designed to address all of these issues. On the basis of route discovery, MANET routing protocols are divided into three categories: (i) reactive, also referred to as on-demand routing protocol, (ii) proactive, also referred to as table driven protocol, and (iii) hybrid protocol. Routing protocols are further classified as flat-based, hierarchical-based, or location-based on the basis of network structure. All nodes in a flat-based protocol are equal, which means they all perform the same function in the network. Various nodes perform different functions in hierarchical protocols, and different cluster leaders are selected among cluster members. Nodes in a location-based protocol depend on and communicate with each other using location information.

9.2. Routing Protocols for MANET:

Routing is the process of moving data from a source point to a destination point inside a network. At least one intermediary node in the network is contacted throughout this procedure. The concept of routing essentially entails two activities: first, finding the best feasible routing routes, and second, moving data across a network. There are two kinds of routing: static routing and dynamic routing. The term "static routing" refers to a manual routing strategy. The administrator maintains a routing table in static routing. The state is the most important factor in dynamic routing. Dynamic routing is available in mobile ad hoc networks. As illustrated in Fig. 2, these procedures may be classified into three categories: proactive, reactive, and hybrid. This categorization of routing protocols is based on their route discovery techniques, such as hop count, link status, and QoS. In the hop count approach, each node's routing table includes information about the next hop to the destination. While link state routing protocols maintain a routing table for absolute topology, which is built up by determining the shortest route of link costs, link state routing protocols preserve a routing table for relative topology. QoS routing is the process of choosing the route that a flow's packets will take depending on its QoS criteria, such as bandwidth, latency, and so on.

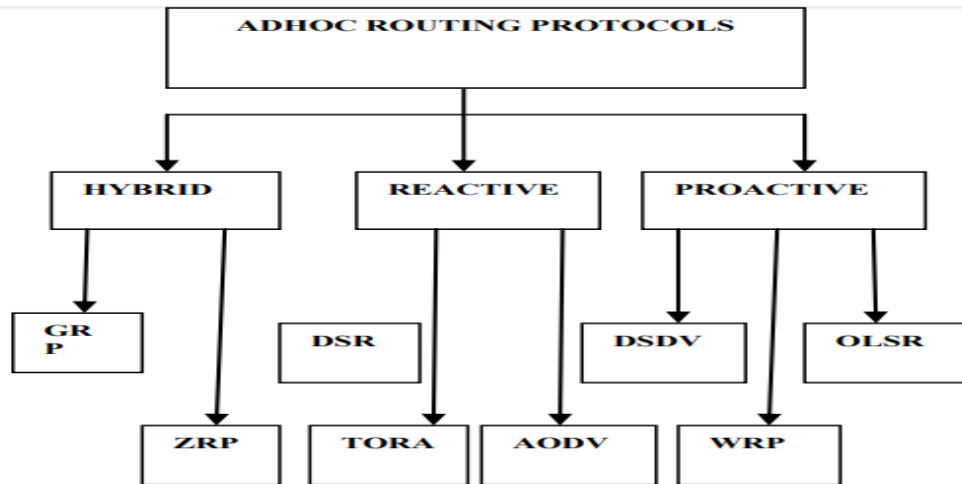


Fig. 2: Illustrates Routing Protocols in MANET

9.2.1. Proactive Routing Protocol:

Each ad hoc node in table-driven routing protocols has a topology table that includes the most up-to-date information about network node interactions. The proactive protocols are also known as table-driven since this table is constantly updated. Each node maintains one or more routing tables, which are regularly exchanged in order to communicate topological information with other nodes and keep a consistent network picture. A transmission will occur without delay if a route has already been established before traffic arrives. Otherwise, traffic packets should wait until the node gets routing information for their destination. Wireless Routing Protocol (WRP), Destination-Sequenced Distance Vector (DSDV), and Optimized Link State Routing (OLSR) are just a few of the proactive routing technologies available.

- *Destination-Sequenced Distance Vector (DSDV):*

Perkins and Bhagwat designed the DSDV protocol, which is a proactive routing class. The DSDV routing class stands for Destination-Sequenced Distance Vector. The Routing Protocol Class is based on the Bellman-Ford Routing Algorithm's concept, but with significant enhancements such as making it loop-free. Due to issues such as count to infinity and bouncing outcomes, the distance vector routing class is less resilient than the link state routing class. Each system maintains a routing-related database that contains entries for all of the network's policies. To maintain the routing table completely rearranged at all times, each device sends various routing communications to its neighbours on a regular basis. When a neighbour device gets the sender's broadcasted different routing message and knows the device's current relation cost, it compares this value to the associated value stored in its routing database.

- *Optimized Link State Routing (OLSR):*

OLSR is a proactive class that uses multipoint relaying, a competent link state packet forwarding system. The clean link state routing class is optimized. Optimizations may be accomplished in two ways: first, by decreasing the amount of control packets, and second, by tumbling the number of associations utilized for promoting link state messages. As you may know, each node maintains the network's topology information by regularly replacing link state communication among the other nodes. The three processes that make up the OLSR routing class are neighbour

sensing, capable flooding, and calculating an optimal route utilizing a variety of shortest-path algorithms. Neighbour sensing is the assessment of changes in the node's immediate vicinity. Using this topological knowledge, each node determines the optimal route to every known destination and records it in a routing table. The most constructive route is then calculated using the shortest path method. When data broadcasting starts, routes to all destinations are immediately accessible and stay so for a certain amount of time until the information is finished.

- *Wireless Routing Protocol (WRP):*

The Wireless Routing Protocol is a table-based protocol that replaces the Bellman-Ford Algorithm's assets. It belongs to the DSDV class. The primary goal is to preserve routing information about the quickest route to each destination among a variety of nodes in the network. WRP (Wireless Routing Protocols) is a class of loop-free routing protocols. WRP is a path-searching method that avoids the count-to-infinity catastrophe by requiring each node to do consistency checks on all of its neighbours' precursor information. Each node in the network has a set of four tables that provide more detailed information. The distance table (DT), routing table (RT), link-cost table (LCT), and message retransmission list (MRL) tables are the ones to look at. In the event that a connection between two nodes fails, the nodes start new communications to their neighbours. With one notable exception, WRP belongs to the class of path-finding algorithms. It overcomes the count-to-infinity problem by requiring each node to perform consistency checks on all of its neighbours' precursor information. This eliminates looping situations and allows for faster route convergence in the event of a connection breakdown.

9.2.2. *Reactive Protocols:*

On-demand routing protocols do not always replace routing information, but instead rely on flooding to acquire data when it is necessary for a node to transmit a data packet. A route request is broadcast to all nodes in the network by the host node that needs to broadcast packets to a network destination. Before sending packets, the host node will wait for the network nodes to respond with a route to the destination. During the route finding process, they construct a route. Route request packets are flooded across the network, beginning with the source's near neighbours. The route discovery procedure is completed after a route is created or several paths for the destination are discovered. A route maintenance procedure ensures that the route remains stable for the duration that it is required from the source. DSR, AODV, and TORA, for example, are examples of source-initiated routing protocols.

- *Ad hoc on-demand Distance Vector (AODV):*

The AODV routing class is a key component of the Reactive protocol, and it constructs routes using a route request/route reply query sequence. A source node sends a route request (RREQ) packet to the network when it seeks a route to a destination for which it does not already have a path. Nodes receiving this packet update their information for the source node and create backward references in their route tables to the original node. The RREQ contains the most recent series number for the target for which the source node is alert in addition to the source node's IP address, current series number, and broadcast ID. If a node receiving the RREQ is either the target or has a route to the destination with an equivalent series number higher than or equal to the one limited in the RREQ, it may send a route reply (RREP). It unicasts an RREP back to the source node if this is the case; otherwise, it retransmits the RREQ. Nodes save the source node IP address of the RREQ and broadcast the ID of a better route. If they get an RREQ

that they have previously completed, they reject it and do not continue with it. The route will be maintained as long as it remains active. A route is considered energetic if data packets are moving from source to destination at some point along the route. The connections will time out and eventually be removed from intermediate node routing tables once the source node stops transferring data packets. If the source node still wants a route after getting the RERR, it may restart route discovery.

- *Temporally Ordered Routing Algorithm (TORA):*

The routing class Temporally-Ordered Routing Algorithm (TORA). Park and Corson came up with the idea. The Temporarily Ordered Routing Algorithm (TORA) is a kind of discrete routing algorithm that is genuinely adaptive and loop-free. It is based on the notion of connection turnaround. It explains the pathways either upstream or downstream using directed acyclic graphs (DAG). To provide this capability, TORA requires node synchronization, which limits the protocol's functionality. TORA routing class is a fairly complicated protocol, but its primary feature of broadcasting manage messages just around the point of crash when a connection stoppage occurs makes it distinctive and essential. When a link fails in the evaluation, all other protocols must re-initiate route detection, but TORA would be able to patch itself up around the point of failure. TORA can scale to larger networks thanks to this feature, although it has a greater overhead for smaller networks. TORA is responsible for four essential operations: route creation, preservation, removal, and optimization. Because every node must have a height, any node that does not has one is considered a deleted node, and its height is null. To improve the connecting structure, nodes are sometimes given additional heights. This is referred to as route optimization.

- *Dynamic Source Routing (DSR):*

DSR is one of the most pure instances of an on-demand routing system based on the source routing idea. It was created with multi-hop ad hoc networks of mobile nodes in mind. It enables the network to self-organize and configure itself without the requirement for any existing network infrastructure or management. DSR, unlike AODV, does not send frequent routing messages, reducing network bandwidth overhead, conserving battery life, and avoiding massive routing changes. Instead, DSR requires MAC layer assistance to detect connection failure. Route Discovery and Route Maintenance are two methods in DSR that operate together to enable nodes to find and maintain source routes to arbitrary destinations in the network. By virtue of source routing, DSR has a distinct benefit. Routing loops, whether short or long-lived, cannot develop since they can be identified and removed instantly because the route is part of the packet itself. This feature allows for a number of helpful protocol improvements. The shortest route is not guaranteed by either AODV or DSR. The first route may be the shortest if the destination can only respond to route requests and the source node is always the route request initiator.

9.2.3. *Hybrid Routing Protocol:*

The hybrid routing protocol is divided into two types. The first is a proactive class, while the second is a reactive class. Proactive and reactive routing methods are combined in hybrid routing systems. Both proactive and reactive routing methods have benefitted from hybrid routing protocols. Because the first nodes contain tables, it acts like a proactive routing protocol. When nodes realize they don't have any routes to target, they begin route discovery and operate as reactive routing protocols. ZRP is the hybrid protocol. Zone Routing Protocol is a protocol that

combines the advantages of both methods (ZRP). Each node in ZRP has a zone surrounding it that contains all of its neighbours. If the destination node's location is inside the source's zone, proactive routing is used; otherwise, reactive routing is used.

- *Zone Routing Protocol (ZRP):*

Zone routing class was proposed by Haas and Pearlman. ZRP It's a hybrid routing class for mobile ad hoc networks that divides nodes into smaller networks (zones). It has the characteristics of both on-demand and proactive routing classes. Proactive Networks limit nodes into sub-networks within each zone (zones). It combines the benefits of reactive and on-demand routing methods. Within each zone, the proactive routing class is changed to improve communication in areas where neighbours are present. To minimize needless communication, the inter-zone interaction employs on-demand routing classes. According on the distance between mobile nodes, the network is divided into routing zones. Given a hop distance d and a node N , all nodes within a communication hop distance of at least d from N are included in N 's routing zone. N 's peripheral nodes are the nodes in its routing zone that are precisely d hops distant from N . One of the most difficult aspects of zone routing is determining the zone's size. Independent Zone Routing (IZR), a superior zone routing system that allows adaptive and flexible reconfiguration of the zone's decreased size, is presented. Furthermore, the IZR class's adaptive nature improves the ad hoc network's scalability. Each node is seldom interested in updating the zone's routing information. Additionally, each node does some limited route optimization, which includes the following actions: removing unnecessary routes, shortening routes, and detecting connection failures.

9.3. Comparison:

Comparison of Routing Protocols in MANET are illustrated in Table 1 below.

TABLE 1: COMPARISON OF ROUTING PROTOCOLS IN MANET

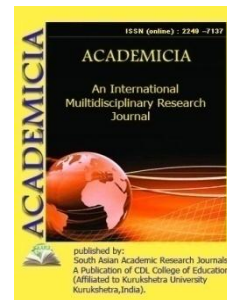
Parameter	DSDV	WRP	OLSR	AODV	DSR	TORA
Routing structure	FLAT	FLAT	FLAT	FLAT	FLAT	FLAT
Routing overhead	HIGH	HIGH	LOW	HIGH	HIGH	HIGH
Caching overhead	MEDIUM	HIGH	HIGH	LOW	HIGH	HIGH
Throughput	LOW	LOW	HIGH	HIGH	LOW	LOW
Loop Free	YES	YES	LOW	YES	YES	YES

10. CONCLUSION

This article explained how to classify various routing systems based on their routing approach. Some key features of the three routing methods, such as reactive, proactive, and hybrid protocols, were addressed. There are a few distinctions between them, as seen in Table 1. In this article, an attempt has been made to focus on a comparison of DSDV, AODV, DSR, TORA, OLSR, WRP, and DSDV. Furthermore, since a single routing protocol cannot perform optimally in all circumstances, routing protocol selection should be based on the needs of the particular application. Our future research effort will concentrate on proposing an extension of current conventional routing protocols that will be superior in terms of security, throughput, efficient resource usage, and service quality.

REFERENCES

1. S. Mirza and S. Z. Bakshi, "Introduction to MANET Routing," *Int. Res. J. Eng. Technol.*, 2018.
2. P. Yang, Z. Li, P. Yang, and Y. Dong, "Information-centric mobile ad hoc networks and content routing: A survey," *Ad Hoc Networks*, 2017, doi: 10.1016/j.adhoc.2016.04.005.
3. L. Raja and C. S. Santhosh Baboo, "An Overview of MANET: Applications, Attacks and Challenges," *Int. J. Comput. Sci. Mob. Comput.*, 2014.
4. M. Kumar and R. Mishra, "An Overview of MANET: History, Challenges and Applications," *Indian J. Comput. Sci. Eng.*, 2012.
5. A. Maghsoudlou, M. St-Hilaire, and T. Kunz, "A Survey on Geographic Routing Protocols for Mobile Ad hoc Networks," *Csit.Carleton.Ca*, 2011.
6. S. K. Arora, M. Y. Mantoo, M. Chishti, and N. Chaudhary, "Performance measurement in MANET," 2014, doi: 10.1109/CONFLUENCE.2014.6949297.
7. J. Khan, Z. Bojkovic, S. I. Hayder, G. A. Mallah, A. Haseeb, and F. Atta, "Simulation analysis of static and dynamic intermediate nodes and performance comparison of MANETS routing protocols," 2013, doi: 10.1007/978-3-642-33018-6_13.
8. A. M. Sllame, "Evaluating the Impact of Routing on QoS of VoIP over MANET Wireless Networks," *OALib*, 2017, doi: 10.4236/oalib.1103361.
9. S. S. Jadhav, A. V. Kulkarni, and R. Menon, "Mobile Ad-Hoc Network (MANET) for disaster management," 2014, doi: 10.1109/WOCN.2014.6923074.
10. N. Aggarwal, T. S. Chohan, K. Singh, R. Vohra, and S. Bahel, "Relative analysis of AODV & DSDV routing protocols for MANET based on NS2," 2016, doi: 10.1109/ICEEOT.2016.7755355.



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COGNITIVE DISSONANCE AND PRAGMATIC INFLUENCE

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ABSTRACT

This article contains a number of theories of dissonance in translation as an alternative to “pragmatic failure”. The aim is to try to prove whether the term “pragmatic failure” which is so widely used and settled in the field of intercultural studies could be appropriately substituted by the term “dissonance” which derives from the theory of “cognitive dissonance” as of the field of cognitive linguistics and social psychology.

KEYWORDS: *Cognitive Dissonance, Theory Of Cognitive Dissonance, Literary Translation, Contextual Translation, Proportionality In The Knowledge System, Proportionality Of Form And Content.*

I. INTRODUCTION

Over the last decades, relationships among language, culture and identity have become a favourite topic in social science, due to this fact, some scholars have lately begun to pay systematic attention to many areas in the field of pragmatic failure, and however, little research has been devoted to Cognitive Dissonance in Intercultural Communication. This has become an important aspect of analysis as it is in its infancy.

A key term should be kept in mind before carrying on with this introduction, that of linguistic etiquette defined by Kasper as “the practice in any speech community of organizing linguistic action so that it is perceived as appropriate/harmonious within the frame of ongoing communication event” [1,27].

Once having this term in mind, the problems arise when the linguistic etiquette is not respected in a conversation due to a wide range of different factors.

A pragmatic failure could be defined as “the inability to understand what is meant by what is said”, however, as it will be explained in the literature review, this term springs two other terms, such being sociopragmatic failure and pragmalinguistic failure [2,25]. Nonetheless, for the purpose of this paper we will try to prove how a dynamic term which encompasses both ideas can be used in order to narrow down the analysis of any intercultural communication process, this is: “cognitive dissonance”. Dissonances can display different degrees of intensity, have rather unpredictable consequences and are strictly bound to contextual conditions and to individual judgments. When going deep into the term “dissonance” we find ourselves facing different types of the latter: intentional, unintentional, intra-cultural and intercultural. However, the scope to which this paper extends will focus on unintentional intercultural dissonance [4,2871].

II. Main part

A dissonance occurs in any circumstance in which speakers, deliberately or not, organize the linguistic action in such a way that hearers perceive it as grammatical but conflicting with the harmonious flow of the conversation [7,110].

In order to expand the concept of Cognitive Dissonance enclosed in the frame of social psychology to intercultural encounters four articles have been selected which stand out in importance for this research paper. It must be held in mind that it is a growing field that of adding up cognitive dissonances to intercultural studies and therefore, the amount of data regarding such is limited; therefore, the reason of choosing these articles will be explained afterwards: Festinger and Carlsmith.

Going Beyond Pragmatic Failures: Dissonance in Intercultural Communication.

Regarding these four articles it is important to note down how they can be divided into sets of two, those dealing with intercultural communication and those dealing with social psychology and science. On one hand, the articles dealing specifically with cognitive dissonance in intercultural communication are those written by Olga Leontovich and Chiara Zamborlin – both deal with the implementation of cognitive dissonance into intercultural communication. Zamborlin uses as her base of research 6 utterances produced by her during her stay in Japan and analyses the dissonances found at the time of the encounter by expanding the theory to a more intercultural approach. Leontovich on the other hand sets her study based on another perspective. While Zamborlin exemplifies her theory through a more quotidian perception, Leontovich intends to assert the need for a high level of intercultural competence for interpreters, translators and intercultural communication specialists in order for them to take cognitive dissonance into account in the intercourse of their professional activities. On the other hand, the articles written by Festinger and Carlsmith and Blackwell et al. deal specifically with Cognitive Dissonance but only at a psychological level which will be tried to be correlated with the other two in order to reach common points and outcomes. Festinger and Carlsmith (1957)'s main hypothesis is “what happens to a person's private opinion if he is forced to do or say something contrary to their opinion?” and base their research on an experimental work based on this question. Their aim was to create dissonance in the mind of their participants and try out how they would react based on

economic enhancements, this is, if the sample they gathered of people would fight back the dissonance created in their minds based on economic remunerations [5,509]. The fourth and last article, although focusing mainly in political science, allows to this review paper to select certain important and curious factors they outline which could be implemented in intercultural studies, which are those of socialization and empathy and ethnic attitude and violence decisions. Its main focus is to prove how actions can induce changes in preference.

In the following section, these four articles will be intertwined by means of the literary review afore presented in order to reach common points overlapping the knowledge they all pose in order to reach a final conclusion as to whether the term cognitive dissonance is appropriate as a more dynamic continued overall umbrella substitute for pragmatic failure in intercultural studies.

III. RESULTS AND DISCUSSION

Festinger (1957) claims in his work dealing with social psychology, under certain conditions, the private opinion of a person can change as to bring it closer to the overt behaviour that person has been obliged to perform. This is, as an example, if at a debate a person is forced to improvise a speech to support a certain point of view which they do not agree with, their private opinion will move towards the position taken in the speech. Therefore, the changed opinion of that person will naturally experience a greater change than that of the people listening or reading it. Stating it in a different manner, as Blackwell et alli (2017) pose, actions may be chosen for various reasons as may be because of imitation, experimentation or habit.

In terms of social psychology, let us say a person believes in “X” but as a result of the pressure put on them, publicly claims to believe in “not X”. Such person therefore now holds two cognitions which psychologically do not fit together. In other words, their cognition of private belief is dissonant with that they claim to have. Nonetheless, the claim of believing in “not X” comes with cognitive associations that that person corresponds with such belief as to cognitive elements of reasons, pressures, promises or rewards which lead that person to state that they believe in “not X”. So to speak, that person is left now with consonances and dissonances about the same cognitive matter [6, 69]. The only way for that dissonance to be reduced is for that person to change their private opinion as to bring it into correspondence with what they have said. Consistently, that private opinion will fluently change in order to finally correspond one way or another with what they have stated. It should be noted that the observed opinion would change the greatest when the pressure upon were sufficient to justify such beliefs.

As Festinger and Carlsmith [16,122] claimed, the more important the subjects tended to believe their experiment was or the more money they would give the participants the less dissonance they would encounter in the results when obliging them to claim something they did not believe in.

As an overall come out of Festinger and Carlsmith [16,128] they clearly admit that cognitive dissonance does not only take place at a small cognitive intrapersonal level as they had tried to demonstrate with their experiment, but rather enlarges to many other areas in life, stating it differently, cognitive dissonance might be operating in many real- life situations, and, indistinctively and more obviously in intercultural relations. However, it could all be summed up as “the consequences of preferences” as Blackwell et alli (2017) define it, still leaving open that such preferences are affected by action choices.

One of the factors which takes part in the whole intercultural situation pulled from the psychological field is that of consequences as has been stated before. When taking this concept to the frame of intercultural communication, stereotypes begin to play an important role. The overt public pressure of cognitive dissonance will be greater the greater the stereotype or lower, if such stereotype is that of a positive one. Preference change will always depend on the individual's tendency to minimize costs, this is, in intercultural communication, a certain person will try to "maximize utility given costs" [9,102]. Although the aim of the paper written on "preferences from behaviour" only deals with action inducing change of preference through cognitive dissonances, it can be stated, as shown in the other three research papers under discussion, that dissonances and change in preference is not only induced and caused by a choice in actions but by many other external factors as will be explained. One of the key points implemented is that cognitive dissonance should not only be seen as a problem as it usually happens since it is associated with pragmatic failure or pragmatic errors in intercultural studies. The simple word "failure" or "error" induces the student to straight ahead ponder it as a mistake, but it is rather a "shaper" to my account [9,103]. All these remarks dealing with social psychology can certainly be expanded to intercultural studies and magnify the scope of understanding many situations which occur in interculturality as Leontovich, O. and Zamborlin [19,68] attempt to and develop in their respective papers.

Dissonances can happen interculturally, according to Zamborlin across three pragmatic domains, being Illocution when the utterance is perceived as a face threatening act being to direct or indirect, Style when the utterance is perceived inappropriate due to the choice of lexis, syntax or formulae and in Discourse when utterances are noticed when an unexpected topic is chosen. As well, related to these, come into play the factors which can trigger a dissonance, being linguistic (due to language transfer), sociolinguistic (when speakers do not conform to the sociolinguistic norms) or pragmatic when speakers only act on the limited encyclopaedic pragmatic knowledge they hold. A lot of work people invest in "relational work" goes unnoticed in the conversation and many other factors apply such as rudeness and politeness. Based on this, Leontovich [18,139] clarifies these are the reasons through which the discrepancy between the ways of categorizing and conceptualizing reality through the prism of different cultures and languages causes cognitive dissonance, still, adding up dissonances in such exchanges cannot only be limited to pragmatic levels but also to the cognitive and semantic strata [7,108].

It is necessary, thus, for people, if they are to have a high level of intercultural competence, to have the ability to find the reasons, types, and effects for cognitive dissonance and the tools to bridge such intercultural dissimilarities when interacting with representatives of an alien culture. The background, encyclopaedic knowledge of a person expands when confronting dissonances while being open to its consequences. The old beliefs clash with the new beliefs contradicting someone's values, morals or convictions and, if responded appropriately the personal encyclopaedia is to expand and advance and progress are accumulated and reached. Zamborlin [19, 97], as has been explained before, defines the possible ways in which cognitive dissonance can take place in intercultural encounters. However, Leontovich [19,145] 5 extends the theory by defining how harmonization can be achieved through four different means: "attempting to explain the inexplicable, [...] minimizing the regret connected with irrevocable choices, [...] justifying their own behaviour which goes against their own principles" and "aligning their perception of other individuals with their own actions

towards them". A point which should be noted as an overall summary of causes is the following gathering of factors which can cause breakdown and cognitive dissonances in intercultural instances: divergence of background knowledge, implicit meanings, violation in the order of speech interaction, extralinguistic factors (gender, age, status, level of intellect, profession, ethnicity), equivocation and uncertainty, use of euphemisms, political correctness, pseudonomination, shift of emphasis, silence, avoidance of response as well as non-verbal (gestures), some provisions of diplomatic protocol and etiquette, the sphere of interpersonal relations, of a person and their environment and the sphere of regulation of people's activity related to the cultural values they are creating.

The search for retrieving consistency as a way out of cognitive dissonance can serve as a proof of an individual's communicative competence. Leontovic [18,123]

To my belief, a proper third-culture person should be able to adapt instantly, if not, naturally and intrinsically to all these situations and have the potential to avoid cognitive dissonance as an innate capacity. Every theory here presented in this review paper poses the solution of one individual changing their actions, their way of acting and responding to certain situations, to change your own beliefs, meaning, to rationalize your action, to change the way you view, perceive and remember your deeds, liquefying the dissonance if you might. However, I do not believe in change, but in expansion adding a more intercultural view on the matter, adapting or expanding your beliefs, taking in your stride the other person's axiology, this is, rather than changing them, actually expanding and acquiring all beliefs, values, morals and standards possible in order to extend the scope and cognitive continuum, becoming dynamic and allowing oneself the option of choosing among a vast field of intercultural encyclopaedic background knowledge.

IV. CONCLUSION

This paper has only dealt with intercultural un-intentional dissonances. However it might be safe to state that cognitive dissonance is appropriate as a more dynamic continued overall umbrella substitute for pragmatic failure in intercultural matters. One of the underlying outcomes is that insufficient knowledge of a foreign language (misunderstanding of polysemy, homonymy, puns and so on) can lead to cognitive dissonance among cultures and languages.

It can also lead, not only to positive outcomes or manipulation intercultural encounters, but also to negative ones, cognitive dissonance could lead to people rationalizing the choice of immoral actions to their own mental benefit and well-being. Pragmalinguistic failure is fairly easy to overcome. It is simply a question of highly conventionalized usage, which can be taught quite straightforwardly as "part of the grammar". Sociopragmatic failure is much more difficult to deal with, since it involves the Student's system of beliefs as much as his/her knowledge of the language. I presume to sum them up under the umbrella term cognitive dissonance. The world view depends on the way reality is conceptualized and categorized in a certain culture where many factors which play a certain role are to be kept in mind: gender asymmetry, local standards of beauty, feelings of offence, perplexity, vexation, norms of behaviour, political, religious, ecological, other types of discourse, embarrassment, identity crisis, amazement, indignation, and frustration. It is not only a nice dynamic continuum to substitute pragmatic failure but it also leaves a wide seam of new research on the open.

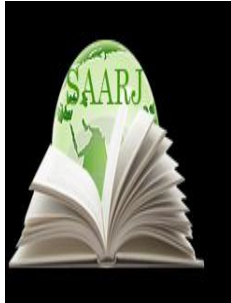
To conclude, self-persuasion is to be mentioned, the self plays a major role in the control of

what happens around oneself, the intention to change yourself, manner of filtering information, simplifying information, combining and restructuring it, being prone to filling in blanks, inclination for self-analysis, everything leads to one conclusion regarding intercultural cognitive dissonance: the pursue of an overall achievement of consonance.

REFERENCES:

1. Расулов, З. И. (2011). Синтаксический эллипсис как проявление экономии языка): автореферат дисс.. кандидата филологических наук/Расулов Зубайдулло Изомович.- Самарканд, 2011.-27 с.
https://scholar.google.com/citations?view_op=view_citation&hl=ru&user=BMFYyZIAAAAJ&citation_for_view=BMFYyZIAAAAJ:UeHWp8X0CEI
2. Gadoeva, Mavluda Ibragimovna; Umurova, Xushvaxt Hakimovna; and Vaxidova, Fotima Saidovna (2019) "The Expression Of The Meaning Of The Category Of Indefiniteness In Nouns And Pronouns In The English And Uzbek Languages.," Scientific Bulletin of Namangan State University: Vol. 1 : Iss. 10 , Article 43.Available at: <https://uzjournals.edu.uz/namdu/vol1/iss10/43>
3. Akramov, I. (2021). Linguistic Culture Expressing Happiness and Contentment in The English And Uzbek. ЦЕНТР НАУЧНЫХ ПУБЛИКАЦИЙ (buxdu.Uz), 1(1).
4. Извлечено от http://journal.buxdu.uz/index.php/journals_buxdu/article/view/288
5. Saidovna, V. F. (2021). Tourism Discourse And Its Terminology. International Journal of Progressive Sciences and Technologies, 25(2), 08-10.
<https://ijpsat.es/index.php/ijpsat/article/view/2871>
6. Ibragimovna, G. M., Saidovna, V. F., & Suleymanovna, K. N. (2020). A short humoristic text for the training of students with specialized of tourism. International Journal of Psychosocial Rehabilitation, 24(2), 509-519. <https://www.elibrary.ru/item.asp?id=43256915>
7. Gadoyeva, M. I., & Kabilova, N. S. (2019). ВЫРАЖЕНИЕ ЗНАЧЕНИЯ НЕОПРЕДЕЛЕННОСТИ ЧИСЛИТЕЛЬНЫМИ, НУМЕРАТИВАМИ И ПОСРЕДСТВОМ СЛОВА “БИР” В АНГЛИЙСКОМ И УЗБЕКСКОМ ЯЗЫКАХ. Theoretical & Applied Science, (11), 699-704. <https://elibrary.ru/item.asp?id=42407825>
8. КОБИЛОВА Н. ХУДОЖЕСТВЕННЫЙ ПСИХОЛОГИЗМ И ПРИНЦИП ЭПИЧЕСКОГО ИЗОБРАЖЕНИЯ. МЕЖДУНАРОДНЫЙ АКАДЕМИЧЕСКИЙ ВЕСТНИК Учредители: Автономная некоммерческая организация "Исследовательский центр информационно-правовых технологий" ISSN: 2312-5519
<https://www.elibrary.ru/item.asp?id=38533356>
9. Kobilova Nargisa Suleymanovna Literary Psychology And Style Theoretical & Applied Science Учредители: Теоретическая и прикладная наука ISSN: 2308-4944eISSN: 2409-0085 <https://www.elibrary.ru/item.asp?id=41328882>
10. Kobilova Nargisabegim Sulaymonbekovna Benefits Of Using Songs In Teaching Foreign Languages To Young Learners <https://www.elibrary.ru/item.asp?id=35081671>
11. Mastura, E. (2017). DEPICTION OF THE NATURALISM PRESENTED IN THE CALL OF THE WILD. Интернаука, (7-3), 6-9. <https://www.elibrary.ru/item.asp?id=29041086>

12. Elmanova, M. (2017). Philosophical Analysis Of Rw Emerson's" Nature" And" Self-Reliance. Интернаука, 7(11 Часть 3), 9. <https://www.elibrary.ru/item.asp?id=29041087>
13. Khayrullayeva, N. (2015). Communicative Peculiarities Of Phraseological Units In Political Discourse. Научная дискуссия: вопросы филологии, искусствоведения и культурологии, (7), 137-141. <https://elibrary.ru/item.asp?id=23760006> Khaydarov, Anvar Askarovich (2020) "EXPRESSION OF CONNOTATIVE MEANING IN ONOMATOPOEIA," Scientific reports of Bukhara State University: Vol. 4 : Iss. 5 , Article 5.DOI: 10.52297/2181-1466/2020/4/5/5 <https://uzjournals.edu.uz/buxdu/vol4/iss5/5>
14. Haydarov, A. A. (2019). Methodological Features Of Imitation Words. Theoretical & Applied Science, (10), 688-690. <https://www.elibrary.ru/item.asp?id=41328966>
15. Akramov, I. (2021). ОСОБЫЕ ЗНАКИ, СВОЙСТВА И ХАРАКТЕРИСТИКИ АФОРИЗМОВ. ЦЕНТР НАУЧНЫХ ПУБЛИКАЦИЙ (buxdu.Uz), http://journal.buxdu.uz/index.php/journals_buxdu/article/view/2386
16. Festinger L.A. Theory of cognitive dissonance, – Stanford.: University Press, 1957,120-148.
17. Bem, Daryl J. Self-perception: An alternative interpretation of cognitive dissonance phenomena. Psychological Review, 74: 183-200, 1967.
18. Leech, Geoffrey N. Principles of Pragmatics. London: Longman, 1983. Leontovich, Olga. Cognitive Dissonance from an Intercultural Communication Perspective,122-155
19. Zamborlin, Chiara. Going Beyond Pragmatic Failures: Dissonance in Intercultural Communication. Walter de Gruyter: Intercultural Pragmatics, 2007,45-98.
20. Naimova, A. (2020). THE MAIN PECULIARITIES OF HERBERT WELLS AND HOJIAKBAR SHAYKHOV'S FAMOUS SCIENCE FICTION WORKS. Theoretical & Applied Science, (3), 417-420. <http://www.t-science.org/axivDOI/2020/03-83/PDF/03-83-78.pdf>



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TREATMENT OF PATIENTS WITH CHRONIC PURULENT MEDIUM OTITIS

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ABSTRACT

The article discusses that acute inflammation of the middle ear is an inflammatory infectious process that captures all parts of the middle ear: the auditory tube, tympanic cavity, mastoid process. According to statistics, over the past 25 years, the incidence of acute otitis media in the population does not tend to decrease. Complication and treatment of acute otitis media.

KEYWORDS: *Chronic Suppurative Otitis Media, Mastoiditis, Pathology, Complications, Treatment.*

INTRODUCTIONS

Acute inflammation of the middle ear develops as a result of damage to the mucous membrane of the tympanic cavity by both bacterial flora and influenza viruses. Microbiological studies of exudate from the tympanic cavity show that most often acute otitis media is caused by various types of streptococci, staphylococci, pneumococci and haemophilus influenzae, less often anaerobes and gram-negative microbes are found. It should be noted that the development of acute otitis media in most cases is preceded by an acute respiratory infection, in which the protective and transport functions of the ciliated epithelium of the auditory tube are disrupted, which contributes to the penetration of pathogenic flora from the nasopharynx into the tympanic cavity. Therefore, in the etiology of acute otitis media, a pathogenic combination of a respiratory virus and a bacterial agent plays a certain role.

Pathogenesis and pathological anatomy of acute otitis media

The pathogenesis of acute otitis media is closely related to the entry of pathogenic flora into the middle ear cavity. There are three main ways of infection of the tympanic cavity:

1. tubular;
2. hematogenous;
3. transtympanic.

The tubal pathway is the main one. Respiratory viral infection, which, as already noted, in most cases precedes the development of otitis media, affecting the mucous membrane of the auditory tube, disrupts the ventilation and drainage functions of the latter. As a result, the intra-drum pressure decreases and the process of exudation of fluid from the vessels of the mucous membrane of the middle ear begins, followed by the penetration of pathogenic microflora and the development of the inflammatory process. The inflammation in the middle ear is usually suppurative. However, the degree of its severity depends on a number of factors, such as:

1. Type and virulence of pathogenic flora.
2. The state of the general reactivity of the organism.
3. The existing pathology of the nasal cavity, paranasal sinuses, nasopharynx.

The inflammatory process in acute otitis media begins with edema and leukocyte infiltration of the mucous membrane, followed by the formation of exudate. The stage of serous inflammation is replaced by a catarrhal one, in which, due to the increased secretion of cells of the integumentary epithelium, the exudate becomes more viscous. Subsequently, with increased infiltration of the mucous membrane by segmented leukocytes, the latter, mixing with exudate, give it a purulent character. With the breakdown of leukocytes in the exudate, lysosomal enzymes are released, which, having proteolytic activity, are capable of disrupting the integrity of the tympanic membrane. The described changes are observed not only in the tympanic cavity, but also in the cells of the mastoid process. As purulent inflammation develops, all the air spaces of the middle ear are filled with edematous, infiltrated mucous membrane and purulent exudate. The mobility of the auditory ossicles is limited. The accumulated exudate puts pressure on the tympanic plexus and eardrum. When the tympanic membrane is perforated, otorrhea-discharge from the ear appears. The release of the tympanic cavity from exudate can also occur when the

drainage function of the auditory tube is restored. As the inflammation subsides in the middle ear, reparative processes begin (the proliferative stage of inflammation), in which there is a migration of mononuclear cells from the vessels into the tissue of the middle ear. The outcome of acute otitis media is largely associated with this stage of the disease. The perforation of the tympanic membrane can be completely healed when all three layers are regenerated. If the mucous and epidermal layers grow together at the edges of the tympanic membrane defect, then a persistent perforation remains. Under certain conditions, infiltration of the tissues of the middle ear, the presence of exudate lead to the development of an adhesive process in the tympanic cavity. The hematogenous pathway of entry of pathogenic flora into the middle ear is observed in infectious diseases (scarlet fever, measles, influenza). A feature of the course of acute otitis media with scarlet fever and measles is the necrotic nature of changes in the mucous membrane, ligaments and walls of the tympanic cavity. Necrotic changes in tissues are associated with thrombosis of the vessels of the middle ear and a sharp violation of trophism. In this case, necrotic destruction of the tympanic membrane leads to the formation of extensive perforations, as a result of which the inflammatory process passes, as a rule, into a chronic stage.

With influenza otitis media, a specific hemorrhagic form of inflammation develops, in which there is a sharp expansion of the blood vessels of the middle and outer ear, followed by the formation of extravasates due to rupture of the vascular walls. Extravasates are filled with hemorrhagic exudate and can be localized in both the outer and middle ear.

The transtympanic pathway of entry of pathogenic flora is observed with injuries of the tympanic membrane of various origins. Violation of the integrity of the tympanic membrane leads to the elimination of the tissue barrier between the middle and outer ear and the penetration of a virulent infection into the tympanic cavity.

Features of the course of acute otitis media.

The disease usually lasts 15-20 days. With certain features of the inflammatory process, the duration of the stages of the process may change. In many cases, acute otitis media ends at the stage of catarrhal inflammation, without turning into a purulent stage, and the duration of the disease is significantly reduced (7-10 days). Due to a decrease in the general reactivity of the body, irrational antibacterial therapy, the inflammatory process can take on a protracted nature both at the pre-perforated and perforated stages. The prolonged course of catarrhal inflammation of the process in the middle ear, as a rule, leads to the formation of adhesions and stiffness of the auditory ossicles. Prolonged otorrhea in acute otitis media may be associated with the involvement of the mastoid process in the inflammatory process, as well as with the proliferative nature of inflammation with the formation of granulations in the middle ear. It should be borne in mind that acute otitis media can occur with damage to the inner ear, especially of influenza origin.

In children of younger age groups, there are significant clinical differences in the course of acute otitis media, which must be known, given the frequency of this pathology. The following factors contribute to the development of acute otitis media in childhood:

1. Structural features of the middle ear: in early childhood, the auditory tube is located more horizontally, has a larger diameter and shorter length, which facilitates the penetration of infection by the tubogenic route. The middle ear cavity contains myxoid tissue, which can quickly become involved in the inflammatory process.

2. Frequent inflammatory diseases of the lymphadenoid tissue of the pharynx and its hypertrophy, especially of the pharyngeal tonsil (adenoids).
3. Predisposition to childhood infectious diseases: measles and scarlet fever.
4. Lack of formation of acquired immunity.

In children of the first year of life, the disease begins violently. The temperature rises to 39-40 C, the child is restless, sleeps and eats poorly, cries constantly, vomiting and diarrhea may appear. In some cases, symptoms of meningism are observed due to the penetration of the infection through the ungrown fissurapetrosquamosa. In children under 6 months of age, otoscopic identification points are indistinct, the eardrum is thicker than in adults. It is not always possible with acute otitis media to see a bright hyperemia of the tympanic membrane or its protrusion. Therefore, otoscopic diagnosis in children is more difficult than usual.

Treatment of acute otitis media

Treatment of acute otitis media has features depending on the stage of the disease. Both general and local treatment is used. General treatment is associated with antibiotics. There is an opinion that at the pre-perforative stage the doctor does not have data on the type of pathogenic flora and its sensitivity to antibiotics, in addition, in 30-40% of cases, the exudate is sterile, therefore, the prescription of antibiotics should be based on data on the most common causative agents of acute otitis media, which are considered pathogenic strains of streptococci and staphylococci. In this regard, the most effective drugs for the treatment of acute otitis media are antibiotics of the penicillin series: benzylpenicillin, phenoxymethylpenicillin, ampicillin, ampiclox, oxacillin; augmentin. Benzylpenicillin is used only parenterally and requires multiple injections to maintain the required concentration. Phenoxymethylpenicillin is administered enterally; for adults, its dosage is 500 mg 3 times a day. Oxacillin belongs to semi-synthetic penicillins and is protected mainly from staphylococcal lactamases, therefore it is considered a less effective antibiotic for streptococcal infection. Of the penicillins, oral aminopenicillins have the broadest spectrum of action: amoxicillin and ampicillin. It should be noted that ampicillin creates insufficiently high concentrations in the blood serum due to the peculiarities of absorption. The most effective drug of the penicillin group is currently considered amoxicillin. It is better absorbed, has a longer half-elimination period, so it can be prescribed 2-3 times a day. Currently, a feature of the bacterial flora is the growing resistance to antibacterial drugs, especially in children who previously received antibiotics, which is reflected in the choice of antibacterial agents. In this regard, the most effective drugs are considered to be a combination of amoxicillin with beta-lactamase inhibitors, which are produced by gram-positive and gram-negative strains of anaerobic and aerobic bacteria. One of the most famous drugs in this group is augmentin, which is a combination of amoxicillin with clavulanic acid. Clavulanic acid prevents the destruction of amoxicillin by beta-lactamases. The drug is available in the form of tablets (375mg, 625mg, 1g), syrup for children (156mg-5ml) for oral administration and injection vials (0.6g, 1.2g). In severe acute otitis media, it is advisable to prescribe antibiotics of the cephalosporin series: cefazolin, cephalexin, cefazemin, claforan, zinacef, ceftriaxone, suprax. In acute otitis media, the appointment of aminoglycoside antibiotics is not recommended, since this increases the risk of their ototoxic action. Clinical data and cytological studies prove that antibiotic therapy shortens the duration of treatment, which has a beneficial effect on the

condition of the mucous membrane of the tympanic cavity and does not lead to the proliferation of fibroblasts.

The use of pain relievers is also a common treatment. Their arsenal is large enough. Basically, the most common drugs in this group are derivatives of metamizole: analgin, baralgin, pentalgin, sedalgin and others. Currently, metamizole and preparations containing it are not recommended by WHO due to the risk of agranulocytosis and are banned for use in more than 30 countries around the world. In this regard, non-steroidal anti-inflammatory drugs, one of which is Nurofen, are widely used. The action of nurofen is associated with the prevention of the synthesis of prostaglandins - mediators of pain, temperature reaction and inflammation. Nurofen is available in the form of tablets (200mg) and for children under 12 years of age in suspension for oral administration. In acute otitis media, the nurofen course is rather short (2-3 days), so side effects are extremely rare.

At the preperforative stage, thermal procedures are actively used as a local treatment in the form of warming semi-alcohol compresses, heating pads, and Solux lamps. To improve the drainage function of the auditory tube, vasoconstrictor nasal drops are prescribed: naphthyzin, galazolin, nasal, otrivin, nasol and vasoconstrictor ointments: sunaref, Simanovsky's ointment, Fleming's ointment. In the external auditory canal at the pre-perforative stage, it is recommended to instill ear drops: carbolglycerol drops (5% solution of carbolic acid in glycerin), otipax, otinum, sofradex, garazone. All of the above drugs have anti-inflammatory, local anesthetic and antiseptic effects. However, they cannot be used at the perforating stage for various reasons: otipax contains 95% ethyl alcohol, sofradex is an aminoglycoside antibiotic (neomycin), carbolic acid has a cauterizing effect on the epithelium of the tympanic cavity. The appointment of UHF at the pre-perforative stage in the absence of an outflow of purulent exudate can lead to the development of complications due to the weakening of natural tissue barriers to the spread of infection from the middle ear to the inner ear and cranial cavity. If the perforated stage does not occur in a timely manner, and the patient has severe ear pain, high fever, there is a protrusion of the tympanic membrane, then on the 4th-5th day of illness, it is necessary to perform paracentesis of the tympanic membrane. The incision of the tympanic membrane is performed with a special paracentesis needle in the postero-inferior quadrant of the tympanic membrane. In children, this intervention should be carried out under Rausch anesthesia, in adults under local anesthesia. At the perforated stage, an important element of treatment is to ensure the outflow of purulent exudate from the middle ear cavities and to prevent possible inflammation of the external auditory canal. Local treatment at this stage is reduced to the introduction of sterile gauze turundas into the external auditory canal, impregnated with antiseptics (dioxidin, rivanol, sodium sulfacyl solution, nifucine), aqueous solutions of antibiotics, as well as the use of ear drops: otofa, cypromed. First, the turundas are changed 6-8 times a day, as the otorrhea decreases up to 2-3 times. At the perforated stage, UHF has a good effect.

After the otorrhea stops, the perforation of the tympanic membrane heals with the formation of a scar. If conductive hearing loss persists after the closure of the perforation, then a course of treatment is carried out aimed at preventing the development of the adhesive process in the middle ear: blowing and catheterization of the auditory tube, pneumomassage of the tympanic membrane, endaural electrophoresis of lidase.

Complications of acute otitis media

Mastoiditis

Mastoiditis develops as a complication of acute otitis media and is an inflammation in the bone cells of the mastoid process. The pathogenic flora, as a rule, are the same pathogens that caused the development of acute otitis media. Inflammation of the mucoperiosteum of the mastoid cells is always observed with purulent inflammation of the middle ear, however, the transition of the inflammatory process to the bone tissue with its subsequent destruction is associated with the following reasons: a decrease in general and local immunity, high virulence of the pathogenic flora and impaired outflow from the mastoid process through aditus ad antrum, due to edema of the mucous membrane. Pathological changes in the mastoid process begin with inflammation of the mucoperiosteum and the formation of serous or serous-purulent exudate in the cells of the mastoid process. In the future, the process involves bone intercellular bridges, which, due to osteitis, are destroyed with the formation of cavities filled with pus. Along with purulent fusion of bone tissue, granulation tissue appears in the cells. It should be noted that destructive changes do not occur simultaneously in different groups of air cells, therefore, during the operation, a thorough revision of all parts of the cellular system is required.

Clinical course of mastoiditis

By the end of the second week, a patient with acute otitis media shows signs of deterioration: the body temperature rises again, pulsating pain in the ear and profuse purulent discharge appear. In the blood test, neutrophilic leukocytosis, a shift in the leukocyte formula to the left, an increase in ESR are noted. During otoscopy, the following symptoms are observed: a large amount of thick, pulsating pus, which quickly fills the ear canal; the tympanic membrane is sharply hyperemic and infiltrated; overhang of the posterior-superior wall of the external auditory canal in the bony section due to inflammation of its periosteum. Of the local symptoms, soreness on palpation of the mastoid process, smoothness of the skin fold behind the ear, pasty soft tissues of the behind the ear region are important.

In the diagnosis of mastoiditis, radiography of the temporal bones in the projections of Schüller and Mayer and computed tomography of the temporal bone in axial and coronary projections are of great importance.

The clinical course of mastoiditis can have many features. So, in the elderly, an atypical course is often observed, when otorrhea and pain on palpation of the mastoid process are absent.

Treatment of mastoiditis

Mastoiditis is a surgical complication of acute purulent otitis media. Conservative treatment is possible only at its initial stages and it does not fundamentally differ from treatment at the perforated stage. From antibiotics, preference is given to drugs of the cephalosporin series and lincomycin.

With mastoiditis, a surgical intervention is performed - antromastoidotomy. Operation antromastoidotomy is sanitizing and is aimed at eliminating the focus of purulent inflammation in the region of the base of the skull. Local infiltration anesthesia is considered the preferred type of anesthesia for middle ear surgery, since during the intervention, control over facial function is necessary to prevent injury to the facial nerve. In children, patients with severe concomitant

pathology: diabetes mellitus, hypertension, coronary heart disease, mental disorders, the operation is performed under general anesthesia. An incision in the behind-the-ear region is made parallel to the behind-the-ear fold, 0.5 cm away from it. With the help of a raspator, the mastoid area is separated so that all the contours of the Shipot triangle (temporal line, spina Henle, apex of the mastoid process) are indicated. Trepanning is carried out using Voyachek's chisels, chisels or a special drill. At the first stage of trepanation, the antrum is opened, at the second stage, a thorough revision of all the cells of the mastoid process is performed, during which pathologically altered tissues (granulation, softened walls of bone cells) are removed. As a result of the operation, a cavity is formed, which heals by secondary intention, so the wound is not sutured. In case of large destruction and, accordingly, the formation of a large cavity, in some cases, it is possible to perform "plastic surgery" with a muscle-fascial flap taken from the temporal muscle. The postoperative period in patients with mastoiditis lasts for a month, when the postoperative cavity closes, purulent discharge from the ear stops and hearing is restored.

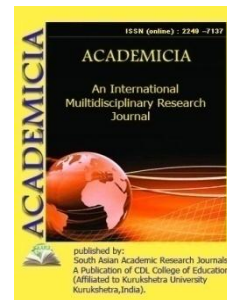
With special forms of mastoiditis, antromastoidotomy has its own characteristics. With squamite and zygomaticitis, surgical revision of the cells of the zygomatic process and scales of the temporal bone is necessary. The most difficult surgical approach for petrositis, when it is necessary to open perilabyrinth inflammation foci. With special forms of mastoiditis, associated with the breakthrough of pus into the soft tissues of the neck, along with antromastoidotomy, an opening of the neck phlegmon is performed with a thorough revision of all purulent leaks and the setting of drains.

Features of the defeat of the mastoid process in children are associated with the fact that the latter is formed by the age of 3, and only antrum is involved in the inflammatory process before this age. The course of antritis can be complicated by a subperiosteal abscess. Antritis treatment can be conservative and surgical. With conservative treatment, along with antibiotic therapy, it is recommended to perform anthropuncture for therapeutic and diagnostic purposes. Surgical treatment is associated with performing an antrotomy operation.

LITERATURE

1. Khushvakova N.Zh., Davronova GB Russian otorhinolaryngology No. 1, (62) 2013.
2. Russian otorhinolaryngology № 3 (82) 2016 Evaluation of the effectiveness of laser therapy and LED phototherapy in the treatment of chronic tonsillitis. Blotsky A.A., Antipenko V.V.
3. Russian otorhinolaryngology № 3 (82) 2016 Evaluation of the effectiveness of laser therapy and LED phototherapy in the treatment of chronic tonsillitis. Blotsky. A.A., Antipenko V.V.
4. Intravenous Laser Blood Irradiation "Triada Publishing House", 2008 A.V. Geynits, S.V. Moskvina, A.A. Achilov
5. Biosensors to control the level of enzymes regulating peroxidation in the human body. Yulaev M.F.
6. Melnikov O.F. Immunology of chronic tonsillitis. Monograph by D.I. Zabolotny, V.V. Kishchuk K Logos 2017-192s
7. SS Nabiyeva, AA Rustamov, MR Malikov, NI Ne'matov // Concept Of Medical Information // European Journal of Molecular & Clinical Medicine, 7 (7), 602-609 p, 2020

8. H.A. Primova, T.R. Sakiyev and S.S. Nabiyeva Development of medical information systems// International Conference on Information Science and Communications Technologies: Applications, Trends and Opportunities, ICISCT, 2019, 9011867
9. H.A. Primova, T.R. Sakiyev and S.S. Nabiyeva Development of medical information systems// Journal of Physics: Conference Series. 1441(2020) 012160 IOP Publishing doi:10.1088/1742-6596/1441/1/012160 (Scopus)
<https://iopscience.iop.org/article/10.1088/1742-6596/1441/1/012160>
10. Khushvakova N.J. and Nishanbaeva F.M. intravenous blood laser irradiation in the treatment of chronic tonsillitis Turkish Journal of Physiotherapy and Rehabilitation; 32(2) p.1534-1538
<https://turkjphysiotherrehabil.org/pub/pdf/322/32-2-198.pdf>
11. AB Karshiev, XA Primova, SS Nabiyeva, AS Egamkulov // Architectural integration problems of MIS // ISJ Theoretical & Applied Science, 05 (85), 733-739 p.



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DETERMINATION OF CADMIUM POISONING IN SKIN WHITENING CREAMS

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ABSTRACT

This article is based on an examination of different studies conducted across the globe on the topic of heavy metal impurities in skin-whitening or lightening treatments. Cadmium (Cd) was chosen as the heavy metal for this study since it is one of the most frequently detected contaminants in a variety of cosmetic products, yet studies on Cd alone are scarce. The acid-digestion procedure is utilized to prepare samples in the majority of tests. Atomic Absorption Spectrometry (AAS) is the most frequently utilized confirmatory method, with the exception of one study that employed inductively coupled plasma atomic emission spectrometry (AES). The difference between AAS and AES is that AAS measures electromagnetic radiation absorption whereas AES tests radiation output. In this study, the World Health Organization (WHO) detection cap or their own nation regulation is utilized as a reference. According to studies, the use of some cosmetic ingredients exposes consumers to tiny quantities of dangerous heavy metals, which may create health issues if they remain in biological processes over time. It was also found that, although the usage of heavy metals in some brands is below the legal limit, they nevertheless represent a considerable risk to people. Both of these tests are being performed in order to identify which brands of cosmetics sold in our sector are in violation of the regulations and to bring this to the notice of the authorities.

KEYWORDS: Cadmium, Concentrations, Cosmetics, Heavy Metals, Lightening Creams, Products, Samples, Skin, Whitening.

INTRODUCTION

Poisoning is a sickness or process in which a living creature is intentionally harmed or affected by a toxic substance or animal venom. Acute poisoning occurs when a toxic substance is introduced in a single event or over a brief period of time. Chronic Poisoning is a repeated or continuous exposure to a toxic substance in which symptoms do not develop immediately or after each presentation. Poisoning symptoms may resemble a number of diseases, including seizures, inebriation, stroke, and insulin response. Poisoning symptoms and adverse effects may include[1].

- Burns or redness around the mouth and lips
- Breath that smells like synthetic chemicals, for example, gas or acetone
- Vomiting
- Difficulty in breathing
- Sleepiness
- Confusion or other altered mental status

The term "heavy metal" refers to any metallic material product with a high thickness that is dangerous or toxic at low quantities. Heavy metals are widespread on the planet's surface. They can't be contaminated or destroyed. They join our bodies in tiny quantities via eating, drinking water, and breathing. Some heavy metals (such as copper, selenium, and zinc) are needed for human digestion to operate correctly. Nonetheless, in greater quantities, they may cause harm. Mercury (Hg), cadmium (Cd), arsenic (As), chromium (Cr), thallium (Tl), and lead are examples of heavy metals (Pb). Heavy metals are hazardous because they seem to build up in the body. Bioaccumulation refers to the expansion of a substance's convergence in a natural living form through time, as opposed to the compound's fixing in the soil. When living things are taken up and put away quicker than they are isolated (used) or discharged, mixes develop. Cadmium is a silvery white metal buried in the crust of the planet. It is isolated during the manufacture of metals such as copper, silver, and zinc, for example. Cadmium is found in some foods and is disseminated through the usage of petroleum derivatives such as coal and gasoline, smoking tobacco, and eating trash. Batteries, make coatings, and metal coatings all utilize it[2].

Cadmium is categorized as a human cancer producing agent because of its detrimental effects on the renal, skeletal, and respiratory systems. It is typically found in the earth's crust in low quantities. Whatever the situation may be, human migration has significantly increased such quantities. Cadmium can travel a great distance via air from the source of discharge. It rapidly accumulates in a number of living types, including mollusks and scavengers. Vegetables, peas, and drab roots have lower concentrations. Human presentation is mainly induced via the consumption of contaminated food, the active and passive breathing of cigarette smoke, and the inhalation of nonferrous metal workers. Long-term exposure to lower levels of Cd has been related to kidney damage, bone malformation, and the propensity of bones to fracture. Cadmium poisoning has been observed in various areas of the globe. It is a global medical issue that affects a range of organs and may result in a number of fatalities each year. Cadmium has an effect on cell proliferation, separation, and apoptosis. These actions operate in combination with Deoxyribonucleic Acid (DNA) fixing tools, the age of reactive oxygen species (ROS), and

apoptosis recruitment. Cadmium attaches to mitochondria and, at low concentrations, may impair both cell respiration and oxidative phosphorylation[3].

A cosmetic is a material that is added to the human body in order to enhance, restore, or change the beauty or appearance of the skin, hair, nails, lips, eyes, or teeth, or to cleanse, colour, condition, or secure the skin, hair, nails, lips, eyes, or teeth. Archaeologists found the earliest cosmetics, which were utilized for eye make-up and the usage of scented lotions. Cosmetics are the most frequently used product among people nowadays, particularly among adolescent females. People's aesthetic consciousness has generated a need for cosmetics in today's market. As a consequence, the cosmetic business has expanded considerably, creating a broad variety of cosmetics for the treatment besides prettification of teeth, nails, hair, skin, and the body, such as sindoor, and eye shadows, among other things. People's wellness awareness, on the other hand, has drawn physicians and academics to find out what's causing their negative effects. Heavy metal poisoning was found to be the core of the issue. The most common pollutants in beauty items are heavy metals such as lead and cadmium[4].

The significance was first identified in 1912, due to Gourbin's fingernail scrapings (accused of strangling his love) then found that the arrangement of the punitive powder on Marie's neck (a handmade restorative). Emile was found guilty of intentional murder by the jury following corrective evidence and other findings.

Despite the fact that demonstrated, it wasn't until the 1980s that scientific professionals started to examine cosmetic samples in detail. Different nations control the usage and acceptance of different methods. The FDA governs the use of these chemicals in cosmetics in the United States, whereas the European Union (EU) Cosmetics Directive controls their use in European nations.

The guideline in India adhered to the EU Cosmetic Directive, as well as the standards established by the Drugs and Cosmetics Rules 1945, the Drugs and Cosmetics Act 1940, and the Bureau of Indian Standards (BIS). The Drugs and Cosmetics Act of 1940 is an Act of the Indian Parliament that governs the import, manufacturing, and distribution of pharmaceuticals in India. The demonstration's primary aim is to guarantee that the prescriptions and cosmetic care items supplied in India are safe, efficient, and satisfy governmental quality standards. Cosmetics, as defined by the Act, are any article intended to be scoured, poured, sprinkled, or splashed on, or acquainted with, or generally applied to the human body or any part thereof for the purpose of purifying, embellishing, advancing the engaging quality, or modifying the appearance, and includes any article intended for use as a section of restorative but excludes cleanser. Cosmetics are controlled in India by the Central Drug Standard Control Organization (CDSCO), which is governed by the Drug and Cosmetic Act 1940 and Rules 1945 (updated up to Dec. 31st 2016). Norms of value in connection to skin care products where the restorative pledges to such standards as may be approved. A cosmetic may be deemed misbranded if it creates an inappropriate shade, or if it isn't marked in an approved method, or if the name, holder, or anything else connected with the restorative contains some explanation that is inaccurate or deceptive in any way[5].

The desire for lighter skin tones has been handed on through the centuries. This is the reason behind the constantly growing frequency of skin lightening treatments. The predominance of skin lightening cosmetics in the beauty business increased as a consequence of this popularity.

Asia has the greatest demand for skin whitening products. Not all skin lightening cosmetics are unlawful, however some creams from outside the EU include ingredients that are banned by safety regulations. Mercury and hydroquinone, for example, have been linked to overdose, skin damage, and liver and kidney failure in long-term usage, as well as corticosteroids, which are only accessible by prescription in the United Kingdom (UK). Misuse of corticosteroid creams has been associated to skin thinning, an increased risk of skin cancer, and, counterintuitively, skin darkening. Skin whitening is utilized to make your skin lighter than it was when you were born. Skin bleaching is another name for this. Creams, washes, pills, and even injections designed to prevent the release of melanin are among the skin lightening medicines available. According to a World Health Organization (WHO) study, 40 percent of Chinese women use skin whitening treatments on a regular basis, compared to 61 percent in India and 77 percent in Nigeria[6].

LITERATURE SURVEY

J. E. Onojah *et al.* explained in the article that long-term exposure to consumer products like cosmetics and hygiene may induce heavy metal poisoning in people. The degree of occurrence of fatal metals in different cosmetics products sold in local stores in Anyigba, Kogi State, Nigeria, were assessed in this research. Five skin lightening creams and five medicated soaps were among the cosmetics tested. After digestion with condensed acids (HNO_3 : H_2SO_4 in a 2:1 ratio), these cosmetics were tested for heavy metals (Cd, Pb, Cr, and Hg). Using a Varian Flame AAS, the concentrations of the selected hazardous heavy metals were measured in triplicate. Chromium was detected in measurable levels in all of the samples examined, with values ranging from 0.0020 to 0.0190 ppm. The concentrations of chromium in samples A (Dettol), B (Fashion fair), C (Septol), D (Tura), and I (Fashion fair) varied from 0.0003 to 0.0027 ppm, whereas the concentrations of chromium in samples F (Fair and White), G (Neurotone), H (Hot Movate), and J (Clear tone) was below the detection threshold. In addition, samples B (Fashion Fair), D (Tura), F (Fair and White), G (Neurotone), and H (Hot movate) contain a measurable volume of lead with concentrations ranging from 0.0063 to 0.0521 ppm, while samples A (Detol), C (Septol), E (Crusader), I (Fashion fair), and J (clear tone) have lead concentrations below the detection level. A detectable amount of mercury was detected in all of the samples examined, ranging from 0.0030 to 3.7022 ppm. The present study clearly demonstrates that the usage of some cosmetic products exposes consumers to tiny amounts of radioactive heavy metals, which may stance health risks if they build in biological processes over time[7].

J. G. Ayenimo *et al.* presented in the article that numerous discovered different there are few or no reports in personal care products, which have biotic effects. Using atomic absorption spectrophotometry, the quantities assessed five different substances commonly used in Nigeria. Many of the medicines contained substantial levels of Cd, Cr, Cu, and Zn. Hair cream contains amounts of Cd and Cu, while primarily responsible for Cr and Zn. It's difficult to tell whether the metal sample are because no cap for cosmetic goods exists; nevertheless, Cd and Cr are prohibited in cosmetics in any amount. The use of these components in soaps and creams for a long period of time may be detrimental to human health and the environment[8].

A. A. Alqadami *et al.* explained in the article, hazardous heavy metals such as metalloid arsenic (As), lead (Pb), titanium (Ti), mercury (Hg), bismuth (Bi), and cadmium (Cd) were identified in using AES. A mixture of hydrofluoric acid, hydrogen peroxide, and nitric acid was employed to completely digest cosmetic samples. The target chemicals were measured using a conventional

addition procedure. Excellent consistency parameters were achieved, such as detection limits, Ti (4.3 ppb), Pb (3.8 ppb), Hg (3.3 ppb), Cd (0.45 ppb), Bi (7.9 ppb), As (4.6 ppb) linearity ($r > 0.999$), as well as the run-to-run besides day-to-day precisions of relative standard deviations of < 3 percent [9].

T. Ahmadi-Jouibari *et al.* articulated in the article that for the detection of cadmium in cosmetic samples, Continuous sample drop flow-based micro-extraction (CSDF-ME) in conjunction with graphite furnace atomic absorption spectrometry (GFAAS) has been developed as a high-performance pre-concentration method. A few microliters of an organic solvent are moved to the bottommost of a conical sample cup in this procedure. As it travels through the organic solvent, administered by a syringe needle is transformed into droplets. As a result, extracts matrix. The conical sample cup is transferred to the GFAAS instrument after utilizing an auto sampler, 20 μ L of the extraction solvent is put into the graphite furnace under optimum circumstances, The method's intra-day as well as inter-day repeatability and reproducibility is 3.2 percent and 4.5 percent, respectively, based upon 7 repetitions. As a consequence, the newly developed method was successfully utilized to extract and quantify cadmium ions in lipsticks, eye shadows, and hair colors, giving acceptable results[10].

DISCUSSION

This study is based on a review of many research on heavy metal contaminants in skin-whitening/lightening creams performed throughout the globe. Cadmium (Cd) was selected as the heavy metal for my research since it is one of the most frequently identified toxins in a range of cosmetic items, and there are few studies on Cd alone. The majority of studies utilize the acid-digestion technique to prepare materials. With the exception of one research that utilized inductively coupled plasma atomic emission spectrometry, atomic absorption spectrometry is the most frequently used confirmatory technique. The distinction between AAS and AES is that AAS measures the absorption of electromagnetic radiation whereas AES measures the output of radiation. The WHO detection limit or their own nation legislation was utilized as a reference in this research. According to research, wearing such cosmetics produces exposing customers to small amounts of deadly heavy metals, which may create healthiness problems if they stay in biological systems for extended periods of time. It was also discovered that, although certain brands' usage of heavy metals is within the legal limit, they still represent a considerable danger to people. Both of these tests are being carried out in order to identify which cosmetics products marketed in our sector are in violation of the regulations and to bring this to the government's notice.

As a result, establishing metals in cosmetic goods regulation limitations is essential. Low-quality materials should be avoided, especially for long-term continuous usage, because heavy metals are readily absorbed via the skin. Following the results, strongly recommended creams be checked for metal being marketed. Certain materials, both local and non-local, breached the rules by utilizing excessive quantities of heavy metal impurities, causing deterioration. The research examined the concentrations of various metals as well as a metal's concentration in different brands. Cadmium poisoning may have a variety of adverse effects, including cell death and enhanced cell proliferation, all of which can lead to cancer. It also has an impact on the blood flow, skeletal muscle, brain, lungs, and kidneys, resulting in heart attacks, liver illness, hypertension, immune system suppression. People who use skin-lightening treatments may be

more susceptible to greater amounts of heavy metals, according to the research. The two studies looked at were both done in Nigeria and showed higher levels of heavy metal toxicity.

Doctors warn that using a whitening cream containing topical steroids for a long period would induce hypertension, high blood pressure, and suppression of the body's natural hormones. Any adverse effects, such as stretch marks, may endure a lifetime. Hydroquinone has been identified by many physicians as the perpetrator in instances of abuse. A blue-black discoloration of the skin is an uncommon adverse effect of abusing hydroquinone. Since poisonous heavy metals are known to persist in organic settings, utilizing these cosmetic products exposes consumers to small quantities of deadly heavy metals, which is competent to offer a health risk.

Each touch departs as indicated by Lockard's trading guideline. As a consequence, traces of cosmetic products are frequently found at a law-breaking scene. The evidentiary value of such follow evidence will be decided by the kind of test technique employed. The optimal competency should be non-ruinous, reproducible, and capable of evaluating a limited number of trials with little to no example preparation. In practice, the system's capacity to break down puzzling. About five-thousand different materials have been recognized as having been utilized in cosmetics. As a consequence, various techniques are required for the efficient separation of restorative displays obtained in criminal cases. For example, chromatographic methods are commonly utilized to separate shade specialists in skin care products, while spectroscopic techniques are used to dissect other natural and inorganic mixes. The methods for assessing different components included in cosmetic displays are shown in the following figure.

1. Metal Contamination from Moisturizing and Skin Lightening Creams:

The amounts of 10 metals (Al, Zn, Mn, Fe, Co, Cu, Cr, Ni, Pb, and Cd) were tested in many frequently used products, as well as unknown beauty care goods, to give insight into the potential of metal harm from their usage. After corrosive absorption, the metal content of these materials was measured by AAS. The dynamic components of beautifying agents are selected depending on the item's expected use. As a result of the methamphetamine manufacturing process, any of the components in these cosmetics were inadvertently used and employed in beautifiers. However, some metals are deliberately employed as remedial treatments. Metals such as lead (Pb), nickel (Ni), mercury (Hg), cobalt (Co), chromium (Cr), cadmium (Cd), arsenic (As), and antimony (Sb) are restricted in beautifiers owing to their toxicity. People's skin is exposed to the majority of these cosmetic care products. Despite the fact that the skin acts as a barrier to the outside world, some medicinal synthetics may permeate the epidermis and disseminate to critical interior organs, causing short- and long-term poisoning.

Cadmium is a cell toxin that causes a range of consequences, such as cell death or enhanced cell growth. As a consequence, Cd is categorized as a category 2A carcinogen by the International Agency for Research on Cancer (IARC) (IARC). Other metals, including Al, Zn, Mn, Fe, and Ni, are essential to humanity since they play a part in a number of biological processes. Notwithstanding the importance of these metals to humans as well as other animals, their presence in ornamental produce offers a major well-being danger. Skin-lightening lotions are in great demand in industrialized nations. Sunscreen filters must be employed in the formulations designed to inhibit the formation natural protection opposed to ultra-violet (UV) rays.

The cream brands selected were intentionally chosen to reflect the brands used by individuals of different socioeconomic levels. To study the variations in elemental concentrations single brand,

an entire of five samples of dissimilar consignment numbers besides manufacturing dates were acquired inside each form or brand. By flame atomic absorption spectroscopy, the entire eaten samples were examined in triplicate for Al, Zn, Mn, Fe, Co, Cu, Cr, Ni, Pb, and Cd (Perkin Elmer, Analyst 200, Norwalk, and USA).

The quantities of the metals examined varied substantially ($p < 0.05$) across brands. Additionally, within a single brand, there are significant differences ($p < 0.05$) in the quantities of some metals. The variations in metal content in these goods are related to variances in raw materials and manufacturing techniques. Batch-to-batch variations in packing, variances in product built-up processes, and contamination from external sources are all possible foundations of irregularity. In contrast to the moisturizing creams, these two testing levels of Cd. The permissible limit in Canada is 3.0 $\mu\text{g/g}$. In this study, three tests with abnormally high Cd quantity, the other body cream samples examined had lower Cd amounts. They discuss creams in this study article. They compared the metal content of skin whitening and moisturizing lotions. They also compared the incidence and composition of each metal under study in creams from different brands and nations. To assess the degree of toxicity, they tested the metal concentration in creams and compared it to the reference level. They also talked about the negative effects of each metal at greater quantities in our body. Except for Ni, the results showed that have tested, indicating that individuals instead of moisturizing creams may be exposed to greater metal concentrations.

2. *Microwave Digestion Used To Determine Heavy Metals:*

The target chemicals were measured using a conventional addition procedure. Cosmetics are recognized to be a vital part of everyday body care. By adding these things to human skin, they create local exposure to certain variables. Cosmetics include a broad variety of ingredients, some of which are potentially hazardous. When breathed, ingested, or absorbed by the skin on topical therapy, it poisons the body, producing various illnesses. It also has a tendency to remain in the body. Cd, Hg, and Pb levels were found to be greater than the WHO's permissible limits in a research performed.

In this study, by utilizing a microwave-assisted acid digestion procedure, the levels were measured and compared to certified findings. The cosmetics samples were gathered in Riyadh, Saudi Arabia, from different beauty aid stores and pharmacies. Strong metal concentrations (Ti, Pb, Hg, Cd, Bi, and As) were detected in 15 cosmetics samples. The accuracy of the method was demonstrated in this article by estimating the amounts of chemicals in cosmetics samples after spiking with specified concentrations of compounds. Heavy metal recovery levels in cosmetic samples were found to be between 87 and 105 percent.

The suggested method's limit of detection (LOD) is designed using a signal-to-noise (S/N) ratio of 3:1. For Cd, a LOD of 0.45 $\mu\text{g/l}$ was obtained. By examining $n = 8$ samples of the same quantity of 0.1 $\mu\text{g/l}$ for Ti, Pb, Hg, Cd, Bi, and As, the precisions of the suggested technique were determined. The values of standard deviation (SD) obtained varied from 1.41 to 2.6 percent. Cd was utilized in six of the investigated samples, with amounts ranging from 0.20 to 0.6 $\mu\text{g/kg}$ of sample. Cd was found in lower quantities in the examined samples. Sample-10 showed the greatest amounts of Cd, while sample-07 had the lowest values. Out of the 15 samples examined, nine were determined to be below the LOD. The WHO has set a Cd limit of 0.3 mg per liter in cosmetology. The quantity of Cd in 11 samples were found under the WHO acceptable limit using this technique. Using statistical MATLAB tools, the usual addition graphs

were produced by displaying the strength in contradiction of the solution of the applied sum alongside the solutions of the computed samples. The results of this research showed that hazardous heavy metal content was present in cosmetics in various amounts. Strong metal (Cd) quantity in cosmetics samples ranged between 0.20 and 0.6 (g1) on average. As a consequence, recommended goods be tested for heavy metals requirements before being sold.

They estimated the quantity of heavy metals in all of the examined samples in this study. Samples were selected at random from the industry, with no limits or selection barriers in place. They determined the spectrum of metals present in the material in this study. They were able to differentiate between samples that were below and above the reference point. They linked the concentration to the WHO's permitted limit. Based on the results, it was decided that the method may be utilized.

Poisoning is a sickness or process in which a living creature is intentionally harmed or affected by a toxic substance or animal venom. Acute poisoning occurs when a toxic substance is introduced in a single event or over a brief period of time. Chronic Poisoning is a repeated or continuous exposure to a toxic substance in which symptoms do not develop immediately or after each presentation. Poisoning symptoms may resemble a number of diseases, including seizures, inebriation, stroke, and insulin response.

CONCLUSION

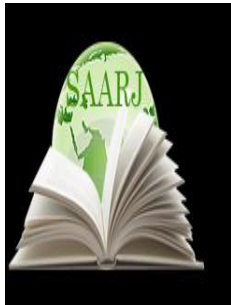
The findings of a study of all research on heavy metal toxicity in skin whitening or skin lightening cosmetics show that harmful heavy metal content (Cd) was present in different concentrations in the cosmetics, with certain products beyond the WHO's permissible limits, potentially causing lethal effects on human health. People hold the notion that if there is poisoning, it can only be found in local items and not in branded ones. However, after evaluating different tests, it is found that non local cosmetic goods have greater levels of heavy metal toxicity than locally marketed products in certain instances. Cadmium poisoning may result in a number of consequences, all of which can lead to cancer. It also affects the blood vessels, cardiac muscle, kidney, lungs, and brain, causing heart attack, hypertension, liver damage, immune system suppression, and other symptoms. According to the results, individuals sensitive to greater amounts of heavy metals. The two investigations that were evaluated were performed and showed a significant degree of heavy metal toxicity.

As a consequence, setting regulatory limits for metals in beautifying yields is essential. Since heavy metals are readily absorbed via the skin, low-quality fabrics should be avoided, especially for long-term continuous usage. As a consequence of the study, it is highly recommended creams be tested for heavy metal stages prior being sold. Certain goods, both local and non-local, violated the regulations and utilized excessive amounts of heavy metal impurities, resulting in pollution. The studies examined the concentrations of different metals as well as the concentration of a metal in various brands. There have been research performed to evaluate the health hazards linked with its toxicity.

REFERENCES

1. F. B. Odukudu, J. G. Ayenimo, A. S. Adekunle, A. M. Yusuff, and B. B. Mamba, "Safety evaluation of heavy metals exposure from consumer products," *Int. J. Consum. Stud.*, 2014, doi: 10.1111/ijcs.12061.

2. C. M. A. Iwegbue, F. I. Bassey, G. O. Tesi, S. O. Onyeloni, G. Obi, and B. S. Martincigh, "Safety evaluation of metal exposure from commonly used moisturizing and skin-lightening creams in Nigeria," *Regul. Toxicol. Pharmacol.*, 2015, doi: 10.1016/j.yrtph.2015.01.015.
3. "Spectrophotometric determination of heavy metals in cosmetics sourced from Kaduna Metropolis, Nigeria," *Sci. World J.*, 2015.
4. O. E. Orisakwe and J. O. Otaraku, "Metal concentrations in cosmetics commonly used in Nigeria," *Sci. World J.*, 2013, doi: 10.1155/2013/959637.
5. S. S. Omenka and A. A. Adeyi, "Heavy metal content of selected personal care products (PCPs) available in Ibadan, Nigeria and their toxic effects," *Toxicol. Reports*, 2016, doi: 10.1016/j.toxrep.2016.07.006.
6. M. D. Faruruwa and S. P. Bartholomew, "Study of heavy metals content in facial cosmetics obtained from open markets and superstores within Kaduna metropolis, Nigeria Citation," *Am. J. Chem. Am. J. Chem. Am. J. Chem. Am. J. Chem. Appl. Appl. Appl. Am. J. Chem. Appl.*, 2014.
7. J. E. Onojah, P.K. and Emurotu, "Heavy Metals in Selected Skin Lighting Creams and Medicated Soaps," *Int. J. Innov. Sci. Math.*, 2017.
8. J. G. Ayenimo, A. M. Yusuf, A. S. Adekunle, and O. W. Makinde, "Heavy metal exposure from personal care products," *Bull. Environ. Contam. Toxicol.*, 2010, doi: 10.1007/s00128-009-9867-5.
9. A. A. Alqadami *et al.*, "Determination of heavy metals in skin-whitening cosmetics using microwave digestion and inductively coupled plasma atomic emission spectrometry," *IET Nanobiotechnology*, 2017, doi: 10.1049/iet-nbt.2016.0212.
10. T. Ahmadi-Jouibari, N. Fattahi, N. Mirzaei, K. Sharafi, and H. Reza Ghafari, "Determination of cadmium in cosmetics from Kermanshah, Iran by graphite furnace atomic absorption spectrometry," *New J. Chem.*, 2017, doi: 10.1039/c7nj00406k.



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A TAXONOMIC STUDY OF STRATEGY APPROACHES

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ABSTRACT

Authors offered many methods to strategy development, and instead of the word "approach," they used terms like "schools of thought," "perspectives," "frameworks," and "models." Planned strategy, emergent strategy, positioning strategy, and other mutually incompatible categories have been used to classify strategy, resulting in ambiguities in the taxonomy. The goal of this research is to see whether author groups are completely distinct or if they can be condensed into a few dominating methods, and the analysis relies heavily on Mintzberg's terminology. This research discovered that there are about six methods into which most of the groupings may be condensed after analyzing the categorization system provided by 13 renowned writers. Fit approach, Planning approach, Emergent approach, Positioning approach, Resource based approach, and Stakeholder approach are the methods. The act of collapsing reduces the number of groups, allowing for a more focused knowledge of strategy while also making the term more manageable from a researcher's perspective.

KEYWORDS: *Emergent Approach, Planning Approach, Positioning Approach, Stakeholder Approaches, Strategic Approach.*

INTRODUCTION

Any organization's success is largely determined by the strategy it has chosen. As a result, organizations, consultants, researchers, and planners are always on the hunt for the right approach to help them succeed. Despite its apparent significance and the fact that it is one of the most studied and thought-about concepts, strategy is simultaneously one of the most misunderstood. The underlying discipline of Strategic Management may also be blamed for the increased complexity of the strategy idea. This is due to the fact that, on the one hand, the roots of the Strategic Management area are varied and can be linked to a variety of disciplines, while, on the other hand, the literature on the topic has grown at an exponential pace. Various methods

to strategy development have been suggested by researchers at various times in the history of Strategic Management[1]. The availability of literature expressing differing points of view has resulted in a wide range of opinions on strategy among various writers. There has been an ongoing attempt to identify distinct schools of thought on strategy formed around different sets of beliefs and assumptions held by such groupings throughout the development of the theory of strategy. The fundamental concepts of certain author categories are the same, according to this article, even if the nomenclatures are different[2]. On the one hand, variety among schools of thought enriches research within the area of study, but on the other hand, it indicates a lack of consistency and coherence. However, they noted that each school's feature explains a particular contribution to the strategic management area, referring to 10 schools of thought. They went on to say that each of the schools represents a distinct perspective or approach to strategy development. Several academics have tried to organize concepts in the same way as Mintzberg did. It implies that academics have also recognized strategic methods, such as those used in their classifications. Authors have traditionally offered various views on the nature and conduct of strategy via categories, which are sometimes known as schools of thought, perspectives, methods, or models[3]. However, since strategy relies on a variety of perspectives and disciplines by its very nature, no one school of thought has been able to offer a full or final explanation. The Mintzberg categorization of 10 schools of thought is believed to be more thorough and generally recognized. Nine of these ten schools of thought address various elements of strategy development, with the tenth not being a strategy in the traditional sense. Many other writers have attempted to describe the idea of strategy in a similar manner, although many have used different terminology. The following categories demonstrate that the development of strategy research is closely linked to the creation of a wide range of paradigms[4]. Each of the categories, which include terms like schools of thought, perspectives, models, and methods, reflects the breadth of the study and the variety of viewpoints on the notion of strategy. The first and second goals of this article are to figure out what the fundamental topic of strategy is in each of the many classifications established by different writers and to find out which points of view are similar. In order to discover the tactics used by businesses, 25 Indian companies were examined[5]. The research found that, in order to thrive, businesses use a variety of strategies throughout the course of their existence. However, the authors found that the majority of businesses choose one of the six most common methods. Because the authors' approach for understanding the nature of strategy differed from the thirteen research included in this article, they were not classified in this analysis. However, as will be shown later in this research, there are six main methods to strategy development that are comparable to the ones. As previously mentioned, this article methodically examines many schools of thinking based on a categorization established by the author. His 10 schools of strategy were selected first because they were more complex or complete. Furthermore, it is based on results from over 30 years of research. Second, each school of thought is created from the spectrum of ideas of a particular set of scholars in the area of Strategic Management, as stated by. The authors claimed that the substance, method, and environment of strategy development are clearly distinct from the characteristics of each school. Finally, each of the nine schools reflects a unique perspective or approach to strategy development[6]. The fundamental subject of the strategy process in each of the nine schools of thought is identified, and each school of thinking is assigned to a particular strategic approach. After the strategic approaches have been identified, classifications by other writers are interpreted. The viewpoints that are

comparable to the previously selected strategic approaches are then put together. It may be deduced that if a certain strategy is backed by a large number of research or academics, that strategy is deemed dominant. The views comparable to the core topic of each of the strategic approaches are discovered and grouped in the following part in order to identify similarities in approaches[7].

Design school's primary slogan is "establish fit," which means that strategy making aims to achieve a match, or fit, between internal capabilities and external possibilities. In this school of thinking, strategy is concerned with assessing the organization's strengths and weaknesses in light of opportunities and dangers in its environment (SWOT). As a result, the fundamental concept of strategy in this method is to match or fit internal company variables like strengths and weaknesses with external ones like opportunities and threats, which is why it's called the fit approach to strategy. Below are some more writers that have discovered this element of strategy development in their research[8]. The fit elements of strategy were described using the 'adaptive' paradigm. According to her concept, the primary aim of strategy is to create a feasible match between the external environment's possibilities and dangers and the organization's skills and resources for exploiting such opportunities. Successful strategies seem to have adapted themselves to the environment, according to the evolutionary perspective, and the job of managers in this approach is to create strategy that best matches the volatility in the environment. As a result, he was alluding to the strategic fit. Similarly, the Harvard policy framework has addressed the issue of fit. They regarded strategy to be concerned with a systematic evaluation of the strengths, weaknesses, opportunities, and threats (known as the SWOT analysis) and it is relevant to both profit and non-profit organizations under a framework they called Harvard policy framework. In his 'prescriptive method,' he seems to have incorporated both planning and fit elements. His strategy emphasizes long-term planning to achieve a 'fit' between an organization and its surroundings. The suggested 'planning' school of thinking examines methods emerging from a regulated, deliberate, and sequential process of formal planning in which goals, budgets, programs, and operation plans are given close consideration. Furthermore, the planning school views strategy as a planned and logical process that falls primarily within the purview of senior management. In the 'linear' paradigm, the planning process emphasizes systematic, sequential, and directed action, suggesting a logical decision-making process, and senior management plays a prominent role. As a result, planning school and Chaffee's linear model have a lot in common[9].

The '8Ps plus Environment' framework was created to describe the many stages of the strategy development. He addressed the planning process in his first 'P,' which he called 'process of decision making.' The strategy in this approach stressed a sequential, linear decision-making process that included senior management. The function of an analysis-driven strategy process and implementation procedure with full dependence on organized action plans, budgets, and balanced scorecards in the 'planning' method. As a result, his method stresses the need of planning. Similar viewpoints may be found in the rational' school of thought's 'planning process approach' and 'planning process framework'. Porter is a member of Mintzberg's "positioning school," which supports strategy development as an analytic process that situates the company in its industry. Porter, the primary proponent of this school of thinking, believed that a company must evaluate both the attractiveness of an industry and its competitive position within that industry using the five forces framework in order to thrive. As a result, he shifted the focus of

rivalry from the business to the industry. In his positioning school of thinking, Mintzberg addressed this issue. Porter developed four basic strategies that aim to put a company in a well-defined 'position' in the economic market-place, dubbed the 'Positioning Approach' to strategy. In the 'strategy as position' viewpoint, the positioning method has been the key concept. According to him, the goal of the company is to acquire a competitive advantage by occupying an appealing and productive position in its surroundings. The study of the competitive environment using Porter's five-force framework is at the heart of the "competitive positioning method." This method aids businesses in determining an industry's potential profitability and selecting a general approach for gaining a competitive edge. As a result, Mintzberg's positioning school of thinking was backed in his competitive positioning strategy[10].

One of the primary responsibilities of the strategist in a competitive setting is to choose an appealing market and maintain a winning position in the marketplace. This element has been explored in the context of "market attractiveness/strategic position," which views a good strategy to be one that allows a company to identify its place in the industry. As a result, he was referring to the process of determining an acceptable industry position or the positioning approach to strategy. Strategies may emerge in all sorts of odd locations and in unique ways in the "learning school," thus they can't be planned. Managers, according to this school of thinking, incorporate their organization's "lessons learnt" into their overall strategy. Managers launch modest projects based on their organizational experiences and pay careful attention over time to what works and what doesn't. Managerial successes generate streams of experiences that may converge into patterns and emerge as emerging strategies. Thus, in contrast to the planned method, which focuses on future activities, 'emergent strategies' reflect previous patterns. In the context of the discussion of emergent elements of strategy. According to this viewpoint, strategy is the result of a steady modification of regular operations in the organization in response to changes in the environment. As a result, strategy is often not pre-planned, but rather develops through time as a result of a variety of forces inside the organization. As a result, the primary concept of this method corresponds to Mintzberg's learning school.

DISCUSSION ON STRATEGY TAXONOMY

A recognizable pattern emerges as a result of comparable effective methods combining to form a pattern of activity. In his 'strategy as pattern' approach, he included this emergent element of strategy. The 'emergent (or learning) approach' has represented the emergent element. In reaction to changes in the environment, he proposed that strategy develop and evolve gradually through time. In their classifications, all of the aforementioned scholars have addressed the emergent element of strategy. Considered strategy is formed in the 'power school' by a process of negotiation between business power holders and/or between the company and its external stakeholders. He highlighted that certain key stakeholders may influence or negotiate plans in their favor via the use of power and politics. As a result, the method in this form is known as a "Stakeholder's approach." Stakeholders are defined as "any group or person who is impacted by or has the potential to influence an organization's goals." Managers should design and execute procedures that satisfy all and only those parties that have a stake in the company, according to the stakeholder approach. They also said that the primary job in this strategy is to manage and integrate stakeholder relationships and interests, which is critical for the firm's long-term performance. The stakeholder method is linked to a 'power' school of thinking, where he argued that strong stakeholders may influence organizational activities and can also use their power to

decide what the company will do. According to this school of thinking, strategy necessitates expertise in stakeholder analysis and the creation of a good political bargaining process that will entice stakeholders to contribute to the organization's growth. That approach, according to her "interpretive" concept, is aimed at motivating stakeholders to behave in the organization's best interests. In this approach, strategy is created via a process of consensus among stakeholders' interests and organizational goals. In this paradigm, she was referring to a stakeholder approach to strategy. How many clusters should be used? This is one of the most important issues in cluster analysis. The research used the dendrogram and agglomeration coefficient to estimate the number of clusters, despite the fact that there were only a few companies examined, and the Lehmann's rule ($n/30$ and $n/60$) was obviously inapplicable. A significant rise in the agglomeration coefficient, expressed as a percentage change, suggests a suitable cutoff point. From three to two clusters and two to one cluster, the coefficients indicate a significant rise. Three clusters had the greatest disparity in percentages of change. The companies were clearly divided into three categories based on their production strategies, according to a visual examination of the hierarchical dendrogram. The proper number of clusters was eventually determined to be three based on the dendrogram and the change in agglomeration coefficients. The k-means clustering algorithm was used to fine-tune the findings from the hierarchical process after setting the number of clusters as three.

When the non-hierarchical and hierarchical cluster solutions were compared, it was discovered that both techniques put 100% of the cases in the same cluster. This demonstrated the cluster solution's dependability and stability. This cluster differentiation strategy's connection is very apparent. This cluster's methods and levels of capabilities are aimed at meeting customer requirements via product and market differentiation, with a strong focus on service, quality, delivery, and flexibility. Differentiators was the name given to the first cluster. They also have some similarities to Sum et al. (2004)'s differentiator group in terms of cluster means, but not in terms of relative rankings. Seven companies make up the third cluster, which accounts for the lowest proportion of the total sample (22.5%). With the exception of cheap pricing, this cluster has the lowest significance meaning of the three clusters. For all of the capabilities, it varies from at least one of the other two clusters. In terms of cheap price, there is no statistical difference between this cluster and the other two. Even while cheap pricing seems to be the most important capacity for this cluster, quality capabilities are quite near to it in terms of significance. Within the cluster, performance and compliance characteristics are ranked second and third, respectively. After-sales service ranks 5 with a mean of 3.00 and delivery speed (rank 6) with a mean of 2.85 are both somewhat important to this cluster. They also put a disproportionately low value on capability-based flexibility. The researchers utilized a cut-off value of 0.30 to determine which skills provided the most value to each canonical discriminant function. Although there are no hard and fast rules regarding how excellent these values are, cut-off values over 0.30 are generally regarded as adequate and sufficient. The multiple discriminant analysis' normalized discriminant function coefficients, discriminant loadings, and group centroids. Vectors were used to show the high structural loadings of variables (more than 0.30), as well as the group centroids. The features of the three strategic kinds are shown in this graphical representation of structural loadings and group centroids. Both discriminant functions offer excellent separation between the three groups, as shown by the Wilks Lambda value and comparison of the group centroids. Two independent variables, I after-sales service and (ii) delivery speed, have a strong positive association with the first function. This function distinguished the manufacturing strategy groups

based on the relative significance of service and speed. Figure 2 shows that the tight correlation between the service and speed vectors and the first function suggests that the first discriminant function emphasizes after-sales service and delivery speed. This dimension is the same as the third dimension discovered in the data from Western Europe. Depending on the competitive skills highlighted, the writers regarded this function as "after-sales service/delivery." As a result, the research will be dubbed "market dependability." The first function is the main source of difference between clusters 1 and 2 vs cluster 3 when the centroids at the plot are examined. High positive coefficients for after-sales service and delivery speed indicate that clusters putting a greater priority on these skills will be allocated to the "market reliability" dimension's high end (positive side). Clusters that place a lesser emphasis on service and speed, on the other hand, will be allocated to the negative side of the dimension. High-end companies strive to compete by providing better after-sales support and closer client relationships, as well as timely delivery of their goods, in order to set themselves apart from their competitors. The second discriminant function showed only a highly significant connection on low price capabilities, implying that it differentiated manufacturing strategy groups based on their relative significance placed on price. While this dimension has a high price coefficient, there is no statistically meaningful connection with any of the other capacities.

As a result, the second function may be understood as the dimension of "market price leadership." This function is used to split clusters. Clusters that put a high value on low prices will likely to be on the high end of the market price leadership dimension, whereas clusters that place a lower value on low prices will be on the low end. The clusters on the figure represent the clustering procedure's manufacturing strategy group assignment. A closer look at the group centroids reveals that differentiators and intermediaries place a premium on client orders and quick answers to their after-sales requests, putting them at the top of the market dependability scale. Intermediators are positioned at the upper end of the market price leadership due to their significant focus on pricing. In other words, inter-mediators fight for market price leadership as well as market dependability. The "lowers" place a lower value on service and quickness due to their position at the bottom of the market dependability. Price, on the other hand, is given less weight due to their position on the bottom end of the market price leadership. Despite the fact that the "lowers" have no significant manufacturing plan, it is clear that pricing capabilities is valued more than differentiators. It has been noted that the Turkish automobile sector has a large number of joint venture and foreign-owned companies. When the distribution of businesses by ownership structure was examined, it was apparent that the overall percentage of firms in the sample with foreign ownership and joint ventures was 51.6 percent. Only 48.4 percent of the companies in the study are Turkish-owned. Tests were conducted to see whether there was a substantial variation in company ownership structure across strategic kinds. It's conceivable that comparable profitability among groups is due to variations in the quality of the execution of the highlighted competitive skills. However, in this view, the lowers put a greater focus on activities such as marketing and finance than on production, and therefore differentiators and intermediators reach a comparable degree of profitability. The reason for this is because the growth record of differentiators and intermediators is statistically better than that of the lowers, despite the fact that the Turkish economy suffered a market contraction due to instabilities unique to the economy soon before the survey period. Total sales in the Turkish automobile industry fell by approximately 25% in the second half of 2006 as a consequence of the recession

(TAYSAD, 2009). Despite this reduction, manufacturing may explain the increase of their market share and sales of differentiator and intermediary companies.

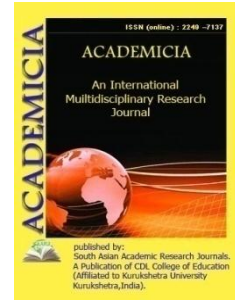
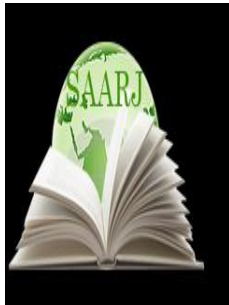
CONCLUSION AND IMPLICATION

The strategy formulation process has developed in a variety of ways, and as a result, academics have represented the strategy process in a variety of ways. Several academics have tried to organize their views on strategy development into a unified paradigm, or school system. Different views on strategy development or strategic methods have been detected by these schools of thought or comparable categories. Researchers looked at Mintzberg's 10 schools of thought and concluded that each one offered unique approaches to strategy development. Mintzberg went into great detail on the 10 schools of thinking, which served as a great beginning point for deciphering the strategic approaches' ideas. Mintzberg's categorization was used to determine the various approaches to strategy in this research. The basic principles of the strategic approaches acquired from Mintzberg's classifications were compared to those given by other writers, and six approaches to strategy were discovered. Fit approach, Planning approach, Emergent approach, Positioning approach, Resource based, and lastly Stakeholder approach are the methods. Each of these strategic approaches to strategic management has its own features and focuses. It was also discovered that planning, positioning, and emergent methods featured in the majority of the classifications, and these techniques may be called dominant strategic approaches. This conclusion, however, needs to be experimentally verified.

REFERENCES

1. J. G. Hougland, J. M. Shepard, and J. Douglas, "Organizations and Environments.," *Acad. Manag. Rev.*, 1980, doi: 10.5465/amr.1980.4288948.
2. D. Miller, "Stale in the saddle: CEO tenure and the match between organization and environment," *Manage. Sci.*, 1991, doi: 10.1287/mnsc.37.1.34.
3. B. Ramdani, D. Chevers, and D. A. Williams, "SMEs' adoption of enterprise applications: A technology-organisation-environment model," *J. Small Bus. Enterp. Dev.*, 2013, doi: 10.1108/JSBED-12-2011-0035.
4. R. Ahuja, M. Jain, A. Sawhney, and M. Arif, "Adoption of BIM by architectural firms in India: technology-organization-environment perspective," *Archit. Eng. Des. Manag.*, 2016, doi: 10.1080/17452007.2016.1186589.
5. C. H. Yeh, G. G. Lee, and J. C. Pai, "Using a technology-organization-environment framework to investigate the factors influencing e-business information technology capabilities," *Inf. Dev.*, 2015, doi: 10.1177/0266666913516027.
6. P. Regnér, "Strategy-as-practice and dynamic capabilities: Steps towards a dynamic view of strategy," *Hum. Relations*, 2008, doi: 10.1177/0018726708091020.
7. C. C. Markides, "Dynamic view of strategy," *IEEE Eng. Manag. Rev.*, 1999, doi: 10.4135/9781452229805.n230.
8. C. Bowman and V. Ambrosini, "How the Resource-based and the Dynamic Capability Views of the Firm Inform Corporate-level Strategy," *British Journal of Management*. 2003, doi: 10.1111/j.1467-8551.2003.00380.x.

9. B. Demil and X. Lecocq, "Business models evolution: Towards a dynamic consistency view of strategy," *Universia Bus. Rev.*, 2009.
10. J. Weerawardena and F. T. Mavondo, "Capabilities, innovation and competitive advantage," *Ind. Mark. Manag.*, 2011, doi: 10.1016/j.indmarman.2011.10.012.



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PROCEDURE FOR DEVELOPMENT OF ENTERPRISE FINANCIAL STRATEGY

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ABSTRACT

In the current economic situation in Uzbekistan, a large number of enterprises need the most effective financial activities based on the scientific methodology of planning their main directions and forms, as well as the development of financial activities. At the same time, the most important tool for the implementation of long-term management of the financial activities of the organization is the formation of a more effective financial strategy.

KEYWORDS: *Financial Strategy, Goals And Objectives, Elements, Sequence, Component Strategies.*

INTRODUCTION

The financial strategy of the enterprise is a general action plan to provide it with the necessary amount of funds. This type of enterprise strategy includes issues that are an integral part of the formation of finance, their planning and implementation of measures to address the problems that ensure a high level of financial stability of the enterprise in modern conditions.

Theoretical aspects of the formation of financial strategy describe the objective laws of doing business, the survival of the enterprise in a constantly changing environment, develop the basic forms and methods of preparation and implementation of strategic financial transactions.

It should be noted that today it is an important resource factor in business, such as investment and innovation policy, which can be identified in terms of existing opportunities of enterprises in modern conditions and the introduction of goods (services) to a highly competitive market.

Covering the entire total activities of the enterprise, the financial strategy of the enterprise forms measures for the optimization of fixed and working capital, more efficient management of capital, optimization of taxation, development of more efficient directions of profit distribution and use. These areas of the company's financial activities are the objects of its financial strategy.

The objects of development and implementation of the financial strategy of the enterprise are the total revenues and receipts of funds, expenditures and payments of funds, relations with tax authorities, budgetary and extra-budgetary funds, relations in the field of lending (Figure 1).

Taking into account the financial capacity of the enterprise, an objective assessment of the external and internal factors of the enterprise, the financial strategy allows to ensure the effective adaptation of the economic and financial capabilities of the enterprise to current conditions. If these factors are not taken into account in the formation of the financial strategy, the enterprise may go bankrupt.

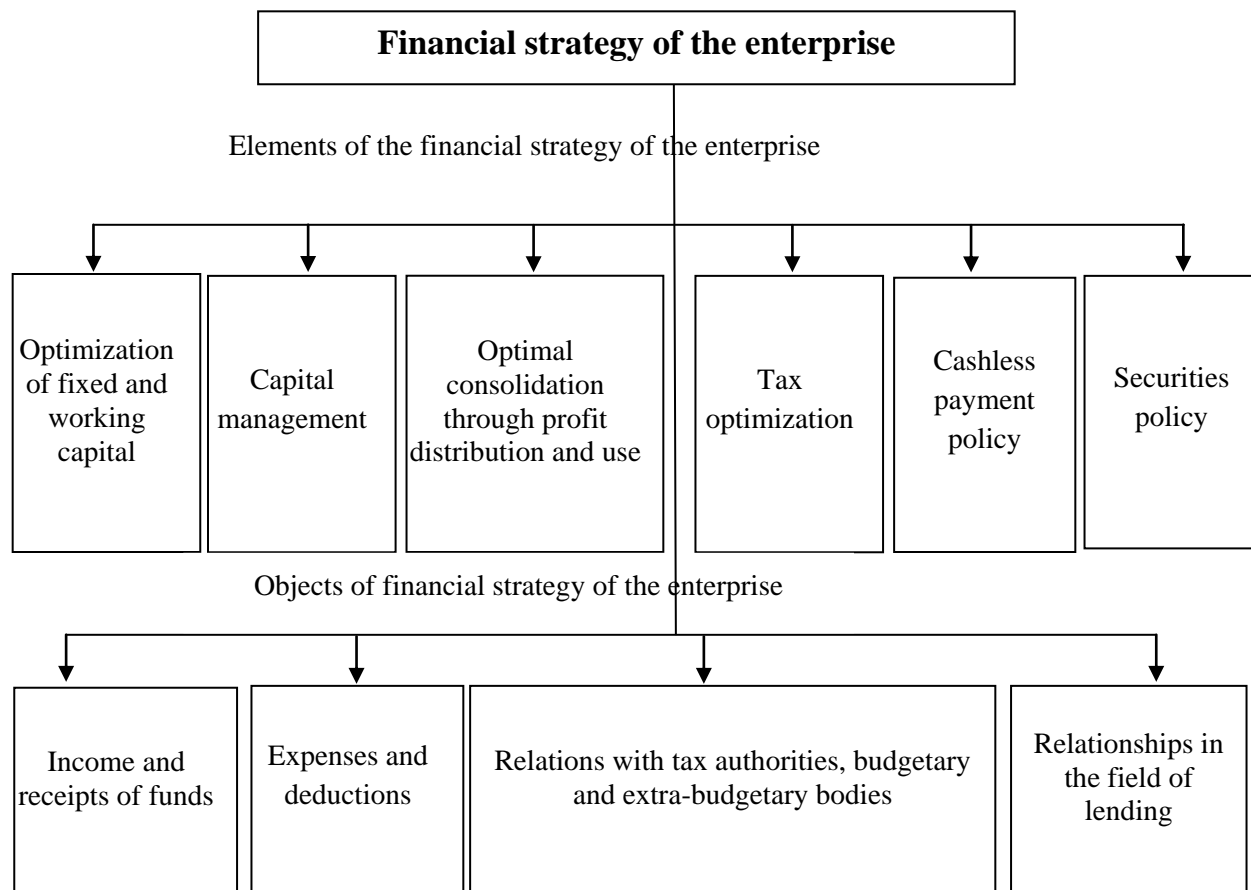


Figure-1. Elements and objects of the financial strategy of the enterprise

Source: developed by authors

Enterprises can formulate the following types of financial strategies: a strategy for achieving general, operational and individual strategic goals (a strategy for achieving specific goals).

The overall financial strategy determines the direction of the enterprise over a much longer but predictable period of time, such as a year. This strategy includes relationships with budgets at all levels, the creation and use of enterprise revenues, determines the level of need for financial resources and finds the necessary sources for their formation.

The operational financial strategy of the enterprise defines the overall overall financial strategy in a short period of time and implements a separate part of the main objectives set out in the

overall strategy. This type of financial strategy can be developed for a month or a quarter, while it creates a strategy for the current maneuvering of financial resources. The operational financial strategy is aimed at controlling the expenditure of funds and the development of possible internal reserves, which is an even more urgent goal in the context of the stagnation of the modern economy.

Operational financial strategy includes total income and cash receipts (accounts with customers for products sold, proceeds from lending to the organization, income from securities transactions) and total expenses (payments to suppliers, payment of wages, liabilities to credit institutions) regulates. This allows for all planned turnovers to receive and spend funds. The operational financial strategy is created within the framework of the overall financial strategy, however, it describes it in detail over a period of time.

Although the strategy for achieving individual strategic goals (strategy for achieving specific goals) is limited to solving a specific or a single strategic task or goal, there are no restrictions on the amount of time that planning can cover. This type of strategy is the effective implementation of financial transactions aimed at ensuring the implementation of measures to achieve the main strategic goal. Thus, in a certain way, the strategy of achieving personal goals is “put on top” of the overall or operational financial strategy and does not conflict with the goals set in them.

The main purpose of the formation of the financial strategy of the enterprise is to provide it with sufficient and necessary financial resources. Thus, the company's financial strategy provides:

- formation of the necessary level of financial resources and their strategic management;
- identification of important areas of the enterprise and focus on their implementation, the use of reserves at the level of financial management of the enterprise;
- gradual achievement of certain tasks;
- the adequacy of the financial activities of the enterprise to its economic situation and capabilities;
- implementation of objective accounting of the financial and economic condition of the enterprise for the current month, quarter, year;
- formation of necessary strategic reserves;
- taking into account the economic and financial capabilities of the enterprise and its main competitors;
- to find the main threat from competitors, to mobilize the necessary efforts to eliminate it and to choose directions more wisely for financial measures;
- the struggle for initiative to gain a significant advantage over competitors.

In accordance with the existing market requirements and the capabilities of this organization, the main strategic goal is to develop and implement the financial strategy of the enterprise, where the main tasks and main activities of financial management are formed through the executors.

The objectives of the financial strategy of the enterprise are:

- study the basic laws and essence of financial management in the enterprise;

- development of various options for the formation of financial resources of the organization in the context of crisis or unstable financial situation and the basic conditions for the preparation of financial management activities;
- forming financial relationships with major buyers and suppliers, credit institutions, tax authorities or budgets;
- identification of reserves and formation of enterprise resources for more rational use of available capacities, fixed and working capital;
- providing the organization with the necessary financial resources;
- implementation of measures for effective investment of temporarily vacant funds of the enterprise to obtain the maximum possible level of profit;
- finding ways to implement an effective financial strategy for the use of financial resources, the development of new types of goods and comprehensive training of employees of the organization;
- formation and implementation of measures to ensure the necessary level of financial stability, the formation of financial strategic vision of potential competitors, their financial, production and economic potential;
- to identify ways out of the current crisis situation, to use the methods of managing the employees of the enterprise in low financial condition and to mobilize the capabilities of the whole team to overcome it.

In developing a financial strategy, the most important attention should be paid to the completeness of the definition of cash income, the mobilization of internal resources of the enterprise, minimizing the cost of production, efficient distribution and use of net profit, determining the required level. The financial strategy has been developed taking into account the risk of non-payment, rising inflation and other force majeure. This strategy must be fully consistent with the production objectives, as it needs to be corrected and modified. Monitoring the implementation of the financial strategy examines the required amount of revenue, their rational and economical use. Proper financial control allows you to identify internal reserves, increase the level of profitability of the enterprise, increase cash flow.

The most important component of the financial strategy is the formation of internal standards, which are used, for example, the main methods of distribution of profits of the enterprise, the limits of liquidity ratios, the marginal value of the ratios. The value of equity and debt capital, the level of accounts payable and receivable, which is used in practice in Russian and foreign enterprises.

The effectiveness of the financial strategy of the organization is manifested by balancing the theory and practice of applying the financial strategy, fully coordinating the financial strategic goals with the availability of real economic and financial capabilities of the enterprise in a clearly centralized manner. Financial strategic management relies on changes in the financial and economic situation in market enterprises operating simultaneously with the flexibility of its application.

The financial strategy is the planning of the most important indicators of the financial condition of the enterprise - the level of liquidity, creditworthiness, the probability of bankruptcy, as well as the ratio of financial results. In order to achieve maximum efficiency in formulating a financial strategy, it is necessary to follow a certain sequence of actions. The sequence of formulating the financial strategy is shown in Figure 2.

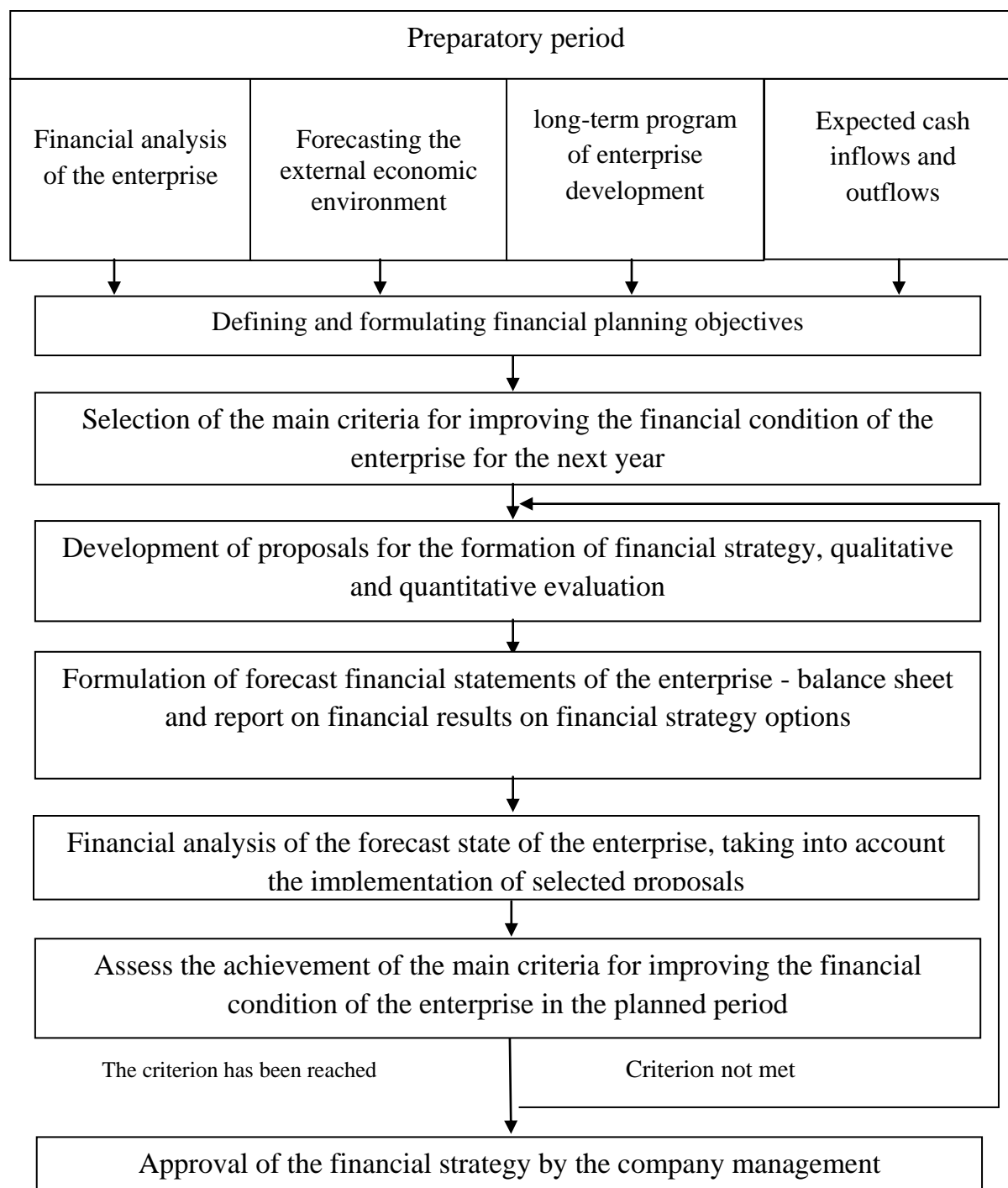


Figure 2. Sequence of formation of the financial strategy of the enterprise

Source: developed by authors

As shown in Figure 2, the process of developing an organization's financial strategy begins with the preparatory phase, in which the organization's financial analysis, forecasting and formation of the external economic environment is a long-term program of business development, taking into account the expected revenues and expenditures of financial resources. According to the results of financial analysis of activities during the reporting period, the necessary level of financial resources, financial planning goal is created based on the assessment of the existing financial situation in the enterprise, taking into account possible changes in the external environment.

Proposals for the formation of the financial strategy of the organization are developed on the basis of conclusions drawn from the results of financial analysis. Proposals can be formed by objects and in several versions can form the overall financial strategy of the enterprise, which is characterized by a mandatory quantitative assessment of proposals and an assessment of the financial results of the degree of impact of proposals on the balance sheet and report. For each option of creating a financial strategy, a forecast balance sheet and a report on financial results are prepared, taking into account the quantitative and qualitative evaluation of the proposals included in the financial strategy.

Depending on the availability of external conditions, the implementation of a particular option of forming an overall financial strategy, an operational financial strategy is formed on a quarterly basis, taking into account the financial performance achieved in the previous period. If an enterprise needs to address a specific overdue financial problem, a strategy to achieve personal goals for a month, quarter, year is formed.

Then, the main criteria for improving the financial condition of the enterprise for the planned period are formed, several options of proposals for the formation of the financial strategy of the enterprise are created, their quantitative and qualitative evaluation in the future. proposals will be implemented, resulting in the selection of key proposals that meet the key criteria for improving the financial condition of these organizations.

Thus, in the formation of financial strategy, special attention should be paid to the justification of the volume of financial resources, the composition of their formation and the direction of expenditure, which defines the tasks and objectives associated with forecasting changes in financial resources. The financial strategy allows to predict the growth of production volume in order to achieve high economic efficiency. The creation of a rational financial strategy should be based on the assessment of real needs, the ability to raise capital, as well as the attraction of debt sources.

REFERENCES

1. M.V.Romanovskiy, O. V. Vrublevsky Textbook for Finance Universities. – M: Perspektiv Publishing House, 2016. - 541p
2. E.S. Stoyanova, Financial Management. Theory and practice: Textbook – M: Perspective, 2015 . 245p
3. Grigorieva T.I. Financial analysis for managers: assessment, forecast: Textbook for masters - M .: Yurayt, 2015 .- 462 p.

4. Kovalev, V.V. Financial Management: Theory and Practice 3rd edition, - Moscow: Prospekt, 2015 1104 p.
5. Polyaka S.P. Financial Management Textbook, M: 2015. -376 p.
6. V.P. Litovchenko Financial Analysis: Textbook - M: 2016. 216 p.
7. Snigireva, G.D. Formation and development of investment systems in the business environment - M.: C, 2016- P.556-560.
8. Teplova, T.V. Financial Management: A Textbook for Universities in Capital and Investment Management. M.: 2016 .504s.



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THE ROLE OF TEACHERS IN BUILDING THE FOUNDATION OF A NEW DEVELOPMENT PERIOD OF UZBEKISTAN

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ABSTRACT

This article discusses the problems between teachers and students and their solutions to the ongoing reforms in the field of pedagogy. They want to have a social style of their own. The process of person-centered education is of special importance not only because it is organized taking into account the external situation of the student, but also the tendencies and aspirations of his inner world. Under the concept of pedagogical support of students is understood the activities of teachers with high professional skills. Because they can provide alert prompt assistance to students.

KEYWORDS: Teacher, education, ability, creativity, Teacher, upbringing, school, reform, problem

INTRODUCTION

“We are the representatives of an enlightened people who have always respected the teacher as great as the father. When I say teacher, I mean people who are most dear and respected to me, intelligent and modern, sincere and kind. Because this teacher taught us all and brought us up among our loving parents. Today, we are laying the foundation for a new era of development in Uzbekistan. Our closest assistants are teachers and coaches, scientific and creative intellectuals,” the President said at the meeting.

It was emphasized that every family, every child's life is connected with school, this issue is the most important work of the state, society. “We all entrust the lives and destinies of our dear children to teachers and coaches. We must pay due respect to these honorable people, the guardians of such incomparable wealth, the builders of the future,” ShavkatMirziyoyev.

Professional skills are also formed on the basis of acquired knowledge, activity skills and life experience.

In order to acquire high moral and ethical qualities and a high level of professionalism, a person must be able to set a goal and constantly seek, study to achieve it. In a traditional education system, the teacher responds only to the external actions of the students. They strive to help students' behavior quickly. For example, they punish warlike children, react to their appearance, their treatment of those around them, or call their parents. Science teachers, on the other hand, take the easy way out by complaining to their class leaders or giving them advice along with the school community.

In most cases, teachers also advise parents to transfer their children to other schools. At first glance, the teacher's approach seems correct and purposeful. They seem to care about the students' health, their lives, their ability to communicate with their peers, their free education, and their maturity.

Their goals are actually the same, but in the process, teachers are unable to choose convenient and effective forms of support for students. They often give orders to students, intimidate them, and as a result, receive a rude response from the student. The help they seek to provide begins to hinder students' development. It hinders active collaboration with other classmates. That is why such help from the teacher does not give the expected effect.

The internal contradictions between the teacher and the students, the anguish in the heart of the student, cause them to become malicious, suspicious of adults. As a result, such students begin to look down on teachers and distance themselves from school.

They look for ways to protect themselves from teachers. They try to adapt to the situation, to move away from themselves. They want to have a social style of their own. The process of person-centered education is of special importance not only because it is organized taking into account the external situation of the student, but also the tendencies and aspirations of his inner world. In this process, the teacher's task is to find the means and ways to realize the individual potential of the students. To do this, they must first understand the problems of the students, not force them to follow the rules they have introduced.

Because of the comprehensive support of the growing and developing person, the idea has been emphasized by many educators and psychologists. Under the concept of pedagogical support of students is understood the activities of teachers with high professional skills. Because they can provide alert prompt assistance to students. The solution to this unique problem is also important for students' mental and physical health, communication, academic achievement, their place in life, and their professional orientation.

At the heart of the concept of pedagogical support is the student's personality. The most acute problem today is the formation of a full-fledged personality. To do this, the educational process must be focused on the individual student. To this end, theorists and practitioners are looking for the same answer to the question of how to sustainably develop the student in the current changing environment.

“At the solemn ceremony dedicated to the inauguration of the President of the Republic of Uzbekistan on November 6, 2021 in Tashkent, President of the Republic of Uzbekistan ShavkatMirziyoyev spoke about the priorities for the next five years. - Taking into account the

demands of our people, we have developed a strategy for the development of New Uzbekistan and held it in a special public discussion during the election process, - said the head of state.

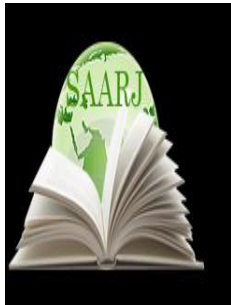
In order to ensure the continuity and continuity of our reforms in this important conceptual document, it was recognized that the principle "From the Strategy of Action to the Strategy of Development" was put on the agenda as the main idea and main criterion. It was noted that this development strategy consists of seven areas.

According to the fourth direction, the issue of quality education will be in the center of attention. To this end, it is planned to gradually increase the monthly salary of teachers and by 2025 to reach \$ 1,000. A national education program will be developed to build new schools, strengthen the existing material and technical base, and ensure continuity between all stages of the industry”
5

In response, the pedagogical teams of educational institutions are required to work consistently in this area.

LIST OF USED LITERATURE

1. Mirziyoev Sh.M. We will build our great future together with our brave and noble people. - Tashkent: "Uzbekistan", 2017.-491 p.
2. Address of the President of the Republic of Uzbekistan ShavkatMirziyoyev to the Oliy Majlis. // January 24, 2020.
3. Report of the video conference chaired by President ShavkatMirziyoyev on October 30, 2020 on the issues of improving the education system in the country, accelerating the development of science
4. Azizxodjaeva N. N. Pedagogical technology and pedagogical skills. - T. : —Science and Technology Publishing House, 2006
5. Speech by the President of the Republic of Uzbekistan ShavkatMirziyoyev on November 6, 2021 at the inauguration ceremony of the President of the Republic of Uzbekistan. // November 6, 2021



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MATHEMATICS: INTEGRAL PART IN COMPUTER SCIENCE FIELD

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ABSTRACT

Despite the many connections across disciplines, there is evidence that computer science practices need little or no mathematical knowledge. This disconnect between the practical and intellectual roles of mathematics in computer science results in an awkward position for mathematics in computer science curricula, which necessitates math courses that are poorly aligned with computer science needs and students who use a lot of math but very little computer science. As a result, computer science graduates are hesitant and unable to utilize mathematics on the job. Fortunately, modest local changes may have an instant impact on the problem's major players. Although everyday practice needs little, if any, mathematics, computer sciences, software engineering, and mathematics are nevertheless linked, according to this article. Our primary concern is the education of computer professionals, the majority of whom are still educated via a curriculum that calls itself "informatics." Rather of referring to a single subject, the term "informatically science" is commonly used. Both software and computer science are addressed in our rationale and results. This research will help engineering students concentrate on the most essential topics in the curriculum.

KEYWORDS: *Computer science, Discrete mathematics, Mathematics, Science, University.*

1. INTRODUCTION

In general, science and engineering are intimately linked to mathematics. Natural science makes mathematical models of the phenomena they investigate; natural sciences and social sciences rely on statistics to tease raw data meaning; in all phases of systems design, building and maintenance, engineers depend on mathematical models. Computer science and software engineering seems to be a few of exceptions to this norm. The usage of mathematics is low in practising software developers[1]. Yet it would be surprising if relationships were as loose as it

looks between computer science, software engineering and mathematics. In the worst possible case, it would be rather harmful for disciplines to reject techniques that characterise areas with the titles they use. The only non-maths of the S&E family would be computer science and software Engineering[2].

In their working life, computer scientists utilise math in many ways. Firstly, mathematics offers the theoretical foundation for many computer sciences subfields, and for others key analytical tools; computer scientists therefore apply specific mathematical themes to specific computer issues[3]. More generally, mathematics gives a framework to discuss computers and computing issues and provides a mental discipline to solve these problems more widely. In view of the condition of each participant, the student's identities as computer scientists were linked to their mathematical viewpoints. This study concentrated on a few student histories. This study also showed that students' perceptions of maths and their study programmes, each affecting the other, are interwoven.

Understanding how mathematics training may affect the views and identity of a student, in particular at an early age in CS, is vitally linked with an important problem present in the field of computer education: diversity. Outline of the current ACM computer science bachelor's programme instruction is broadly based on its mathematical needs, and many CS programmes are deliberately constructed early in the course of the study with a mathematical component. The link between these two disciplines must be understood in order to grasp the significance of mathematics for students who study computer science (CS) and software engineering (SE). This essentially minimises the difference between science and engineering[4]. The distinction between chemical engineering and chemistry or between physics and electrical or engineering is understood by many. One is science, which primarily advances disciplinary knowledge, and the other, which consists largely of applying this information to the achievement of humanity's technical requirements.

In their first mathematical course, the students are generally exposed to the principle of mathematical induction. Recursion and iteration are key philosophical and informatics principles for implementation. However, the connections between mathematical induction, recursion and iteration are not well understood by many graduates. Most basic CS textbooks and data structures / algorithms literature give a minimum of induction math since the classes are not usually preconditioned by discrete mathematics[5]. Some curricula require mathematics as the basis for the course on the data structures to establish these important connections.

In order to succeed, the teachers of these two courses must coordinate carefully and deliberately. The mathematics faculty, who may not be well aware of the linkages and/or could feel that discrete mathematics is a difficult subject, which requires many preconditioned classes, usually teaches CS/SE students' Mathematics courses. This creates an even larger gulf for CS/SE students who are already a little mathematical phobic. The Mathematical Association of America (MAA) acknowledged these problems and dealt with them in its 2004 guidelines for curricula[6].

The qualities of a graduate in computer science could hardly, as taught today, be distinguished from those of a graduate in software. The latter might have some additional software engineering courses; both are, however, mostly trained in programming entry-level roles. It is not really science or engineering, actually.

ABET, an accrediting board for engineering and technology, has been established in the United States to certify the undergraduate programmes in computer science and software engineering. Below is the definition of engineering by the US Engineering and Technology Accreditation Board[7]: The following: "Engineering is a profession where math and natural science is used with judicial judgement and learnt the materials and strengths of nature in the interest of a cost-effective method".

Typical curriculum for education in computer science do not cover discrete mathematics and software. University programmes generally need discrete math and software engineering courses, but they are often given as an alternative if the place they merge—courses in the field commonly termed formal methods. Standard discrete math courses offer minimum motivation and application of materials.

The conventional courses in Software Engineering do only use a little if any discrete mathematics, and the formal courses in computer science normally are optional and late. These factors lead to pupils having a minimal education in current software theory and practise based on mathematics. In addition, pupils are not given an opportunity to evaluate the usefulness and value of this content and to ask, literally, why they should attend discrete maths classes. A rich background is the discrete mathematical teaching.

This definition is not very well met by computer engineering. What is "natural science" or "natural materials and forces?" it is believed that think computer science, a man-made discipline, is the foundation of software engineering, that "materials" are mostly physical rather than conceptual and that "natural forces" are truly "universe laws." The alternative definition could therefore be as the profession of engineering in which knowledge of fundamental mathematics and sciences, acquired through study, experience and practise, are applied to the development of ways to use the materials, concepts and laws of the universe economically in the interest of the human race.

Fundamental mathematics and science" appear to represent this connection and dependence better and more generally. The following graphic containing basic mathematics as discrete Mathematics, including Logic, may be shown for software engineering. The approach is being developed largely by the Bachelor of Informatics as preparation for the graduate studies in advanced knowledge and as a professional track in software systems design/development[8]. Graduates of both programmes, while this would not be their major professional route, should be skilled programmers. Programmers are essentially technicians, and experts who are able to achieve their objectives without a thorough grasp of the basic mathematics or physics behind them.

In earlier parts of this article, the validity of a recursive or iterative pattern was argued in the context of a mathematical induction. The linkages are seen to be essential to the motivation of students may, and must be established in the first year. Mathematical induction is widely acknowledged a challenging topic for pupils. This was examined by mathematical educational scientists[9].

In the first discrete mathematics course, the classical technique to the teaching of mathematical induction is to use multiple numerical examples and problems as a modular unit. For CS/SE major induction, other courses generally touch on mathematical induction (e.g., algorithm analysis, theory of computation, etc). This is considered insufficient for students to comprehend

and utilise induction and to establish the required relationships with CS.A person with knowledge of HOW will always have a job, but the individual with knowledge of HOW will always be his boss[5].

Training vs education! Training versus education! Most students try rather than to grasp the basis for the information they have to obtain a career (HOW) as well as (WHY). This is the idea of education "to fill a vessel, "those which is also a component of the software-practitioner knowledge survey. The driving factor behind many professions' curriculum growth is frequently knowledge rather than understanding, mostly owing to the demand of companies, managers and students. Knowledge-based courses are also more easily taught and evaluated by students.

1.1 Who Should Teach Mathematics?

This is a question more significant than the substance of the course. Most CS/SE departments can do discrete work just as much as most physical departments can teach calculus. CS/SE departments are professors. (This would not be pushed too far into analogies, as physicists frequently know the topic of the calculus enough well to teach it, but few have a broad mathematical perspective or background to accomplish this properly. On the other side, CS/SE faculty members frequently have the necessary perspective and background, although this may not be true much longer.)

Anyway, CS/SE professors have as many teaching courses directly inside the subject as their colleagues in physics without strictly teaching extra mathematical courses. In general, physicists are quite pleased to teach their prospective pupils' mathematics, especially since, at least in the past, they swung enough weight to ensure that calculus courses covered the necessary materials[10]. Thus, CS/SE may almost dictate the curriculum for such courses, because they are by far the major customer departments for those courses.

In addition, the mathematical departments are certainly hungry enough to be willing to teach the courses at least in theory. For their design and operation, the modern systems depend heavily on software. Specification, design and execution of reliable software with rigorous development procedures must be simple for the next generation of developers. To assist prepare this generation, we designed a teaching strategy and two-fold-focused materials: to increase the knowledge and enjoyment of discrete mathematical structures (DM) that underlie software engineering theory (SE).

However, it was true that a decade ago, very few mathematics faculty departments were sufficiently aware of computer science and that they had to give them a decent mathematical course for students who were going to participate in CS or SE programs. Does that continue to be true? (It is usually accurate, with certain quality institutions of tiny liberal arts being possibly the primary exceptions.)

In any events, CS/SE programmes should certainly strive for their mathematics courses in maths. It is a long-term objective of the CS/SE programmes. If your Department of Mathematics is still unable to provide you excellent enough work, it is certainly advantageous to urge your Mathematics Department to employ discrete mathematicians to accomplish that.

1.2 Arguments Favouring Mathematics in CS/SE Curricula

Some practitioners are going to need some arithmetic. However, not a single specialised math course in CS/SE curriculum can reasonably be justified by either the number of mathematicians or the quantity of mathematics they will need. However, excellent reasons exist for incorporating a CS/SE curriculum in some mathematics classes. Here is a couple here.

- Its impact on the mind is the important yet unproven reason for mathematics instruction at any school level. In other words, study mathematics improves pupils' learning skills. Mathematics is very crucial for students of CS/SE as the logical thought contained in all mathematical ideas is so close to the logical idea necessary in all the construction of software.
- Some, but not many of the CS/SE graduates will pursue professions where math is required. This number can rise as and when developers of software are usually more formal than they are today so that they begin to be utilised more extensively, for example in The Science of Programming.
- A few CS/SE graduates will attend a graduate school in CS, although very few. Some of them, maybe far more mathematically based on what they learn than anything else in CS/SE undergraduate curricula.

1.3 Mathematics and Reasoning

Many computer tasks need practitioners to rationally and thoroughly analyse issues and their solutions – frequently using mathematical tools and methodologies. For instance,

- Whenever issues or solutions are offered, users should question what assumptions and how they might affect whatever results they have gotten or programme behaviour.
- When a problem solution is suggested to an algorithm, developers and researchers must assess if the method is proper and efficient in using resources.
- When software is proposed as algorithm implementation, testing organisations and users can verify that the software complies with the requirements stated both formally and experimentally. (The formal verification necessary exists in instances.
- The requirement to be fair in mathematical terms has been established by electronic gambling devices in some jurisdictions[1]. A position announcement by an amateur gaming firm was recently received from one author seeking "to create, test and analyse new games," and "to compose mathematical evidence for game submissions to regulators".)
- If multiple possible solutions to a problem are presented, practitioners should under different assumptions can assess the relative advantages and drawbacks of these options.

In this issue, many of the following topics are included in my article entitled "Mathematical Reasoning in Software Engineering Education." They are presented with further reasons for their completeness. They are thorough, yet they understand that there are many viewpoints on these problems.

- Abstract software.
- Mathematics and Software Engineering are commonly associated with notations, symbols, abstractions and accuracy.
- For modelling and software system behaviour, mathematics is crucial.
- Mathematically based are many fields of application (engineering, science, economics, etc).
- For most issue solving, mathematical reasoning is crucial, notably the construction of software systems.

1.3.1 Software is abstract:

The fundamental form of mathematics was one of the earliest abstractions our ancestors devised. Since the beginning, mathematics is now the fundamental instrument for humans. For non-physical objects, such as software, abstract reasoning requires no greater tool than mathematics. A software system may thus be seen as a model for a desired process or calculation that is mathematically accurate. Software experts largely agree on the abstract nature of software, but appear to prefer to use alternate, non-mathematical methods to describe, design, build, test, debug and manage software systems. This will progressively change, as systems get bigger and more complicated, mathematical instruments (e.g. modelling and model checks) become accessible, and graduates are more mathematically knowledgeable and more aware of the mathematical potential as a reasoning tool.

1.3.2 Notes, symbols, abstracts, precise

All four of them rely largely on the software. For ordinary objects and concepts, notations and symbols are abstractions. This is why $y = ax + b$ is known from algebra and the programming count = 0. In their context of use, both are widely understood and accurate. Students are encouraged to master programming language notations, symbols, accurate syntax and semantics. Actually, this is none other than mathematics, which is generally easier to understand. Students, however, regard mathematics as static and rotary. Programming is seen as dynamic and exciting, attractive to our operating brains. Other computer languages and tools deliver comparable delights when instructors find and embrace them. These include standard ML, Miranda and Haskell languages, language design and testing, and languages like Maple, Mathematica or Axiom programming mathematics. Their usage is wide and is suitable for pupils who acquire a declarative thinking style. They employ notes, symbols, abstractions and accuracy.

1.3.3 Software modelling systems:

Before any item begins to be built, a model, even a conceptual one, must be developed. Today software development is more of an art in which the initial concept takes shape slowly – like melting a piece of clay. However, for projects in which more accurate understanding of the desired item is necessary before building, such adhoc techniques are not acceptable. The first solution is to construct, analyse and test a "mathematical" model. New tools, languages and approaches for modelling software are changing whose use will once become the standard. Languages are now available for system specification.

1.3.4 Domains of application:

Mathematics is a rich global, inclusive language for communication across different communities. Accordingly, the programme offers software practitioners a tool for efficient communication of mathematical underpinnings to customers and associates of all disciplines (ingenieurs, scientists, mathematicians, statistics, actuarials, and economics).

2. DISCUSSION

The understanding of details (i.e. jargon, true tables, formal rules of logic) and understandings (i.e. paraphrasing formal rules), and rudimentary applications usually start at the beginning of Bloom's taxonomical processes inside a learning environment. Computer science is no exception, whether or not in its mathematical elements. This is the basis for thinking about Algorithms, programmes, systems etc. This basic work is necessary. This basic level of reasoning and comprehension, however, is insufficient to actually make practical use of computer science. Students need to understand more than the routine mechanics. Such learning occurs when subsequent courses are based on introductory courses and practise in both organised and open settings at a more profound level of analysis. Although this analytical analysis may not be included in every topic discussion in higher levels, students must regularly and in many different circumstances encounter it. If undergraduate programmes do not work with the mathematics that they demand, they restrict the capacity of graduates to apply mathematics in later studies or jobs.

There are (and have been) a number of methods to bridging the gap between the role of mathematics in informatics and the way it is taught in computer science undergraduate education. However, none of these indications shows a clear promise of success.

Mathematical requirements are applied more efficiently. Although most informatics curricula provide room for different mathematics courses, few actually teach mathematics, which is critical to the field. However, correcting this inefficiency is difficult. Under explicit or implicit pressure, prerequisite structures in mathematics departments may require computer science students to take basic, but not directly applicable, programs in engineering schools and computer programs to include maths that are traditional to physical sciences, even if they are not critical to computer science.

Mathematics may be included in computer science courses, and vice versa. The primary issue, which has been addressed in a number of ways, is the underuse of mathematics in the computer science curriculum. Henderson taught a first course for IT majors in the 1980s and 1990s that focused on the foundations of informatics research in terms of mathematical reasoning and problem solving. In the early 1990s, further efforts to integrate discrete concepts with mathematical disciplines, such as Foundations of Computer Science, were part of the curriculum. In the late 1990s and early 2000s, Baldwin and Scragg developed a course that introduced many of the discrete mathematical skills required by computer scientists in elementary algorithm design and analysis; today, curricula of software engineering that emphasize mathematical technologies to produce accurate programs are used. However, none has gained momentum beyond its creators. They have been seen as interesting, and perhaps even commendable, by the computer science community, but not as paradigm-shifting innovations that must be adopted.

3. CONCLUSION

The computer science is frequently used to simulate the phenomena it examines, like conventional areas of engineering. In addition, computational and mathematical thinking are intimately linked. Paradoxically, though, many graduates of computer science and software engineering perform effectively as professionals without mathematics explicitly being applied to their job. This contradiction leads mathematics to be discomfortable in IT courses: while the majority of these programmes include suitable mathematics, they frequently include a lot of non-computer-based mathematics, yet they often ignore other applications when teaching certain mathematical applications. This odd approach of computer science mathematics has surprisingly long remained resistant to revision. Although the exact causes vary each school, we feel that the overall explanation is because the faculty of computing just does not consider the issue as a matter of urgency. In addition, in fact the problem appears to be small, as long as graduates of computer science find work or employment in graduate schools in the subject and the area itself grows. However, there is cause for alarm from a longer perspective. Slowly mathematical instruments and procedures are adopted by software development and testing and today's graduates must be adapted over their careers to such tools and processes. As graduates go through their professions, they become responsible for system design, assessment of test findings or quality metrics, architectural choices or algorithms and similar actions requiring quantitative examination of data and comparison of possibilities.

REFERENCES

1. T. C. Lethbridge, "Priorities for the education and training of software engineers," *J. Syst. Softw.*, 2000, doi: 10.1016/S0164-1212(00)00009-1.
2. S. Surakka, "What subjects and skills are important for software developers?," *Commun. ACM*, 2007, doi: 10.1145/1188913.1188920.
3. J. A. Laub, "Assessing the servant organization; Development of the Organizational Leadership Assessment (OLA) model. Dissertation Abstracts International," *Procedia - Soc. Behav. Sci.*, 1999.
4. D. L. Parnas, "Software engineering programmes are not computer science programmes," *Ann. Softw. Eng.*, 1998, doi: 10.1023/a:1018949113292.
5. A. B. Tucker, C. F. Kelemen, and K. B. Bruce, "Our curriculum has become math-phobic!," in *SIGCSE Bulletin (Association for Computing Machinery, Special Interest Group on Computer Science Education)*, 2001, doi: 10.1145/366413.364593.
6. W. Barker and S. L. Ganter, "Fundamental mathematics: Voices of the partner disciplines," in *A Fresh Start for Collegiate Mathematics: Rethinking the Courses Below Calculus*, 2006.
7. D. Thandapani, K. Gopalakrishnan, S. R. Devadasan, and R. Muruges, "Implementation of European Quality Award in Engineering Educational Institutions via Accreditation Board for Engineering and Technology," *Int. J. Bus. Excell.*, 2013, doi: 10.1504/IJBEX.2013.050576.
8. "Session details: Why universities require computer science students to take math," *Commun. ACM*, 2003, doi: 10.1145/3262533.
9. L. Cassel, A. Clements, and G. Davies, "Computer Science Curriculum 2008: An Interim

Revision of CS 2001,” 2008.

- 10.** A. O. Bilska *et al.*, “A collection of tools for making automata theory and formal languages come alive,” *SIGCSE Bull. (Association Comput. Mach. Spec. Interes. Gr. Comput. Sci. Educ.*, 1997, doi: 10.1145/268085.268089.



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AN ANALYSIS OF DEEP LEARNING FOR RENEWABLE ENERGY FORECASTING

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ABSTRACT

Order to increase the accuracy of sustainable energy forecasting is important to power system planning, management, and operations as renewable energy becomes more prevalent in the worldwide electric energy grid. According of the sporadic and unpredictable nature of renewable energy data, this is a difficult job. To date, a variety of approaches have been developed to enhance the forecasting accuracy of renewable energy, including physical models, statistical methods, artificial intelligence techniques, and their hybrids. Deep learning has been widely described in the literature as a potential form of machine learning capable of finding intrinsic nonlinear characteristics and high-level invariant structures in data. This article offers a thorough and in-depth examination of deep learning-based renewable energy forecasting techniques in order to assess their efficacy, efficiency, and application potential. Deep belief network, stack auto-encoder, deep recurrent neural network, and others are the four categories of extant deterministic and probabilistic forecasting techniques based on deep learning. To enhance forecasting accuracy, we also analyze viable data preparation approaches and error post-correction procedures. Various deep learning-based forecasting techniques are thoroughly examined and discussed. Furthermore, we look at the present research efforts, difficulties, and study and future research orientations in this field.

KEYWORDS: Artificial intelligence, Deep learning, Network, Renewable, Technique.

INTRODUCTION

Fossil fuels have always been the world's most significant source of energy today. Hydrocarbons or its derivatives, such as coal, oil, and fossil fuels, are examples of fossil fuels. Fossil fuels take many generations to produce, and existing stocks are destroyed far quicker than new fossil fuels are created. Simultaneously, fossil fuels produce greenhouse gases, which exacerbate climate change also including global warming, putting people's livelihoods in jeopardy[1].

To begin with, renewable energy resources are plentiful and renewable across the globe, and they are unrenewable. Furthermore, renewable energy is clean, green, and low-carbon, making it good for environmental protection. In particular, renewable energy may efficiently decrease sulfide, carbide, and dust emissions, lowering the danger of air pollution and the greenhouse impact. Furthermore, the usage of renewable energy may help to decrease the use of natural fossil fuels while also achieving the goal of environmental protection. As a result, renewable energy has exploded in popularity in recent years. But even though renewable energy is seen as the another very promising alternative to fossil fuels because it is clean, green, and naturally replenished over a large geographic area, it also introduces schedulable uncertainty, which jeopardizes energy system reliability and stability, particularly with massive renewable energy integration. On the one hand, renewable energy is characterized by high volatility, intermittent nature, and unpredictability, all of which will certainly raise the reserve capacity of electric energy systems, raising the cost of power production. The utilization of renewable energy, on the other hand, necessitates a high number of power electronics, which lowers the power system's rotational inertia and therefore diminishes the system's stability margin. As a result, renewable energy forecasting is critical for reducing associated uncertainties, which is beneficial to electrical power and energy system planning, management, and operation. Due to the intermittent, chaotic, and unpredictable character of renewable energy data, reliable renewable energy forecasting remains a difficult job. Various methods for providing accurate renewable energy forecasts for the next several minutes in these next few days have been described in the literature. Physical approaches, statistical models, artificial intelligence techniques, and their hybrid methods are generally classified into four groups[2].

Physical technologies are based upon numerical weather prediction algorithms that simulate atmospheric dynamics using physical principles and boundary conditions to simulate atmospheric dynamics. Limited area models, such as in the fifth-generation mesoscale model and high resolution fast refresh, are included in NWP models, as are global models, including the global forecast system and integrated forecast model. Temperature, pressure, jaggedness, and orography are only a few of the climatic and geographical variables that go into NWP. Physical techniques are effective in predicting atmospheric dynamics, but they need a lot of computing resources since they require a variety of material to calibrate. This becomes much more problematic when physical techniques make unanticipated mistakes during prediction[3].

1.1. Basic structures of deep learning

This section will explain the fundamentals of deep learning, which in itself is important for improving forecasting accuracy for renewable energy sources. In general, three major kinds of deep learning were presented in this report: stacking auto-encoder, deep belief network, while deep recurrent neural network. Furthermore addition, forecasting models are developed based on stacked extreme learning machines, deep reinforcement learning, and convolutionary neural

networks have been described. We'll now go over their fundamental architecture and the training processes that go with them[4].

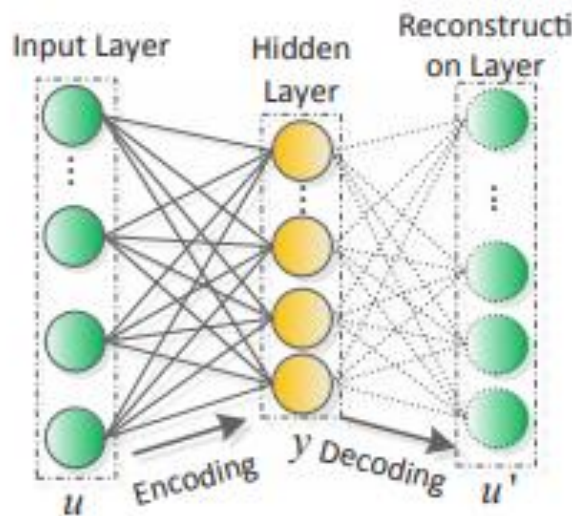


Figure 1: Illustrate the basic unit of an auto-encoder is made up of an encoder and a decoder

1.1.1. Stacked auto-encoder

A stacked auto-encoder is a fully convolutional network made up of several layers of auto-encoders, with each layer's outputs linked to the parameters of the next. As portrayed in Figure. 1, each auto-encoder (AE) is made up of an encoder and a decoder, with the goal of reconstructing its own inputs unsupervised. The AE is trained to minimize the reconstruction error across the input space using predefined distributional assumptions. The conventional squared error and cross-entropy objective functions may be utilized as the minimization objective function in general. Only its latent information in the hidden layer is used in the decoding process to recreate the inputs, suggesting that the latent variables already retain a lot of information from the input. As a result, the encoder and decoder's nonlinear transformation may be regarded as a sophisticated feature extractor capable of maintaining latent abstractions and invariant structures in input. After then, an SAE is created by discarding the decoder and stacking the encoders hierarchically. The first layer of an SAE is trained as an independent AE, with the input serving as the training dataset. Even before the first auto-training encoder's process is over, the first AE's hidden layer and the second hidden layer are regarded as a new AE. The training procedure is same to that of the first AE[5]. Multiple auto-encoders may be layered hierarchically in this manner by executing the encoding rule of each layer in a bottom-up order, and an SAE is formed as a result. Previous research has shown that SAE has a promising and stable performance for high-level feature abstractions and representations.

1.1.2. Deep belief network

Hinton was the first to create the deep belief network, which has since been used in a number of fields. It's a generative graphical model made up of unsupervised, basic networks (limited Boltzmann machines) with bidirectional and symmetrical connections across layers. As

presented in Fig. 2, a limited Boltzmann machine works as a stochastic neural network and comprised of one layer of Boolean visible neurons and one layer of binary-valued hidden units, with the first and b indicating their respective biases. A RBM's main goal is to learn a probability distribution across its input data space in order for its configuration to have desired characteristics[6]. The allocation is discovered by minimizing an energy model that is built as a function of network characteristics using thermodynamics.

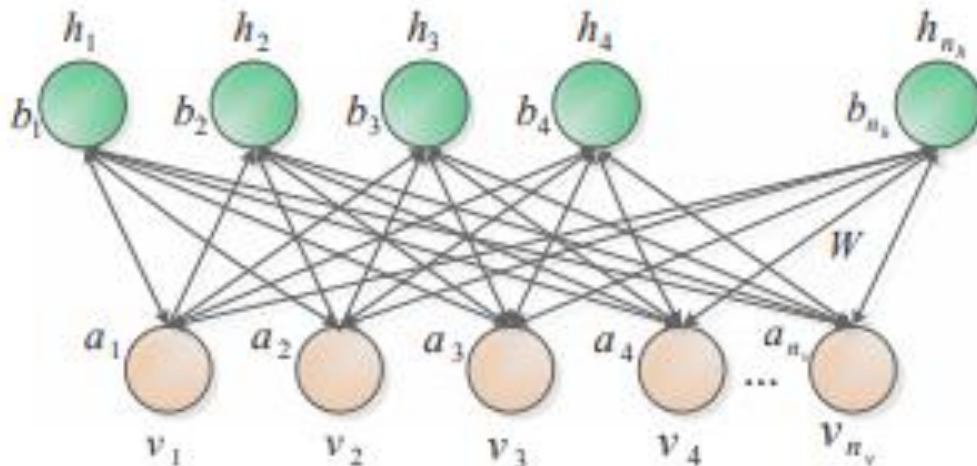


Figure 2: Illustrate the basic unit of Boltzmann machine works as a stochastic neural network

The clustering algorithms may then be determined by repeatedly estimating the engagement probability of the hidden layer supplied the visible layer and indeed the probability of the visible layer given the hidden layer. The estimate procedure, on the other hand, necessitates the calculation of reconstructed-data-driving probabilities across visible and concealed layers, which is very difficult in practice. Applying alternating Gibbs sampling to any stochastic state of the neurons until a particular convergence criteria, such as k-steps, is met is one viable approach.

The unsupervised greedy method is used to pre-train the network parameters in the DBN training process. The 4 major stages are as follows:

- Using an alternating Gibbs sampling and contrastive divergence method to adequately train the first RBM;
- Configuring that the very first RBM's network parameters and thresholds, then utilizing the hidden neurons' results as the second RBM's input vector;
- As much as the second RBM is completely trained, stacking it atop the first RBM;
- Following the processes, stacking the remaining RBMs one by one. DBN's training process and binary construction make it highly successful for feature extractions, which makes it appealing in a variety of applications including time series forecasting.

1.1.3. Deep recurrent neural network

The term "deep recurrent neural network" comes from the term "recurrent neural network," which is a kind of artificial neural network in which nodes are connected to form a directed

graph [64]. It uses feedback connections to remember the brain states at earlier time steps to simulate the temporal dynamic behaviors seen in time series data. Figure 3 depicts an RNN's usual structure. Unlike feedforward neural networks, RNNs can handle time series sequences of inputs using neural internal states, making them suitable for renewable energy forecasting[7].

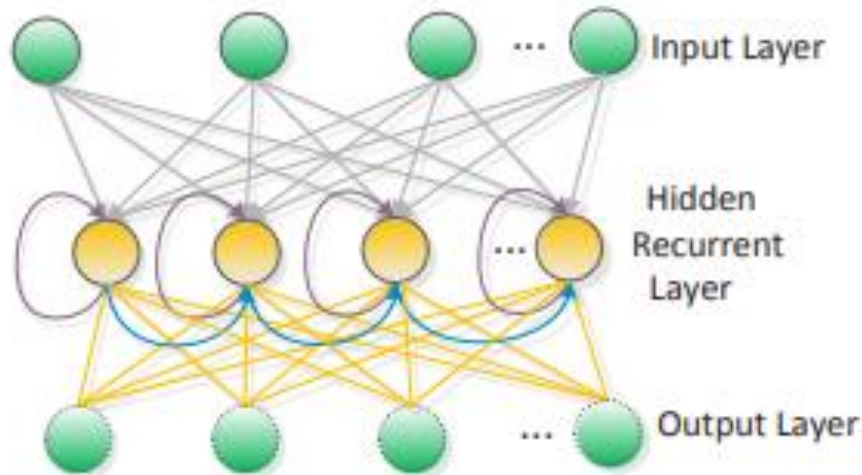


Figure 3: Schematic diagram shows the typical structure of a recurrent neural network

Deep RNN may be expressed in four distinct ways when compared to ordinary RNN. The first method is to deepen the input-to-hidden equation to learn additional non-temporal structure from either the inputs. This approach, rather than the affected by the following, tends to flatten the manifolds within which the data concentrations and untangle the underlying variation components. Because the connection between representation characteristics can be represented more simply, the deep information structure enables learning the temporal correlation between many times steps simpler. The second characteristic of deep RNN is to deepen the hidden-to-output function, which allows for more compact hidden states. One of most significant advantage of this formulation is its great efficiency in summarizing the history of prior inputs, making real-time output prediction simpler.

1.1.4. Additional deep learning structures

Many alternative deep learning structures, including deep convolutional neural networks, stacked extreme learning machines, and generative adversarial networks, have been suggested for feature extraction. Based on translation invariance features and shared-weights architecture, the deep convolutional neutral network serves as a variant of multilayer perceptions with minimum preparation. It must have been motivated by biological information processing, in which the connection arrangement between neurons mimics the visual structure of animals. DCNN is made up of a series of alternating convolution and pooling layers. The low-level maps with local characteristics are mapped into multiple high-level maps with global features via the convolution layer, which uses a convolution operator. Weight sharing is often used in the convolution layer to minimize memory footprints and the amount of network parameters, making the feed forward and back propagation process easier. With this method, all neurons in the same output map have the same weight and bias, even if their inputs come from different places. The pooling layer is a

more condensed version of the input maps. It lowers data dimensionality by turning input layer neuron clusters into a single output layer neuron.

1.2. Forecasting models based on deep neural networks

Numerous deep learning models are examined. These systems, on the other hand, are employed for feature extraction and can also be directly accustomed renewable energy forecasts. This section explains the basic framework of deep learning-based deterministic and probabilistic renewable energy forecasting.

1.2.1. Models of deterministic forecasting

In summary, Figure 4 depicts a deep learning-based objective forecasting system for renewable energy. It includes data preparation approaches, a deep learning-based feature extractor, regression algorithms, and error post-processing tools, as demonstrated. The raw renewable energy time series analysis is first decomposed into various components with varying frequencies using data preparation methods. Outliers and behaviors are better in each component than in the original data. Then, for each component's forecasting, a feature extractor and a repressor are built separately. Using current optimization methods, the network topologies and model parameters may be fine-tuned. The forecasting findings are then rebuilt by adding all of the predicted components together. Finally, to rectify the rebuilt forecasting findings, different error post-processing methods may be used.

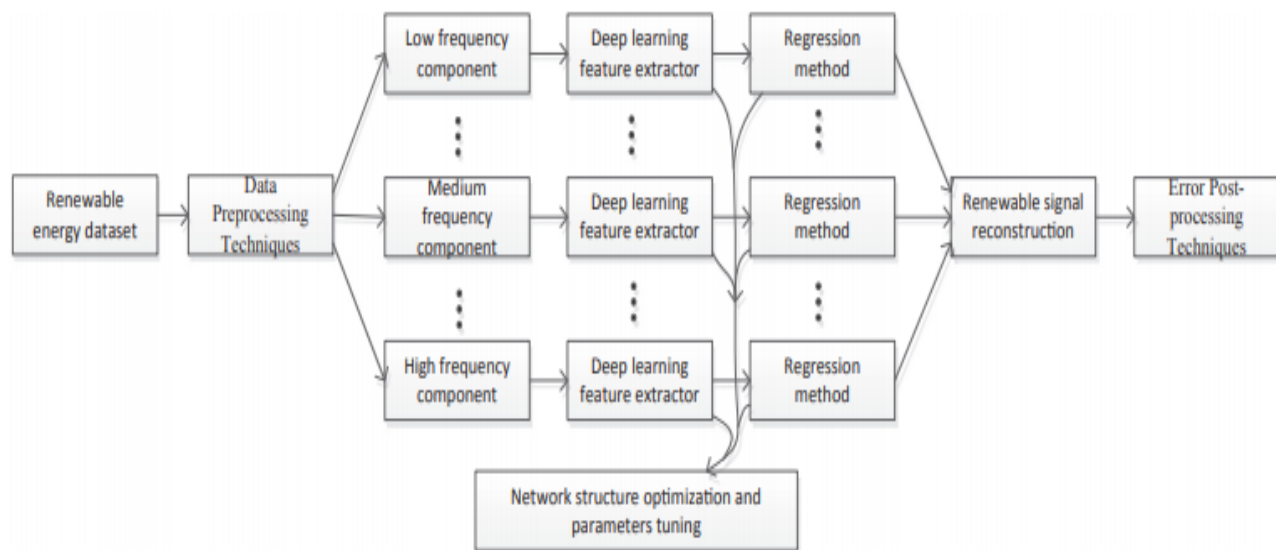


Figure 4: A general framework for renewable energy forecasting

1.2.2. Techniques for data preprocessing

Raw renewable energy information is prone to a wide range of irregularities, including fluctuation and spikes. The forecasting performance is harmed by these irregularities, which have nonlinearity and non-stationarity characteristics. As a result, a number of data preprocessing schemes have been developed to biodegrade the renewable energy signal up into multiple components with better information variance and isolated occurrence behavior. The adverse consequences of irregularities on forecasting accuracy can indeed be appropriately mitigated

with the help of all these data preprocessors. Wavelet decomposition but instead empirical mode decomposition were indeed two of the most prominent used methods in the literature. Those certain decomposition methods have also been reported, including Fourier transform, seasonal adjustment method, and vibrational mode decomposition. Wavelet transform and wavelet packet decomposition make up WD. Two components are used to perform multi-resolution time series data analysis in the time and frequency domains. The approximate and detail subseries are obtained using a low-pass and high-pass filter, respectively. The variation between wavelet transform but instead wavelet packet decomposition is that even the former consists of dividing the original signal into several minimum and maximum frequency components, whereas the latter divides it into several high and low frequency components. WD techniques have been shown to be very useful in forecasting performance improvement because the decomposed thread always have fewer outliers and lower uncertainties[8].

LITERATURE REVIEW

Considering electric infrastructures are aging, traditional power grids are being updated into smart grids that allow two-way communications between consumers and utilities, making them more susceptible to cyber-attacks. However, owing to the assault cost, the attack method may change significantly from one operating situation to the next from the adversary's viewpoint, which has not been taken into account in prior research. As a result, two-stage sparse cyber-attack models for smart grid with full and partial network information are presented in this article. Then, in order to efficiently identify existing cyber-attacks, a defensive mechanism based on interval state estimation (ISE) is created in a novel way. The lower and upper limits of each state variable are represented as a dual optimization problem in this mechanism, with the goal of maximizing the system variable's variation intervals. Finally, a common deep learning algorithm, known as a stacked auto-encoder, is intended to extract nonlinear and non-stationary characteristics in electric load data. These characteristics are then used to enhance electric load forecasting accuracy, resulting in a narrower range of state variables. A parametric Gaussian distribution is used to represent the uncertainty in predicting mistakes. Comprehensive testing on different IEEE benchmarks have proven the validity of the suggested cyber-attack models and defensive mechanisms[9].

Laura Frías-Paredes et al. studied the wind and solar energy generation have grown in popularity in recent years, and it is anticipated that these energy sources will account for a significant portion of overall energy output in the future. They do, however, have intrinsic unpredictability, which means that energy production fluctuates in unpredictable ways. As a result, forecasting mistakes have a significant influence in the costs and effects of renewable energy integration, management, and commercialization. This research makes a significant contribution to the problem of evaluating prediction models, particularly in the time component of prediction error, which improves on earlier pioneering findings. In order to evaluate the accuracy of energy forecasting, a novel technique for matching time series is developed. This technique is based on a novel set of step patterns, which are an important part of the algorithm for calculating the temporal distortion index (TDI). This family reduces the transformation's mean absolute error (MAE) in comparison to the reference series (the actual energy series) and also provides for precise control of the prediction series' temporal distortion. The use of Pareto frontiers as characteristic error curves is enabled by the simultaneous consideration of temporal and absolute mistakes. To demonstrate the findings, real-world wind energy predictions are utilized[10].

DISCUSSION

Along with its capacity to deal with large amounts of data and high-performance computing power, deep learning management systems have grown rapidly. There's now a lot of research on using deep learning to predict renewable energy. Deep learning-based forecasting models, on the other hand, face two major issues. Conquering these obstacles will aid in improving the deep learning prediction model's accuracy. There seem to be a large couple of published on deterministic renewable energy prediction to date. However, deep learning-based probabilistic forecasting models have received insufficient attention. The probabilistic forecasting model can quantify the uncertainties in renewable energy time-series data numerically. As a direct consequence, probabilistic renewable energy forecasting is critical for the economic operation and day-to-day management of the electric power and energy system. This article's comparative analysis can assist renewable energy forecasting professionals in determining which deep learning algorithm can help them improve their forecasting tools. This publication fills in the gaps in order to explore the potential of deep learning in the context of renewable energy forecasting.

CONCLUSION

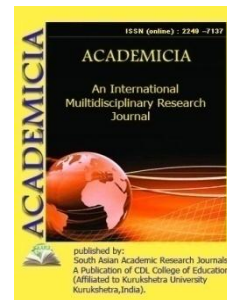
The above paper presents a comprehensive review of recent deep learning-based renewable energy forecasting models. A multi-layer perceptron with multiple hidden layers is what deep learning is. It mainly a consequence features to create more abstract high-level features or characterizes attribute categories to learn about the input data's inherent nature. Deep learning-based forecasting models are classified into the following categories in this paper: DCNN, DRNN, DBN, SAE, and other deep learning models. Either every type of forecasting model is explained in great detail. In furthermore, some data preprocessing and post processing techniques are presented in this report in order to improve prediction accuracy. The publication then goes on to show a large number of simulation results that demonstrate the feasibility and effectiveness of deep learning-based forecasting models. Ultimately, we go over some of the challenges that deep learning-based prediction models face, as well as some of the future research directions that could be pursued. This article's comparative analysis may aid renewable energy forecasting experts in determining which deep learning algorithm can help them improve their forecasting tools. This publication fills in the gaps in order to explore the potentials of deep learning in the context of renewable energy forecasting.

REFERENCES

1. B. Pillot, M. Muselli, P. Poggi, and J. B. Dias, "Historical trends in global energy policy and renewable power system issues in Sub-Saharan Africa: The case of solar PV," *Energy Policy*, vol. 127, no. November 2018, pp. 113–124, 2019, doi: 10.1016/j.enpol.2018.11.049.
2. H. Wang, Z. Lei, X. Zhang, B. Zhou, and J. Peng, "A review of deep learning for renewable energy forecasting," *Energy Convers. Manag.*, vol. 198, no. July, p. 111799, 2016, doi: 10.1016/j.enconman.2019.111799.
3. J. Manero, J. Béjar, and U. Cortés, "Wind energy forecasting with neural networks: A literature review," *Comput. y Sist.*, 2018, doi: 10.13053/CyS-22-4-3081.
4. A. Gensler, J. Henze, B. Sick, and N. Raabe, "Deep Learning for solar power forecasting - An approach using AutoEncoder and LSTM Neural Networks," 2017, doi:

10.1109/SMC.2016.7844673.

5. L. Cheng *et al.*, “Ensemble recurrent neural network based probabilistic wind speed forecasting approach,” *Energies*, 2018, doi: 10.3390/en11081958.
6. Q. Hu, R. Zhang, and Y. Zhou, “Transfer learning for short-term wind speed prediction with deep neural networks,” *Renew. Energy*, 2016, doi: 10.1016/j.renene.2015.06.034.
7. Y. Chen, X. Wang, and B. Zhang, “An unsupervised deep learning approach for scenario forecasts,” 2018, doi: 10.23919/PSCC.2018.8442500.
8. H. Shao, X. Deng, and Y. Jiang, “A novel deep learning approach for short-term wind power forecasting based on infinite feature selection and recurrent neural network,” *J. Renew. Sustain. Energy*, 2018, doi: 10.1063/1.5024297.
9. H. Wang *et al.*, “Deep Learning-Based Interval State Estimation of AC Smart Grids Against Sparse Cyber Attacks,” *IEEE Trans. Ind. Informatics*, vol. 14, no. 11, pp. 4766–4778, 2018, doi: 10.1109/TII.2018.2804669.
10. L. Frías-Paredes, F. Mallor, M. Gastón-Romeo, and T. León, “Assessing energy forecasting inaccuracy by simultaneously considering temporal and absolute errors,” *Energy Convers. Manag.*, vol. 142, pp. 533–546, 2017, doi: 10.1016/j.enconman.2017.03.056.



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RESEARCH ON STUDY OF MINERALOGICAL COMPOSITION OF PRODUCTS OF FIRING OF SULFIDE CONCENTRATES OF MOLYBDENUM

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ABSTRACT

The article deals with the formation of oxidized particles during oxidative roasting of molybdenum sulfide concentrates and cakes, as well as under-oxidized cinders and dust of molybdenum production. In the course of the work, various factors influencing the oxidative roasting process, parameters and requirements for the supplied and discharged material were investigated. The results of the analyzes are summarized and conclusions based on them are drawn.

KEYWORDS: *Multiple Hearth Furnace, Intensive Roasting, Cinder, Sulfides, Molybdenum, Cake, Soda Leaching, Oxidative Roasting, Concentrate, Desulfurization, Oxidation State.*

INTRODUCTION

An industrial method for extracting molybdenum includes roasting its concentrate, purifying the obtained calcine by a hydrometallurgical method to MoO_3 , and reducing trioxide with hydrogen to metal. Although this method is the main method for the production of molybdenum and has been used for a long time in the industry, research on its application to various concentrates, as well as the kinetics and mechanism of roasting, is ongoing. still in short supply [1]. However, as a result of the well-known disadvantages of pyrometallurgical extraction of molybdenum, hydrometallurgical processes are becoming more and more attractive. Among them, nitric acid

leaching, pressure oxygen leaching, electro oxidative extraction, sodium chlorate and hypochlorite leaching, and bioleaching are more popular. [2].

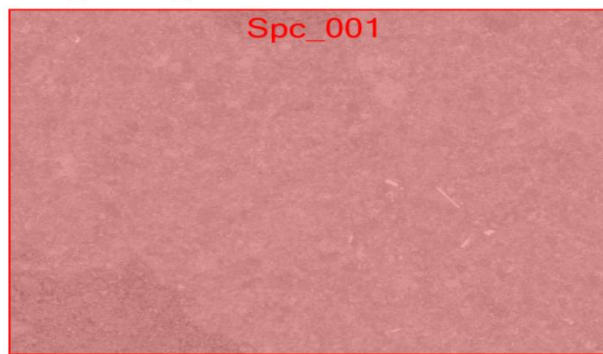
Objects and methods of research

We have studied the kinetics and mechanics of the solid-state reaction between MoS_2 and MoO_3 for the formation of MoO_2 in an atmosphere with a nitrogen content of 450-700 ° C using untreated samples of molybdenum production, pressed melange samples and pure MoS_2 and MoO_3 dumplings with the contacting side. The results show that, for untreated samples, the reaction reaches a maximum conversion of 67.3% at 650 ° C in 75 minutes, while for compressed samples, the conversion under similar conditions reached 96.1% in 75 minutes, which reflects the effect of physical conditions of both types of experiments on reaction kinetics [3]. The calculated values of the activation energy for the two experimental conditions are coherent with an average value of -44.2 ± 1.9 kJ, which is in the range of reactions in the solid state, controlled by diffusion [4]. For samples with a contacting face above 923 K, the results seem to indicate that molecular diffusion in the solid state and MoO_3 in opposite directions in the newly formed crystal structure of MoO_2 can occur with the established diffusion coefficients of MoS_2 in MoO_2 and MoO_3 in MoO_2 at 923 to 1.08×10^{-6} and $7.78 \times 10^{-6} \text{ cm}^2/\text{s}$, as well as with constant diffusion coefficients of MoS_2 in MoO_2 and MoO_3 in MoO_2 at 650 °C 1.08×10^{-6} and $7.78 \times 10^{-6} \text{ cm}^2/\text{s}$ 973 K and $1.13 \times 10^{-5} \text{ cm}^2/\text{s}$, respectively[5].

RESULTS AND DISCUSSION

There are four known molybdenum sulfides: Mo_3S_4 , Mo_2S_3 , MoS_2 , and MoS_3 . Sulfide Mo_3S_4 is formed from aqueous solutions and decomposes at about 120°C to $\text{MoO}_3 \cdot n\text{H}_2\text{O}$ and sulfur. Trisulfide MoS_3 usually contains an excess of sulfur in the form of $\text{MoS}_3 + x$, in which $x = 0-0.7$. When heated in an inert atmosphere between 527 and 573K, it decomposes into MoS_2 and sulfur. Molybdenite (MoS_2) decomposes to Mo_2S_3 and gaseous sulfur in a neutral atmosphere above 1673 K [6]. There are two known molybdenum oxysulfides, MoO_2S and MoS_2 , but they are very unstable and decompose to MoS_2 and oxygen. Several molybdenum oxides have been identified with oxidation states from 2 to 6, most of which are non-stoichiometric, and only two (MoO_2 dioxide and MoO_3 trioxide) are stoichiometric, stable compounds.

Sem_BED-C_001



200 μm

Some others, such as Mo_5O_{12} , Mo_3O_8 , Mo_2O_5 , Mo_4O_{11} and Mo_9O_{26} , have been found in small amounts in multi-hearth furnaces and appear to be solid solutions of MoO_2 and MoO_3 in various proportions [6-8].

A general chemical analysis of samples was carried out over the entire surface of each sample to determine the possible components of the studied objects, which are shown below in the figures below..

Fig. 1. General elemental analysis of the entire surface of the soda leach sludges

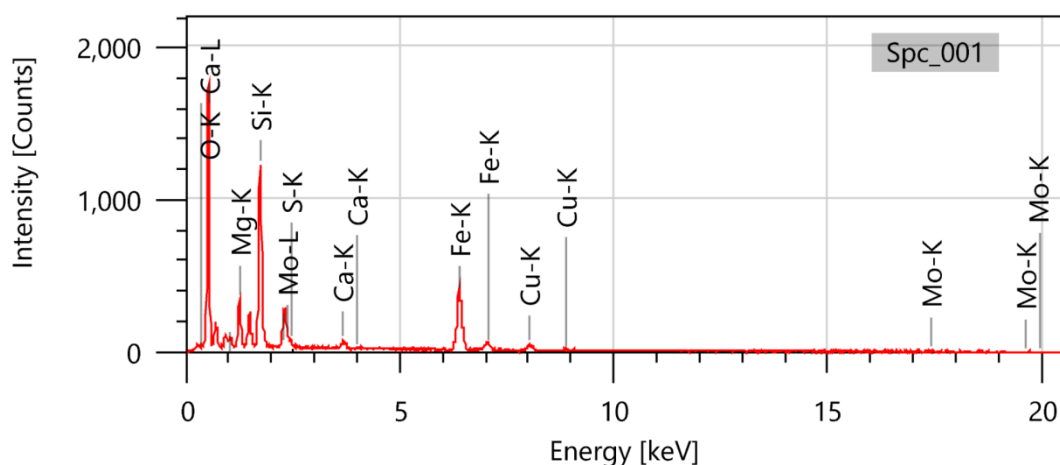


Fig. 2. Results of the analysis of the leaching sludge sample

TABLE 1 ELEMENTARY COMPOSITION OF THE TOTAL AREA OF THE LEACHING SLUDGE SAMPLE

Element	Line	Mass%	Atom%
O	K	42.10 ± 0.41	62.95 ± 0.61
Na	K	1.37 ± 0.11	1.43 ± 0.12
Mg	K	4.92 ± 0.15	4.84 ± 0.14
Al	K	3.27 ± 0.12	2.90 ± 0.11
Si	K	16.62 ± 0.24	14.15 ± 0.20
S	K	2.80 ± 0.13	2.09 ± 0.10
Ca	K	0.85 ± 0.07	0.51 ± 0.04
Fe	K	20.83 ± 0.36	8.92 ± 0.16
Cu	K	3.23 ± 0.21	1.22 ± 0.08
Mo	L	4.01 ± 0.34	1.00 ± 0.08
Total		100.00	100.00
Spc_001			Fitting ratio 0.0357

The results of the analysis show that the leaching cake sample contains mainly different iron oxides, and molybdenum sulfides is 6.8%. This proves that after soda leaching of molybdenum concentrates, up to 4% of molybdenum remains in the sludge.

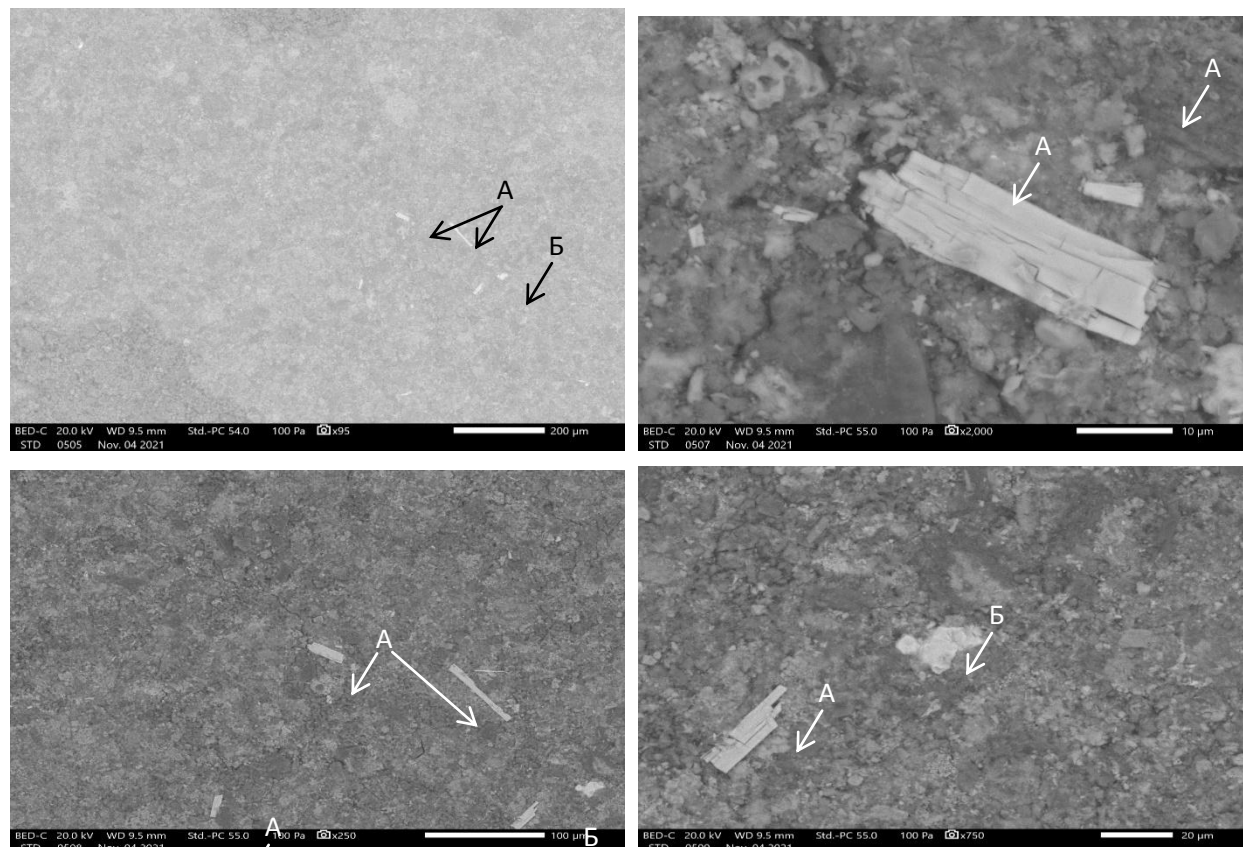


Fig. 3. Scanning electron microscope images (leaching sludge)

Figure 3 shows images of a scanning electron microscope of the leach cake. The figure shows molybdenum particles bound by oxygen and sulfides, and the main part of the surface is filled with iron oxides. Determined by the values of A - molybdenum oxides, B - sulfide particles of molybdenum, and the rest, mainly iron oxides. In a scanning electron microscope, heavy particles are shown brighter, since the brighter the particles, the heavier. From the above, it can be concluded that the main surface of the sample is iron oxides. These conclusions are confirmed by the data in Table 1. Table 1 shows that the sample contains 20.83% Fe and 42.10% oxygen.

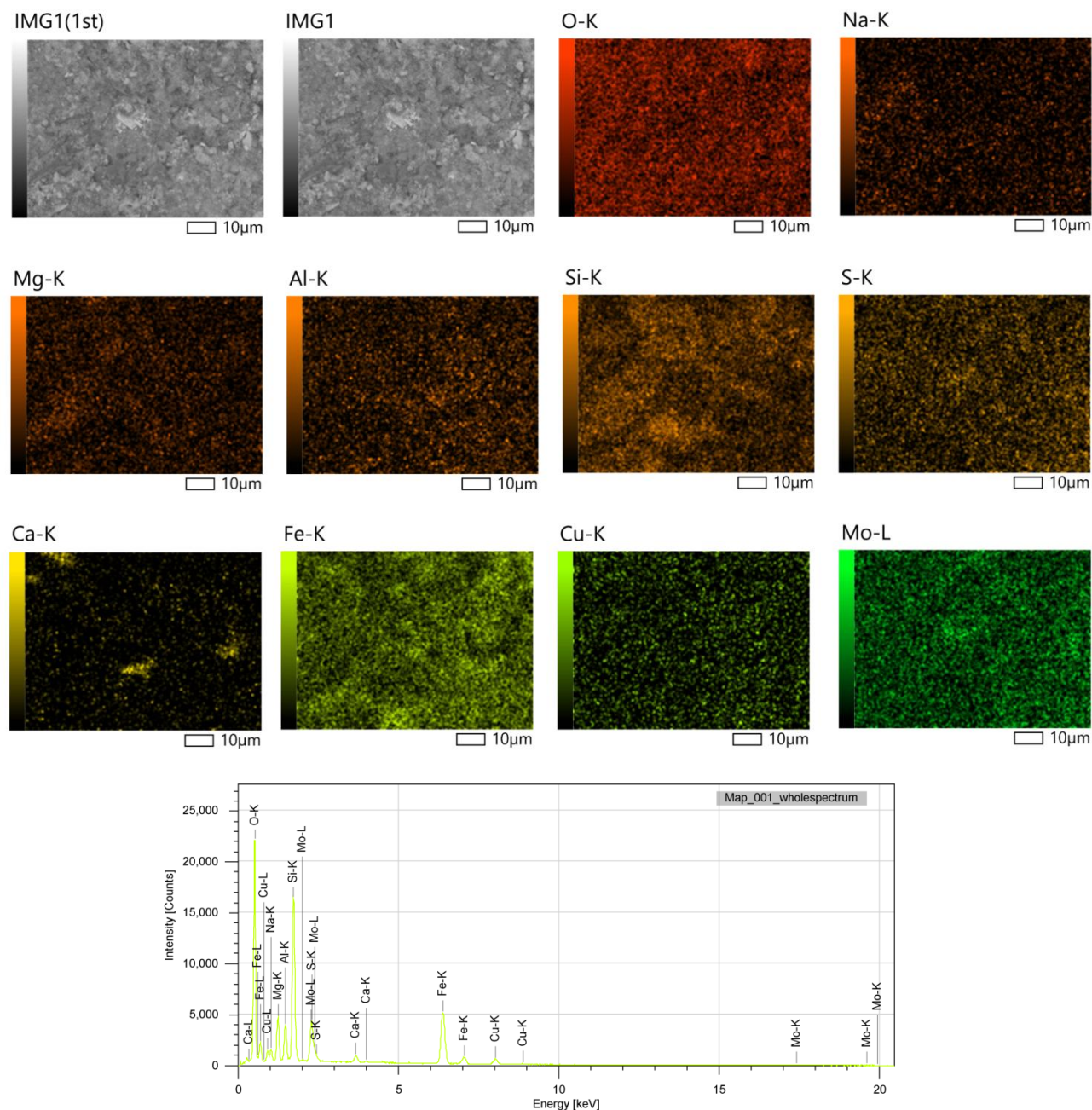


Fig. 4. Results of EMF analysis of leaching cake samples

Next, an EDS analysis was performed to study the complete surface map (mapping method) (Figure 4.). This method determines in what part of the sample the constituent elements are located. Figure 4. states that the sample contains mainly oxygen, and where there is oxygen, the signals of Fe and Si shine through. The signals of molybdenum and sulfur are very close, so the patterns of the L-line of molybdenum and the K-line of sulfur are almost the same. The energy resolution of the energy dispersive spectrometer is 130 eV. But the difference between the $L\alpha$ line of molybdenum and the $K\alpha$ line of sulfur is almost 14 eV[7]. Therefore, when analyzing an energy dispersive spectrometer, it shows molybdenum and sulfides in one peak.

A general analysis of a sample of a molybdenum middling product was carried out to determine the elemental composition.

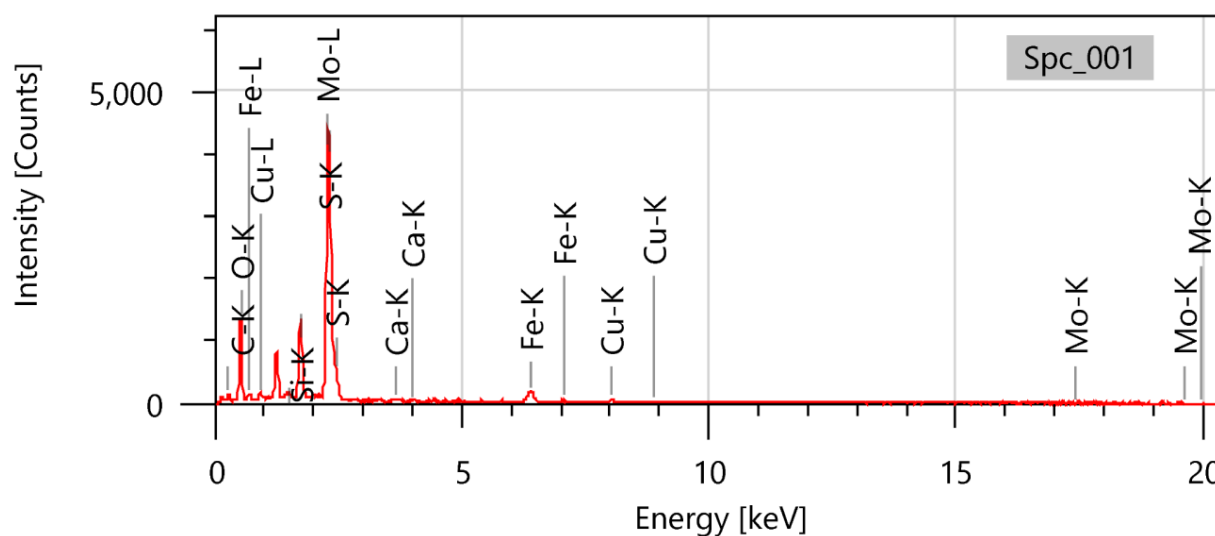
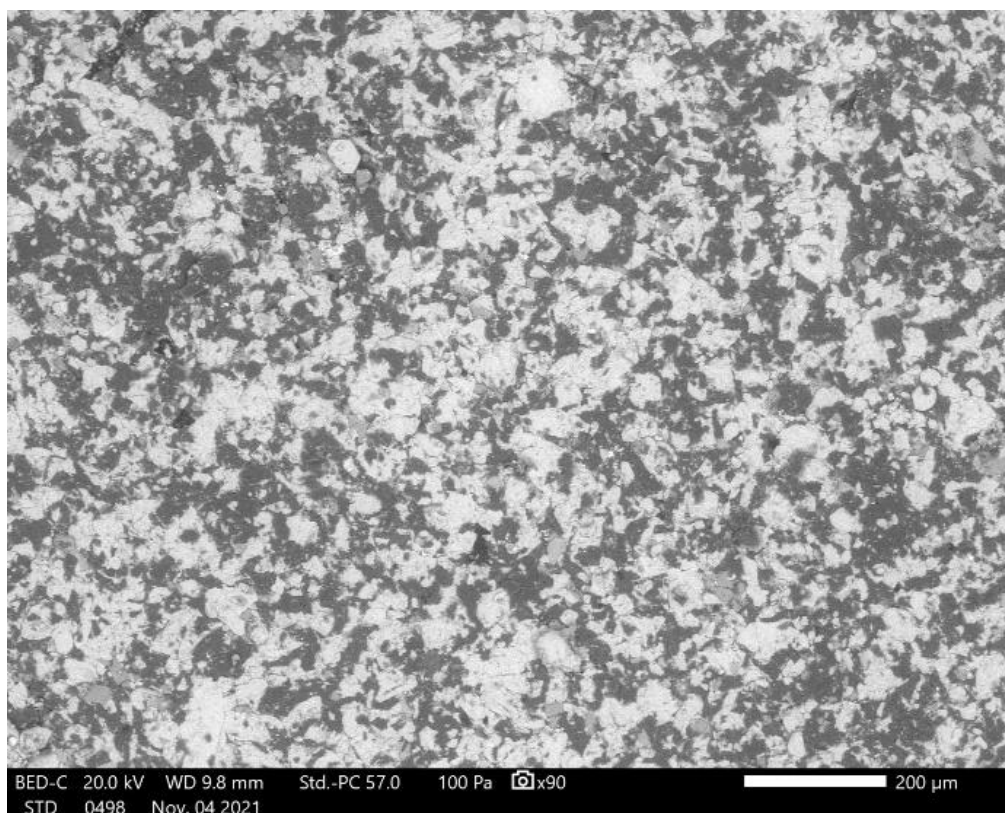


Fig. 4 General elementary analysis of the entire surface of a sample of molybdenum production middlings.

As a result of the analysis, the elementary composition of the molybdenum middling product was determined. Based on the analysis results, it can be seen that molybdenum in the sample is 25.5%, S - 18.54%, Si - 6.12%, Cu - 8.9%, O - 31.18%, Fe - 3.74 %. For a more accurate

determination of the structure of samples of middlings of molybdenum production, several images were taken in different magnified states from 90x to 3300x.

The work of Sooeun Shin and Eunsoo Kim [8-12] shows the structural analysis of molybdenum oxides, which shows the mineral is an acicular state. Based on the literature data on the structures of minerals, it is possible to determine visually which minerals are in the sample based on the table of data on the elemental composition of the analyzed object.

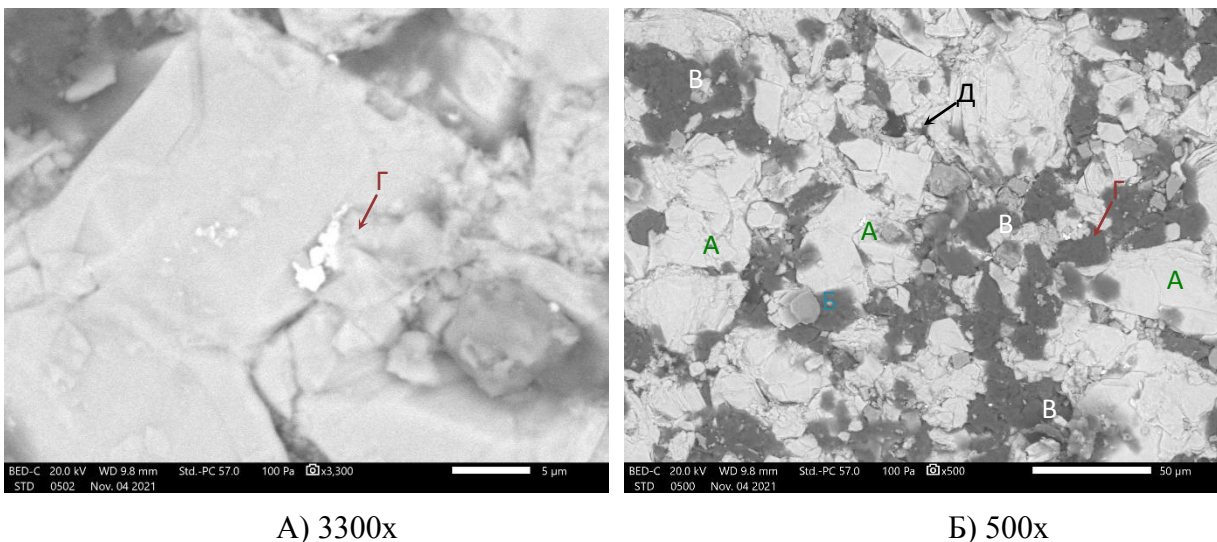
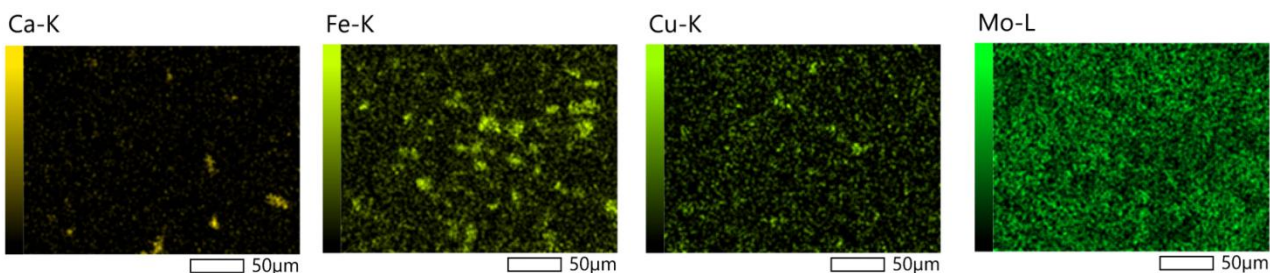


Fig. 5. Images of a scanning electron microscope with a magnification of 90x and 500x

From the images and the data table, it can be determined that the sample of molybdenum middling contains mainly molybdenum sulfides, chalcopyrite, pyrite and various iron sulfides, as well as SiO_2 and iron oxides. The 500x image definitely showed which particles are at which points on the surface. For example, A - molybdenum sulfides, B - silicates, C - iron oxides (hematite, goethite, etc.), D - possible heavy metals (Pb, Pd), E - carbon compounds. Figure 5. And for a detailed determination of heavy metal, the image was enlarged to 3300x and the elementary composition of this area was determined.

The elemental composition of this area shows that there is 17.38% Pb in this area.

Further, by the mapping method, the state of the elements in the object under study is determined.



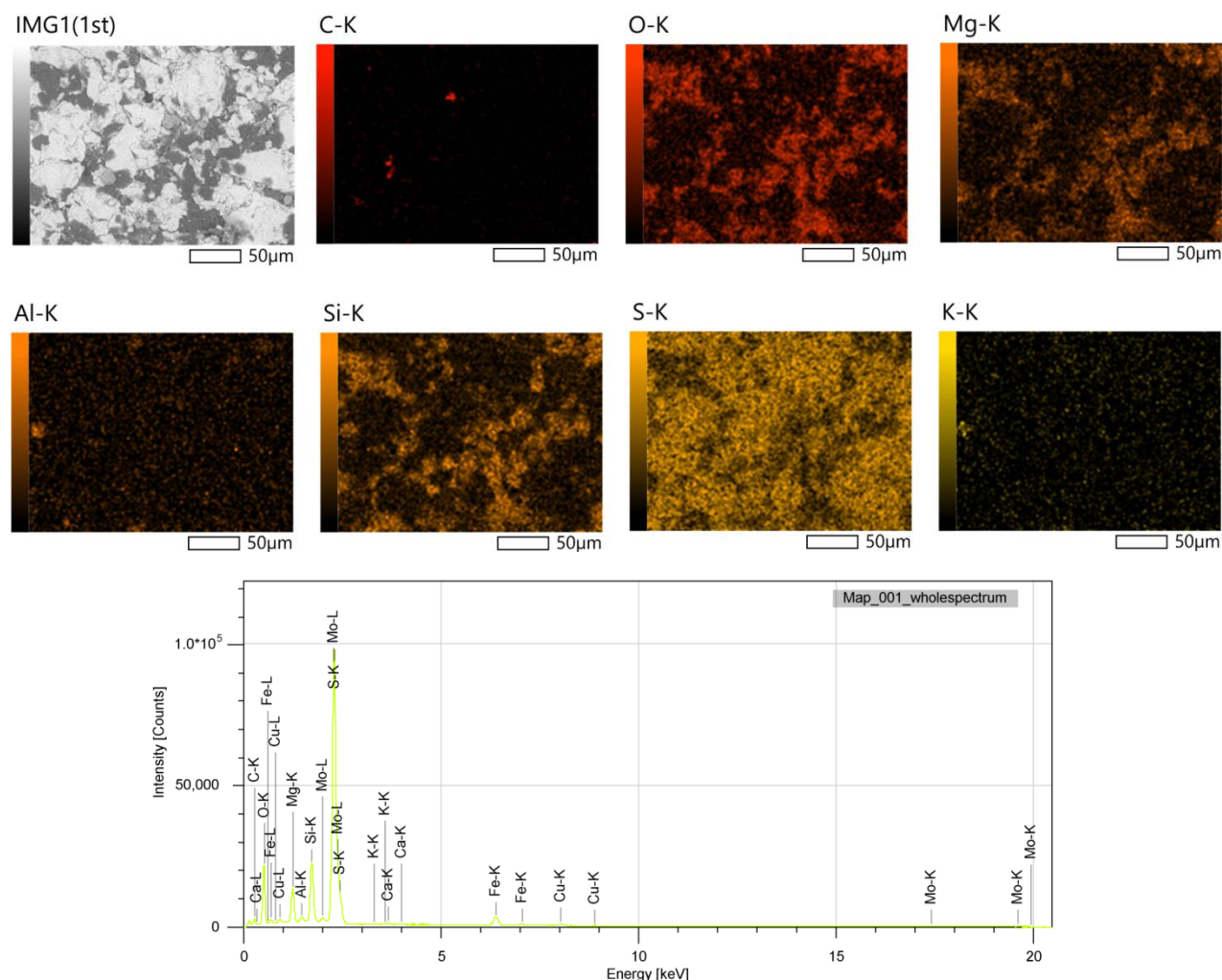


Fig.6. Results of EDS analysis of samples of molybdenum middlings

The above analyzes state that a sample of molybdenum middlings contains molybdenum in sulfide compounds and Al, Fe, Mg and Si in the form of oxides. When determining the structure of molybdenum middlings, the content of chalcopyrite, pyrite and iron sulfides was determined. Analyzes of individual sample sites for the determination of heavy metals are presented in the appendices.

Analyzes for determining the elemental composition of a sample of cinders of molybdenum production middlings have been carried out. In the course of the work, images of the scanning electron microscope of the sample were obtained.

In contrast to the middlings of molybdenum production in cinders, the bulk of molybdenum sulfides is formed by molybdenum oxides. From Figure 2.8. it can be seen that bright particles expressing molybdenum compounds are shown as an acicular structure and this states that the main part of sulfides during oxidative roasting is oxidized.

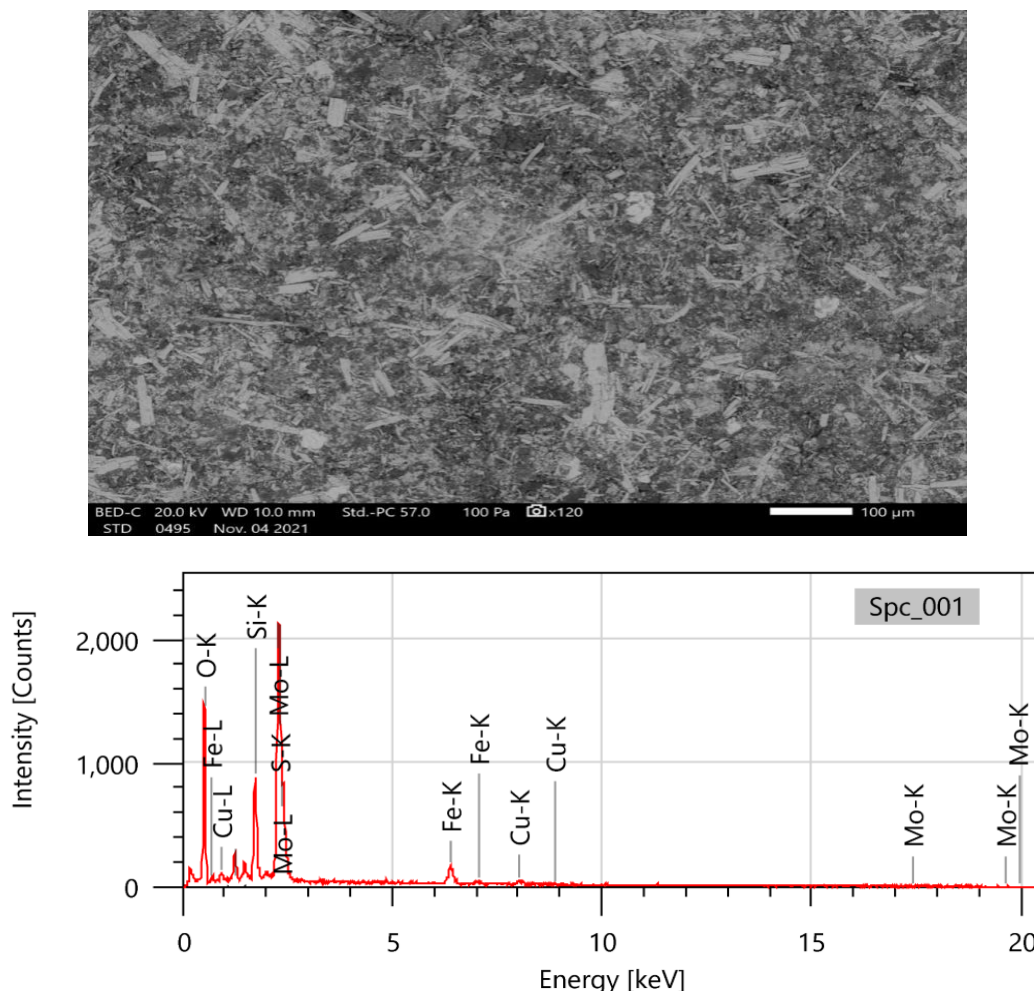


Figure 7. General elementary analysis of the entire surface of the sample of the middlings of molybdenum production

Figure 7. shows that oxidized molybdenum particles have a size of up to 100 μm . However, the presence of molybdenum sulfide compounds is also impossible to refuse. In Table 1 it is possible to compare the sulfur and molybdenum contents, which indicate the oxidation of sulphide particles. Table 2 it is shown that the sulfur content in the middlings of molybdenum production is 18.54%, and 4.69% sulfur remains on the cinder (Table 2.).

TABLE 2 ELEMENTARY COMPOSITION OF THE TOTAL AREA OF THE SAMPLE OF CINDERS OF MOLYBDENUM MIDDLING PRODUCT

Element	Line	Mass%	Atom%
O	K	42.45 ± 0.45	73.12 ± 0.82
Mg	K	1.84 ± 0.07	1.34 ± 0.10
Al	K	1.03 ± 0.05	2.20 ± 0.09
Si	K	5.94 ± 0.11	1.52 ± 0.07
S	K	4.69 ± 0.16	6.10 ± 0.12
Fe	K	4.26 ± 0.13	4.29 ± 0.10
Cu	K	2.00 ± 0.13	0.77 ± 0.06

Mo	L	37.79 ± 0.49	10.67 ± 0.11
Total		100.00	100.00
Spc_001	Fitting ratio 0.0478		

Figure 8 shows the change in the structure of molybdenum middlings after oxidative firing. An increase in the mass fraction of oxygen and a decrease in sulfides indicate the quality of the oxidative roasting process. By studying the mechanisms of oxidation and determining the parameters of oxidative firing, it is possible to determine the optimal firing conditions, this is discussed in the following chapters of the thesis.

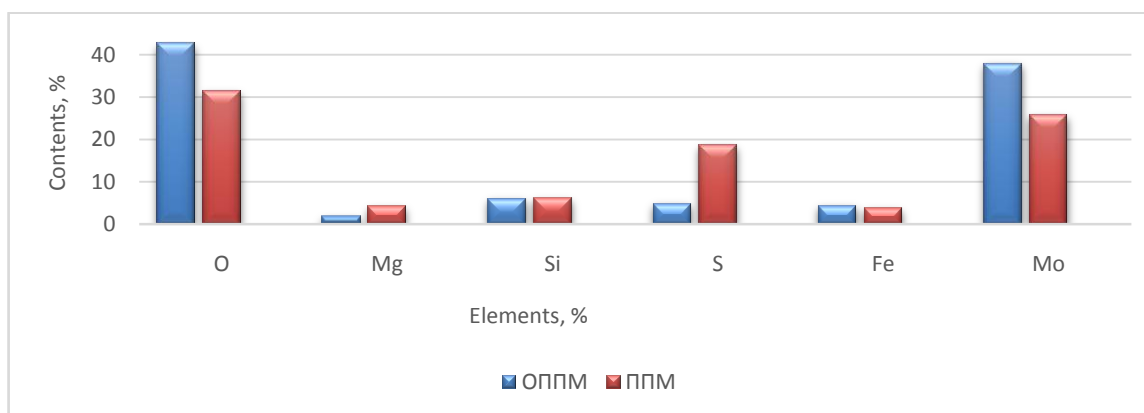
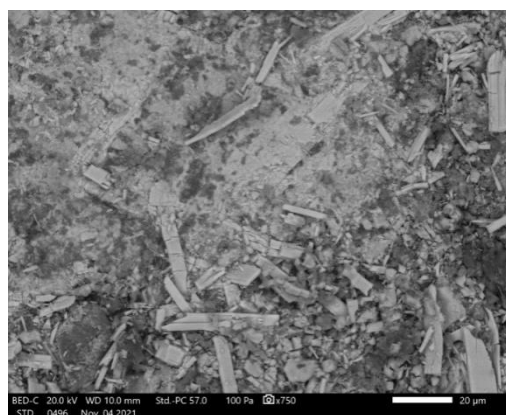


Fig. 8 Changes in the structure of molybdenum middlings during oxidative firing.

Figure 9. shows the structures of an oxidized sample, sulfide particles are contained in an insignificant amount. The main part of the sample is covered with molybdenum oxides, also in table 2 it is indicated that the sample contains 42.45% oxygen and 37.79% molybdenum, up to 5-6% additional components such as Fe, Cu, Si, Al and Mg.



A) 950x



B) 750x

Fig 9. Images of a scanning electron microscope with a magnification of 90x and 500x

Several photographs and elementary analysis of dust samples from oxidative roasting of molybdenum production were made. Below, in Figure 10. a 60x enlarged photograph of molybdenum dust under an accelerating voltage of 20.0 kV and low vacuum is presented.

The elemental composition of the dust was determined to further clarify the shape of the state of the elements in the sample. The composition of the dust contains much more sulfur than cinders of molybdenum middlings. This is due to the fact that the volatilized dust is under-oxidized, molybdenum in it remains in the sulfide form up to 7-8%. To refine the analysis results and find the shape and structure of minerals in the sample, electron dispersive spectral analysis was performed using a JEOL IT200 scanning electron microscope.

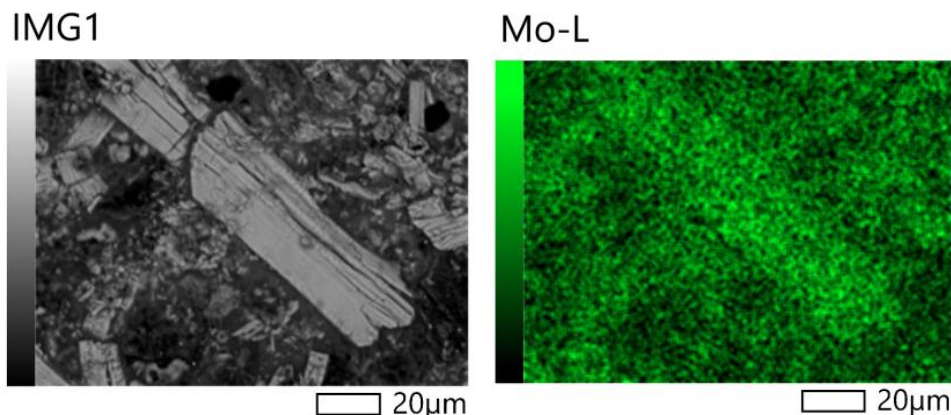


Fig. 10. Determination of mineral particles by the EDS method

Figure 10 shows that the large acicular particle contains molybdenum as a whole, and the particle is brighter than the rest of the areas. The needle-like structure of this mineral means that this mineral is molybdenum oxide, now you can compare the results of oxygen indicators, since the picture with oxygen may confirm this opinion. Figure 12 compares the signals of the $L\alpha$ line of molybdenum and the $K\alpha$ line of oxygen.

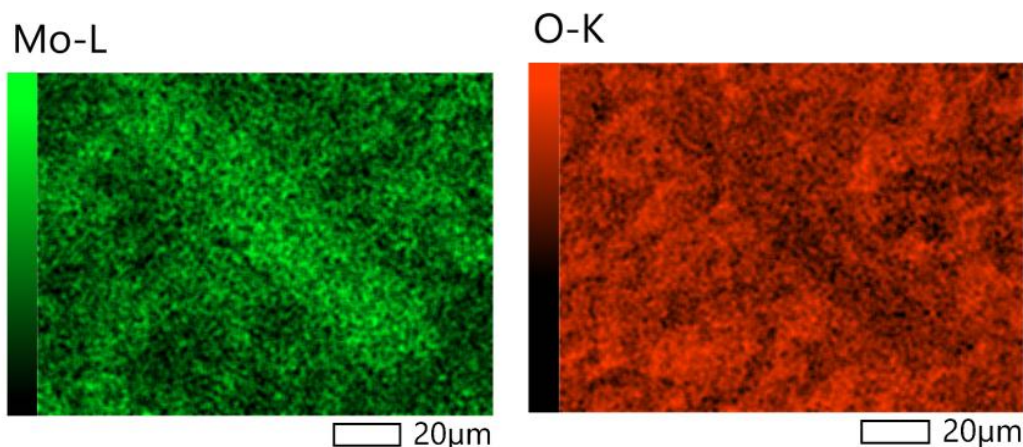


Fig. 12. Comparison of mineral particles by the EDS method (Mo-O)

The traces of the selected particle are almost the same in both figures, which means that in this area of the sample, oxygen and molybdenum are bound, or it can be inferred that molybdenum is in an oxidized state here.

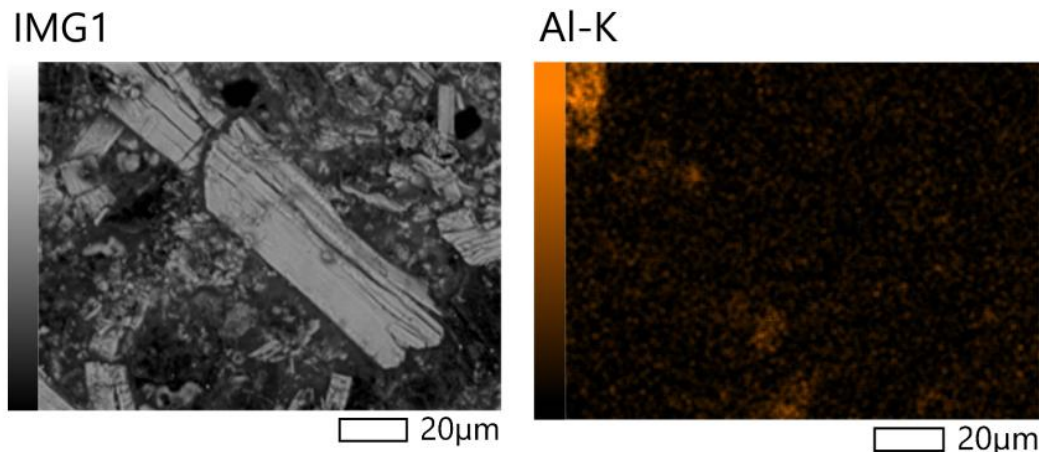


Fig.13. Determination of the form of finding aluminum by the EDS method

By comparing the pictures, you can see the points where the aluminum is. Aluminum is a lightweight non-ferrous metal, so it appears darker in images.

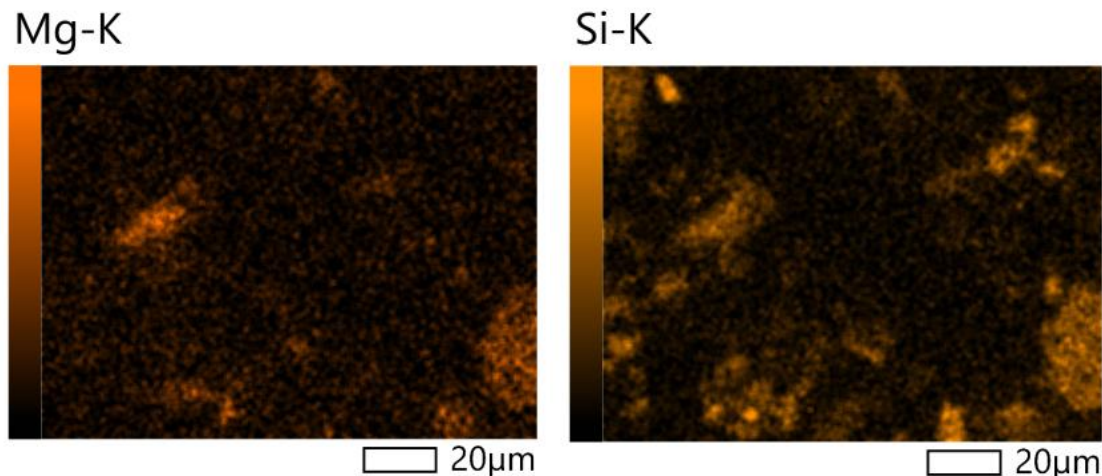


Fig. 13. Determination of the form of finding minerals Mg-Si

Figure 13 indicates the presence of talc ($\text{Mg}_3\text{Si}_4\text{O}_{10}(\text{OH})_2$) in the sample. Translucence of magnesium and silicon is located in basically the same places on the surface.

CONCLUSIONS

The kinetics and mechanism of the solid state reaction between MoS_2 and MoO_3 with the formation of MoO_2 in a nitrogen atmosphere between 450 and 700°C were studied using bulk mixed samples, mixed compressed granules and pure granules of MoS_2 and MoO_3 with a single contacting surface. The results show that for bulk samples the reaction reaches a maximum conversion of 67.3% at 650 ° C in 75 min, while for compressed samples the conversion under similar conditions reaches 96.1%, which indicates the effect of the physical characteristics of both types of experiments on diffusion coefficient of MoS_2 and / or MoO_3 through the newly formed crystalline layer of MoO_2 . The calculated activation energies for both experimental conditions agree with an average value of -44.2 ± 1.9 kJ, which is in the range of diffusion-controlled reactions. The literature has not reported any other value for this reaction.

REFERENCES:

1. Khasanov A.S., Tolibov B.I. Firing of molybdenum cakes in a new type of kiln for intensive firing // Mining bulletin of Uzbekistan. No. 4 (75), 2018. -P131-135
2. Selçuk Kan & Kağan Benzeşik & Ömür Can Odabaş & Onuralp Yücel. Investigation of Molybdenite Concentrate Roasting in Chamber and Rotary Furnaces. Mining, Metallurgy & Exploration (2021) 38:1597–1608
3. Behzod Tolibov, & Abdurashid Hasanov. (2021). Research In The Field Of Intensive Oxidative Roasting Of Molybdenum Sludges. The American Journal of Applied Sciences, 3(09), 57–66. <https://doi.org/10.37547/tajas/Volume03Issue09-09>
4. Wilkomirsky, I. A. E. (1974). Recirculating fluidized bed process for the roasting of molybdenite concentrates (T). University of British Columbia. Retrieved from <https://open.library.ubc.ca/collections/ubctheses/831/items/1.0078690>
5. C. Ramana, V. Atuchin, I. Troitskaia, S. Gromilov, V. Kostrovsky, G. Saupe. Low-temperature synthesis of morphology controlled metastable hexagonal molybdenum trioxide (MoO_3). Solid State Commun., 149 (2009), pp. 6-9
6. Tolibov B.I., Khasanov A.S., Pirmatov E.A. Factors influencing technological indicators in the production of molybdenum // Universum: технические науки: электронный научный журнал, 2021. 10(91).
7. T. Marin, T. Utigard & C. Hernandez (2009) Roasting Kinetics of Molybdenite Concentrates, Canadian Metallurgical Quarterly, 48:1, 73-80, DOI: [10.1179/cm.2009.48.1.73](https://doi.org/10.1179/cm.2009.48.1.73)
8. Tolibov B.I., Khasanov A.S., Pirmatov E.A. Investigation of the possibility of using the technology of soda leaching of molybdenum // Universum: technical sciences. 2021.10 (91). URL: <https://www.7universum.com/ru/tech/archive/item/12444>
9. P.Aleksandrov, A.Medvedev, V.Imideev, D.Moskovskikh. Chemistry and Mechanism of Interaction Between Molybdenite Concentrate and Sodium Chloride When Heated in the Presence of Oxygen. Metallurgical and Materials Transactions, January 2017. DOI: 10.1007/s11663-016-0889-1
10. Khasanov A.S., Tolibov B.I. Investigation of the possibility of the process of oxidation of sulfide materials in a furnace for intensive roasting. Gornyi Zhurnal. No. 9, 2018 -P85-88
11. Liu D. et al. High-pressure Raman scattering and x-ray diffraction of phase transitions in MoO_3 //Journal of applied physics. – 2009. – T. 105. – №. 2. – C. 023513.
12. Hasanov A.S., Tolibov B.I., Pirmazarov F.G. Advantages of low-temperature roasting of molybdenum cakes // International scientific-practical conference on the theme: «International science review of the problems and prospects of modern science and education». - Boston, USA: 2019. - P. 17-18.



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PAINTING: CREATIVE SOURCE FOR CONTEMPORARY ART

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ABSTRACT

In the formation of the national school of fine arts of Uzbekistan, painting in the 1920s and 1930s was a kind of foundation and creative basis that determined subsequent trends. This article reveals the dependence and close relationship of the artistic process of the 1920-1930-years from the historical and political events of the time, that this period was an important factor in the formation of national identity of art and that art is a creative source for contemporary art.

KEYWORDS: *Artistic Process, National School, Contemporary Art*

INTRODUCTION

In the formation of the national school of painting of Uzbekistan the painting of the 1920s-1930s served as a kind of Foundation determining the trends of its development. A characteristic feature of the creative process of this time was the coexistence of various artistic styles and trends — both realistic and avant-garde. Although the study of fine art of this period is a topical problem of art criticism, many aspects of this phenomenon have not received proper coverage. An important source for studying the creative processes of that time are poorly researched or unpublished works of artists stored in museums in Uzbekistan but not introduced into scientific use.

Currently, the State Museum of Arts of Uzbekistan stores a large number of poorly studied works by Alexander Volkov (about 50 paintings, 90 graphics), UstoMumin (more than 20), Oganess Tatevosyan (more than 500), Nikolai Karakhan (more than 30) and Ural Tansykbayev (more than 60 works).

Painting of the 1920s and 1930s is important in understanding the origins of the formation of the national identity of modern fine art in Uzbekistan. The unusual interpretation of the national heritage of the East the mutual influence of the traditions of the East and the West in the art of this period make it consonant with the artistic processes of our time.

The main results and findings

In 1934, the State Museum of Oriental art (Moscow) hosted a major exhibition called "Artists of Uzbekistan". Some of the works on display at the exhibition surprised Moscow experts as the color and General artistic features were signs of the Eastern rather than Western avant-garde. "The paintings showed the influence of the European avant-garde including the Cubo-futurists — but at the same time the medieval culture of Central Asia with its monumental architecture, ornaments and the Asian sun breathed on the canvases, refracted by all the avant-garde colors" (1, p.5).

As a result of the Russian colonization of Central Asia Western culture began to penetrate the States of the region beginning in the middle of the XIX century. The first Russian artists who came here mainly painted pictures of an ethnographic everyday nature. This situation was observed at the very beginning of the twentieth century. But already in the painting of the 1920s and 1930s, we can distinguish several groups of artists who differ in style principles.

The group of A. Volkov included artists such as U. Tansykbayev, N. Karakhan, A. Podkovyrov, P. Shchegolev. Their creativity was formed on the basis of a combination of avant-garde with national traditions. They saw the rhythm and flatness characteristic of the avant-garde in the samples of local applied art: carpets, embroidery products, colored silk fabrics.

The second group included artists N. Kashina, M. Kurzin, E. Korovai, V. Ufimtsev who chose the directions of futurism and supremacism. These trends were close to the Russian art of the 1920s. Futurists did not recognize the past and in their work did not refer to the traditions of the East. The artists of this group reflected the realities of modern Uzbekistan.

There was another group of artists consisting of followers of P. Benkov who brought the trends of impressionism to the painting of Uzbekistan.

Since the mid-1920s the pressure of the Communist ideology has been increasing and artists have had to change their creative principles and approaches by checking with the authorities. The state's policy in the field of art was aimed at establishing such postulates as partisanship, collectivity and nationality. Repression began against artists who adhere to freedom of creativity. Two years before the opening of the exhibition "Artists of Uzbekistan "in Moscow on April 23, 1932 "the Decree on the restructuring of literary and artistic organizations" was adopted and the process of liquidation of various art groups, primarily avant-garde ones began. The fight against formalism was launched in the country and the above-mentioned exhibition was the last of its kind. Some of the paintings displayed at the exhibition "Artists of Uzbekistan" were left in the collection of the Moscow State Museum of the peoples of the East. These works were kept in the secondary scientific and auxiliary Fund of the Museum for many years were not exposed to the public.

Violent disputes over various trends of traditions and schools (avant-garde, impressionism, realism) which unfolded in the 1920s by the mid-1930s weakened under the ideological pressure of social realism. Due to its distance from the center Uzbekistan has become a kind of reserve for such trends and trends in the fine arts as the avant-garde and impressionism. But when the wave of struggle against formalism swept over Uzbekistan artists were forced to comply with the requirements set. And yet although they moved to the position of social realism in their works there are not only features that meet the requirements of social realism but also some features of

avant-garde. The subject matter in the fine arts has changed: it has appeared story compositions related to modern times such as multi-figure works reflecting field work (cotton picking) holidays, portraits of workers and dehkans. In the genre of portraiture attention was paid not so much to the person portrayed as to the creation of a generalized image of a contemporary. In the works of many artists forced to work in line with social realism their inner sense of discontent is noticeable. In the works of A. Volkov and U. Tansykbayev tried to paint pictures in accordance with the artistic method of social realism the closeness of their work to the avant-garde in artistic form and color is noticeable.

Such paintings by Alexander Volkov as "Self-Portrait", "Mountain landscape", "Factory workers", "construction of a brick factory", "Foundry work at the Selماش plant", "Blue day" created in the 1920s-1930s but not shown until now can serve to reveal the originality of his work and deserve a separate study. The artist has been searching for his creative path for many years. In his paintings "The sound of camel bells" (1917-1924), "Camel Caravan" (1920) in the guise of heroes — Eastern people in the movement of carts and camels, the rhythm of life is clearly felt. In the composition of A. Volkov's paintings the harmonious arrangement of details (caravan, carts, musicians, etc.) is particularly highlighted. The artist working on the form and color scheme of paintings first wrote sketches for each cycle of works again and again referring to the chosen topic. The result of creative search was the creation of such paintings as "Pomegranate teahouse" (State Tretyakov gallery Moscow, Russia), "Dance", "Evening in Bukhara" (state Museum of art of Uzbekistan). Summing up the many years of creative search that preceded the creation of these paintings A. Volkov wrote in his article that these searches laid the Foundation for achieving the individuality of his painting of artistic skill (2, p. 18).

Decorative Convention serves as the basis for Ural Tansykbayev's paintings. His works ranging from small sketches to large paintings have taken their rightful place among the exhibits of various museums. His works are considered examples of a kind of national art school of the early twentieth century. The artist's works created in the late 1920s and early 1930s indicate that he reached creative maturity and inner potential that served as the basis for further creative development of the artist. A. Tansykbayev found his own unique writing style and showed incredible creative activity. Due to many internal and external factors U. Tansykbayev quickly learned the basics of avant-garde art.

Such paintings as "Foundry works", "Factory workers" are radically different from his other works. Despite the socialist theme in these works the former painting techniques of A. Volkov are felt: bright juicy colors, flatness of style and static compositional solutions. Still Life of U. Tansykbayev "Kumgan" (1935) which is stored in the Nukus state Museum of art named after I. Savitsky belongs to a number of unique works in terms of color and artistic solutions. Although this still life resembles the works of A. Matisse, its Eastern colorfulness and symbolism is marked by the seal of the unique and incomparable style of U. Tansykbayev. The alternation in the arrangement of the opposite: a warm fire and the cold blue tones — gives it a brightness. The background is multi-colored embroidery. This kind of image is almost never found in the future of his work. The plot of "Streets of Tashkent" by U. Tansykbayev (1935) is made in two versions one of which is stored in the State Museum of arts of Uzbekistan and the second — in the Nukus state Museum of arts named After I. Savitsky. In the paintings, the street appears in different angles. The first work shows trees along the road and shows the end of the street while the

second shows only part of the same street. These works are similar in color scheme: they have a common gray scale and are written in an impressionist manner.

In his works Alexander Nikolaev (UstoMumin) whose work is distinguished by a special grace harmoniously combined the features of the art of the European Renaissance of Russian iconography and Eastern philosophical views. UstoMumin drew on the deep foundations of fine art and created new traditions based on the legacy of the past. UstoMumin's work "Rowers" (from the Fund of the State Museum of arts of Uzbekistan) is painted in unusual style for his work and differs from his other works. The work is done with bright colors applied with a brush in separate broad strokes. The work is fragmentary and not fully depicted. At the bow of the boat is one standing man in a boat-three bare-chested rower. Water is shown by horizontal lines consisting of immiscible paint strokes from blue to turquoise shades. The picture is supplemented with an image of mountains and the sky. The figures of the rowers are not written graphically in the manner typical for UstoMumin but in broad spots of color. However, the arrangement of images and color scheme shows that this work belongs to the brush of UstoMumin.

Comparing the works of the above-mentioned masters makes it possible to determine the goals of creative searches of artists of that time and show the originality of their styles. These searches serve as a vivid example for contemporary artists. And Museum collections give an opportunity to take a fresh look at the work of artists of the 1920s and 1930s and understand how wide the traditions of Uzbek fine art are. But the main thing is that these artists managed to harmoniously combine the traditions of the East and the West in their works which is very important for modern art.

Although the heyday of fine art at the beginning of the last century takes a very short period, it also has a fruitful influence on modern art. The political system of the 1930s affected not only the fine arts but also other areas of art. Despite the fact that a lot of time has passed since then the art of the beginning of the last century has changed to a certain extent its philosophical artistic, ideological, formal and other features continues to live in the work of modern artists. The appeal to the art of the beginning of the last century can be observed in the fine arts of the 1980s that is after the change of several generations.

In 1988 at the initiative of a group of artists who expressed in their works the public mood caused by the processes of reconstruction the "Association 23" was created. the members of the organization were B. Zhalolov, Zh. Umarbekov, A. Mirzaev, A. Nur, V. Akhunov, A. Turdiev, A. Sharzhanov, K. Yusupov, E. Mansurov, M. Tokhtaev, N. Shin, B. Boboev, G. Kodirov, B. Makhkamov (Tashkent), U. Boltaboyev, Sh. Toshboev, S. Alibekov (Ferghana), A. Krikis, A. Isaev (Samarkand), M. Abdullayev, Z. Saidzhonov, R. Shodiev (Bukhara). Later the members of the Association joined by M. Smith and F. Ahmadaliev. In the Declaration adopted by the Association it was declared that schematism is a superficial reflection of the truth, etc. The text of the Declaration also noted the need to pay special attention to the creative development of the fine arts of Uzbekistan in the 1920s and 1930s. "Association 23" continued to operate until 1992. During this time, he organized and held about ten exhibitions in Tashkent and Samarkand. The works created during this period make it possible to trace the formation of plastic traditions in the fine arts. These works marked the beginning of the development of fine art in the years of independence (3, p. 14-16).

Since the 1990s, changing socio-economic conditions have led to a renewal of not only society but also the consciousness of artists. New trends in the fine arts of Uzbekistan were expressed on the one hand in the rejection of the principles of social realism, on the other hand, in increased attention to the cultural heritage and traditional culture of Uzbekistan and their interpretation. The influence of works created at the beginning of the last century on modern fine art and their connection can be seen in addition to the works of the above-mentioned painters and in the works of such artists as H. Mirzaakhmedov A. Ikromzhonov, H. Zagonov, M. Karabayev, T. Karimov, B. Ismoilov, D. Rahmankova.

Painting by A. Mirzaev "Connection of times. Images" (2004) was undoubtedly influenced by the image of a teenager in UstoMumin's "Quail lover" (1928). Next to the teenager is a modern woman. Zh. Umarbekov's painting "The Youth of Tahir and Zuhra "(2005) shows a stylistic affinity with the work of UstoMumin "The Boy in the fur hat". And in the characters of the work of Zh. Umarbekova's "Teenagers" (2005) also shows a stylistic affinity. The painting shows three teenagers holding birds in the lap of nature. The similarity of this work is most noticeable in the compositional structure and the image of the characters in this work the artist used brighter colors. In the landscapes of Zh. Umarbekov written at the beginning of his creative activity the compositional structure characteristic of the work of U. Tansykbayev and in further works-compositions characteristic of the work of A. Volkov. The stylistic and semantic meanings inherent in the works of the beginning of the last century are clearly visible in the works of today's artists. They create unique paintings through the use of new artistic means. But in the works of modern artists there are almost no paintings close to the technical skill of UstoMumin that there are no works written on paper in tempera and resembling miniature works.

An artist of any era based on his own vision and the requirements of the time is searching for the appropriate form and style. The interest in the philosophy of art in the work of artists of that time testifies to the harmony of the work of today's generation of artists with the art of the 1920s and 1930s. In the process of understanding historical and political changes and gaining national identity, artists turn to the trends of the avant-garde in the fine arts and to the aesthetics of the East in order to study the artistic heritage.

CONCLUSION

In conclusion, it should be noted that many works created in the 1920s and 1930s and still remain unknown to the public are important evidence that in the fine arts of Uzbekistan in the 1920s, under the influence of Western modernism, Russian avant-garde, Eastern decorative art and many other trends a peculiar phenomenon called "Uzbek avant-garde" was born. The fine arts of Uzbekistan in the 1920s and 1930s, along with a harmonious combination of Western and Eastern art traditions, were influenced by the trends of realism and impressionism. On this basis a kind of local painting appeared in Uzbekistan. Due to the remoteness of Uzbekistan from the center in the 20s of the last centuries the traditions of the avant-garde and other trends continued to live in the fine arts. Despite the triumph of the canons of social realism in 1928-1929 the art of avant-garde and impressionism continued to exist almost until 1935. The traditions of the "Uzbek avant-garde" have not died out after almost a century and still have a fruitful influence on painting and graphics. They are clearly manifested in the rapidly developing process of modern art.

REFERENCES:

1. Turkestan avant-garde: exhibition catalog. Authors of the introductory article: E. S. Ermakova, T. K. Mkrtychev, M. L. Khomutova. - Moscow, 2009.
2. Article by the artist Volkov. 1928. - Central state archive of the Republic. -R-394 Foundation. Inventory 1. Case No. 338.
3. Khakimov A. A. New Uzbek painting. - Tashkent, 2014.
4. Alimkulova, D. (2020). PAINTING: CENTURY TRADITION. *International Engineering Journal For Research & Development*, 5(9), 6-6.
5. Alimkulova, D. (2019). National Institute of Art and Design named after KamoliddinBehzod. *HistoryResearchJournal*, 5(4), 104-108.



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REVIEW ON DETERMINATION OF HEAVY METALS IN PAN MASALA/SMOKELESS TOBACCO

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ABSTRACT

This study is based on an examination of numerous studies on the topic of heavy metal in pan masala/smokeless tobacco. Heavy metals have been utilized in a variety of pan masala/smokeless tobacco products. The acid-digestion procedure is utilized to prepare samples in the majority of tests. Atomic Absorption Spectrometry is the most frequently employed confirmatory method, although inductively coupled plasma Atomic Emission Spectrometry was utilized in certain studies. According to studies, the use of some cosmetic products exposes users to tiny quantities of dangerous heavy metals, which may create health issues if they remain in biological processes over time. Certain companies went beyond the regulations and utilized high quantities of heavy metal impurities, causing toxicity. The studies examined the concentrations of different metals as well as the concentration of a metal in various brands. The investigations performed to evaluate the health hazards connected with its toxicity. It was also found that, although the usage of heavy metals in some brands is below the legal limit, they nevertheless represent a considerable risk to people. Both of these studies are being performed in order to identify which brands of pan masala offered in our market are in violation of the regulations and to bring to the notice of the authorities. As well as educating young people, both men and women, of the risks it presents to their health.

KEYWORDS: Blood, Heavy Metals, Lead, Pan Masala, People, Poisoning, Symptoms, Smokeless Tobacco, Toxicity.

INTRODUCTION

Forensic research is the study of crime using empirical concepts, methods, and procedures. Anything contentious or disputed is a lesser known definition of the term "forensic". Some ideas in forensic science include.

- The application of science to the resolution of legal issues.
- A scientific study with the purpose of reaching a judgment in a court of law. Saying something was forensically determined, for example, indicates that the evidence was collected scientifically with the purpose of being examined (and argued) in a court of law[1].

Forensic chemistry utilizes chemical ideas and concepts in a legal setting to evaluate forensic data. Forensic chemistry is concerned with the physical and chemical characteristics of a substance. Unknown items found at a crime scene may be identified with the assistance of a forensic chemical expert. To assist in the identification of unknown chemicals, specialists in this field utilize a range of methods and equipment. Examples of these techniques include superior fluid chromatography, gas chromatography, mass spectrometry, nuclear ingestion spectroscopy, Fourier change infrared spectroscopy, and thin layer chromatography. Because of the potentially hazardous nature of some devices and the vast number of unknown chemicals that may be discovered at a scene, it is essential to use a range of methods. In order to preserve proof, forensic chemists favor non-destructive methods. Chemistry researchers, especially their forensic colleagues, testify in court as expert witnesses to their findings[2].

Areca nut, slaked lime, catechu, and other flavour ingredients are mixed in Pan Masala (PM) (PM). It is widely accessible and utilized by individuals from all walks of life in India. Since it promotes sibling chromatin exchange and chromatin abnormalities, it is geno-toxic. It is a major cause of oral sub mucous fibrosis in humans, which also leads to oral cancer. It induces neoplastic tumors in the lungs, liver, and stomach in laboratory animals. It is hepatotoxic, producing an increase in enzyme levels as well as improper glucose and lipid metabolism. It produces increased creatinine and sperm abnormalities in the kidneys and testes, respectively. PM is a highly hazardous substance that affects virtually all organ systems, therefore a national policy banning the production, transportation, selling, and marketing of PM is urgently required. Betel quid pan masala (PM) is betel leaves combined with areca nut, while pan masala is tobacco mixed with areca nut, catechu, and lime and blended with gulkhand. This medicines are frequently utilized by both young and old individuals. To explore the link between long-term PM consumption and health concerns, a preliminary toxicity and chemical analytical assessment conducted undertaken[3].

A main example of Indian PM contained 13 polycyclic sweet-smelling hydrocarbons (PAHs), benzene hexa chloride (BHC), 1,1-trichloroethane, and 2, 2, bis-pchlorophenyl isomers. Furthermore, nitrosamine, heavy metals (lead, cadmium, nickel), and pesticide toxins have been shown to be hazardous in PM. An increase in the rate of sister chromatid exchange (SCE) and chromosomal abnormalities in mouse bone marrow cells from the Chinese hamster ovary (CHO) cell line indicates PM components' geno-harmful potential. Different PM brands' aqueous and ethanol extracts were found to have mutagenic capabilities. According to early studies, PM has the potential to be carcinogenic, tumorigenic, teratogenic, and mutagenic. As a consequence, the toxicology of PM effects in unadulterated purebred Swiss mice was studied using various PM brands. The use of smokeless tobacco, which is commonly used all over the world, produces oral

sub mucosal fibrosis (OSMF), a long-term and debilitating illness of the oral cavity with the potential for danger. This study will concentrate on the intake of smokeless tobacco, such as dish and gutkha, as well as the function of these chemicals in the recruitment of OSMF and, eventually, oral malignant growth. The list of articles to be assessed was created using PubMed, Scopus, and Google Scholar's reference finding tools. The fibrosis of the submucosal tissue is produced by continuous biting of the dish and gulping of gutkha. OSMF is caused by a number of causes, the most well-known of which are smokeless tobacco and its additives, such as betel quid, areca nuts, and slaked lime, which are used in container and gutkha tobacco[4].

In South Asian countries, women are more likely than males to get oral cancer. For human oral epithelial cells, the slaked lime in the betel quid, whether with or without areca nut, exhibits cancer-causing and geno-harmful effects. In smokeless tobacco, chemicals such as 3-(methylnitrosamino) - proprionitrile, nitrosamines, and nicotine induce fibroblast, deoxyribonucleic corrosive (DNA), and deoxyribonucleic corrosive (RNA) annihilation, as well as cancer-causing effects in tobacco users' mouths. The metabolic enactment of nitrosamine in tobacco by cytochrome P450 molecules may result in the improvement of N-nitrosornicotine, a significant cancer-causing agent, and micronuclei, which are indicators of genotoxicity. These results result in increased DNA damage and, ultimately, oral disease. The betel leaf is used to package a variety of fixings. Tobacco, nuts, stale lime, tastes, and areca nut wrapped in betel quid are the most frequently utilized container fixes. In both developed and developing countries, tobacco is frequently used alongside other drugs. A tobacco business developed in India approximately three decades ago, producing gutkha, which is made composed of catechu, spices, chewing tobacco, areca nut, and slaked lime wrapped in pouches or tins[5].

LITERATURE REVIEW

J. Vini Mary Antony *et al.* explained that the investigation's primary aim was to discover clue metals in the largest generally names were selected predicated upon people's widespread usage of publicly accessible items on the Internet. All cases were tested for follow metals, such as Cadmium (Cd), Nickel (Ni), Chromium (Cr), Lead (Pb), and Arsenic (Ar), using an AES method. The total metal focuses for cadmium, chromium, arsenic, nickel, and lead were all less than 0.1 mg/kg in each of the four instances. The testing may show that the amounts of following metals in the examples above, such as Cadmium (Cd), Nickel (Ni), Chromium (Cr), Lead (Pb), and Arsenic (Ar), are considerably less harmful and unlikely to cause sickness[6].

S. K. Nigamet *al.* presented in the article that tobacco is mixed with areca nut, catechu, and lime in betel quid dish pan masala (PM), whereas skillet masala is tobacco combined with areca nut, catechu, and lime then blended with gulkhanda. This medication is frequently utilized by both young and elderly individuals equally. A preliminary chemical study and poisonousness assessment of PM in mice were done to explore the connection between long-term PM exposure and health concerns. Compound assessment of various types of PM was done using HPLC, GLC, AAS, ES, TLC, GCMS, and sequential extraction for PAH, toxins, metals and minerals, electrolytes, medicines, and xenobiotics. Throughout the IP and PO regimens, trained Swiss mice were utilized to evaluate ethanolic PM extricates. In Rajaniganda and Pan Parag Zarda, which are regarded xenobiotics for pre-harmful damage, PAH levels were somewhat higher ($p < 0.01$). High fixations ($p < 0.01$) of DDT and BHC isomers, which mainly impact nerves and muscles, were also found in PM. The increased metal and mineral content of PM promotes considerable oral fibrosis. PM contains a high concentration of chemicals, particularly nicotine, which may

cause issues in the gastrointestinal system. In mice fed various amounts of simple and mixed PM for 16 and 90 days, researchers observed no impact on blood and organ loads (kidney, heart, spleen, and liver), but they did detect limited testis. The mice that were administered the PM-Zarda combo and cared for it for 90 days had the greatest chromosomal damage in their bone marrow. Among the chromosomal abnormalities found were ploidy, misfortune, parts, openings, erasures, and trades in ring chromosomes. The PM caused sperm head abnormalities (limited, obtuse, three-sided, and banana morphologies), as well as odd, undefined, tailless, and simple sperm, with the greatest impact in the three-month-care group. The levels of glucose, cholesterol, and protein in the testis were all found to be substantially higher ($p < 0.01$). In the 16-day local area, red blood corpuscles (RBC), white blood corpuscles (WBC), hemoglobin, and erythrocyte sedimentation were unaffected[7].

S. Verma *et al.* articulated that convergences of seven main metals, namely Zn, Fe, Cu, Cr, Pb, Ni, and Cd, were resolved in 30 samples of diverse brands of five distinct tobacco item categories easily accessible in Indian commercial sectors. Cigarettes, stogies, and bidi are the three kinds of tobacco consumed by smoking, while biting tobacco and snuff are ingested independently by biting. The metal material was intended to accept both smoking and non-smoking kinds, brands, and components. In the non-smoking area, biting tobacco samples showed more heavy metals than snuff samples. When compared to cigarettes and stogies, Bidi includes the least amount of metal content of all the smoking methods. This could be ascribed to the addition of metal to completed items during both material and actual processing; bidi is the most basic and smallest component. Because each brand's assembly innovations are distinctive and recognizable, intra-brand differences often imply something very similar. With a few exceptions, the findings are virtually indistinguishable from previous records. Creator recognize that, despite the negative consequences of direct tobacco smoking on human health, the smoke and debris produced may be a significant booster of metal load in the ground, air, and water[8].

O. E. Orisakwe *et al.* pointed to the fact that smokeless tobacco is gaining popularity as a healthier alternative to smoking. Data on the negative consequences of smokeless tobacco is limited in Nigeria, as it is in much of Sub-Saharan Africa. This study analyzes the significant metal hazards of the smokeless tobacco types widely accessible in Nigeria. A commercial container convention was utilized to investigate thirty Nigerian smokeless tobacco variants. By adding 10 mL of a combination of nitric and hydrochloric acids (HCl: HNO₃, 3:1) to the blend and drying it, assimilation was enhanced. After that, the mixture was combined and separated with 20 mL deionized water. The groups of lead, cadmium, chromium, cobalt, and nickel in the filtrate, which was set up in a standard volumetric carafe, were determined using nuclear ingestion spectrophotometry. The dietary admittance and the aim danger remaining were both handled. Nickel, cobalt, besides chromium had convergences of 0.02-0.07 g/g, 0.01-0.03 g/g, then 2.77-11.40 g/g, respectively, while cadmium with lead had convergences of 0.00-2.48 and 0.01-0.17 g/g, respectively. Individual admissions for nickel, cobalt, besides chromium were from 2-7 g/day, 1-3 g/day, and then 277-1140 g/day. Lead and cadmium admissions were usually 0-248 and 1-17 g/day, respectively. Even if there was no apparent danger when each element was evaluated and handled individually, the perceived hazard may be increased when all heavy metals are taken into consideration. Heavy metal is common in Nigerian smokeless tobacco, which may be harmful to people's health[9].

DISCUSSION

Metallic components having a thickness higher than that of water are referred to as significant metals. Due to the assumption that substantiality and poisonousness are related, heavy metals too include metalloids like arsenic, which may cause damage at low levels of exposure. Environmental poisoning of these metals has lately been a rising issue for the climate and global well-being. Human openness has also grown as a consequence of a substantial growth in their usage in a range of commercial, agricultural, homebrew, and specialist applications. The climate has identified geogenic, mining, ranger service, synthetic, indigenous effluents, and air sources as wellsprings of heavy metals. Mines, foundries, and smelters, as well as other metal-based assembly activities, are especially polluted. According to research, metals including copper (Cu), cobalt (Co), iron (Fe), chromium (Cr), manganese (Mn), magnesium (Mg), nickel (Ni), molybdenum (Mo), zinc (Zn) and selenium (Se) are necessary nutrients for a range of biochemical and physiological processes. Insufficiency infections and diseases are caused by a lack of key micronutrients. Fundamental heavy metals perform biochemical and physiological roles in plants and animals. They are key components of many primary compounds and play a vital part in oxidation-decrease processes. Copper is needed as a cofactor for a few oxidative pressure-related proteins, including superoxide dismutase, catalase, cytochrome oxidases, peroxidase, monoamine oxidase, ferroxidases, plus dopamine-monoxygenase. As a consequence, it's an essential supplement for metalenzymes involved in hemoglobin creation, carb digesting, catecholamine biosynthesis, and collagen, elastin, and hair keratin cross-connection. Cu proenzymes engaged in redox processes take use of copper's propensity to cycle between an oxidized state, Cu (II), and a deficient state, Cu (I). Nonetheless, since the shift from Cu (II) to Cu (I) would usher in the era of superoxide and hydroxyl radicals, is it conceivable that copper is poisonous? Excessive copper toxicity has also been related to cell damage in humans, leading to Wilson disease. A few extra necessary components, such as copper, are needed for natural function; however, excessive quantities of these metals damage cells and tissues, resulting in a range of undesirable consequences and human diseases. There is a small range of fixations amid beneficial and harmful effects for particular components, such chromium and copper. Different metals with no realized organic capacities incorporate uranium (U), vanadium (V), titanium (Ti), tin (Sn), thallium (Tl), tellurium (Te), strontium (Sr), silver (Ag), platinum (Pt), mercury (Hg), lithium (Li), lead (Pb), indium (In), nickel (Ni), gold (Au), germanium (Ge), gallium (Ga), cadmium (Cd), bismuth (Bi), beryllium (Be), barium (Ba), arsenic (As), antimony (Sb), and aluminum (Al) have no settled natural capacities and are considered as superfluous metals. Various instruments, some of which are not well-known, mix heavy metal-induced harm and cancer-causing properties. Each metal, on the other hand, is believed to guarantee unique qualities besides physical including chemical aspects which add to its own toxicological systems of exploit. The research focuses at the environmental effect, advancement, and usage of arsenic, cadmium, chromium, lead, and mercury, as well as the potential for humanity permeability plus atomic pathways of genotoxicity, toxicity, plus cancer-causing nature. As poisonous centralizations of heavy metals accumulate in the body's delicate tissues, excessive metal damage ensues. Depending on the metal burned-through, the side symptoms and actual aftereffects of substantial metal harmfulness vary. Several important metals, including as zinc, copper, chromium, iron, and manganese, are needed in tiny quantities for physical work. Nonetheless, if the metals collect in the body in high enough quantity to foundation damage, serious injury will follow. Pollution, air or water pollutants, food variations,

medicines, poorly covered food holders, and the use of toxic paints are all potential of inflicting severe metal damage.

Lead production line representatives, welders, battery plant workers, then fastens can be exposed to Pb if suitable insurance is not obtained. While Pb is contained in the bones, it may damage the structure of any organ. Lead poisoning has various consequences based on the age of the individual and the quantity of lead they've been exposed to. The severity of lead poisoning in children includes a broad spectrum of symptoms. Individuals who have been poisoned are unable to exhibit any signs or symptoms. Side effects typically emerge after three to a month and a half of therapy. Overexposure to lead leads youngsters to become less lively, rebellious, argumentative, and moderate (lazy). Migraines, tiredness, stomach discomfort, anorexia, blockage, slurred speech, changes in renal capacity, notably large amounts of protein in the blood, plus an oddly insipid complexion (paleness) owing to a lack of iron in the red platelets are just a few of the symptoms (pallor). Neurological indications linked with lead poisoning include a reduced ability to regulate intentional signals (ataxia), enlargement of the optic nerve, seizures, spasms, cerebrum damage, and impaired cognition. Any of the children who are affected have learning or behavioral difficulties, as well as mental obstacles and particular impairments in language, perception, coordination, conduct, and academic performance. In certain circumstances, manifestations may be dangerous. Lead poisoning in adults may cause greater circulatory strain and harm to the reproductive organs. Fever, migraines, sickness, lethargy (fatigue), regurgitating, anorexia (a lack of hunger), stomach pain, clogging, knee pain, loss of recently learned abilities, incoordination, languor, trouble sleeping (a sleeping disorder), fractiousness, hindered cognition, mental trips, or seizures are a few of the additional signs that can occur. Low iron levels in red platelets (paleness), fringe neuropathy, and, in rare instances, cerebrum discomfort may also be signs of the illness (encephalopathy). Individuals who have been affected have experienced decreased endurance besides muscular strength, renal disappointment, wrist drop, plus social changes like hostility, sorrow, or uneasiness. In some instances, the adverse effects may be hazardous. It's also found in things like blood, nails, sweat, spit, and bosom milk.

Rendering to the World Health Organization (WHO), adults and children are exposed to 25g/kg/week of lead. Net intake of lead is 40 percent from dietary sources, 10 percent from drinking water + food, then up to half via inward breath of Pb compounds (JECFA) (JECFA). This implies that with a daily intake of 5 g/kg bw, lead maintenance in the body produces an increase in blood Pb levels, impacting the hematological and immunological systems.

Cadmium is utilized in a number of applications, including electroplating, high-capacity batteries, fume lamps, and a few patches. It's conceivable that the signs don't show until two or four hours after the doors open. Inordinate openness may result in weakness, headaches, sickness, vomiting, stomach cramps, loose stools, and fever. Furthermore, emphysema (reformist reduction of lung function), pneumonic edema (abnormal buildup of fluids within the lungs), and windedness (dyspnea) may be present. Increased salivation, tooth yellowing, a random heartbeat (tachycardia), reduced degrees of iron in red platelets (weakness), light blue coloring of the mucous plus skin films, or a lessened sense of smell are all potential side effects in certain individuals (anosmia) (anosmia). People with cadmium poisoning may also have abnormally high intensities of protein in their urine, minor variations in liver occupation, or bone relaxing

owing to the unexpected function of the kidney trenches (renal cylindrical fracture) (renal cylindrical breakage).

According to the WHO-JECFA, individuals should eat 3.5 g/kg bw/week of cadmium. A criterion of 0.19-0.99 g/kg bw/day is set in light of the collecting characteristic plus the long natural 1/2-life of Cd. For a 60-kg individual, this amounts to 30 g Cd per day. The amount of Cd absorbed after oral infiltration is affected by physiological limits like age plus the quantity of Zn, Ca, besides Fe deposited in the physique. Rendering to the board of trustees, disc utilization from daily food and drink is approximately 12-25 g, of which 0.6-1.3 g/day is actually consumed, and net inhalator intake from the climate is 0.149 g/day, from which 0.04 g/day is truly swallowed.

Arsenic is a synthetic chemical that is used to produce pesticides. Arsenic gas has a few commercial applications. Excessive exposure may induce migraines, lethargy, wretchedness, seizures, and even death. Injuries to the cerebrum (encephalopathy), fringe neuropathy (nerve breaking at the borders), precapillary hemorrhages in the white matter, plus degradation or insufficiency of the oily casings surrounding the nerve strands are all frequent neurological symptoms. Skin problems include cross-over white groupings on the fingernails with substantial liquid development in the fragile layers of tissue beneath the skin. Gastrointestinal indications include a flu-like illness, which is characterized by retching, fever, stomach discomfort, and sometimes bloody loose fasses. Hemolysis (the breakdown of hemoglobin in red platelets), fragility (platelets), plus a low pulse are just a few of the symptoms (hypotension). Anyone may have a garlic-like taste that is noticeable on their breath. Shortcomings, body pains, chills, and fever are all typical symptoms of continuing damage. Arsenic poisoning symptoms typically emerge two to two months after the opening.

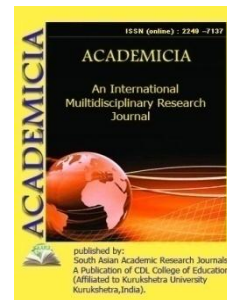
CONCLUSION

The results of all studies on heavy metal toxicity in pan masala/smokeless tobacco indicate that hazardous heavy metal content was found in pan masala in different amounts, with some items above the WHO's permitted limit, possibly having fatal consequences on human health. Pan Masala, on the other hand, is just as hazardous, according to health experts, to a human body, if not more. The only difference between the two is that gutka contains tobacco in it whereas pan masala does not. Experts claim that about 40 chemicals contained in these materials, in addition to nicotine, are considered to be toxic. These materials, according to studies, contain significant amounts of toxic heavy metals such as lead, copper, and zinc, which are possibly more hazardous than cigarettes. Many of these heavy metals harm the kidneys and the liver. A person may potentially develop liver cirrhosis or acute tubular necrosis, a kidney illness defined by tubular cell damage. Precancerous lesions (little white spots) and ulcers in the mouth or on the tongue are symptoms of persistent copper poisoning, opening the mouth completely. But are not only carcinogenic, they also have the potential to induce cardiac problems. Additionally, pregnant women who consume these foods may have a shorter gestation time, a greater chance of stillbirth, and a lower birth weight for their kid. Toxic metals may damage DNA directly or indirectly, raising the risk of cancer. Heavy metals wreak havoc on physiological processes in two ways: first, they build up and impede functioning in key organs and glands, and second, they displace dietary elements that are necessary for biological function. The toxic ingredient of pan masala is more hazardous than cigarettes. Pan Masala products should be banned since heavy metals are readily absorbed by the skin after long term usage. As a consequence, it is highly

recommended that smokeless cigarette products be tested for heavy metal requirements prior to commercialization.

REFERENCES

1. D. Dhaware, A. Deshpande, R. N. Khandekar, and R. Chowgule, "Determination of toxic metals in Indian smokeless tobacco products," *ScientificWorldJournal.*, 2009, doi: 10.1100/tsw.2009.132.
2. P. Priyambada and G. Anju, "QUANTITATIVE ESTIMATION OF MAGNESIUM CARBONATE IN PAN MASALA AND GUTKA," *Int. J. Curr. Pharm. Res.*, 2018, doi: 10.22159/ijcpr.2018v10i5.29691.
3. A. N. Shaikh, R. N. Khandekar, S. J. S. Anand, and U. C. Mishra, "Determination of some toxic trace elements in Indian tobacco and its smoke," *J. Radioanal. Nucl. Chem. Artic.*, 1992, doi: 10.1007/BF02034808.
4. A. K. Yadav, C. P. Kaushik, A. K. Haritash, B. Singh, S. P. Raghuvanshi, and A. Kansal, "Determination of exposure and probable ingestion of fluoride through tea, toothpaste, tobacco and pan masala," *J. Hazard. Mater.*, 2007, doi: 10.1016/j.jhazmat.2006.07.051.
5. O. E. Orisakwe, Z. N. Igweze, K. O. Okolo, and N. A. Udowelle, "Human health hazards of poly aromatic hydrocarbons in Nigerian smokeless tobacco," *Toxicol. Reports*, 2015, doi: 10.1016/j.toxrep.2015.07.011.
6. J. Vini Mary Antony *et al.*, "Detection of trace metals among the most commonly available smoked and smokeless tobacco products," *J. Pharm. Sci. Res.*, 2017.
7. S. K. Nigam and H. Venkatakrishna-Bhatt, "Analysis and toxicity of plain (PMP) and blended (PMT) Indian pan masala (PM)," *Eurasian J. Med.*, 2013, doi: 10.5152/eajm.2013.04.
8. S. Verma, S. Yadav, and I. Singh, "Trace metal concentration in different Indian tobacco products and related health implications," *Food Chem. Toxicol.*, 2010, doi: 10.1016/j.fct.2010.05.062.
9. O. E. Orisakwe, Z. N. Igweze, K. O. Okolo, and G. C. Ajaezi, "Heavy metal hazards of nigerian smokeless tobacco," *Tob. Control*, 2014, doi: 10.1136/tobaccocontrol-2012-050955.



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A STUDY ON BIOMASS ENERGY RESOURCES, POTENTIAL, RENOVATION AND RULE IN INDIA

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ABSTRACT

The biofuel production resource, potential, energy conversion, and strategy for promotion adopted by the Indian government are addressed in this message. As of March 31, 2013, India's total installed capacity for electricity production was 2666GW. Renewable energy accounts for 10% of total generation, with biomass accounting for 12% of total power production. India has a surplus of agricultural and forest land, resulting in an annual biomass availability of approximately 500 million metric tons. The overall capacity of biomass power production in India is 17,000 MW. At the moment, 2660 MW of electricity is produced, with 1600 MW coming from cogeneration. This study also discusses the different types of biomass in India. According to the study, India has a huge potential for bio mass feed supply from several sources. The Indian government implemented several policies and initiatives for biomass power production. Such regulations have covered the whole biomass energy industry, including biogas, biodiesel, and other biofuels. With strategic strategy and program, the Government of India has concentrated on the deployment and promotion of biomass energy, which is a significant part of this research study.

KEYWORDS: Biomass, Energy, India, Renewable, Power.

INTRODUCTION

Biomass energy production has been encouraged in many developed and developing nations via well-designed laws and financial incentives. Feed-in tariff systems were established by several governments as a policy tool to encourage investment in the renewable energy industry. India is a rapidly expanding nation, and its energy consumption is rising in tandem with its economic and industrial development[1]. Oil and coal are the primary sources of energy for India. India's

energy consumption from conventional sources is 150 GW (coal, fossil fuels, and oil), 4.78 GW (nuclear energy), 29.40 GW (hydropower), and 26.52 GW (sustainable sources). Fig. 1 illustrates India's large percentage of different energy resources as of March 31, 2013.

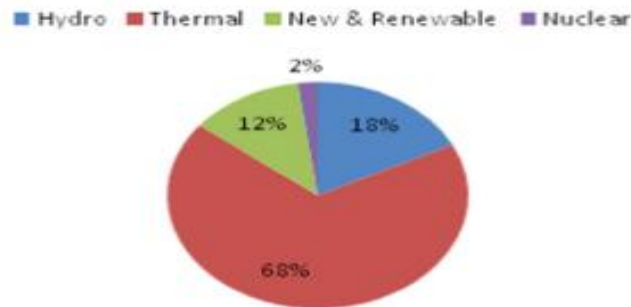


Figure 1: Illustrate the percentage share of various energy resources in India up to 31st March 2013

Due to a lack of knowledge and acceptance of renewable energy sources by electricity consumers in India, non-renewable fuels have been utilized often. There are many drawbacks to utilizing nonrenewable energy resources, including their limited availability in the environment, lack of environmental friendliness, and cost, since India imports all of these types of energy supplies[1]. As a result, it's critical to look into a variety of alternative sustainable energy sources. Biomass energy is one of the non-conventional sources that can supply grid-quality electricity. Biomass is a sustainable energy source that is made up of a complex mixture of carbon, nitrogen, hydrogen, and oxygen[2]. This content's biomass is derived from live or dead plants, agricultural residues, timber, and agro-based industries. In India, biomass energy consumption has been practiced from ancient times. It's found in cow dung cake, firewood, husk, and a variety of other natural feedstocks. Direct use of biomass in solid form, on the other hand, was neither safe nor painless since it produced a lot of smoke and ash[3].

As a result, the Indian government is encouraging biogas plants since they emit no smoke and are therefore pollution-free. Many incentives are available for the construction of a biogas plant. New biomass gasification technology is being developed. Technology has been developed that transforms biomass into more efficient syngas. Following the evaluation of biomass's potential, technology applied biological and thermochemical conversions in order to use biomass to generate fuel gases[4]. These fuel gases may be utilized to generate electricity. Biomass-based energy production is currently significantly on the increase. It is mostly due to rising electricity consumption in rural areas, as well as a lack of alternative fuel options. It is now critical to supply energy for civilization's progress via biomass. Global warming, resource depletion, and other worldwide problems have led to the choice of sustainable development in the current situation. In the electricity industry, one of the most important green sources is renewable energy, such as biomass[5].

The technique used by MNRE to provide subsidies is based on co-generation and biomass gasification generation. The biomass potential of India is identified state by state in this study. The different types of biomass found in India, as well as their conversion methods, are briefly discussed. The scope, potential, and situation of biomass power deployment in India were addressed in this article. It is stated that India has a policy of giving subsidies for biomass

electricity. With strategic strategy and program, the Indian government has concentrated on the deployment and development of biomass energy, which is a significant part of this communication.

India's biomass resources are enormous

Biomass is described as a bio residue produced by water-based vegetation, forest or organic waste, agricultural production waste, or trash from the agro- or food-processing industries. In India, many biomass resources are accessible in various forms. Grass, woody plants, fruits, vegetables, manures, and aquatic plants are only a few examples of how they are categorized in nature. Algae and Jatropha are currently utilized in the production of bio-diesel[6]. Agricultural crop residue, energy plantation, and municipal and industrial waste are the three main sources of biomass energy. The different classifications of biomass available in India are shown in Figure 2.

Residue of agricultural crop

Because India has such a large agricultural land area, it produces a lot of residue. These residues have the potential to be used as a biomass feedstock for energy production. Agricultural residue refers to all organic components generated as a by-product of the processing harvesting of agricultural crops[7]. There are two types of agricultural residues: main and secondary residues. Field based or primary residue is that which is acquired in the field at the time of yield, while processing based or secondary residue is that which is assembled during processing. Primary residues include rice straw, sugar cane tops, and bagasse, while secondary residues include rice husk and bagasse. Animal feed, fertilizers, and other products are made from primary residues. As a result, its energy use potential is limited. Secondary residues, on the other hand, are abundant at the yielding site and may be confined as an energy source.

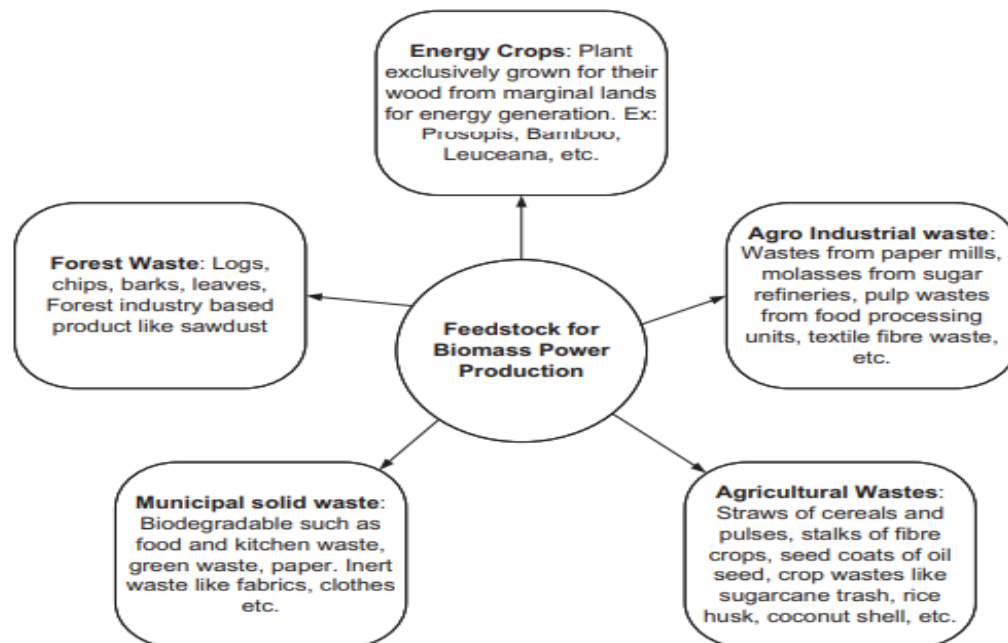


Figure 2: Illustrate the diagram shows the classification of available biomass resources in India

Agricultural feed-stocks-energy plantation

Cattle and animals thrive on a big scale in India due to the vast population's reliance on agriculture. As a result, many types of biomass potential are available in Indian communities. Corn, sugarcane, cereals, pulses, rubber, and other crops have all been utilized to generate biomass power. Dry and wet biomass are residues from crop collected as biomass for energy use. These crops are distinguished by a number of characteristics that allow them to be considered as biomass potential, such as calorific value, moisture content, carbon proportion, ash content, and so on[8]. These characteristics are important for converting both wet and dry biomass into usable energy.

Large amounts of different biomass wastes are accessible in India, making biomass waste a viable fuel for biomass power generation. Bio-chemical and thermo-chemical conversion processes may be used to transform these wastes into energy fuels known as bio-fuels. Industrial wastes and wastewaters: Water and soil contamination are caused by sewage and other pollutants. Dumping may have severe consequences. Organic matter seeps into ground water or escapes to surface waterways through organic decomposition of wastes on land, spawning pollution that causes health issues and fish death. Black liquor from the paper and pulp industry, milk processing facilities, breweries, the vegetable packing business, and animal dung are all examples of discharges.

- Food sector wastes: Hotel, restaurant, and community kitchens generate a lot of waste, such as vegetable flay, stale food (e.g. uneaten bread, rice, veggies, etc.), and fruit and vegetable rejections from the dish washer. Similarly, the confectionery business generates a significant quantity of trash. Fruit and vegetable scrap, nonstandard food, pulp and fiber produced from sugar and starch extraction, filter sludge, and other solid wastes are generated by these businesses. All of these solid wastes may be used to generate biogas via anaerobic digestion. Typically, these wastes are disposed of in landfills. Fruit and vegetable waste, meat washing waste, poultry and fish cleaning waste, and wine making waste are all examples of liquid waste.
- Animal wastes: Organic matter, moisture, and ash make up the majority of animal manure. Animal dung may decompose in either an aerobic or anaerobic setting. CO_2 and stable organic molecules are generated under aerobic circumstances, whereas additional CH_4 is produced under anaerobic ones. India has a high potential for CH_4 generation owing to the increased output of animal dung, which allows for a large energy potential.
- Municipal solid trash: Each year, thousands of tons of residential garbage are collected, the overwhelming majority of which is dumped on open fields. Paper and plastic make up the majority of municipal solid trash in India, accounting for 80% of total MSW. Anaerobic digestion or indirect combustion may both be used to transform municipal solid waste into electricity. Natural decomposition produces methane and carbon dioxide in a 1:1 ratio on waste sites. These gases are extracted from the stored material, swabbed, and cleaned before being fed into IC engines or gas turbines for energy generation. In a high-rate biomass digester, the organic fractional portion of MSW may be stabilized anaerobically to produce biogas for steam and power production.
- Sewage: Comparable to other livestock manure, sewage is however a source of biomass energy. Using the anaerobic digestion process to produce biogas, energy may be extracted from sewage.

Biomass energy conversion technologies

Different feedstocks are accessible for conversion to bio-fuels including for power generating purposes, as shown by India's biomass potential. The kind and amount of biomass feedstock, as well as the environment and economic circumstances, all influence biomass conversion processes. Biomass is converted to energy utilizing two major process technologies: thermochemical and biochemical/biological. Mechanical extraction, such as rapeseed methyl ester bio-diesel, is the third method for generating energy from biomass. Pyrolysis, biomass gasification, combustion, and liquefaction are the thermal conversion processes.

Thermochemical transformation

The thermo-chemical biomass is converted is accomplished via three major processes: combustion, gasification, and pyrolysis.

- Combustion

Combustion processes of burning biomass in air to transform the chemical energy contained in biomass towards heat, mechanical power, and electricity via various processes and equipment such as furnaces, stoves, steam turbines, boilers, and so on. Although any kind of biomass may be burned, combustion is only practical for biomass with a moisture level of less than 50%, unless the biomass is pre-dried. Biomass with a high humidity is more adapted to biological conversion.

- Gasification

Gasification is the partial oxidation of biomass at extreme heat, usually in the region of 800–900 °C, to produce a combustible gas mixture. The gas generated has a low calorific value (CV) and may be immediately burned or utilized as a fuel for gas engines and gas turbines. This generated gas may be utilized as a feedstock (syngas) in the manufacture of compounds such as methanol.

- Pyrolysis

Pyrolysis is the process of converting biomass into liquid, solid, and gaseous components in the absence of oxygen. If flashing pyrolysis is utilized, pyrolysis may be used to create bio-oil, allowing for an efficiency of up to 80% in the conversion of biomass to bio-crude. The bio-oil may be utilized in engines and turbines, and it is also being explored as a feedstock for refineries. However, certain issues need to be resolved, such as corrosiveness and low thermal stability. For only certain applications, upgrading bio-oils by reducing the oxygen content and eliminating alkalis via hydrogenation and catalytic cracking of the oil may be needed.

Conversion of natural chemicals

Fermentation and biomass gasification are the two major processes utilized, with a third process produced by mechanical extraction/chemical conversion being used less often.

- Fermentation

Fermentation is widely utilized commercially to generate ethanol from sugar crops (such as sugar cane and sugar beet) and starch crops in a variety of nations (e.g. maize, wheat). The biomass is crushed down, and enzymes convert the starch to sugars, which yeast subsequently converts to ethanol. Distillation is an energy-intensive stage in the ethanol production process,

with 1000 kg of dry maize yielding approximately 450 l of ethanol. The solid waste from this procedure may be fed to cattle, and the bagasse from sugar cane can be utilized for further gasification or as a fuel for boilers.

- Anaerobic digestion is a kind of digestion that occurs in the absence of oxygen

Organic matter is immediately transformed to a gas called biogas during anaerobic digestion. It is mostly composed of methane and carbon dioxide, with minor amounts of other gases including hydrogen sulfate. Bacteria transform biomass in an anaerobic environment, producing a gas with an energy content of 20–40% of the feedstock's lower heating value.

LITERATURE REVIEW

Subhes C. Bhattacharyya studied India is home to a quarter of the population of the global total who do not have access to electricity, and approximately 40% of those who do not have access to modern energy. Despite a number of efforts and regulations aimed at assisting low-income families, this scenario persists. The administration, alarmed by the severity of the issue, has lately launched an ambitious rural electrification initiative. This article examines India's energy access issue and argues that, due to the low penetration of electricity in the poor's energy mix, rural electrification by itself is difficult to address the problem[9].

Shonali Pachauri et al. studied India and China are both in the midst of an energy transformation. Through the study of both aggregate data and nationally representative household surveys, this article analyzes the home energy transitions in different countries. In many ways, the two nations are diametrically opposed. In aggregate, China's residential energy usage is double that of India. Furthermore, in China, virtually all homes have access to electricity, while in India, almost half of rural families and 10% of urban households do not. In comparison to urban Indian homes, urban Chinese households get a higher proportion of their total energy from liquid fuels and grids (77 percent) (65 percent). Nonetheless, Indians get a somewhat higher share of their total household energy requirements from liquid and grid sources than Chinese with similar incomes at every income level. Despite these disparities, the countries' energy consumption patterns and the variables affecting a transition to modern energy are comparable. Urban homes in both countries use a disproportionately high percentage of commercial energy and are considerably further advanced in the transition to modern energy than rural households. However, because of a continuing reliance on inefficient solid fuels, which account for approximately 85 percent of rural household energy requirements in both nations, overall energy consumption in rural homes surpasses that in urban households. In addition to urbanization, income, energy costs, energy access, and local fuel supply are also important drivers of the shift in both countries[10].

DISCUSSIONS

In India, agencies and businesses are experimenting with converting various waste biomass to energy and reporting positive results. MNRE displayed a massive amount of installed capacity and excess biomass data. Thermo-chemical and bio-chemical technologies are now being utilized to transform biomass into energy. The kind of biomass conversion technology used is determined by the form of energy needed, such as heat, mechanical, or electrical energy; pyrolysis, fermentation, and mechanical extraction create liquid fuels appropriate for use as transportation fuels, and so on. Syngas was created via the gasification of biomass. Different biomass power

generating plants have been built in various Indian states to meet the country's energy needs via biomass gasification.

CONCLUSION

A thorough examination of biomass resources and possibilities has been provided. It may be stated that India has a great potential for exploring existing biomass and converting it to electricity. In India, there are many resources in a broad range of forms of biomass. Waste biomass may be obtained from a variety of sources, including agricultural waste, food waste, and large-scale industrial wastewaters, indicating a shift to non-conventional energy sources. Bagasse cogeneration, which utilizes sugar mill waste to generate electricity, is also used by the states. In India, a number of power generating projects based on gasification-based cogeneration rural electrification facilities have already shown to be effective. These plants have not only addressed the rural electrification issue for distant communities, where infrastructure expenses for traditional electricity might have been very expensive, but they have also reduced the cost of power production. The government's main goal in giving subsidies or financial aid is to promote the use of non-conventional energy sources, which aids in the nation's long-term growth.

REFERENCES

1. A. Kumar, N. Kumar, P. Baredar, and A. Shukla, "A review on biomass energy resources, potential, conversion and policy in India," *Renew. Sustain. Energy Rev.*, vol. 45, pp. 530–539, 2015, doi: 10.1016/j.rser.2015.02.007.
2. M. Hiloidhari *et al.*, "Bioelectricity from sugarcane bagasse co-generation in India—An assessment of resource potential, policies and market mobilization opportunities for the case of Uttar Pradesh," *J. Clean. Prod.*, 2018, doi: 10.1016/j.jclepro.2018.02.087.
3. V. V. N. Kishore, P. M. Bhandari, and P. Gupta, "Biomass energy technologies for rural infrastructure and village power - Opportunities and challenges in the context of global climate change concerns," *Energy Policy*, vol. 32, no. 6, pp. 801–810, 2004, doi: 10.1016/S0301-4215(03)00002-8.
4. F. Kellner *et al.*, "Forecasting for dynamic line rating," *Renew. Sustain. Energy Rev.*, 2015.
5. R. Singh and A. D. Setiawan, "Biomass energy policies and strategies: Harvesting potential in India and Indonesia," *Renewable and Sustainable Energy Reviews*. 2013, doi: 10.1016/j.rser.2013.01.043.
6. S. Manju and N. Sagar, "Progressing towards the development of sustainable energy: A critical review on the current status, applications, developmental barriers and prospects of solar photovoltaic systems in India," *Renewable and Sustainable Energy Reviews*. 2017, doi: 10.1016/j.rser.2016.11.226.
7. M. Hassan, K. Natarajan, P. Pelkonen, A. Zyadin, and A. Pappinen, "Perspectives of Feedstock Supply for Biomass-Based Energy Plant Development in India: Views from an Expert Survey," *Challenges*, 2015, doi: 10.3390/challe6010071.
8. B. Baruah, "Creating Opportunities for Women in the Renewable Energy Sector: Findings from India," *Fem. Econ.*, 2015, doi: 10.1080/13545701.2014.990912.
9. S. C. Bhattacharyya, "Energy access problem of the poor in India: Is rural electrification a

remedy?,” *Energy Policy*, vol. 34, no. 18, pp. 3387–3397, 2006, doi: 10.1016/j.enpol.2005.08.026.

- 10.** S. Pachauri and L. Jiang, “The household energy transition in India and China,” *Energy Policy*, vol. 36, no. 11, pp. 4022–4035, 2008, doi: 10.1016/j.enpol.2008.06.016.



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ARTISTIC-PSYCHOLOGICAL DESCRIPTION AND CLASSIFICATION OF LONELINESS IN LITERATURE

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ABSTRACT

The article discusses literary-philosophical essence, artistic-psychological description and classification of loneliness concept. The appeal to the problems of human aloneness and the alienation of social relations is due to the increasing role of telecommunication technologies in the life of people. The relevance of this topic is due to the need for theoretical understanding of the phenomenon of loneliness of a person. Loneliness is a versatile concept. Its causes, forms, manifestations, mental states and external factors are different. Therefore, it is studied in philosophy as a concept, in psychology as a psychological state, in medicine as a disease, in tasavvuf as a means of reaching God.

KEYWORDS: Loneliness, State, Mental, Psycho-Social, Classification, Depression, Aesthetic, Emotional

INTRODUCTION

In most works of art it is observed that human emotions, people's mental attitude to life realities are expressed in a unique poetic, symbolic way. This, of course, is intended to increase the aesthetic impact of that work. In order to reveal the symbolic-semantic aspects of various human mental states, which are embodied in the literature and have a symbolic nature, it is important to study the socio-vital, psychological basis of their occurrence.

DISCUSSION

The problem of society and man has always been one of the main themes in the literature of the people of the world. In particular, it is emphasized and described that the isolation of a person from society, people is a tragic situation. Because loneliness condemns a person to despair,

depression, and throws him into a whirlpool of endless mental anguish. In loneliness, a person can either lose his identity or realize his identity. Because a lonely person who has not found another person to communicate with dares to talk to himself or to express his thoughts to a bird, an animal, or a tree, even if the process goes on for a long time, it can lead to mental disorder. But in solitude, a person also makes a self-examination, thinking about the factors that caused him to fall into a state of loneliness. In the process, a person speaks to himself and through his monologues confesses inwardly his faults and shortcomings, which cannot be revealed openly in front of others, and whose pride or arrogance does not allow him to speak openly.

Man differs from other beings in terms of experiencing various processes, events, situations, states depending on the nature of the natural-spiritual, divine phenomena associated with him. Therefore, the psychological phenomena and situations that a person experiences are basically grouped into three categories:

1. Mental processes - in which a person forms and understands the basic ideas about the reflection of the environment around him, on this basis, creates a system of concepts in the brain. The mental process describes the changing state of a person. It embodies a system of states that reflects the sequence of human transition from one state to another.

2. Mental traits are the most common traits in a person, which determine his personality and the level of behavior. Mental characteristics can be either normal or transient in a person. They arise through certain mental states.

3. Mental states are certain mental manifestations of a person's level of activity at any given moment and the quality of the implementation of these mental processes.

ANALYSIS

A number of words and phrases have been formed in language to express mental states, and in speech a person expresses curiosity, concentration or dispersion of thought, inability to concentrate, hesitation, thoughtfulness, and a number of other states. They are also related to human cognitive activity and are often referred to as “mental abilities”.

Based on the above, human mental states can be classified as follows on the basis of various criteria. Including:

a) mental states;

b) emotional states;

c) volitional mental states.

Human psychological states are usually studied into three major groups according to whether they are **positive or negative, or specific**. It has been proven that a person's positive psychological state is influenced by joy, happiness, love and other positive aspects of daily life, while negative psychological states are caused by bad states such as grief, hatred, confrontation, conflict, obstruction, depression, despair.

Bright patterns of mental states are often observed in connection with the emotional side of life. Because in psychology, the so-called “emotional states”, such as emotions, depressed or high moods, desires, etc., can change the whole psyche of a person in a certain way in a certain time.

By now, loneliness as a communicative state of mind has become one of humanity's global problems. Because loneliness results from a person's lack of communication with those around them. Therefore, the concept of loneliness is subjectively considered unacceptable. In recent years, many psychologists are trying to study not only the socio-cultural, religious, political, psychological factors associated with the origin of loneliness, but also its scientific, philosophical and artistic descriptions, to distinguish it from other mental states. According to psychologist R.S. Nemov: "Loneliness is a difficult state of mind, usually a bad mood and a painful emotional experience" [6; 718]. Russian scientist L.A. Karpenko, on the other hand, considers loneliness to be one of the factors influencing the emotional state of a person who is isolated from other people or in an unnatural, changing environment [7; 496].

In general, psychologists distinguish four types of loneliness:

1. Cosmic loneliness - a person's departure from the essence of "all-encompassing": a) nature, space, world; b) God.

2. Cultural loneliness is the incompatibility of human values, ideas that occur in a particular cultural environment, the understanding and worldview of those around them. Such inconsistencies are usually due to the following factors: a) migration; b) the rapid orientation of society to new values (often associated with revolutions, major reforms); "conflicts between fathers and children" representing old and new cultures are typical; c) the rapid intellectual development of a person, the problem of communicating with people close to each other, and so on.[8]

3. Social loneliness is the loneliness of a person due to exclusion from a particular group. Dismissals, resignations, retirements, falling into a new work environment, breaking up with old friends are examples of this.

4. Personal loneliness is the loss of emotional connection with a self-esteeming person (close relative, friend, lover).

In general, when a person's relationship with others does not develop at all, a state of loneliness occurs. Such a person cannot establish a relationship of friendship or love with those around him. Not only does he become indifferent to people, but he also causes others to ignore him.

The following **socio-psychological** factors of loneliness are observed in literature:

- Loss of a friend or lover due to death;
- Rejection, abandonment by a living parent;
- orphan hood;
- Inability to communicate with people;
- Fear of public interference;
- Change of residence;
- going to a place where people are completely absent (such as space, a deserted island);
- falling into a new, unfamiliar area where communication is inconvenient;
- Transition to the next stage of mental development;

- Infidelity and divorce;
- rupture of personal relationships with family members;
- incurable disease, disability;
- disorders of consciousness, emotional trauma, mental disorders, insanity;
- strict devotion to religion;
- some religious ceremonies and rituals;
- commitment to science;
- devotion to art;
- grief from unrequited love;
- race;
- betrayal, treachery;
- committing a crime;
- rejection by society: exile or imprisonment;
- negative impact of current events;
- alienation from society, inability to accept society;
- retirement;
- poverty;
- despair, uncertainty about the future;
- dislike of the human race, hatred of people, love of animals rather than them, and so on.

Thus, loneliness is a complex psychological process, along with various emotional experiences. But often loneliness in a person's life is caused by the annoyance, infidelity, betrayal, indifference, oppression of the people around him, especially those closest to him. In addition, the negative traits of human nature, such as selfishness, indifference, arrogance, conceit, cowardice, skepticism, impatience, ingratitude can also contribute to the formation of loneliness in his personality [10]

There is also a category of people in life who prefer to be free and independent, who see loneliness as the best way to achieve this. In this sense, loneliness is positive for some and negative for others.

Of course, the benefits of loneliness are also undeniable. This is recognized by those who have chosen loneliness as a way of life for themselves. However, there are those who feel remorse and guilt for living their lives alone.

However, the negative perception of loneliness is also known from the fact that it is used in the form of deportation, imprisonment, and other forms of punishment, such as forced social isolation. Such convicted persons are deprived of their civil rights under the laws of society and are prohibited from acting in person.

The above considerations indicates that there are two types of loneliness: a) volunteer; b) mandatory.

According to the goal of voluntary solitude, self-improvement will be focused on overcoming spiritual difficulties. It takes into account the internal concentration of mental decline and its problems.

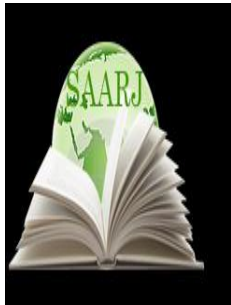
Compulsory loneliness results from the deprivation of liberty, social and political rights, imprisonment, deportation, or forced marriage, and so on.

CONCLUSION

The feeling of loneliness has a great impact on a person's emotional state, mental state. It plays two different roles in a person's life, depending on how a person reacts to loneliness: positive or negative. On the one hand, loneliness is a very unhappy, isolated state caused by negative feelings such as despair, fear, suffering, impatience, lack of self-confidence or sadness that prevent a person from making the necessary connections with others, on the other hand, loneliness is a person living his life by himself, a deep understanding of their behavior, the time given to understand, is an opportunity experienced. On the other hand, man achieves peace, tranquility, tranquility in solitude. Most importantly, during this opportunity, a person clarifies his thoughts, decisions, realizes the essence of his personal existence.

REFERENCES

1. Mijuskovic, B. L. (1979). Loneliness in philosophy, psychology, and literature. Assen: Van Gorcum.
2. Fromm. Erich, The Art of Loving. New York: Harper, 2006.
3. О.С. Алейникова. Диссертация: Одиночество: философско-культурологический анализ. 2005.
4. И. С. Кон. В поисках себя. Личность и её самосознание. М.: Политиздат, 1984.
5. А. Ю. Гарбузов. Генезис одиночество. НГУ, 2009
6. Немов, Р. С. Психология: учебник / Р. С. Немов. – Москва: КноРус, – 2014. – 718 с.
7. Карпенко Л. А. Психология. Словарь 2-е изд., испр. и доп./ Л. А.Карпенко. - М.: Политиздат, 1990. – 496 с.
8. Kilicheva, M. R. (2019). Depiction of human psyche in Ulugbek Khamdam's novel "Loneliness". ISJ Theoretical & Applied Science, 12 (80), 678-680.
9. Kilicheva, M. (2020). The interpretation of loneliness in Uzbek and world proverbs. International Journal on Integrated Education, 3 (1), 165-167. <https://doi.org/10.31149/ijie.v3i1.307>
10. Kilicheva Mekhrinis Rajabovna, "The Literary-Philosophical Essence Of The Concept Of Loneliness", IEJRD - International Multidisciplinary Journal, vol. 5, no. Conference, p. 4, May 2020.



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ANALYSIS OF SPIRITUAL NEEDS

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ABSTRACT

The article covers the fact that spiritual needs are a factor determining the level of development of society, moral ideals, goals and interests. Also, the importance of the system of spiritual needs in the creation of the third Renaissance Foundation has been scientifically analyzed. It is possible to raise the level of knowledge of society, expand its worldview and through it influence the development of the country. Systematic work has been carried out in the country on the acquisition of knowledge and the acquisition of knowledge by people. Failure to meet the spiritual needs can lead to the emergence of various destructive ideas in the stable life of society, in some cases to pose a serious threat to the life of the state and society.

KEYWORDS: *Third Renaissance, Spiritual Need, Self-Realization, Morality, Aesthetics, Cognition, Society, Personality, Material Need.*

INTRODUCTION

The needs that arise in the life of a person – motivate him to creative activities. The creative activity of man is manifested in two directions: material production and spiritual production (cultural products designed to meet spiritual needs are created). Spiritual needs are more diverse and more complex in relation to substances.

The fact that human spiritual activity is aimed primarily at rational practical and theoretical knowledge of existence, if necessary, into emotional, heuristic Knowledge, Discovery, is one of the important signs of spiritual production or intellectual labor, creativity. This process is the process of satisfying the spiritual needs of a person through the creation of ideas, knowledge, theories, artistic images and other spiritual values, as well as the development of spiritual consciousness, worldview.

"Spiritual needs is a concept that expresses the desire of the state, society and the individual to meet spiritual demands, interests and needs other than material needs in a stable life," the Explanatory Dictionary of the basic concepts of spirituality says. Spiritual needs are clearly manifested in social, political, philosophical, scientific, moral, religious, legal and other directions. Failure to meet the spiritual needs can lead to the emergence of various destructive ideas in the stable life of society, in some cases to pose a serious threat to the life of the state and society. Therefore, with the gradual satisfaction of requirements and interests, manifested in the style of spiritual needs, it is possible to overcome many ideological-social problems.

Satisfied spiritual needs are the cause of the rise in the life of the individual and society, leading it towards development. In the essence of spiritual needs, first of all, the internal most important interrelations of things and phenomena, interests and aspirations, their legal relevance are expressed. Spiritual and cultural needs material and social requirements of a developed nation, requirements for a comfortable and free life, science and new advanced technologies are also high. The spirituality, science, literature and art of the people whose economy has developed, the opportunities to raise the culture of life, the cultural level will be high. These are, in turn, democratic freedoms, the opportunity to develop civil society.

Independence is ensured, the state of danger (satisfaction of the need for security) makes it easier for people living in a society to develop by employing their creative abilities. Spiritual needs are perceived in the form of manifestations of the parties, connections, characteristics that make up these things and phenomena. In its essence, a person emerges from self-expression and understanding by striving for knowledge, perfection, following high ideals. Spiritual needs indicate the level of development of society, moral ideals, the character of what goals and interests are oriented towards ideas. In its essence, it has concentrated the potential of creativity, creativity and creativity, and the satisfaction of spiritual needs becomes a tool for the development of society, social, economic, political improvement.

Spiritual needs are considered a high need, they can be divided into a number of groups:

The need for self-awareness (national self-awareness). One of the most difficult problems a person has is the realization of his own. Self-awareness is inherent in a person who knows his dignity, the feeling of appreciating others is also strong. It is considered that a person who knows his ancestry, his place in life and in society, his rights, responsibilities, civil duty, understands his own. Also, self-awareness expresses itself as a representative of the nation, a sense of belonging to his fate, aspirations, goals, and a sense of responsibility, pride in his native language, national culture, that is, a healthy pride. Self-awareness is an important spiritual need that is encountered at a time when the human mind begins to recognize it. National self-awareness is a deep understanding of what opportunities a person has for the prosperity of Vatan and the rise of society, the ability to mobilize himself for the emergence of these opportunities.

For people who do not understand themselves, reject humane ideas and views, demands and norms, do not know their place in the life of society, their rights, responsibilities, civil duty, there is no need for Renaissance or cultural development at all. In such a society, various problems arise: alienation among people, dependence on technical devices, weakening of human ideas, the degradation of values, the disappearance of material cultural and spiritual items.

Today, for the purpose of national self-awareness, the educational system has been radically changed, spiritual sciences have been enriched, our national values and cultural heritage have

been restored, people have been given extensive information about the scientific achievements, inventions and discoveries of great scientists. With the help of media, systematic programs on the spiritual life of society, its foundation, national self-awareness are being developed and delivered to the audience. So, without realizing our national identity, we must understand that our views on the creation of the third Renaissance, the measures that are being taken, are futile.

Cognition, acquisition of knowledge – is manifested in everyday life as the spiritual need of man. This need, as a form of spiritual activity, has been passing through certain stages of development from the time of the appearance of society to the present day. Through knowledge, a person acquires information and imagination about the surrounding world, deals with a certain type of activity.

In modern society, people are required to be educated. It is possible to raise the level of knowledge of society, expand its worldview and through it influence the development of the country. Systematic work has been carried out in the country on the acquisition of knowledge and the acquisition of knowledge by people. The president noted that the role of knowledge in creating a huge spiritual wealth in the country during the new awakening, making the life of the people comfortable and leaving a worthy legacy for future generations is incomparable: "the greatest wealth is intelligence and knowledge, the greatest legacy is good upbringing, the greatest poverty is ignorance."

The need of people to have a moral culture and to manifest them in a holistic manner is the basis of human activity and movement in today's society. Moral norms have a positive effect on the mood, behavior, everyday life of people, fulfilling motivating (stimulating) and restrictive (prohibiting) functions.

While morality forms the basis of human spirituality, moral needs also form the basis of people's spiritual needs. When people enter into a relationship in society, they need a variety of moral norms (Hello alik, shame, honesty, deceptions, correctness, honesty, respect, consideration of each other's interests, reconciliation, mutual assistance, kindness, fear of the Forbidden, negative attitude towards those who are deceitful, fraudulent, arrogant, etc.). Norms of morality are accepted by society and meet the moral needs of people, in turn, the satisfied moral needs are dictated by the creation of new, higher moral standards. It serves for the development of the spiritual environment of society.

Through the norms of morality – in the family, in the neighborhood, in labor, in production, in the person, in the group, even in the nation, etc., relations between people are regulated. It relies not on socio-political power (the power of state and administrative bodies), but on public opinion. For this reason, people are voluntarily subject to moral demands and norms. Moral ideas, norms, principles have a universal social meaning, and for all representatives of a particular culture, Kat.

In order to introduce the idea of the third Renaissance put forward by the president into life, an important role is played by the formation of honesty and decent living in society, the achievement of respect and attention of people, the good behavior, treatment of a person, the avoidance of lies, forgery and many other positive and moral qualities.

The aesthetic needs of a person are inextricably linked with the creative activity, which is the product of this activity. In the process of man's creative activity, an aesthetic goal, an aesthetic

ideal is formed. Hunarmad takes into account the tastes of people, the requirements of beauty in the work that he creates, in the product of the factory production, the bust created by the sculptor is beautiful, with elegance ishlangan, the state of rudeness, the person depicted seeks to describe the character, harmony, harmony, symmetry.

Aesthetic needs also form the basis of spirituality, like morality. Aesthetic needs are formed in the basis of the aesthetic consciousness of society and people, aesthetic needs, in turn, fall into the system of spiritual needs. When society develops aesthetic consciousness, aesthetic needs also rise accordingly. For example: if the work created by a writer, sculptor, singer, artist corresponds to the requirements of aesthetic taste, elegance, the projection of events in them is illuminated in proportion, harmony, if the behavior of the heroes of the work is not a fake, it is perceived as a great achievement in the field of art, and is respected among readers, viewers, observers, because their aesthetic And the satisfied need gives an "order" to create a new spiritual product.

The rise in the spiritual needs of people contributes to the development of the spiritual life of society. Although aesthetic categories are perceived as one for people (Beauty and honor, tragedy and comedy, elevation and depth), people can approach some products consumed in the spiritual life of society in different ways, and their spiritual needs can also be distinguished from each other: the national mentality of people, the religious-moral, the system of national values, individual tastes, the general spiritual-cultural level of For example, pornographic films, which are sold in film stores of many foreign countries, are highlighted as products that satisfy the spiritual needs of the population, more precisely, the needs for certain information, knowledge. Since it does not fit into our national mentality, this situation is assessed by our people as a source of dirt, not a product that satisfies the spiritual and aesthetic need.

Aesthetic taste is a manifestation of a person's thoughts, thoughts, behavior, behavior, behavior, behavior, material and spiritual products, on the basis of which lies the ability to distinguish beauty from vanity, to enjoy. The person who has developed an aesthetic taste will visit the various works that are exhibited in the visions not only for "just Tamasha", but also to see the beauty, elegance, artistic idea in it.

One of the main reasons why the rich cultural and spiritual heritage created in the "period of awakening" has not lost its value even today is that the products created by the creators have been created in a beautiful, harmonious way in all respects, without shortcomings, created with taste, to the extent that they can meet the spiritual needs of man.

Giving a person an objective and positive knowledge of the essence, meaning of true beauty, the need to strive for beauty is an important factor in the formation of his aesthetic consciousness, the development of his aesthetic needs, the raising of his spirituality by growing up, turning real beauty into the ideal of man. And this is one of the main requirements of the third Renaissance.

The need for creativity. Creativity is a constructive activity of a person aimed at creating innovation. In the process of creativity, the emotional (emotional perception, perception, imagination, emotion, passion, etc.) of the human psyche is formed.k.), rational (intelligence, understanding, ingenuity, attention, memory) and informal (intuition, spiritual guidance, etc.) unsurlari being in a mutually active relationship, this manifests the researcher's knowledge, skills, experience and talent. Creativity is also a manifestation of creativity, the activity of creating spiritual products. Representatives of writers, poets, artists, sculptors, illustrators,

illustrators, singers, dancers, directors and other people of creativity create their own products taking into account the "talabi of the era".

The need to master the craft. One of the most important things for Man is to master the craft. To understand the essence of any thing, to know the good and bad side of the world's events, to correctly understand the value of people, to properly organize the comfortable life of the family, to learn the craft in order to be an excellent person in all respects, to be skillful is a necessary need for a person.

Social feelings, which are formed under the influence of the external environment together with the external feelings of a person, are again perfected by upbringing: responsibility, humanity, love for people, morality and aesthetic tastes, with the help of which man finds content in his spiritual needs.

Contemplation and creative imagination are also the main criteria that shape spiritual needs, like feelings. Because with the help of creative imagination, people create a foundation for thoughts, views, ideas, theories. For example, artists, poets, musicians, etc. famous works of art, which appeared in their creative imagination as an idea before, will later become a source that satisfies the spiritual needs of people.

In conclusion, the spiritual needs of Man are manifested in many ways depending on the level of material and spiritual development of society. The spiritual need of a person creates spiritual interest, it is manifested in the process of the activity of a person, and as a result, spiritual value arises. Spiritual value, in turn, is the basis for the decision-making of a higher spiritual need. This cycle of spiritual development lasts forever.

USED LITERATURE

1. Mirziyoyev Sh.M. Teachers and mentors are our great strength, base and foothold in the restoration of the new Uzbekistan. People's questions. 2020 y., №207
2. Spirituality: Explanatory Dictionary of basic concepts. – Tashkent: publishing house named after Gafur Gulom, 2009. -25 b.
3. Erkaev A. Spirituality is the badge of the nation. T.: 1997, -188 b.
4. Erkaev A. Three laws of spirituality. Journal of thought. 2017, №2, 20-26 b.
5. Umarov E., Abdullaev M. Fundamentals of spirituality. "Publishing house named after chulpon-matbaa creative house" Tashkent-2006



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EVALUATION OF MACHINE LEARNING TECHNIQUES FOR GLAUCOMA RECOGNITION AND PREDICTION

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ABSTRACT

Glaucoma is a quiet vision thief. Early detection of glaucoma is almost difficult, and there is currently no treatment for glaucoma in its latter stages. This research looked at a variety of automated glaucoma detection methods. A thorough review of the literature was performed on preprocessing, feature extraction, feature selection, Machine Learning methods, and data sets utilized for testing and training. Automated glaucoma prediction is critical, but sadly, only a small amount of work has been done in this area, and only a minimal level of accuracy has been reached. However, automated glaucoma detection has progressed to the point that most machine learning methods can correctly identify 85 percent of glaucoma patients. Glaucoma can be predicted successfully using Optical Coherence Tomography.

KEYWORDS: *Glaucoma Detection, Glaucoma Prediction, Feature Selection, Feature Extraction, Machine Learning.*

INTRODUCTION

Glaucoma is a medical disease in which the optic nerve is damaged, and it is the second most common cause of visual loss. It's called the "quiet thief of sight." The illness of glaucoma was first discovered in the 17th century. Its significance as a cause of blindness has been recognized since the nineteenth century. The first understanding of its etiology and therapy dates from the twentieth century. Its averting will, ideally, be a task for the twenty-first century. Glaucoma is derived from the ancient Greek word glaucoma, which means cloudy or blue-green tint. It was most likely used to describe someone who had a swollen cornea or was quickly developing a cataract, either of which would have been caused by chronic (long-term) increased pressure within the eye. Glaucoma may be automatically diagnosed based on a number of clinical findings by various eye-care specialists. It is a collection of illnesses with certain similar

features, rather than a single disease. The ophthalmoscope was a significant innovation that made it feasible to identify glaucomatous abnormalities in the fundus. Glaucoma simplex is a condition that causes blindness due to high intraocular pressure. The development of the tonometer and the perimeter, as well as the usage of cocaine, helped to advance glaucoma diagnosis. The first successful surgical glaucoma therapy[1].

Various Machine Learning methods have been used to automate the diagnosis and prediction of glaucoma during the past few decades. Neural networks, decision trees based on ID3 methods, Vector Support Machine, Naive Bayes classifier, k- closest neighbor, Canny edge detector, active contour model, linear regression, and Fuzzy min-max neural network were used to accomplish automated glaucoma diagnosis. There has been very little work done on automated glaucoma prediction, with just two methods being used: fuzzy logic and linear regression[2].

1.1. Glaucoma detection method that is automated

Figure 1 depicts a general automated glaucoma detection method.

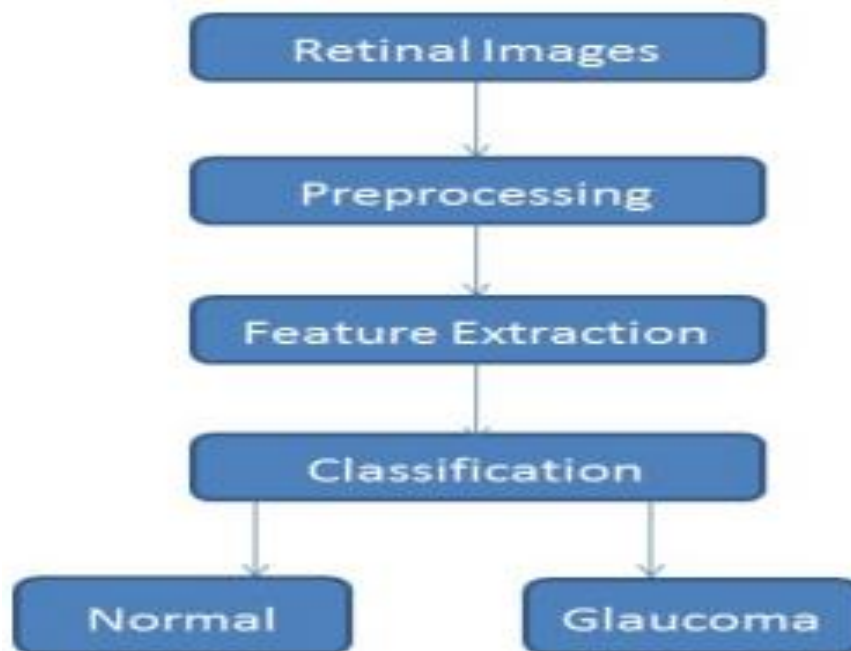


Figure 1: Illustrate the diagram shows the generic Process for Automated Glaucoma Detection

The initial step in the identification of glaucoma is to obtain a digital picture of the retina. Then, in order to equalize anomalies with pictures, preprocessing is needed. Feature extraction is the process of reducing the number of resources needed to properly describe a big data collection. A feature is a significant piece of information that may be used to classify anything[3]. The study of an image's characteristics is referred to as classification. The dataset is divided into two groups based on the results of the analysis: normal and glaucoma-affected.

1.2.Types of glaucoma

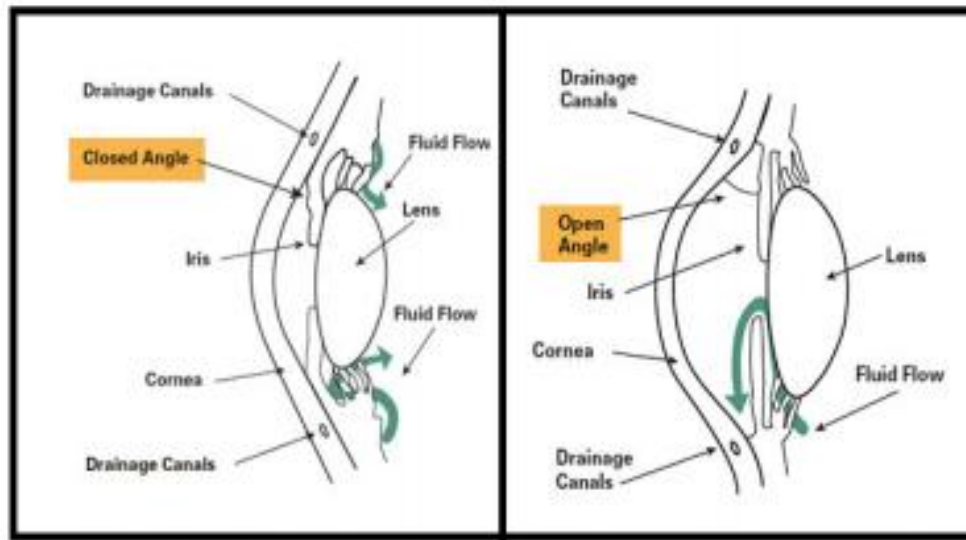


Figure 2: schematic diagram shows the types of glaucoma: (a) and (b) represents, angle-closure glaucoma and open-angle glaucoma respectively.

Transparent glaucoma and Angle-Closure glaucoma are the two most common forms of glaucoma. The much more prevalent kind of glaucoma, open-angle glaucoma, accounts for at least 90% of all glaucoma cases. Glaucoma is caused by an increase in ocular pressure in both types of glaucoma. Angle-Closure glaucoma has a small angle between the IRIS and the cornea, while open-angle glaucoma has a broad angle[4]. Angle-closure glaucoma (a) and open-angle glaucoma (b) are shown in Figure 2. Angle-Closure glaucoma develops rapidly and has noticeable symptoms, while open-angle glaucoma develops slowly and has no noticeable symptoms.

1.3.Technologies for ophthalmic imaging

The most significant factor in glaucoma detection is the ophthalmic imaging technology utilized to collect images for glaucoma detection. The more comprehensive and crisp the picture under observation, the more precise the detection and prediction will be. Fundus pictures, Confocal Scanning Laser Tomography, and Optic Coherence Tomography are among the ocular imaging technologies used to acquire images for the diagnosis and prediction of glaucoma. Fundus pictures are basic digital photographs that do not include any of the eye's interior features[5]. A laser light is used in CSLT. Confocal imaging is the technique of using a focused laser beam to scan an object part by part and collecting the reflected light via a tiny opening called a confocal pin hole. The interior features of the eye are captured via OCT, which utilizes light and generates a picture based on reflected light. Figure 3 depicts an overview of work done to identify and forecast glaucoma using various imaging methods. It can be observed that only a small amount of work has been done in glaucoma prediction, with the majority of work being done utilizing fundus images.

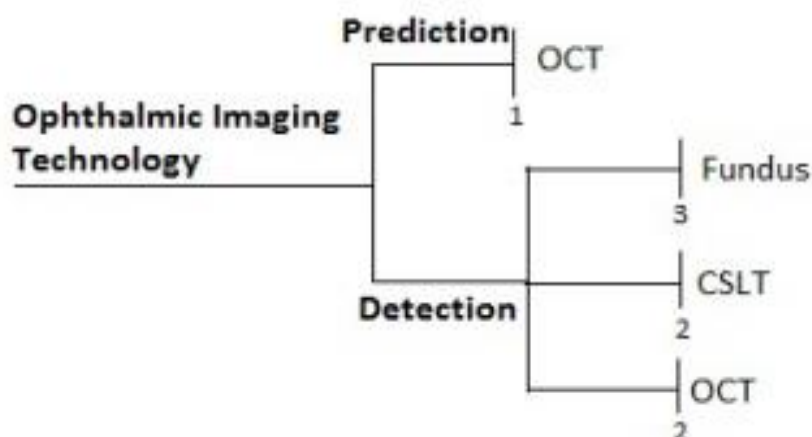


Figure 3: Overview of Ophthalmic Imaging Technologies used for detection and prediction of glaucoma

1.4. Techniques for preprocessing

For error-free glaucoma diagnosis, several preprocessing methods have been used to pictures. Figure 4 depicts several glaucoma detection preprocessing methods.

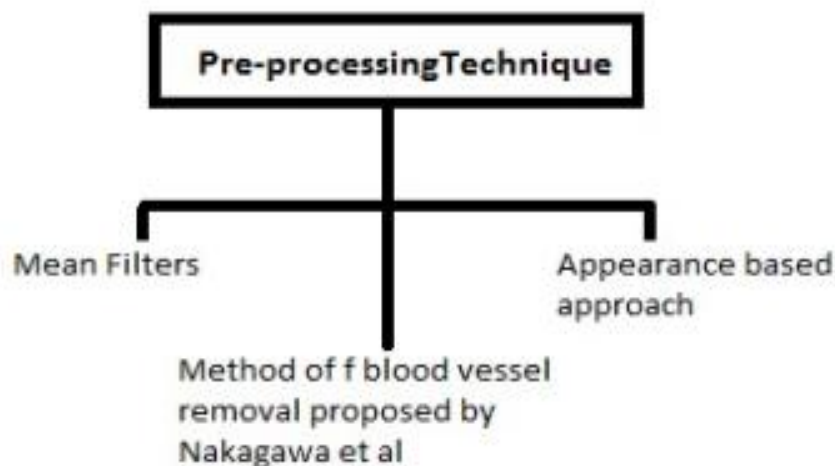


Figure 4: Illustrate the diagram shows the preprocessing Techniques used in detection of Glaucoma

Appearance based approach was implanted in to segment blood vessels and spatially in paint them to a vessel free image.



Figure 5: Illustrate the Vessel in painting on color fundus Image after preprocessing

After preprocessing, Fig. 5 displays a vessel-free picture. The methodology of blood vessel elimination suggested by Nakagawa et al. was used in preprocessing[6]. Color convention, scaling the picture, and noise reduction from the original image were all done using mean filters in the pre-processing of OCT images.

1.5. Techniques for extracting features

The most important activity is feature extraction. The accuracy of the system is mostly determined by its features. Various automated feature extractions were utilized to make the glaucoma detection procedure effective. Figure 6 depicts a few methods utilized in the glaucoma detection procedure, as well as the method approach used to identify feature Mean and Variance. Luminance and translation invariance size were included in several extractions such as Pixel Intensity Value, Textures, F Pixels Intensity, and Histogram Model[7]. Utilized the P-tile threshold technique to identify color and form. Macular Cub was used in to extract characteristics such as the macula thick sequential FMM in the painting technique module to detect features such as the cup to disc ratio, configuration, and vessel distribution information. Feature Extraction Techniques for Detection (Fig. 6).

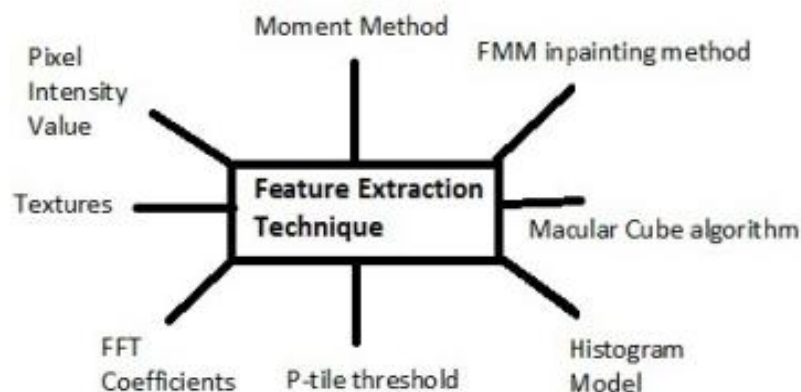


Figure 6: Feature Extraction Techniques used in detection of glaucoma

1.6. Technique for selecting features

The process of choosing a subset of relevant characteristics for use in model building is known as feature selection. Various feature selection methods utilized in glaucoma detection are shown

in Figure 8. Principle Thirty of the 950 dimensions were identified using the component analysis method.

1.7. Glaucoma detection using a referential detection feature

Glaucoma is a word that refers to a collection of illnesses rather than a specific condition. Glaucoma is detected using a variety of referral detection features. Different referential detecting characteristics that have been utilized in glaucoma detection are mentioned in Fig. 7.

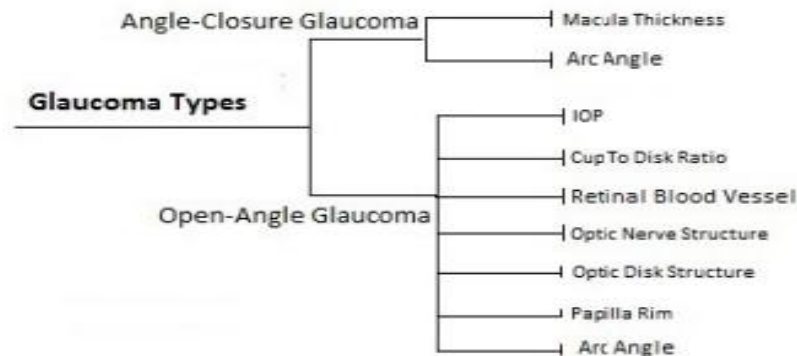


Figure 7: Indication of Recommendation Detection Feature for glaucoma

Angle-closure glaucoma was detected using Macula Thickness. Inter Ocular Pressure (IOP) was utilized as a detecting method. For the purpose of detection, the retinal blood vessel was utilized. The structure of the optic nerve was utilized. The rim of the papilla was utilized to detect activity. The arc angle was utilized to determine if the patient had open-angle or angle closure glaucoma[8].

REVIEW OF THE LITERATURE

In the framework of clinical vision research, Miguel Caixinha investigated the role of machine learning methods for diagnosis and illness monitoring. Many eye disorders that lead to blindness may be prevented or postponed if identified and treated early on. New sources of data for early illness diagnosis and patient management are now accessible because to recent advances in diagnostic equipment, imaging, and genomics. Machine learning methods first appeared in the biomedical sciences as clinical decision-support tools to enhance the sensitivity and specificity of illness diagnosis and monitoring, allowing clinicians to make more objective decisions. This paper provides an overview of machine learning methods for multimodal ocular illness diagnosis and monitoring. Machine learning algorithms are used to identify complicated patterns in a dataset automatically. When a group label is provided for each instance, these methods allow for the creation of homogenous groups or the creation of a classifier that predicts group membership of new cases. To guarantee that machine learning methods work well in a particular dataset, all potential sources of bias should be eliminated or reduced. The second part of this article will describe and explore the use of machine learning methods in ocular disease detection and monitoring[9].

Machine learning is involved with the creation and implementation of algorithms and methods that enable computers to “learn” patterns in data via repeated processes. CHRISTOPHER

BOWD researched it. Observed or unobserved processes may be used. Machine learning classifiers are not bound by statistical assumptions, making them flexible to a wide range of data. Recent applications of MLC approaches to the identification and monitoring of glaucoma using visual field and optical imaging data indicate that these methods can outperform existing methods. This paper covers MLC methods as they have been used to visual function and optical imaging in glaucoma research. It also offers some background on the classification problem in glaucoma and the construction and assessment of MLCs[10].

DISCUSSION

This article discusses some of the most common machine learning techniques used in vision science. However, in order to develop unbiased prediction models in clinical vision sciences, a number of issues must be resolved. The selection of the training sample is one of the main issues with prediction models in eye disorders. For patient diagnosis or illness prediction, predictive models should be developed. The majority of published studies only examine one eye per patient, which is chosen at random, based on the patient's right or left eye, or based on the patient's worse or better eye. New methods must be developed to build a prediction model that considers eye specific variables within each patient rather than each eye separately. Clustering-based approaches may be able to solve this issue. Because the model was trained solely for glaucoma or non-glaucoma prediction, a glaucoma detection model deployed in a patient with diabetic retinopathy may fail to recognize the patient's eyes as sick.

CONCLUSION

Glaucoma steals vision invisibly and causes irreversible loss to vision without being detected in its early stages. Glaucoma has no symptoms until it has progressed to the point where it is chronic, and there is currently no treatment for the illness in its advanced stages. Early identification of glaucoma has received little attention. However, automated glaucoma identification utilizing machine learning has shown to be an effective approach, with an 80 percent success rate. Because of its capacity to extract comprehensive and in-depth internal structures of the eye, OCT pictures may be utilized to accurately anticipate glaucoma symptoms. Existing prediction models, on the other hand, are often based on a training set consisting of one of the patient's eyes, with the selected eye being normal or sick. For example, proposed a nonparametric method in which each eye is treated as a sub-unit of a cluster, i.e. the patient. Furthermore, while employing the predictive models in the real world, the patients' eyes may be in a different state from the one that was taken into account when the models were being trained. Glaucoma patients with early detection and recovery.

REFERENCES

1. T. Khalil, S. Khalid, and A. M. Syed, "Review of Machine Learning techniques for glaucoma detection and prediction," *Proc. 2014 Sci. Inf. Conf. SAI 2014*, pp. 438–442, 2014, doi: 10.1109/SAI.2014.6918224.
2. A. A. Salam, M. U. Akram, K. Wazir, and S. M. Anwar, "Using Structural Features," *Ieee*, vol. 1, 2015.
3. R. Belgacem, I. taamallah Malek, H. Trabelsi, and I. Jabri, "A supervised machine learning algorithm SKVMs used for both classification and screening of glaucoma disease," *New Front. Ophthalmol.*, 2018, doi: 10.15761/nfo.1000211.

4. T. Köhler, R. Bock, J. Horneegger, and G. Michelson, "Computer-aided diagnostics and pattern recognition: Automated glaucoma detection," in *Teleophthalmology in Preventive Medicine*, 2015.
5. S. Cheriguene, N. Azizi, and N. Dey, "Ensemble classifiers construction using diversity measures and random subspace algorithm combination: Application to glaucoma diagnosis," in *Studies in Computational Intelligence*, 2016.
6. Chengqi Zhang*, Ling Guan**, and Z. Chi, "Introduction to the Special Issue on Learning in Intelligent Algorithms and Systems Design," *J. Adv. Comput. Intell. Intell. Informatics*, 1999, doi: 10.20965/jaciii.1999.p0439.
7. M. Christopher *et al.*, "Retinal nerve fiber layer features identified by unsupervised machine learning on optical coherence tomography scans predict glaucoma progression," *Investig. Ophthalmol. Vis. Sci.*, 2018, doi: 10.1167/iov.17-23387.
8. T. Khalil, S. Khalid, and A. M. Syed, "Review of Machine Learning techniques for glaucoma detection and prediction," 2014, doi: 10.1109/SAI.2014.6918224.
9. M. Caixinha and S. Nunes, "Machine Learning Techniques in Clinical Vision Sciences," *Curr. Eye Res.*, vol. 42, no. 1, pp. 1–15, 2017, doi: 10.1080/02713683.2016.1175019.
10. C. Bowd and M. H. Goldbaum, "Machine learning classifiers in glaucoma," *Optom. Vis. Sci.*, vol. 85, no. 6, pp. 396–405, 2008, doi: 10.1097/OPX.0b013e3181783ab6.



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AN OVERVIEW ON PYROLYSIS OF PLASTIC TRASHES

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ABSTRACT

Due to the many uses of plastics in a variety of industries, worldwide plastic manufacturing has grown throughout time. The constant demand for plastics resulted in the buildup of plastic trash in landfills, which took up a lot of space and contributed to the environmental issue. Because plastics are a petroleum-based substance, increased demand for plastics resulted in the depletion of petroleum as a non-renewable fossil fuel. Recycling and energy recovery methods are two options for managing plastic trash that have been explored. However, the recycling technique had several disadvantages, such as high labor costs for the separation process and water pollution, which made the practice less sustainable. As a result of these flaws, researchers have shifted their focus to the energy recovery technique to offset the high energy consumption. Plastic waste conversion to energy was created after significant study and technological development. Because petroleum was the primary source of plastic, the conversion of plastic to liquid oil via the pyrolysis process had enormous potential, as the oil produced had a high calorific value comparable to commercial fuel. The pyrolysis process for each type of plastic was reviewed, as well as the main process parameters that influenced the final end product, such as oil, gaseous, and char. Temperatures, reactor type, residence time, pressure, catalysts, fluidizing gas type, and flow rate were among the key parameters discussed in this study.

KEYWORDS: *Energy recovery, Fuel, Liquid product, Plastic wastes, Pyrolysis.*

INTRODUCTION

For much more than 50 years, plastic has played an important part in improving people's quality of living. It is essential for the development of numerous goods in a variety of industries, including construction, healthcare, electronics, automotive, packaging, and others. The increasing expansion of the global population has raised the need for commodity plastics. Plastic

output peaked at about 299 million tons in 2013 and has continued to rise. The ever-increasing demand for plastic has resulted in an annual increase in trash buildup[1]. This demonstrates that the proportion of plastic trash that ended up in the landfill was still extremely high, occupying a significant amount of space. Plastics may take billions of years to naturally breakdown. They disintegrate gradually because plastic is made up of molecular bonds including hydrogen, carbon, and a few additional elements like nitrogen, chlorine, and others that make it extremely durable. Continuous landfill dumping of plastic would undoubtedly pose a significant environmental threat.

Pyrolysis is the process of using heat and pressure to break down long chain polymer molecules into smaller, less complicated ones. The procedure requires high heat for a brief period of time in the absence of oxygen. Oil, gas, and char are the three main products generated during pyrolysis, and they are important in sectors such as production and refineries. Many researchers selected pyrolysis because it produces a large quantity of liquid oil, up to 80 weight percent, at a modest temperature of 500 degrees Celsius. Furthermore, pyrolysis is very adaptable, since process parameters may be tweaked to maximize product yield depending on preferences[2]. The liquid oil generated may be utilized in a variety of applications, including furnaces, boilers, turbines, and diesel engines, without the need for further treatment or upgrading. Pyrolysis, unlike recycling, does not pollute water and is considered a green technology when the pyrolysis waste, which is gaseous, has a significant calorific value that may be utilized to offset the pyrolysis plant's total energy demand. Because it does not need an expensive sorting procedure, the process handling is also simpler and more flexible than traditional recycling methods.

1.1 Pyrolysis of plastics

Various kinds of plastics feature different compositions, which are often described in terms of their proximate analysis. Proximate analysis is a method for determining the chemical characteristics of a plastic composite using four specific elements: moisture content, fixed carbon, volatile matter, and ash content. The main variables that affect the liquid oil output in the pyrolysis process are volatile matter and ash content. High volatile matter promoted liquid oil production, while high ash content reduced liquid oil production, resulting in higher gaseous output and char formation. These features suggest that plastics have a great potential for pyrolysis to generate significant amounts of liquid oil. Because the findings of the plastics proximate analysis are so compelling, the next discussion will concentrate on the pyrolysis process factors that have a significant impact on liquid output[3].

PET (polyethylene terephthalate) has emerged as a popular plastic packaging material for a variety of food items, including drinks such as mineral water, soft drink bottles, and fruit juice containers. This is owing to its inherent characteristics, which make it ideal for high-capacity, lightweight, and pressure-resistant containers. Electrical insulation, printing sheets, magnetic tapes, X-ray and other photographic film are some of the additional uses for PET. The widespread usage of PET would result in a build-up of PET trash in landfills. The current practice for dealing with accumulated plastic waste was to recycle PET waste. However, the bulkiness of the containers results in frequent collections, which raises transportation expenses. PET trash must be separated into various grades and colors to facilitate recycling, which makes recovery inefficient and uneconomical[4]. As a result, additional options for PET recovery, such as the pyrolysis method, have been investigated, and the product yield has been evaluated by a number of researchers.

Polyethylene with a high density

HDPE is defined as a long linear polymer chain with a high degree of crystallinity and little branching, resulting in great strength. HDPE is extensively utilized in the production of milk bottles, detergent bottles, oil containers, toys, and other items because to its high tensile characteristics. The different uses account for approximately 3% of the plastic waste category, which is the third most common kind of plastic found in municipal solid trash. HDPE wastes have a lot of promise for pyrolysis since they may generate a lot of liquid depending on the setup conditions. Many research on HDPE pyrolysis at various operating settings have been performed to determine the product yield[5].

1.2. Polyvinyl chloride (PVC) is a kind of plastic.

PVC is unique because it is made up of 57 percent chlorine and 43 percent carbon, unlike other thermoplastics such as polyethylene, polystyrene, and polypropylene, which may be softened by heating and are exclusively produced from oil. PVC has a high fire resistance due to its chlorine content, making it ideal for electrical insulation. PVC is a versatile material since it may be combined with a variety of additives. Wire and cable insulation, window frames, boots, food foil, medical equipment, blood bags, automobile interiors, packaging, credit cards, synthetic leather, and other uses of PVC are common. Despite its broad range of uses, research on PVC pyrolysis has been limited in the literature owing to the hazardous chemical that it tends to produce when heated to high temperatures[6].

1.3. Polyethylene with a low density

LDPE has greater branching than HDPE, which leads in a weaker intermolecular force and therefore lower tensile strength and hardness. LDPE, on the other hand, has greater ductility than HDPE because the side branching makes the structure less crystalline and easier to shape. It has high water resistance and is therefore extensively used in plastic bags, packing foils, garbage bags, and other applications. All of these products are ubiquitous in our everyday lives, and as a result, LDPE trash has accumulated to the point that it is now the second most frequent plastic waste in MSW, behind PP. Pyrolysis of LDPE to oil product has recently garnered a lot of interest from researchers as a method to recover energy and minimize waste.

- *Polypropylene*

PP is a chemically and thermally resistant saturated polymer having a linear hydrocarbon chain. PP, unlike HDPE, does not melt at temperatures below 160 degrees Celsius. It has a lesser density than HDPE, but it has a greater hardness and stiffness, making it a better choice for the plastics sector. PP accounts for approximately 22% of the plastic wastes category, which contains the most plastics in MSW. Flowerpots, office files, vehicle bumpers, pails, rugs, furniture, storage boxes, and other items are among the many uses. Because of the increasing need for PP in everyday life, the quantity of PP wastes grows each year, pyrolysis of PP is one of the energy recovery techniques available. Several studies have looked at the pyrolysis of PP at different temperatures and pressures to determine the liquid oil production and characteristics.

- *Polystyrene*

PS is composed up of styrene monomers derived from petrochemical liquids. A lengthy hydrocarbon chain with phenyl groups linked to every other carbon atom makes up the structure.

PS is colorless by nature, but it may be tinted using colorants. Its heat resistance, as well as its acceptable durability, strength, and lightweight, make it suitable for a wide range of applications, including food packaging, electronics, construction, medical, appliances, and toys. The enormous quantity of PS in MSW collected each year is reflected in the broad variety of uses. PS is unfortunately not accepted in the roadside recycling program, which only accepts glasses, papers, cans, and certain plastics[7]. Despite the fact that there is a plastic category, most individuals do not place foam food packaging in the plastics recycling bin and instead place it in the general trash. Because of its low density polystyrene foam, PS is usually not separated and is difficult to collect for recycling. As a result, the only option to completely use PS waste is to use the pyrolysis process to convert it into a more valuable oil product rather than letting it sit in landfills indefinitely.

- *Mixed plastics*

As noted previously, the pyrolysis process offers an advantage over recycling in that it does not need a thorough sorting procedure. Most plastics are incompatible with one another in the recycling process and cannot be processed together. For example, a little quantity of PVC contamination in the PET recycling stream would damage the whole PET resin, turning it yellow and brittle, necessitating reprocessing. This demonstrates that the recycling process is so sensitive to contamination that all plastics must be separated by resin type, color, and transparency. However, since liquid oil can still be generated from the mixed polymers in the feedstock, the pyrolysis method seems to be more sustainable. Several researchers who studied the pyrolysis of mixed polymers have run across this problem.

1.4. The condition of the process parameters

In every process, parameters play a critical role in maximizing product yield and composition. The generation of ultimate end products such as liquid oil, gaseous, and char may be influenced by critical process factors in plastic pyrolysis. Temperature, reactor type, pressure, residence duration, catalysts, fluidizing gas type, and rate are some of the most significant factors. Controlling the parameters at various levels may result in the desired product. The subsections that follow go through the operational settings in more detail.

- *Temperature*

Temperature was among the most important operational factors in pyrolysis since it affects the polymer chain's breaking response. The Van der Waals force attracts molecules together, which prevents them from collapsing. When the temperature of a system rises, the vibration of molecules within the system rises, and molecules prefer to evaporate away from the object's surface. When the energy generated by the Van der Waals force along polymer chains is higher than the enthalpy of the C–C bond in the chain, the carbon chain is broken.

1.5. Reactors' types

The kind of reactor has a significant effect on the mixing of polymers and catalysts, residence duration, heat transmission, and reaction efficiency in producing the desired end product. In the lab, most plastic pyrolysis was done in batch, semi-batch, or continuous-flow reactors such fluidized bed, fixed-bed reactor, and conical spouted bed reactor. In the next subsections, the benefits and drawbacks of each reactor will be addressed.

- *Reactors, both batch and semi-batch*

During the reaction, a batch reactor is essentially a closed system with no input or outflow of reactants or products. One of the benefits of batch reactors is that they may obtain high conversion by keeping the reactant in the reactor for a long period of time. Batch reactors, on the other hand, have the drawbacks of product unpredictability from batch to batch, high labor costs each batch, and difficulties in large-scale manufacturing.

- *Reactors with fixed and fluidized beds*

Although it is simple to construct, there are certain limitations, such as the uneven particle size and form of plastics used as feedstock, which may create problems during the feeding process. Furthermore, the reaction's access to the catalyst's accessible surface area is restricted. Several studies, however, opted to utilize a fixed-bed reactor for plastic pyrolysis.

- *Reactor with a conical spouted bed*

The CSBR (conical spouted bed reactor) offers excellent mixing and can handle a wide particle size range, bigger particles, and different particle densities. CSBR was utilized by several researchers in their plastic catalytic cracking studies. When treating sticky materials, it also had a significant heat transfer between phases and a slight DE fluidization issue. However, a number of technical issues have arisen during the operation of this reactor, including catalyst feeding, catalyst entrainment, and product collection, making it less desirable.

- *Microwave-assisted technology*

Microwave technology has recently gained popularity, and it now provides a new method for waste recovery through the pyrolysis process. A microwave-absorbent substance, such as particulate carbon, is combined with the waste products in this procedure. The microwave absorbent absorbs microwave radiation to provide enough thermal energy to reach the temperatures needed for extensive pyrolysis. Microwave radiation has many benefits over traditional pyrolysis, including faster heating, higher manufacturing speed, and cheaper prices. Microwave energy is delivered directly to the material via molecular interaction with the electromagnetic field, unlike traditional techniques, thus no time is spent heating up the surrounding region.

1.6. By-products of the plastic pyrolysis

As a by-product of the pyrolysis of plastics, char and gas are produced. In pyrolysis, many factors such as temperature, heating rate, pressure, and residence duration have a significant impact on the percentage of by-product. The following is some information on the by-products produced:

In the pyrolysis process, char production is aided by a slow heating rate at a very low temperature and a lengthy residence period. Even though char production in the rapid pyrolysis process is often minimal, the characteristics and uses of the char should be considered to fully realize the promise of plastic pyrolysis. The char characteristics produced from the pyrolysis of HDPE plastic waste were investigated. The major components of the char were determined to be volatile matter and fixed carbon, whereas moisture and ash were minority, according to the proximate analysis.

The optimum conditions for maximizing gas generation in the pyrolysis process were gas, high temperature, and extended residence time. These circumstances, on the other hand, are diametrically opposed to the characteristics that optimize oil output.

LITERATURE REVIEW

J.F. Mastral et al. studied the scientific life at the moment bed reactor was used to catalytically breakdown high density polyethylene in order to achieve a high yield of gas fractions at moderate temperatures between 350 and 550 C. Nanocrystal line HZSM-5 zeolite was employed as the catalyst. The gas fractionation, which were mostly made up of olefins, had high yields of butanes. Waxes were entirely made up of linear and branched paraffin with C10 to C20 components. The impact of temperature and the polymer-to-catalyst proportion on product yield was investigated. When the operating temperature was modest or the polymer to catalyst ratio was high, gas conversion was significantly reduced. The gas as well as wax compositions substantially changed, indicating that a portion of the HDPE was thermally decomposed, increasing the olefin content in the waxes. Experiments with high polymer to catalysis ratios, achieving a 50 percent olefin content in the waxes, revealed the similar variance. Thermal and catalytic degradations may both be blamed for the variations in product distributions[8].

MochamadSyamsiro et al. studied the goal of this study was to look into the manufacture of fuel oil from municipal plastic trash using a series of pyrolysis and catalytic reforming methods. In Yogyakarta, Indonesia, three types of municipal plastic trash were collected from the ultimate disposal site and a small recycling business. In this research, commercial Y-zeolite and natural zeolite catalysts were utilized. The findings indicate that feedstock types have a significant impact on product yields and quality of liquid and solid outputs. The liquid percentage from HDPE trash was the highest. The addition of catalysts decreased the liquid fraction while increasing the gaseous fraction. In addition, pyrolysis of municipal plastic wastes generated greater heating value solid products than biomass and relatively low level coal[9].

Yusaku Sakata et al. studied the thermal decomposition of polymeric polymers into fuel oil in the presence of a mesoporous silica accelerator has been studied. The yields, composition, frequency rate of degradation of polyethylene using KFS were compared to those obtained using a solid acid catalyst and non-catalytic heat degradation. PE degraded just as quickly over KFS, which has no acid sites, as it did over silica–alumina, and the output of liquid products was greater. These results indicate that the mesoporous enclosed by the silica sheet may serve as a flask for keeping radical species for a long period, and that long-lived radicals therefore accelerate the breakdown of polymers[10].

DISCUSSION

This analysis revealed that many studies have been conducted to examine the possibility of the plastic pyrolysis process for producing valuable goods such as liquid oil, with promising findings. This method has many benefits, including improving waste management, decreasing reliance on fossil fuels, expanding energy sources, and preventing environmental pollution. The method may be used with a variety of settings, resulting in a variety of liquid oil production and quality. Aside from that, this method provides more flexibility and economic feasibility in terms of process management and product variability. At various circumstances, summarized the optimal temperature needed to maximize liquid oil production in thermal and catalytic pyrolysis.

The kind of reactors, pressure, heating rate, and pyrolysis time for each form of plastic are also impacted. The fluidizing media used in all of the tests was nitrogen gas.

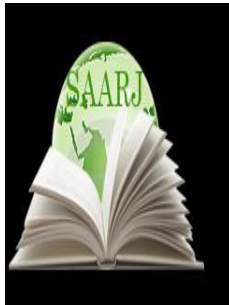
CONCLUSION

This study offered a brief overview of plastic pyrolysis for each kind of plastic, as well as a discussion of the key influencing factors for optimizing liquid oil production. According to studies in the literature, most researchers selected the pyrolysis process because of its ability to convert the most energy from plastic trash into useful liquid oil, gaseous, and char. As a result, it is the greatest option for converting plastic waste and is also the most cost-effective in terms of operating. Adjusting the settings to obtain the flexibility it offers in terms of product choice is possible. Pyrolysis may take place in a thermal or catalytic process. With the appropriate catalyst selection, the catalytic process offered a lower operating temperature and a higher output of liquid oil for most polymers. The process's long-term viability is clear, given that the quantity of plastic trash accessible in each nation is in the millions of tons. Waste management becomes more efficient using the pyrolysis technique, which requires less landfill capacity, produces less pollution, and is also more cost effective. Furthermore, because of the availability of the pyrolysis technique for decomposing plastic into useful energy fuel, the reliance on non-renewable energy sources such as fossil fuels may be decreased, thus alleviating the increase in energy demand.

REFERENCES

1. S. M. Fakhrhoseini and M. Dastanian, "Predicting pyrolysis products of PE, PP, and PET using NRTL activity coefficient model," *J. Chem.*, vol. 2013, pp. 7–9, 2013, doi: 10.1155/2013/487676.
2. S. D. Anuar Sharuddin, F. Abnisa, W. M. A. Wan Daud, and M. K. Aroua, "A review on pyrolysis of plastic wastes," *Energy Convers. Manag.*, vol. 115, pp. 308–326, 2016, doi: 10.1016/j.enconman.2016.02.037.
3. Adnan, J. Shah, and M. R. Jan, "Thermo-catalytic pyrolysis of polystyrene in the presence of zinc bulk catalysts," *J. Taiwan Inst. Chem. Eng.*, vol. 45, no. 5, pp. 2494–2500, 2014, doi: 10.1016/j.jtice.2014.05.011.
4. M. Elsharafi *et al.*, "Heat transfer technology to convert plastic trash to oil," 2017, doi: 10.1115/IMECE2017-70953.
5. A. Aboulkas, K. El harfi, and A. El Bouadili, "Thermal degradation behaviors of polyethylene and polypropylene. Part I: Pyrolysis kinetics and mechanisms," *Energy Convers. Manag.*, vol. 51, no. 7, pp. 1363–1369, 2010, doi: 10.1016/j.enconman.2009.12.017.
6. K. H. Dufrane and M. Wilke, "Controlled Air Pyrolysis Incinerator," 1983.
7. A. A. Natividad, J. Timoneda, J. Battle-Sales, V. Bordas, and A. Murgui, "New Method for MEasuring Dehydrogenase Activity in Soils," 1997.
8. J. F. Mastral, C. Berrueto, M. Gea, and J. Ceamanos, "Catalytic degradation of high density polyethylene over nanocrystalline HZSM-5 zeolite," *Polym. Degrad. Stab.*, vol. 91, no. 12, pp. 3330–3338, 2006, doi: 10.1016/j.polymdegradstab.2006.06.009.

9. M. Syamsiro *et al.*, “Fuel oil production from municipal plastic wastes in sequential pyrolysis and catalytic reforming reactors,” *Energy Procedia*, vol. 47, pp. 180–188, 2014, doi: 10.1016/j.egypro.2014.01.212.
10. Y. Sakata, M. Azhar Uddin, A. Muto, Y. Kanada, K. Koizumi, and K. Murata, “Catalytic degradation of polyethylene into fuel oil over mesoporous silica (KFS-16) catalyst,” *J. Anal. Appl. Pyrolysis*, vol. 43, no. 1, pp. 15–25, 1997, doi: 10.1016/S0165-2370(97)00052-1.



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FORMATION OF A MECHANISM OF STATE SUPPORT FOR INNOVATIVE DEVELOPMENT IN THE SERVICE INDUSTRIES

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ABSTRACT

The article discusses issues related to innovative development in the service industries, as well as the formation of a mechanism for state support. It also provides definitions and opinions of scientists, through which the formation of a mechanism of state support for innovative development in the service sectors is determined.

KEYWORDS: *Economy, State, Service Sector, Innovation, Mechanism, Reforms, Competition, Development.*

INTRODUCTORY PART

An important factor in the growth of the competitiveness of any country is its gradual transition to an innovative path of development. According to authoritative experts, "in solving the entire spectrum of strategically important problems of various countries in the 21st century, a key role is assigned to innovations, innovative activities and a knowledge-based economy or an innovative economy." Indeed, world experience shows that the transition to the path of sustainable development of such highly developed countries as the United States and Japan, a number of countries of the European Union and Southeast Asia, was achieved mainly through the expansion of innovation processes in the real sector of the economy.

The main factor in the effectiveness of innovation is the presence of an economic mechanism called by K. Freeman "national innovation system". It is precisely at its formation that in recent decades the activities of the governments of a number of states intending to achieve significant success in world markets in the face of tougher competition have been aimed.

Main part. In Uzbekistan, innovation activities are supported by the state. This is done through the regulatory system, government and departmental funds, large projects and investment programs, taxation, and other instruments. After independence, one of the first normative

documents in this area are the Decree of the President of the Republic of Uzbekistan "On state support of science and the development of innovative activities" dated July 8, 1992, and the Decree of the Cabinet of Ministers "On measures of state support for the development of science and innovation" of July 21, 1992, which created the basis for stimulating the country's innovative development.

In accordance with the Resolution of the President of Uzbekistan "On measures to improve the coordination and management of the development of science and technology" dated August 7, 2006, reforms in the field of management and financing of domestic science, focusing its efforts on priority areas for the country were continued. Thus, the Decree of the President of the Republic of Uzbekistan "On additional measures to stimulate the introduction of innovative projects and technologies into production" dated July 15, 2008, in accordance with which structural reforms were carried out in the system research management.

In the period 1992-2017. in accordance with the adopted legal acts, responsibility for the implementation of innovative projects under priority state programs was assigned to the Committee for the Coordination of Science and Technology Development under the Cabinet of Ministers (later renamed the Agency, since 2018 - the Ministry of Innovative Development), and the promotion of science-intensive technologies in production - to the Ministry of Economy.

The gradual development of the science management system made it possible to improve the mechanism for promoting research: from fundamental and applied developments to innovative works aimed at their practical application. Annual republican fairs of innovative ideas, technologies and projects have become one of the important tools for the implementation, as well as the commercialization of research results, ensuring a closer connection between science and production, manufacturers of innovative products and their consumers. Thus, during the fairs, more than 4 thousand innovative ideas, developments and technologies were demonstrated. Over 3 thousand contracts were signed with a total value of over 110 billion soums. As a result, more than \$ 1.0 trillion worth of new products was produced. soums.

Discussions and results. The measures taken over the years of independence to form an innovative economy as a whole contributed to the development of productive forces through a deeper use of intellectual resources and the results of fundamental and applied work. At the same time, a significant role in the formation of an innovative economy belongs to the Academy of Sciences and its research institutes, centers and other structures, through whose efforts many large innovative projects have been introduced into production.

Today, one of the priority tasks can be identified in the sphere of high technologies, in the sphere of innovation activity from the transfer of the domestic industry to a raw material orientation. With the help of which it is possible to quickly increase the competitive potential of the economy by increasing its comparative opportunities in science, high technologies and education, as well as to increase welfare and, on the basis of, use new sources of economic growth.

State regulation of current innovation activity and prospective development should be carried out both at the local and at the sectoral level by observing the basic principles, forms and implementation of methods of such regulation, which are regulated by regulatory legal acts.

The purpose of innovation policy is to create favorable conditions for innovation activities, to overcome the low level of innovation security, on this basis, sustainable economic growth, as well as stable social development.

It should be noted that state regulation and support of innovative entrepreneurship is implemented in specific areas through the use of methods and implementation mechanisms. It is important to emphasize that the effective functioning of a well-functioning mechanism of state regulation and support is formed with a full-fledged innovative entrepreneurial activity.

After reviewing the opinions of some scientists, it was concluded that the degree of state regulation decreases after overcoming the crisis and the formation of innovative entrepreneurship, but at the same time its quality improves. Based on this, it can be noted that in order to support and develop innovative entrepreneurship in the region of districts and cities, it is imperative to develop a concept of state regulation of innovative entrepreneurship in the service sector.

The main directions of innovative development, sectoral components, business entities of the service sector, are also that the management decisions taken should have a significant impact on the effectiveness of innovative projects and programs, while contributing to a constant increase in the amount of funds allocated for the development of and the introduction of innovations by business entities of the sectoral components of the service sector.

Conclusion. Thus, we propose an organizational and economic mechanism for supporting and developing innovative entrepreneurship in the service sector, which is developed on the basis of an analysis of practical experience in the Republic of Uzbekistan and other countries.

The peculiarity of this mechanism lies in the fact that the main role is offered to organizations and enterprises in the service sector, and the mechanism is aimed at participating in the implementation of the business, where it is taken into account that its interests are aimed at developing demand and for innovation from the enterprise of the region, district and city. This mechanism for its implementation determines the guidelines for their initiatives and activities, i.e. organize conditions for the development of partnerships between business and science.

LIST OF USED LITERATURE

1. Kadyrov A.A. The main directions of the formation of the National Innovation System of Uzbekistan
2. Freeman C. Technology Policy and Economic Performance, London, Pinter Publishers, 1987.
3. Salixov Sh. In Uzbekistan, an effective mechanism for the development of scientific research in the real sector of the economy is developing.
4. Tepman L.N. Risks in economics. - M.: UNITI, 2002.
5. Ivanov I.A. Innovation management: Uchebnik dlya vuzov. - M.: Izd-vo «BARO-Press», 2001.
6. Igoshin N.V. Investitsii organizatsiya, upravleniye finansirovaniye - M.: Finansy, UNITI, 2000.- 234p.; Marshall A. Printsipy ekonomicheskoy nauki - M.: Ekonomika, 1990.-456p.; Molodtsova R.G. Investitsii v innovatsii v kontseptsii ekonomicheskogo rosta: Nauchnoye izdanie

- M.: REA, 2007.-212p.; Sphere of service: economics, management, marketing. Practicum: uchebnoe posobie / kollektivavtorov; under red. T.D. Burmenko. - M.: KNORUS, 2013.-422p.

7. Trifilova A.A. Evaluation of the effectiveness of innovative development of the enterprise. - M.: Izd-vo «Finance and Statistics», 2005.



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THE ROLE OF WORLD LITERATURE IN THE DEVELOPMENT OF ABDULLA ORIPOV'S POETIC THINKING

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ABSTRACT

The article discusses the roots of poetic thinking, creative concept and philosophical observation, which are the basis of the poetry of Abdulla Aripov, one of the great representatives of Uzbek literature. The author scientifically proves the role of world literature in the development of the poet's literary and aesthetic world with the help of examples. Abdulla Aripov's attitude to Dante's work, in particular, analyzes issues related to the translation of "Divine Comedy", draws valuable theoretical conclusions.

KEYWORDS: Poet, World Literature, Translation, Genre, Aesthetic View, Trend, Artistic Analysis.

INTRODUCTION

There will, of course, be the geniuses of a particular nation who have left their mark on world literature, who have influenced the socio-aesthetic views of mankind with their works in which human ideas are uniquely expressed. The great creators of Eastern and Western literature and the best works they have left are proof of our point. Since the advent of written literature, several books have seen the face of the world, but only a handful have had a strong influence on the consciousness of the whole earth. The sentences "100 best works", "10 great writers and works" were not in vain. In addition, it is natural that great artists have contributed to the global prestige of any nation. For example, Cervantes is Spanish, Shakespeare is English, Alisher Navoi is Uzbek, Goethe is German, Tolstoy is Russian, and Chingiz Aitmatov is the pride and visiting card of the Kyrgyz nation.

Mana Italiya - Dante Diyor,

Tagor shuhratiga noil Hindiston.

Farzandlar o'z yurtin nomusi, ori,

Bulbulim bor deydi har qanday bo'ston.

The literary heritage they left had a positive impact on the development of world literature in many ways. The deep intellect, philosophical conclusions, logical thinking, figurative style of expression, modernity of the ideas propagated by the highly talented have made a great contribution to the determination of the nature of the subsequent fiction.

Garchi zaminda ko'p har hil xoru xas,

Tog'larga mengzashar dunyo tomini.

Ayonki, to'rt-beshta yomonlar emas,

Yaxshilar tanitar yurtning nomini.

There are many factors that contributed to the formation of the phenomenon of Abdulla Aripov. The poet fell in love with literature even before he went to school. At first, under the influence of fairy tales, songs, and legends told by his mother, he was fascinated by the mysterious charm of literature, but later his goal was to get acquainted with the masterpieces of world literature in his brothers rich library. As the future poet points out in his autobiography, it is true that Abdurazzaq's brother sent exercises to various editors and was aware of the content of the responses from the editors, which in a sense served him as a literary school. "The work of genius talents should be analyzed in the context of national and world literature and art. Then the uniqueness of their thinking and works, their contribution, the scale and potential of their talent will be more clearly revealed. Otherwise, the opinions expressed about him will become a collection of unproven, lofty praises "[10.21]. Indeed, a poet is brought up by a certain nation, and if he is truly gifted, his writings are of universal significance. As the poet himself noted, the great scientist, writer, creator does not have a nation, everyone accepts it as his own. Representatives of world literature, science and civilization are proof of our opinion. Abdulla Aripov's acquaintance with the works of the world's leading artists, inspired by his artistic thinking, certainly influenced his creative process. The ancient philosophical way of thinking, the feelings of humanity and nationalism have now made their way to topics at the level of world literature.

Abdulla Aripov's works are full of works on the most topical issues of space and world art. Among them, "Face to Face" is spiritually close to the search for answers to such questions as Sophocles, Dante Alighieri, Shakespeare's fate, human dignity, human perfection. Through the work, Adam is confronted with man. Emotions such as lust, greed, and jealousy have completely destroyed the innocence of the beginning. At the beginning of the work, the poet turns the pages of an old notebook and remembers the past one by one. And for some reason the fact that the lyrical protagonist is closer to the natural world attracts the reader's attention. In fact, although the human child touches the animal in the womb, the poet looks at the mammoths with compassion, not at his predecessor. Instead, he calls people "wild crowds".

Dunyo ham bir vaqtlar mamont talashib,

Adashib ketgandi yo'lidan menday.

For centuries, the world, which the poet blamed, was divided into “wild crowds.” The lust that first destroyed nature together then preyed on the fate of the mammoths. The ancient custom emphasized by the poet has been broken and has not yet been healed. The arrogant laughter of the oppressors and the cries of the oppressed still haunt this world.

Asrlar shundayin tentib o'tdilar,

Yer uzra hukmron g'am bo'ldi faqat! [5.61]

This grief was the cry of the representatives of world literature, sometimes expressed in the form of comedy, sometimes tragicomedy, sometimes tragedy.

Nahot o'sha Freyd haq bo'lsa yohu,

Nahot qotil bo'lsa, o'sib chaqaloq?!

In addition, a deep acquaintance with world literature and admiration for the artists of the word paved the way for the emergence of rare translations in the works of Abdulla Aripov. Aligeri Dante, a unique representative of world literature, skillfully translated the “Hell” part of the “Divine Comedy” into Uzbek.

The translation was made available to a wide readership in 1975. Thanks to the poet's philosophical thinking and eloquence, our people also benefited from Dante's “Uzbek grace”, his thoughts on world civilization and man, society, destiny, humanity. “If artistic skill is added to thinking on a cosmic scale, it will raise any work to a higher level, bring international fame to the artist. This can be seen in the example of high art and classical literature.”[10.23]

The Divine Comedy was in fact an echo of Dante's genius, the reflection of Western philosophy on the world, life, and people. As the poet began his translation, he first became acquainted with the trends in world literature, his aesthetic views, and the content of selected works on the Western worldview. In order to “recreate” this literary and philosophical work in the Eastern spirit, of course, a strong scientific and philosophical handbook was needed. Abdulla Aripov's love for world literature from a young age, his constant acquaintance with the unique works of world writers, and his personal way of thinking helped to translate such a magnificent work. In contrast to Dante's personality and work, the writer's deep cosmic thinking, his search for meaning in coming and going, his logical conclusion that every action must have an answer, and the consolidation of these views with religious literature require serious preparation for reading. From the content of the work, we feel more clearly that humanity has the same roots, the same aspirations, but we also realize that the features of lust and ambition are the same. It took a great deal of skill to fully unravel Dante's creative catharsis, his heartaches, his bitter laughter over the people and the society they formed. Abdulla Aripov skillfully performed this difficult and arduous task. Because when the poet entered the work with big dreams, as a result of the attitude of his “teachers”, “great word artists” who tried to mislead him, even at the beginning of the great path, his conclusions were stabilizing. Seeing the real faces of the people around him, the tragedy of the ideal and real clash, the streak of lines on the portrait of the imaginary man, of course, left a mark on the poet's psyche. Perhaps that is why the poet did not feel complete satisfaction in his heart even after the translation of “Divine Comedy”. He was determined to sing the pain of the earth surrounded by humiliation and ignorance against the background of the “other world”. Just as Dante's heroes were his contemporaries, the characters in the dramatic epic The Road to Heaven were no strangers to Abdulla Aripov. Speaking about this epic, the poet said

that he had seen all the people in the work in his life, for example, the image of a friend, a well-known literary scholar, my friend Begali Kasimov. The poet also noted that in the epic he tried to reveal the inner and outer world of the heroes as much as possible, in fact there is no word or paint to describe in detail the people in Hell and Arosat.

According to a U.S. press release, the great genius Alighieri Dante's Divine Comedy, written between 1307 and 1321, was recognized as the first of the top ten books created in the West in the last millennium. Among these ten books of the last millennium are Thomas Aquinas's Scale of Theology (1463), Thomas More's Utopia (1616), Immanuel Kant's Critique of Pure Consciousness (1781), and Friedrich Nietzsche's "Zoroaster says so" (1883-1885) and Sigmund Freud's Interpretation of Dreams (1900). [8.43]

Another great poet, Goethe, wrote of Dante: "Dante seems great to us, but behind him lies the culture of many centuries." [9.318] Philosopher Najmiddin Kamilov, as a researcher who has done a lot of research on the interaction, integration processes and effects of Eastern and Western literature, also emphasizes the influence of Muslim oriental scholars on Dante's work. The celestial bodies depicted in the Divine Comedy, their statements about their motion and properties, and their measurements of distance are all taken from Al-Farghani. Following Al-Farghani, who explained the motion of the planets in terms of human ability and activity, Dante writes: "Venus rules our souls and other qualities because of the generosity of those who move them" (Bazm, II, 2). When speaking of other planets, the poet presents the ideas of the Uzbek scientist as truth." [3.74] Thus, the synthesis of Eastern and Western thought is reflected in the creation of a great work.

Lekin paydo bo'lib oftob shu mahal

Yulduzlar to'dasin ortga kuzatdi:

Ilohiy muhabbat misol dastavval,

Sitoralar to'pin bu yon uzatdi.

(Dante Aligeri. Hell, I, 37-40. Translated by Abdulla Oripov)

When we read these verses, we instinctively remember that Alisher Navoi provided the universe and planets with deep astronomical knowledge. Abdulla Aripov, in the example of Dante's work, imagines that he began to translate this work because he saw the respect and recognition of the Western world of thought in the East.

Kozimni uzoqqa yugurtdim shunda:

Xisobdon Evklid, Batlimus, Galen,

Gippokrat, Ibn Sino, Ibn Rushd Paydo -

Yangi Koyalarni tartib etgan chin.

(Dante Aligeri. Hell. IV, 142)

Yes, Dante was looking for the truth - to find ways to purify people from the sins of hell, to lead them to perfect moral purity. [4.85] The whole essence of Abdulla Aripov's poetry was to sing of perfection, sincerity, faith, honesty, piety.

Bu olam shunaqa qurilgan o'zi,

*Hidlashib ko'rish hatto hayvonot.
 Qur'oniy kalomdir "Assalom" so'zi,
 Do'zaxi sanalur takabbur har zot. [7.17].*

The poet writes that the question of arrogance is harsh, that people live within the divine precepts. He is horrified that some of the people around him are completely losing their image of humanity in the pursuit of lust, envy, pride, wealth, career. He even likens it to the signs of the Hour.

*Idrok odamlarni butkul tark etgan,
 Go'daklar ko'zida yovvoyi bir his.
 Avliyolar ko'kka bosh olib ketgan,
 Xukmini o'tkazar har qanday joyda Iblis.[6.69].*

The fragments above seem to fit perfectly into the landscape that Dante has been writing about for centuries. This means that over the years, the poets' expressions of the heart's feelings, moods, and sufferings have remained the same.

The first epic contains 34 songs, and the second and third epics contain 33 songs. Each stanza of the song consists of three lines, and these three are both rhyming with each other and the content is connected like a chain. This sequence continues from the beginning to the end of the song [8.43].

During the translation, the poet reviewed, analyzed and compared other translations of the work. But the poet's creative perfection, philosophical depth, and instinctive knowledge served to convey the structure, scheme, and idea of the work in its original form. In order to preserve the rhythm of the work, special attention was paid not only to the word, but also to the presence of vowel, consonant sounds. The translation turned out perfectly for the poet's good understanding that even the sounds play a role in illuminating the spiritual world of the lyrical hero, his inner world, and that the melody is also symbolic.

The philosophical concepts reflected in artistic creation can be of two basic types. The first of these, traditionally, stems from the philosophical ideas that preceded and contemporaries the creator. This form of philosophical artistic interpretation is of a relatively universal nature. The second form of philosophical-artistic interpretation cannot be completely devoid of the above elements. At the same time, individual leadership is at stake. The authors of works of this nature are among the most philosophical. They are a factor in drawing philosophical conclusions from any universal reality [2.97]. Based on the above considerations, the fact that both Dante and Abdulla Aripov draw philosophical conclusions, with an original way of thinking, is fully consistent with both classifications.

The influence of world literature on the work of Abdulla Aripov continued in the form of reading, translation, composition, compliments. During the translation of the Divine Comedy, the poet managed to preserve the rhythm, the essence, the spirit of Dante. Such literary influences later continued in a series of poems and the dramatic epic The Road to Paradise.

The last 30-40 years of Uzbek literature have been influenced by Abdulla Aripov's poetry. [11.238]

Abdulla Aripov has made creative trips to many countries around the world. Series such as The Book of Hajj, The Voices of Japan, The Book of Geneva, and Impressions of Italy are proof that the poet sang the universal ideas of life in his own words, in his own voice [1.131]

In short, the great poet of the Uzbek people Abdulla Aripov, while diligently and steadily studying the advanced creative experience of world literature, enriched them with new artistic discoveries. Through his lyrical poems and epics, he was able to demonstrate how high individual poetic thinking is. Through this, he made a worthy contribution to the development of not only Uzbek literature, but also the literary and aesthetic thinking of the peoples of the world.

REFERENCES:

1. Jabborov Nurboy. Time, criteria, poetry. - Tashkent: NMIU named after Ghafur Ghulam, 2015.
2. Jurakulov Long. Biographical interpretation: history, nature, methodology. // Journal of News of the National University of Uzbekistan, 2006.
3. Komilov Najmiddin. Caravans of contemplation. - Tashkent: Sharq, 2011.
4. Komilov N. Caravans of contemplation. - Tashkent: Sharq, 2011.
5. Oripov Abdulla. Selected works. Four volumes. The first volume. T.: Literature and Art, 2000.
6. Oripov Abdulla. Selected works. Eight volumes. Volume 7 –Tashkent: NMIU named after Ghafur Ghulam, 2013.
7. Oripov Abdulla. Selected works. Volume 8 - Tashkent: NMIU named after Ghafur Gulom, 2016.
8. Saidov Akmal, Abdurahmonov Qalandar, Gulom Mirzo. Uzbekistan is my lovely homeland. - Tashkent: Akademnashr, 2021.
9. Эккерман П.Л. Разговоры с Гёте в последние годы жизни, М.- Л. «Академия», 1934, стр 318
10. Erkaev Abdurahim. Abdulla Oripov genius. - Tashkent: Golden Edition, 2021.
11. Qosimov B. The enlightenment of the awakened nation. - Tashkent: Manaviyat, 2011.



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REVIEW ON AUTOMATIC RAIN WATER HARVESTING

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ABSTRACT

The purpose of this article is to examine several kinds of long-term water collecting techniques from air fogs and dew. We report on the water collection performance of different fog collectors from across the globe in this article. In addition, we look at the technical elements of fog collector feasibility studies. The increases in efficiency Bioinspired technology is often used in modern fog collecting technologies. Fog Global fog incidence clearly limits harvesting technologies. Dew water harvester, on the other hand, is it's ubiquitous, but it needs a cooled condensing surface to work. The collecting of dew water is discussed in this review. Rainy water harvesting utilizing a radiative cooling surface, solar regenerated desiccant systems, and active condensation technology are the three types of systems. All of these methods have one common goal. is the creation of an atmospheric water collector capable of producing water regardless of humidity, geographical position, cheap cost, and supplies that may be found locally.

KEYWORDS: ARM7 (Advanced Reduced Instruction Set Computer), LCD (Liquid Crystal Display), ROM (Read-only Memory), Rain.

INTRODUCTION

About $\frac{2}{3}$ of the earth surface is covered with water. However, the amount of usable water is very small. The growing population and growing industries and agricultural practices needs lots of water. The huge consumption of water is causing reduction of available water. We need to think about various ways to save and conserve water resources. One of the very important inventive measures for conservation of water is rain water harvesting. Basically water comes on the surface with rain, however it gets collected in the rivers which ultimately flows into the ocean. Which means that the usable water is lost in the ocean[1]. We can catch the rainwater and prevent it from flowing into the ocean, this is rainwater harvesting.

There are mainly two methods for rainwater harvesting:

- **Rooftop rainwater harvesting:** during raining rain water gets collected on the rooftop. It can be transferred to a storage tank through a pipe. Often water contains soil particles and other impurities in such case water should be filtered to remove these impurities. Water stored in this storage tank can be used to fulfill our water needs. Instead of storage tank water can also be transferred to a pit in the ground from where it saves into the soil. The saved water gets added to ground water and so the level of water increases. In both ways we can prevent water from flowing away[2].
- **Roadside drains:** Rainwater falling on the road gets collected in the drains. The drains can be modified so that the water entering in them get seeped into the soil or this water can be collected in a storage structure as well[3].

The classification of atmospheric water collecting methods is shown in Figure 1. Harvesting water from fog, or visible cloud water droplets or ice crystals floating in the air at or near the Earth's surface, is the first type. It usually happens as a result of more moisture in the air or a drop in the ambient air temperature[4]. Methods may be classified into two categories: conventional and contemporary. Water vapor collection is the second kind of collecting. While fog may be seen with the naked eye, water vapor is created by the evaporation of liquid water or the sublimation of ice. Dew water is produced when water vapor condenses on a surface that has been cooled below the dew point temperature of atmospheric water vapor. While fog water collecting systems are more conventional in nature, utilizing a mesh-like structure, dew water harvesting techniques use a variety of technologies. Early experiments used passive systems with radiative condensers, but due to their poor efficiency, researchers used solar-regenerated desiccant techniques to improve moisture sorption and desorption. However, this has not shown to be adequate on its own[5]. Dew water harvesting research also includes integration with active cooling condenser technology, which includes the use of traditional vapor compression air conditioning systems and, more recently, thermoelectric coolers. Due to the high efficiency of active cooling condenser systems, readers will be provided with a selection of commercially available water harvesting technologies incorporating active cooling condenser systems at the conclusion of this article.

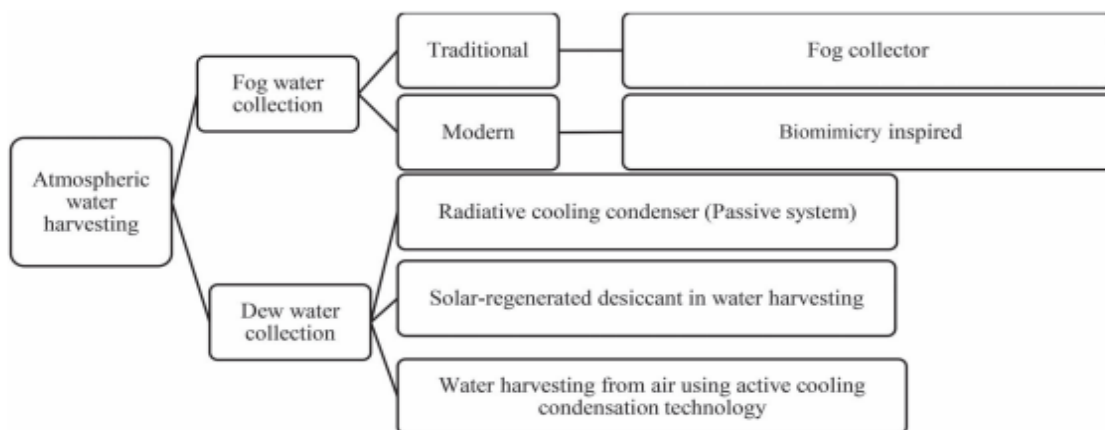


Figure 1. Illustrate the categories of atmospheric water harvesting techniques

Apart from the above methods Aqua space rainwater harvesting is one of the larger rainwater harvesting systems which can be constructed using a sub-surface rainwater exchange system[6]. This system is a revolutionary design that combines a recirculating decorative water feature with a sub-surface rain water harvesting storage system. The clean, filtered water that is stored in the sub-surface can be stored for irrigation or to maintain the water level in the decorative water feature[7]. To make this Aqua space rainwater more effective an LPC2148 controller which is an ARM7 based microcontroller with high performance of 32-bit RISC microcontroller with thumb extensions 512KB on-chip flash ROM with in-system programming and in-application programming, 32KB+8KB of data memory is used along with a raindrop sensor, LCD and an alarm, wherein the raindrop sensor will sense the rain water moisture, LCD is attached to the sensor to display whether the droplets is rain drop or not. An alarm to alert the presence of rain. Once the presence of rain is detected an input is sent to the controller and the controller makes the motor to open the valve of the pump. Then the water passes through the pump and we can further proceed to the harvesting process[7].

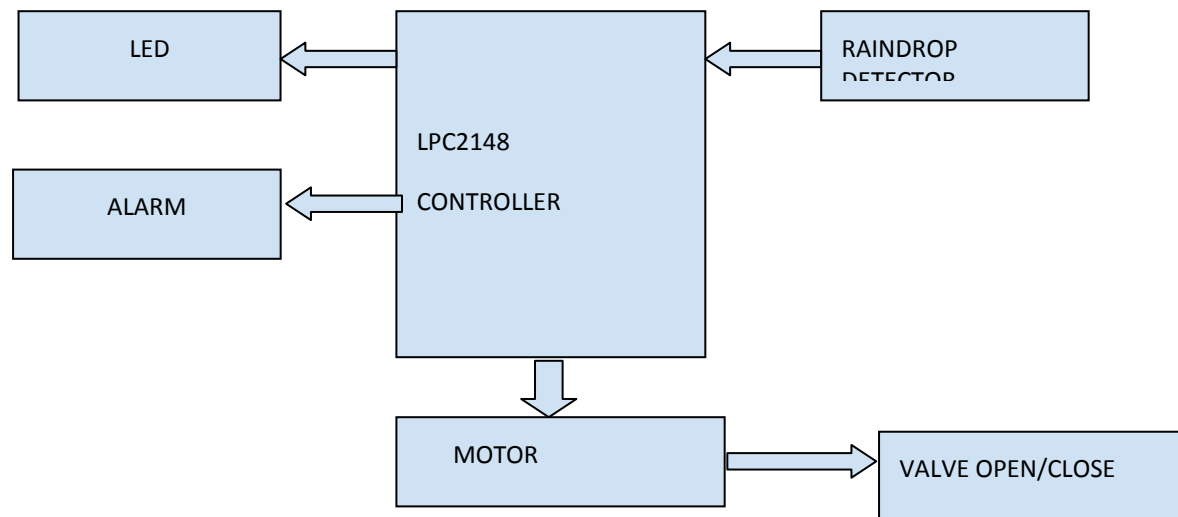


Figure 4: This figure shows the block diagram of rainwater detection and storage process wherein a LPC2148 controls the entire process of rainwater detection system. Once the detector detects the rainwater the motor opens the valve to store the water for further use[8].

This are the component used in my research paper to complete the Aqua space rainwater harvesting system using ARM7 comptroller:

1. Lpc2148
2. Raindrop sensor
3. Led
4. Alarm

Harvesting dew water

When fog droplets collide and intercept with the collecting surfaces in fog water harvesting, water is collected. However, the worldwide fog occurrence, which is highly reliant on geographical and metrological variables or circumstances, is the primary limiting factor in

collecting water from fog droplets. Only a small number of locations have climatic circumstances that allow moist air to spontaneously cool below its saturation temperature, resulting in fog[9]. As a result, fog is believed to be even less accessible than saltwater as an alternate supply of freshwater on a worldwide scale. Because water vapor is widespread in the atmosphere, freshwater may be collected at a variety of places if it is condensed by cooling. Nonetheless, the condensation process is more thermodynamically complex than fog harvesting, since it includes a large amount of heat release. Dew water is made up of water droplets that form when water vapor condenses on a surface at a temperature below the dew point temperature.

Dew water collecting methods are classified into three categories in this paper:

1. Passive (radiative) cooling condenser,
2. Desiccant renewed by the sun and
3. Active cooling condensation technique for water collection from the air.

Projects from the last 30 years to the present

Fog harvesting is prevalent in dry and semi-arid regions near the coast, where clouds develop over the water and are driven towards the mainland by the prevailing winds. When the clouds collide with the surface of the hills near the sea, they turn into fog. Various fog collection installations exist in various locations, including the Namib Desert in Africa, for both research and real-world uses[10]. The desert is well-known for its ability to gather water through fog collecting. A fascinating study was conducted to determine the quality of Namibian fog water. Three Topnaar communities in the Namib Desert were researched for fourteen SFCs. Klipneus community has the highest water collection. In terms of water quality, the first washing of SFCs produces murky, brackish water containing NaCl following a no-fog period. The water was deemed unfit for human consumption on a case-by-case basis. Despite this, the water recovered after the first washing was determined to be quite clean and low in salt concentration. In the 1980s, fifty fog catchers were used in a study experiment in Chile's Coquimbo area.

The design of fog catchers

The prevailing wind exerts pressure on the mesh in LFCs, which subsequently exerts stresses on the supporting structures, weakening or breaking the foundation. Meanwhile, UV light and other external conditions may harm the mesh and other components of LFCs. The failure of LFCs in severe weather is mostly due to a lack of a logical or designed design approach. This seems to explain the fog collector maintenance problem that the locals are having. Robust materials for fog collectors were developed utilizing stronger stainless steel mesh, coupled with poly material, to meet various environmental circumstances, such as for extremely windy locations.

Studies on the efficacy and practicality of fog collectors

A fog water collectors would serve as a wind-driven fog barrier. However, the fog water collector does not disturb a part of the fog. Despite the fact that the fog collector collides with the fog, it is unable to catch all of the liquid water present in the fog.

There seem to be losses as a result of:

1. Fog circling the fog water collector.
2. Fog flowing through the mesh apertures.
3. Droplets bouncing back into the wind.

Fog interception effectiveness refers to the percentage of fog collected by the fog water collector. The caught water droplet mixed, moved to the bottom portion of the fog collector, and was delivered to the water tank through the water gutter. However, there is the possibility of re-entrainment at the water gutter, where water may return to the air flow or some water from the mesh slack, wrinkles, and folds may enter the gutter and be collected at the water tank.

Pyramid collector made of glass

- desiccant beds on shelves,
- glass pyramid collector
- A slanted wall covering
- A collecting cone
- A condenser portion affixed to the pyramid's top, shielding it from the sun. As desiccants, sawdust and cloth soaked with CaCl_2 were explored.

Overnight, the beds' coverings are left open to allow the desiccant to collect water vapor from the air. During the day, the covers are closed, allowing the beds to be heated by solar radiation, which condenses on the sides and, in particular, at the pyramid apex, where it is collected by a central cone and travels via a tube to an external container as shown in figure 1. The cloth bed system outperformed the sawdust bed system in terms of water yield.

Surface is corrugated

Introduced the use of an integrated desiccant/solar collector to harvest water from humid air, based on the concept of desiccant moisture absorption at night and simultaneous desorption and water vapor condensation during the day. During the evenings, they utilized a tiny air circulation fan to push ambient air into the glass-enclosed solar collection. A thick layer of corrugated fabric was employed as the desiccant bed in the collector as shown in figure 2. During the absorption/desorption process, the usage of a corrugated surface was intended to enhance the heat and mass transfer area.

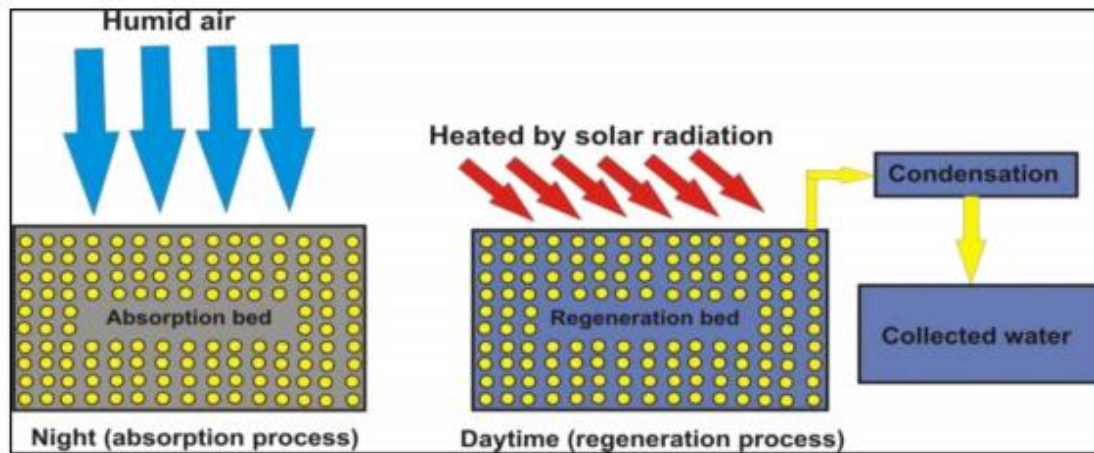


Figure 1: Wet desiccant technique for water production from atmospheric air

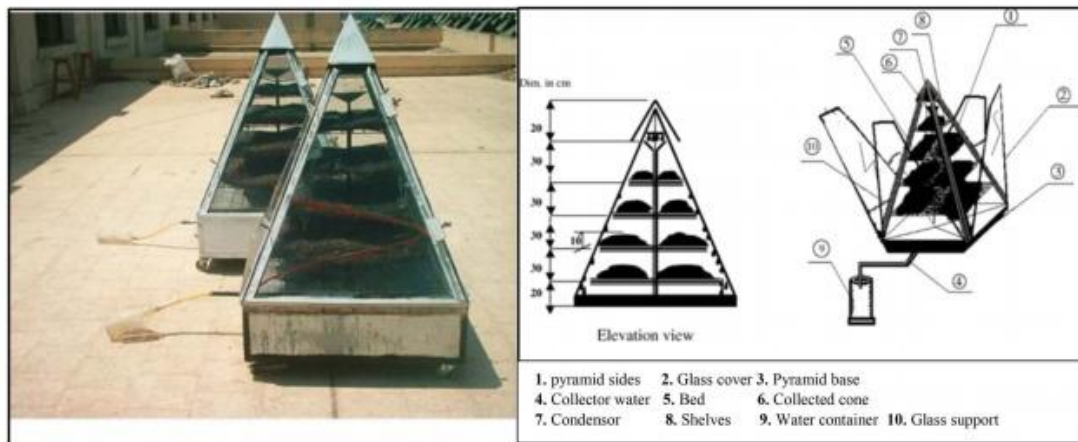


Figure 2: (a) Photograph of the system used. (b) Pyramid with glass covers open at night (right)

In this literature an lpc2148 microcontroller is interfacing with a raindrop sensor which will detect the rain, an LED to display whether the moisture is rain drop or not and an alarm attached to make an alert. The rain water detector is used in the irrigation field, home automation, communication, automobiles etc. The drawback of this literature is it just detects the raindrop not showing the method of harvesting[11]. This paper disclose creates a truly sustainable water feature using all rain water. The underground reservoirs comprise of the aqua box storage units, this are made from recyclable plastic and the modular nature of this unit allows it to put together in such configuration to meet the sight requirements for any size projects. The best thing about this system is we can drive heavy equipment over the top of the system once it is buried under the ground, it is very useful for commercial application. Aquaspace snorkel vault and centipede has a high efficiency pumping system and provides a convenient access point for inspection and maintenance. The rain exchange comes in free packets, easy to use kits and can also be customized for the larger or more unit projects. This entire process helps us to capture, filter and reuse rainwater.

DISCUSSION

One of the beautiful and easy technique is used in this project to harvest rainwater i.e. Aqua space rain water harvesting. By this technique we can capture, filter and reuse rainwater. The best thing about Aqua space rainwater storage system is it adds beauty to our home. If each and every home follows this technique, we can give rise to a green environment as green earth is degrading day by day also we will be able to store large amounts of water for our daily use. In this research paper Aqua space rainwater harvesting is successfully done using an ARM7 controller. The process starts with the detection of rainwater, once the rain water is detected an input signal to the LPC2148 controller. Then the controller converts the received input analog signal to digital signal. An output from the controller allows the LED to display the status whether the moisture is rainwater or not. If the detected moisture is rain water, then an alarm gives an alert to the authorized person and the controller sends a signal to the motor to open the valve. The open valve allows the rainwater to flow through the pipe and passes through the filtering process called Aqua space downspout filter.

CONCLUSION

Water is a basic need in everyday life. So saving water and using it in a proper manner is very important. Here is a project by which we can check the rainwater status, so that if the water status is confirmed motor valves get activated and rain water gets harvested. This filter is located at the base of the downspout and has a 300-micron bag located inside of it. It is made for the easy removal and capture of all the leaves, twigs, sediments and seeds that are generated from the roof. From here the water goes through a pipe system into the underground modular reservoir. The revolutionary design of a rain change system combines the modular underground reservoir with a decorated water feature. The benefit of that is we get the sight and sound of the water feature combined with aeration and filtration aspects of the moving water also gives us more usable water. This creates a truly sustainable water feature using all rain water. The underground reservoirs comprise of the aqua lox storage units, this are made from recyclable plastic and the modular nature of this unit allows it to put together in such configuration to meet the sight requirements for any size projects. The best thing about this system is we can drive heavy equipment over the top of the system once it is buried under the ground, it is very useful for commercial application. Aqua space snorkel vault and centipede has a high efficiency pumping system and provides a convenient access point for inspection and maintenance. The rain exchange comes in free packets, easy to use kits and can also be customized for the larger or more unit projects. This entire process helps us to capture, filter and reuse rainwater.

REFERENCES

1. A. Campisano, G. D'Amico, and C. Modica, "Water saving and cost analysis of large-scale implementation of domestic rain water harvesting in minor Mediterranean islands," *Water (Switzerland)*, 2017, doi: 10.3390/w9120916.
2. H. Jarimi, R. Powell, and S. Riffat, "Review of sustainable methods for atmospheric water harvesting," no. February, pp. 253–276, 2020, doi: 10.1093/ijlct/ctz072.
3. D. Hillel, "Water Harvesting," in *Encyclopedia of Soils in the Environment*, 2004.
4. W. T. Chong *et al.*, "Performance assessment of a hybrid solar-wind-rain eco-roof system for buildings," *Energy Build.*, 2016, doi: 10.1016/j.enbuild.2016.06.065.

5. S. Reckinger, J. Bocchino, A. Jackowitz, and J. Perry, "Rainwater Harvesting for Campus Student Center: A Sustainable, Community-Orientated Senior Design Project," *Int. J. Serv. Learn. Eng. Humanit. Eng. Soc. Entrep.*, 2014, doi: 10.24908/ijlsle.v9i1.5288.
6. "Rainwater Harvesting System." .
7. F. R. Rijsberman, "6.11 Rainwater harvesting," *Water Policy*, 1998.
8. B. O. E. D. B. Xjui, "Rainwater harvesting: a lifeline for human well-being," *Water*, 2009, doi: 10.1016/j.watres.2007.01.037.
9. J. L. Guo, J. Gu, G. H. Yin, and X. Li, "Effect of shallow-buried drip irrigation on water consumption characteristics and yield of spring maize in semi-arid region of western Liaoning," *Chinese J. Ecol.*, 2017, doi: 10.13292/j.1000-4890.201709.011.
10. J. Albergel, S. Nasri, and J. M. Lamachère, "Project of research on hill reservoirs in the semi arid zone of Mediterranean periphery," *Rev. des Sci. l'Eau*, 2004, doi: 10.7202/705526ar.
11. "Rain Sensor Interfacing with LPC2148." .



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DETECTION OF ZOLPIDEM IN SPIKED DRINKS USING HIGH PERFORMANCE THIN LAYER LIQUID CHROMATOGRAPHY

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ABSTRACT

An elite fluid chromatographic interaction with brilliant recognition for simultaneous examination of certain benzodiazepines (BZDs) is developed for legal screening of tainted non-cocktails. The cases were examined following a required cycle of pH correction and separation. It was done at 45°C with a variable advance of 15mM phosphate support: methanol (50:50 v/v) at a stream rate of 1.4 mL/min on a C18 segment (250 mm × 4.6 mm, 5μm). An Ultra Violet (UV) detector tuned to 245 nm was used to evaluate the column eluent. The eluting peaks were promptly discovered, recognized, and measured as a consequence of this. Calibration curves for all medicines in the 0.510 μg/mL range with a linear regression coefficient higher than 0.996. The BZDs showed recovery rates that varied from 93.7 to 108.7 percent. In addition, the detection limits were 0.03-0.05 g/mL. The detection limits were found to be between 0.01 and 0.02 μg/mL. For all BZDs at all focuses in the range of 0.45 to 7.69 percent, the coefficients of differentiation within and between days were resolved. The technique will offer an unmistakable, responsive, and fast way for screening six BZDs in contaminated sodas in legal assessment.

KEYWORDS: Alcohol, Analysis, Benzodiazepines, Chromatography, Effects, Samples, Whiskey Cream, Zolpidem.

INTRODUCTION

Non-benzodiazepines, commonly known as "Z Pills", are psychoactive medicines that are used by doctors to treat a range of sleep disorders. It is also used to relieve anxiety, relax muscles, and promote relaxation. They have benzodiazepine-like characteristics in nature. Non-benzodiazepines exhibit chemical characteristics that are different or totally separate from benzodiazepines, and are thus molecularly unrelated to them. Non-benzodiazepines are classified

into three molecular classes. Non-benzodiazepines are attractive to criminals because of their availability and synergistic interaction with alcohol. They have a strong predisposition for hypnosis, anterograde amnesia, and muscle relaxing induction. Overdose symptoms include depression in the central nervous system (CNS), impaired balance, ataxia, and slurred speech. Because of these qualities, it is a potent weapon used by criminals to lace the drinks of unsuspecting women and men in pubs and bars in order to rob, sexually harass, or kill them later[1].

Drug-Facilitated Sexual Assault (DFSA) and Drug-Facilitated Crime (DFC) are on the increase globally, including in India. Because of their availability and synergistic action with alcohol, non-benzodiazepines are attractive to offenders. Hypnosis, anterograde amnesia, and muscular relaxation induction are all prevalent among them. Depression in the central nervous system (CNS), poor balance, ataxia, and slurred speech are all signs of an overdose. It is a potent weapon used by criminals to lace the drinks of unsuspecting women and men in pubs and bars in order to rob, sexually abuse, or murder them later[2].

Drug-Assisted Sexual Assault (DFSA) and Drug-Facilitated Crime (DFC) are on the increase all over the globe, including in India. Valium and Xanax are two well-known brands. In the United States, they are among the most frequently used medicines. When individuals who don't have a prescription obtain these drugs and utilize them for their sedative effects, it's termed harassment. Since they may substantially suppress and even abolish functions that normally urge a person to avoid or even want to fight sexual harassment or abuse, benzodiazepines have been used as a "date rape" drug. The number of individuals arrested and convicted of this crime has increased significantly in recent years. The chemical is frequently added in powder or liquid form to alcoholic beverages or even soft drinks, and it has a bitter taste[3].

The actions of benzodiazepines on the synapse gamma-amino butyric acid (GABA) at the GABA receptor include calming, anticonvulsant, and muscle relaxant, hypnotic, plus anxiolytic. High dosages of some of the more limited acting benzodiazepines may potentially induce anterograde amnesia and dissociation. Long-term consequences of benzodiazepine use may include mental degeneration, as well as emotional and social problems. Feelings of choppiness, inability to think effectively, lack of sex-drive, agoraphobia and social fear, anxiety and discouragement, loss of confidence in sports activities and hobbies, and trouble to feel or express emotions are all conceivable[4].

High-Performance Thin Layer Chromatography (HPTLC) proven to be a more sophisticated kind of thin layer chromatography (TLC) that provides superior division. HPTLC definition includes established qualitative and quantitative measuring methods, as well as fulfilling all consistency requirements for usage in fully supervised settings. HPTLC is unaffected by sample type, chromatogram growth, or detection. HPTLC offers the following benefits over other chromatographic techniques[5].

- Less time spent inspecting, 3 to 20 minutes for a good division.
- Recognition affectability is 5 to 10 times better than conventional TLC.
- Quantitative examination needs highly repeatable, crisp groupings.
- Easy coupling with bioassays, making it especially suitable for impact-coordinated analysis.

- After assessment, specified zones may be consumed by mass spectrometry (MS), so there's no need to record each run, including grid and foundation.

LITERATURE SURVEY

U. Bustoet *al.* explored that to compare the pharmacology and habit auction of bretazenil, a fractional benzodiazepine agonist, across various sections to the immediate effects of diazepam and alprazolam. A fake treatment, within subject, randomized, twofold visually impaired preliminary aroused the interest of 28 male volunteers. They were non-subordinate CNS depressant buyers at this time, competent to identify 150 mg secobarbital from fake treatment with fantastic emotional benefits. Subjects were given fake treatment and the two center dosages of diazepam, bretazenil, and alprazolam for the first 7 days of the trial, followed by either the most severe or least portion of each medication for the following 3 days, depending on their clinical response. To quantify pharmacological results, researchers utilized goal measures (e.g., psychomotor execution), subject-appraised questionnaires (e.g., Profile of Mood States), and spectator-evaluated scales. Every one of the three prescriptions could be identified from fake treatment in the majority of tests. When it comes to portion-related psychomotor and memory impairment, bretazenil beats diazepam and alprazolam. Both alprazolam and diazepam raised subject and eyewitness evaluated sleepiness and like in a portion dependent way, while bretazenil increased sedation and loving in a part independent method. The results of the research supported the hypothesis that bretazenil has an incomplete agonist pharmacological profile. Bretazenil has a lower probability of misuse than diazepam and alprazolam, as shown by abstract effect estimates, which are important for assessing maltreatment responsibility[6].

G. Darcourt *et al.* presented in the article that zolpidem refers to a novel class of hypnotic medicines with a neuro pharmacological profile different from those previously accessible. In rats, it produces soothing or mesmerizing effects at much lower doses than relaxant effects. Zolpidem is used to address a sleeping problem for a short length of time in therapeutic treatment. When given several times absence of dynamic short course of movement lasting effects experimental. Polysomnographic data indicates that zolpidem produces a sleeping pattern that is similar to physiological sleep, and that abrupt cessation has minimal or only mild impacts on sleep architecture. During its clinical development and post-marketing experience, data from active volunteers and patients, both adult and elderly, were utilized to study elements of zolpidem's general safety. When administered according to the prescription recommendations, zolpidem tends to be well tolerated in adults and the elderly. According to the current data, the likelihood of aggression or dependence in these circumstances is extremely low[7].

G. Famigliniet *al.* articulated in the article that Benzodiazepines (BDZs) are frequently utilized in clinical practice as tranquilizers and antidepressants. However, due of their extensive availability and synergistic effects with alcohol, they are attractive to criminals. In certain instances, analyzing alcohol buildups from a crime scene is needed to identify criminal conduct for legal purposes. Milk-based beverages (bourbon creams) are becoming more popular owing to their decreased alcohol level and great taste. Traditional analytical methods may be unable to distinguish the presence of opiates or other chemicals owing to the complexity of this instance, which includes proteins and unsaturated fats. Due to these features, bourbon creams are suitable for illicit applications. In this research, eight BDZs were identified from bourbon cream and broken down using MS. The QuEChERS convention is fast, simple, compact, powerful, robust, and safe, and it can effectively remove much of the grid from the target mixture while still

obtaining acceptable recovery rates. The technique described is simple and fast, and it has been evaluated for accuracy, consistency, and recovery. Individually, the ID and evaluation limits were 0.02-0.1 mg/mL and 0.1-0.5 mg/mL. Bourbon cream drinks were gathered and tested in the wake after being maintained with business prescriptions at a convergence of 20 mg/mL, demonstrating the method's usefulness in forensic research[8].

M. G. Griswold *et al.* pointed towards the fact in the article although alcohol use is a major cause of mortality and injury, its overall connection with health is complex owing to the possible preventative benefits of moderate alcohol intake on certain diseases. The Global Burden of Diseases, Injuries, and Risk Factors Study 2016 utilized our quantitative method to deal with health bookkeeping to increase evaluations of liquor utilization, liquor inferred passing, and handicap altered more seasoned. Utilizing six-hundred-ninety-four data wellsprings of individual plus populace level liquor use, as well as 592 planned and review concentrates on the danger of liquor use, the creator assessed the commonness of current drinking, abstention, the dissemination of liquor use among current consumers in standard beverages every day (defined as 10 g of unadulterated ethyl liquor), and liquor inferred passing. Unlike earlier predictions, the inventor made many methodological advances. To begin, creator revised liquor marketing forecasts to account for unrecorded and guest use; second, creator led impacts connected to liquor use; then third, creator developed a new method to evaluate the degree of liquor use that lowers the anticipated danger to a person's prosperity. Ends: In 2016, alcohol consumption was the seventh largest cause of death and disability-adjusted life years (DALYs) worldwide, accounting for 22 percent (95 percent vulnerability span (UI) (1.5-3.0) old enough normalized female passing and 68 percent (5.8-8.0) old enough normalized male passing. In 2016, alcohol consumption was the main cause of mortality among people aged 15 to 49 years old all over the globe, accounting for 38 percent (95 percent UI 32-43) of female fatalities and 122 percent (108-136) of male deaths. In the population aged 15-49 years, female inferable DALYs were 23 percent (95 percent UI 2.0-2.6) and male inferable DALYs were 89 percent (7.8-9) inferable. Tuberculosis (14 percent (95 percent UI 1.0-1.7) of total passing), car accidents (12 percent (0.7-1.9), and self-injury (11 percent (0.6-1.5)) were the three main causes of inferred passing across this age range. In 2016, malignancies accounted for a substantial percentage of all liquor inferable passing, accounting for 27.1 percent (95 percent UI 21.3-233.3) of all out liquor inferable female passing and 18.9 percent (15.3-22.6) of all absolute liquor inferable male passing in populations aged 50 and older. Zero standard drinks for seven days was the measure of liquor consumption that produced the least degree of harm in terms of all wellbeing characteristics (95 percent UI 0.0-0.8). (95 percent UI 0.0-0.8). Liquor misuse is a significant contributor to worldwide illness burden and has far-reaching implications for one's health. Creator found that the danger of all-cause mortality, especially malignant growths, increases with rising levels of usage, with zero being the lowest degree of use that lowers health hazards. These results indicate that worldwide alcohol control efforts should be refocused on methods to decrease overall population-level consumption. The Bill and Melinda Gates Foundation is getting money[9].

H. K.J. *et al.* explained in the article that zolpidem is an imidazopyridine that is used to treat a sleeping disorder (recommended dosage: 10 mg/day in adults, 5 or 10 mg/day in the elderly or patients with hepatic impairment) for a short length of time (<four weeks). Information indicates that zolpidem's mesmerizing adequacy is similar to non-benzodiazepine, triazolam, temazepam,

nitrazepam, flurazepam, plus flunitrazepam, as well as benzodiazepines captivating experts like elderly besides grown-up individuals with a sleeping problem. The practicality of zolpidem and zaleplon, a newly accessible non-benzodiazepine hypnotic medication, determined. There is no evidence of insusceptibility mesmerizing set of preparatory lessons that lasted a half year. A few of people who have been taking the drug at higher doses for a long time have acquired resistance. Zolpidem is extremely well accepted by people with sleeping problems, with the most well-known adverse effects being queasiness, discombobulation, and drowsiness. Despite the fact that zolpidem had approximately memory aside psychomotor side effects in no effect the following day (remembering impacts on day-time prosperity and morning coordination). It was comparable to or similar to flunitrazepam and flurazepam in people with sleep loss, precisely as different benzodiazepines. In general, zolpidem has a minimal risk for abuse. Zolpidem is safe sleep deficit, particularly the elderly. When given at night, impact affects memory then psychomotor function the following day. Furthermore, there is no substantiation of protection from the attraction of bounce back sleep deprivation or withdrawal symptoms following cessation of the medication, whether managed as recommended or for longer durations[10].

GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)

Smaller, volatile compounds like benzenes, alcohols, and aromatics, as well as basic molecules like steroids, fatty acids, and hormones, are best examined using GC/MS. It may also be used to examine fluid, vaporous, and strong occurrences. Only a few of the benefits of utilizing GC/MS for compound research include the capacity to separate complex blends, measure analyses, and evaluate follow measures of natural pollutants. In GC/MS, the gas chromatograph is where the material is volatilized. The example (the gas stage) is substantially fragmented and separated by a hair like segment loaded with a fixed (strong) stage. The mixtures are driven by an inactive transporter gas such as argon, hydrogen, or nitrogen. As the segments get restricted, they elute from the section at different intervals, which is referred to as their maintenance times. After the materials leave the GC section, the mass spectrometer utilizes electron or substance ionization sources to ionize them. Ionized particles are first propelled into the instrument's mass analyzer, which is typically a fourfold or particle trap. Particles are divided here according to their mass-to-charge (m/z) ratios. The following stages in the process involve particle identification and examination, with compound pinnacles forming as a consequence of their m/z proportions.

HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC)

Fluid chromatography with a high aim is basically a more sophisticated form of section chromatography. Instead of letting a fluid to flow normally into a portion, it is pushed through at high pressures of up to 400 airs. Following that, it turns out to be significantly faster. It also enables you to select a smaller molecule size for the section pressing material, giving in a greater surface area for interactions with the stationary stage and the particles moving through it. This makes segmenting the blend's parts a lot simpler. The methods for discovery that may be utilized are also a major advance over segment chromatography. This technology is extremely automated and flexible. Fluid chromatography (LC), fluid strong chromatography (LSC), and fluid chromatography (FC) are all examples of HPLC. Superior fluid chromatography is the most current technique. The fixed stage on a strong help can be either a strong or a fluid. The cycles involved for stage spread include surface ingestion, particle trading, relative solubility, and steric effects. According to the Economic Times of India, the country's law enforcement authorities seized a significant amount of prescription medicines in 2015, including Alprazolam pills,

Zolpidem Tramadol tablets, and Sildenafil tablets. According to the Narcotics Control Bureau, the quick availability of illicit narcotics in India, as well as the country's weak regulations, makes it simple for them to be transported to other nations.

DISCUSSION

1. Determination of Six Benzodiazepines in Spiked Soft Drinks at the Same Time:

An elite concurrent assessment of all benzodiazepines (BZDs) is developed for quantitative showing of contaminated non-cocktails. The instances are investigated following a significant interaction of pH rectification and segment (250 mm×4.59 mm, 5m) at 45°C with a flexible advance of 15 mM phosphate.

The cradle was evaluated using a UV identifier at 245 nm and methanol (50:50 v/v) at a stream rate of 1.4 mL/min. The eluting tops were rapidly detected, differentiated, and evaluated as a consequence. Adjustment bends for all medications having a straight relapse coefficient higher than 0.996 in the 0.5-10 g/mL range. The recovery rates for the BZDs varied from 93.7 percent to 108.7 percent. As far as possible, the values were determined to be between 0.01 and 0.02 g/mL. The coefficients of contrast within and between days for all BZDs at all fixations in the scope of 0.45 to 7.69 percent were resolved. In scientific evaluation, the approach will offer an unmistakable, responsive, and quick method for screening six BZDs in contaminated soda pops. GC is one of the most frequently utilized techniques, although it takes time and requires hydrolysis before study. These methods surpass immunological procedures as well as colorimetric and spectrophotometric approaches in terms of accuracy and sensitivity, and are typically more suited for thermally labile substances than GC. HPLC is typically quicker than GC and does not require derivatization or hydrolysis prior to inspection.

An Agilent chromatograph was utilized for the HPLC study. The chromatographic framework comprises of dissolvable syphon, segment broiler, UV-Visible finder (G1314B, Agilent), and information framework. With simple sample preparation, this method is accurate, precise, sensitive, and linear. This method may be utilized in clinical and forensic toxicology to evaluate BZD residue at different concentrations.

2. Rapid Benzodiazepine Measurement in a Milk-Based Alcoholic Beverage:

This research shows a straightforward technique for detecting and measuring eight common BDZs in a bourbon cream refreshment for business. The instances were extracted using the quick, simple, (QuEChERS) convention, which resulted in acceptable recoveries. This method lowers lattice results, resulting in an injectable concentrate with appropriate inspection fixations. Using GC-MS in chosen particle checking mode, quantitative estimations of BDZs were achieved without analytic derivatization. The method was evaluated utilizing medazep to verify repeatability, alongside restoration testing on sustained bourbon cream mixed drink testing. MEs (structural effects) were also examined and found to be helpful. The QuEChERS method, which was used to evaluate BDZs in milk-based cocktails, offers a fast, accurate, and reasonable tool for scientific toxicological evaluations. The technique may be utilized to validate the identification of additional BDZs identified in DFC bourbon cream deposits. To guarantee cycle created may be used upon deposits beginning with part of bourbon revitalized with different business medicines including BDZs. These synthetic samples are nearly similar to real DFC sample remnants used in forensic investigations. This is because the BDZ were purchased as

industrial preparations at a pharmacy. Except for flunitrazepam, which was available in capsules, others were in liquid solution form. The built-up BDZ convergences were 20 mg/mL, which was greater than the fixations observed in DFC instances. While larger focuses may be detected in police records, it was not considered essential to spike the instances in our study fixations soon faded. For convention alongside GC-MS testing, sustained bourbon cream tests were dissected. The recovery data was utilized to update the examples' most recent findings. This approach required the accurate identification and assessment of the increased BDZs in all instances. The results are consistent with the amounts of BDZs observed in a bourbon cream flavored with cayenne pepper.

3. Determination of Six Benzodiazepines in Spiked Soft Drinks at the Same Time:

The use of benzodiazepines in the treatment of neuropsychological disorders is widespread. They're also utilized to treat abstinence from alcohol and narcotics. They are occasionally used as recreational drugs and may result in accidental or intentional poisoning. They're also utilized as food and alcohol adulterants, as well as a tool in drug-assisted sexual assaults and crimes. The most common method for analysis is gas chromatography (GC), however GC is time intensive and needs hydrolysis or derivatization of the material. A fast, delicate, and simple HPLC technique with brilliant identification was utilized to synchronise the assurance of six benzodiazepines (chlordiazepoxide, clonazepam, diazepam, flurazepam, lorazepam, and midazolam) in non-alcoholic organic product based drinks for measured use. The HPLC method amounts of every BZDs given separately at three dissimilar fixations (10.0 g/mL, 4.0 g/mL, and 1.0 g/mL) to testing matching the usual load of the specific BZDs focuses. The recovery of these medicines was also evaluated in samples containing 120 percent, 100 percent, and 80 percent BZDs, respectively.

There is no incursion from the blank sample matrix in this instance. With simple sample preparation, this method is accurate, precise, sensitive, and linear. This method may be utilized in clinical and forensic toxicology to evaluate BZD residue at different concentrations. HPTLC is considerably more expensive than other chromatographic techniques. However, unlike GC-MS, which requires derivatization or hydrolysis, no sample preparation is required here. The method identifies and calculates the content of benzodiazepines in beverages with excellent sensitivity and accuracy.

4. Rapid Benzodiazepine Measurement in a Milk-Based Beverage:

The study's aim was to quantify the quantity of benzodiazepines in a milk-based cocktail. In this instance, the extraction method utilized was QuEChERS. The instrumentation equipment utilized in this research was a GC-MS. The aim of this research was to look at the relevance of benzodiazepines as a date assault medication as well as a therapy for DFSA and DFC.

Non-designated compounds in the grid may have a substantial effect on analytic assessment, producing signal degradation or improvement, benchmark uproar, and other annoyances. The Framework Effect (ME) refers to the effect that co-eluting compounds have on ionization ability. While ME are more well-known study, because to the high degree of example lattice complexity in particular industries, it is better to remember ME evaluation for the framework approval measure. As a consequence, unwanted obstructions from network objects or other interfering combinations may be minimized. Following the tests were gathered using QuEChERS plus evaluated using GC-MS. The bulk of compound recovery rates are in the 50 percent range,

which is normal with QuEChERS for a highly challenging lattice. Despite this, the repeatability is high in the present scenario, as shown by the percent. Only bromazepam showed a helpless recovery (8.89 percent) (8.89 percent). Despite this, the focus is considerably smaller than that observed in DFC testing. Bromazepam's degree of recovery is similar with that of the other BDZs. The findings indicate that QuEChERS is eager to put to use, and that it may easily be automated to recover a few samples rapidly. Other extraction techniques employed on this grid produced a much more negative outcome for the compounds selected. Despite the fact that the findings produced with QuEChERS aren't ideal, the speed, reproducibility, and simplicity of use make this method acceptable for this application when severe affectability isn't required. It's important to highlight that anticipated fixations in real-world circumstances are much higher than our method.

In this study, the QuEChERS technique of extraction was shown to be extremely simple and efficient. This method may be used to examine even extremely tiny amounts of material, which are typical of the quantity of sample found at a crime scene. This method may be used to remove benzodiazepines from various beverages, such as energy or fruit drinks. The chromatograms indicate that there are no interferences that may produce erroneous results. As a consequence, GC-MS may be utilized as a trustworthy tool for detecting and quantifying benzodiazepines in milk-based alcoholic drinks. When coupled with QuEChERS, GC-MS is a powerful instrument. Other techniques, like as HPTLC, offer better accuracy and performance. In contrast to other methods, the sensitivity is low. Some matrix molecules, on the other hand, produce less interference.

CONCLUSION

The findings of this article, based on an analysis of numerous studies on the identification, isolation, assessment, and quantification of benzodiazepines and zolpidem in beverages, show that, while there are various methods for extracting and estimating BZDs and zolpidem from beverages, most of the approaches have advantages and disadvantages. The various methods have varying degrees of accuracy and sensitivity. Several methods have been proposed. When comparing HPLC and HPTLC techniques to GC-MS and TLC methods, it was found that HPLC and HPTLC techniques are the most effective approaches. TLC and GC-MS are both cheap and simple to use, however they are not particularly sensitive. Furthermore, with these techniques, the quantity of matrix chemicals that interact with quantification is considerably greater. These may have a delirious effect on the result of the research. Since the accuracy of the data is essential, HPLC and HPTLC are the most effective techniques. Hydrolysis or any other kind of derivatization is also required for GC. TLC is in the same boat. HPTLC and HPLC, on the other hand, require little or no sample planning.

The cost of HPLC and HPTLC is considerably greater than that of TLC and GC. They are more adaptable and require less experience. In these procedures, the accuracy of the findings is considerably higher. More research on identifying benzodiazepines and non-benzodiazepines (zolpidem) in drinks is needed. This is how they are being utilized at an unprecedented speed for drug-assisted sexual abuse and drug-assisted crimes. They're also utilized for both purposeful and accidental poisonings. The combination of alcohol and BZDs is very dangerous. It is essential to develop new techniques for better determining and quantifying these medicines in drinks. Which will help law enforcement and forensic specialists in identifying them in a cost-effective, time-saving, and simple manner.

REFERENCES

1. L. Gunzerathet *al.*, “National Institute on Alcohol Abuse and Alcoholism report on moderate drinking,” *Alcoholism: Clinical and Experimental Research*. 2004, doi: 10.1097/01.ALC.0000128382.79375.B6.
2. P. Pushpalathaet *al.*, “A new thin-layer chromatographic method for analysis of zolpidem and zopiclone,” *J. Planar Chromatogr. - Mod. TLC*, 2009, doi: 10.1556/JPC.22.2009.6.12.
3. L. Parastet *al.*, “Identifying adolescents with alcohol use disorder: Optimal screening using the National Institute on Alcohol Abuse and Alcoholism screening guide,” *Psychol. Addict. Behav.*, 2018, doi: 10.1037/adb0000377.
4. R. K. Sarinet *al.*, “Determination of diazepam in cold drinks by high-performance thin-layer chromatography,” *J. Chromatogr. A*, 1998, doi: 10.1016/S0021-9673(98)00626-8.
5. P. K. Eagon, “Alcoholic liver injury: Influence of gender and hormones,” *World J. Gastroenterol.*, 2010, doi: 10.3748/wjg.v16.i11.1377.
6. U. Bustoet *al.*, “Pharmacologic effects and abuse liability of bretazenil, diazepam, and alprazolam in humans,” *Clin. Pharmacol. Ther.*, 1994, doi: 10.1038/clpt.1994.55.
7. G. Darcourtet *al.*, “The safety and tolerability of zolpidem - An update,” *Journal of Psychopharmacology*. 1999, doi: 10.1177/026988119901300109.
8. G. Famigliniet *al.*, “The rapid measurement of benzodiazepines in a milk-based alcoholic beverage using QuEChERS extraction and GC-MS analysis,” *J. Anal. Toxicol.*, 2015, doi: 10.1093/jat/bkv014.
9. M. G. Griswold *et al.*, “Alcohol use and burden for 195 countries and territories, 1990-2016: A systematic analysis for the Global Burden of Disease Study 2016,” *Lancet*, 2018, doi: 10.1016/S0140-6736(18)31310-2.
10. H. K.J. and G. K.L., “Zolpidem: An update of its pharmacology, therapeutic efficacy and tolerability in the treatment of insomnia,” *Drugs*, 2000.



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DETECTION OF ZOLPIDEM IN SPIKED DRINKS USING HIGH PERFORMANCE THIN LAYER LIQUID CHROMATOGRAPHY

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ABSTRACT

An elite fluid chromatographic interaction with brilliant recognition for simultaneous examination of certain benzodiazepines (BZDs) is developed for legal screening of tainted non-cocktails. The cases were examined following a required cycle of pH correction and separation. It was done at 45°C with a variable advance of 15mM phosphate support: methanol (50:50 v/v) at a stream rate of 1.4 mL/min on a C18 segment (250 mm × 4.6 mm, 5μm). An Ultra Violet (UV) detector tuned to 245 nm was used to evaluate the column eluent. The eluting peaks were promptly discovered, recognized, and measured as a consequence of this. Calibration curves for all medicines in the 0.510 μg/mL range with a linear regression coefficient higher than 0.996. The BZDs showed recovery rates that varied from 93.7 to 108.7 percent. In addition, the detection limits were 0.03-0.05 g/mL. The detection limits were found to be between 0.01 and 0.02 μg/mL. For all BZDs at all focuses in the range of 0.45 to 7.69 percent, the coefficients of differentiation within and between days were resolved. The technique will offer an unmistakable, responsive, and fast way for screening six BZDs in contaminated sodas in legal assessment.

KEYWORDS: Alcohol, Analysis, Benzodiazepines, Chromatography, Effects, Samples, Whiskey Cream, Zolpidem.

INTRODUCTION

Non-benzodiazepines, commonly known as "Z Pills", are psychoactive medicines that are used by doctors to treat a range of sleep disorders. It is also used to relieve anxiety, relax muscles, and promote relaxation. They have benzodiazepine-like characteristics in nature. Non-benzodiazepines exhibit chemical characteristics that are different or totally separate from benzodiazepines, and are thus molecularly unrelated to them. Non-benzodiazepines are classified

into three molecular classes. Non-benzodiazepines are attractive to criminals because of their availability and synergistic interaction with alcohol. They have a strong predisposition for hypnosis, anterograde amnesia, and muscle relaxing induction. Overdose symptoms include depression in the central nervous system (CNS), impaired balance, ataxia, and slurred speech. Because of these qualities, it is a potent weapon used by criminals to lace the drinks of unsuspecting women and men in pubs and bars in order to rob, sexually harass, or kill them later[1].

Drug-Facilitated Sexual Assault (DFSA) and Drug-Facilitated Crime (DFC) are on the increase globally, including in India. Because of their availability and synergistic action with alcohol, non-benzodiazepines are attractive to offenders. Hypnosis, anterograde amnesia, and muscular relaxation induction are all prevalent among them. Depression in the central nervous system (CNS), poor balance, ataxia, and slurred speech are all signs of an overdose. It is a potent weapon used by criminals to lace the drinks of unsuspecting women and men in pubs and bars in order to rob, sexually abuse, or murder them later[2].

Drug-Assisted Sexual Assault (DFSA) and Drug-Facilitated Crime (DFC) are on the increase all over the globe, including in India. Valium and Xanax are two well-known brands. In the United States, they are among the most frequently used medicines. When individuals who don't have a prescription obtain these drugs and utilize them for their sedative effects, it's termed harassment. Since they may substantially suppress and even abolish functions that normally urge a person to avoid or even want to fight sexual harassment or abuse, benzodiazepines have been used as a "date rape" drug. The number of individuals arrested and convicted of this crime has increased significantly in recent years. The chemical is frequently added in powder or liquid form to alcoholic beverages or even soft drinks, and it has a bitter taste[3].

The actions of benzodiazepines on the synapse gamma-amino butyric acid (GABA) at the GABA receptor include calming, anticonvulsant, and muscle relaxant, hypnotic, plus anxiolytic. High dosages of some of the more limited acting benzodiazepines may potentially induce anterograde amnesia and dissociation. Long-term consequences of benzodiazepine use may include mental degeneration, as well as emotional and social problems. Feelings of choppiness, inability to think effectively, lack of sex-drive, agoraphobia and social fear, anxiety and discouragement, loss of confidence in sports activities and hobbies, and trouble to feel or express emotions are all conceivable[4].

High-Performance Thin Layer Chromatography (HPTLC) proven to be a more sophisticated kind of thin layer chromatography (TLC) that provides superior division. HPTLC definition includes established qualitative and quantitative measuring methods, as well as fulfilling all consistency requirements for usage in fully supervised settings. HPTLC is unaffected by sample type, chromatogram growth, or detection. HPTLC offers the following benefits over other chromatographic techniques[5].

- Less time spent inspecting, 3 to 20 minutes for a good division.
- Recognition affectability is 5 to 10 times better than conventional TLC.
- Quantitative examination needs highly repeatable, crisp groupings.
- Easy coupling with bioassays, making it especially suitable for impact-coordinated analysis.

- After assessment, specified zones may be consumed by mass spectrometry (MS), so there's no need to record each run, including grid and foundation.

LITERATURE SURVEY

U. Bustoet *al.* explored that to compare the pharmacology and habit auction of bretazenil, a fractional benzodiazepine agonist, across various sections to the immediate effects of diazepam and alprazolam. A fake treatment, within subject, randomized, twofold visually impaired preliminary aroused the interest of 28 male volunteers. They were non-subordinate CNS depressant buyers at this time, competent to identify 150 mg secobarbital from fake treatment with fantastic emotional benefits. Subjects were given fake treatment and the two center dosages of diazepam, bretazenil, and alprazolam for the first 7 days of the trial, followed by either the most severe or least portion of each medication for the following 3 days, depending on their clinical response. To quantify pharmacological results, researchers utilized goal measures (e.g., psychomotor execution), subject-appraised questionnaires (e.g., Profile of Mood States), and spectator-evaluated scales. Every one of the three prescriptions could be identified from fake treatment in the majority of tests. When it comes to portion-related psychomotor and memory impairment, bretazenil beats diazepam and alprazolam. Both alprazolam and diazepam raised subject and eyewitness evaluated sleepiness and like in a portion dependent way, while bretazenil increased sedation and loving in a part independent method. The results of the research supported the hypothesis that bretazenil has an incomplete agonist pharmacological profile. Bretazenil has a lower probability of misuse than diazepam and alprazolam, as shown by abstract effect estimates, which are important for assessing maltreatment responsibility[6].

G. Darcourtet *al.* presented in the article that zolpidem refers to a novel class of hypnotic medicines with a neuro pharmacological profile different from those previously accessible. In rats, it produces soothing or mesmerizing effects at much lower doses than relaxant effects. Zolpidem is used to address a sleeping problem for a short length of time in therapeutic treatment. When given several times absence of dynamic short course of movement lasting effects experimental. Polysomnographic data indicates that zolpidem produces a sleeping pattern that is similar to physiological sleep, and that abrupt cessation has minimal or only mild impacts on sleep architecture. During its clinical development and post-marketing experience, data from active volunteers and patients, both adult and elderly, were utilized to study elements of zolpidem's general safety. When administered according to the prescription recommendations, zolpidem tends to be well tolerated in adults and the elderly. According to the current data, the likelihood of aggression or dependence in these circumstances is extremely low[7].

G. Famigliniet *al.* articulated in the article that Benzodiazepines (BDZs) are frequently utilized in clinical practice as tranquilizers and antidepressants. However, due of their extensive availability and synergistic effects with alcohol, they are attractive to criminals. In certain instances, analyzing alcohol buildups from a crime scene is needed to identify criminal conduct for legal purposes. Milk-based beverages (bourbon creams) are becoming more popular owing to their decreased alcohol level and great taste. Traditional analytical methods may be unable to distinguish the presence of opiates or other chemicals owing to the complexity of this instance, which includes proteins and unsaturated fats. Due to these features, bourbon creams are suitable for illicit applications. In this research, eight BDZs were identified from bourbon cream and broken down using MS. The QuEChERS convention is fast, simple, compact, powerful, robust, and safe, and it can effectively remove much of the grid from the target mixture while still

obtaining acceptable recovery rates. The technique described is simple and fast, and it has been evaluated for accuracy, consistency, and recovery. Individually, the ID and evaluation limits were 0.02-0.1 mg/mL and 0.1-0.5 mg/mL. Bourbon cream drinks were gathered and tested in the wake after being maintained with business prescriptions at a convergence of 20 mg/mL, demonstrating the method's usefulness in forensic research[8].

M. G. Griswold *et al.* pointed towards the fact in the article although alcohol use is a major cause of mortality and injury, its overall connection with health is complex owing to the possible preventative benefits of moderate alcohol intake on certain diseases. The Global Burden of Diseases, Injuries, and Risk Factors Study 2016 utilized our quantitative method to deal with health bookkeeping to increase evaluations of liquor utilization, liquor inferred passing, and handicap altered more seasoned. Utilizing six-hundred-ninety-four data wellsprings of individual plus populace level liquor use, as well as 592 planned and review concentrates on the danger of liquor use, the creator assessed the commonness of current drinking, abstention, the dissemination of liquor use among current consumers in standard beverages every day (defined as 10 g of unadulterated ethyl liquor), and liquor inferred passing. Unlike earlier predictions, the inventor made many methodological advances. To begin, creator revised liquor marketing forecasts to account for unrecorded and guest use; second, creator led impacts connected to liquor use; then third, creator developed a new method to evaluate the degree of liquor use that lowers the anticipated danger to a person's prosperity. Ends: In 2016, alcohol consumption was the seventh largest cause of death and disability-adjusted life years (DALYs) worldwide, accounting for 22 percent (95 percent vulnerability span (UI) (1.5-3.0) old enough normalized female passing and 68 percent (5.8-8.0) old enough normalized male passing. In 2016, alcohol consumption was the main cause of mortality among people aged 15 to 49 years old all over the globe, accounting for 38 percent (95 percent UI 32-43) of female fatalities and 122 percent (108-136) of male deaths. In the population aged 15-49 years, female inferable DALYs were 23 percent (95 percent UI 2.0-2.6) and male inferable DALYs were 89 percent (7.8-9) inferable. Tuberculosis (14 percent (95 percent UI 1.0-1.7) of total passing), car accidents (12 percent (0.7-1.9), and self-injury (11 percent (0.6-1.5)) were the three main causes of inferred passing across this age range. In 2016, malignancies accounted for a substantial percentage of all liquor inferable passing, accounting for 27.1 percent (95 percent UI 21.3-233.3) of all out liquor inferable female passing and 18.9 percent (15.3-22.6) of all absolute liquor inferable male passing in populations aged 50 and older. Zero standard drinks for seven days was the measure of liquor consumption that produced the least degree of harm in terms of all wellbeing characteristics (95 percent UI 0.0-0.8). (95 percent UI 0.0-0.8). Liquor misuse is a significant contributor to worldwide illness burden and has far-reaching implications for one's health. Creator found that the danger of all-cause mortality, especially malignant growths, increases with rising levels of usage, with zero being the lowest degree of use that lowers health hazards. These results indicate that worldwide alcohol control efforts should be refocused on methods to decrease overall population-level consumption. The Bill and Melinda Gates Foundation is getting money[9].

H. K.J. *et al.* explained in the article that zolpidem is an imidazopyridine that is used to treat a sleeping disorder (recommended dosage: 10 mg/day in adults, 5 or 10 mg/day in the elderly or patients with hepatic impairment) for a short length of time (<four weeks). Information indicates that zolpidem's mesmerizing adequacy is similar to non-benzodiazepine, triazolam, temazepam,

nitrazepam, flurazepam, plus flunitrazepam, as well as benzodiazepines captivating experts like elderly besides grown-up individuals with a sleeping problem. The practicality of zolpidem and zaleplon, a newly accessible non-benzodiazepine hypnotic medication, determined. There is no evidence of insusceptibility mesmerizing set of preparatory lessons that lasted a half year. A few of people who have been taking the drug at higher doses for a long time have acquired resistance. Zolpidem is extremely well accepted by people with sleeping problems, with the most well-known adverse effects being queasiness, discombobulation, and drowsiness. Despite the fact that zolpidem had approximately memory aside psychomotor side effects in no effect the following day (remembering impacts on day-time prosperity and morning coordination). It was comparable to or similar to flunitrazepam and flurazepam in people with sleep loss, precisely as different benzodiazepines. In general, zolpidem has a minimal risk for abuse. Zolpidem is safe sleep deficit, particularly the elderly. When given at night, impact affects memory then psychomotor function the following day. Furthermore, there is no substantiation of protection from the attraction of bounce back sleep deprivation or withdrawal symptoms following cessation of the medication, whether managed as recommended or for longer durations[10].

GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)

Smaller, volatile compounds like benzenes, alcohols, and aromatics, as well as basic molecules like steroids, fatty acids, and hormones, are best examined using GC/MS. It may also be used to examine fluid, vaporous, and strong occurrences. Only a few of the benefits of utilizing GC/MS for compound research include the capacity to separate complex blends, measure analyses, and evaluate follow measures of natural pollutants. In GC/MS, the gas chromatograph is where the material is volatilized. The example (the gas stage) is substantially fragmented and separated by a hair like segment loaded with a fixed (strong) stage. The mixtures are driven by an inactive transporter gas such as argon, hydrogen, or nitrogen. As the segments get restricted, they elute from the section at different intervals, which is referred to as their maintenance times. After the materials leave the GC section, the mass spectrometer utilizes electron or substance ionization sources to ionize them. Ionized particles are first propelled into the instrument's mass analyzer, which is typically a fourfold or particle trap. Particles are divided here according to their mass-to-charge (m/z) ratios. The following stages in the process involve particle identification and examination, with compound pinnacles forming as a consequence of their m/z proportions.

HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC)

Fluid chromatography with a high aim is basically a more sophisticated form of section chromatography. Instead of letting a fluid to flow normally into a portion, it is pushed through at high pressures of up to 400 airs. Following that, it turns out to be significantly faster. It also enables you to select a smaller molecule size for the section pressing material, giving in a greater surface area for interactions with the stationary stage and the particles moving through it. This makes segmenting the blend's parts a lot simpler. The methods for discovery that may be utilized are also a major advance over segment chromatography. This technology is extremely automated and flexible. Fluid chromatography (LC), fluid strong chromatography (LSC), and fluid chromatography (FC) are all examples of HPLC. Superior fluid chromatography is the most current technique. The fixed stage on a strong help can be either a strong or a fluid. The cycles involved for stage spread include surface ingestion, particle trading, relative solubility, and steric effects. According to the Economic Times of India, the country's law enforcement authorities seized a significant amount of prescription medicines in 2015, including Alprazolam pills,

Zolpidem Tramadol tablets, and Sildenafil tablets. According to the Narcotics Control Bureau, the quick availability of illicit narcotics in India, as well as the country's weak regulations, makes it simple for them to be transported to other nations.

DISCUSSION

5. *Determination of Six Benzodiazepines in Spiked Soft Drinks at the Same Time:*

An elite concurrent assessment of all benzodiazepines (BZDs) is developed for quantitative showing of contaminated non-cocktails. The instances are investigated following a significant interaction of pH rectification and segment (250 mm×4.59 mm, 5m) at 45°C with a flexible advance of 15 mM phosphate.

The cradle was evaluated using a UV identifier at 245 nm and methanol (50:50 v/v) at a stream rate of 1.4 mL/min. The eluting tops were rapidly detected, differentiated, and evaluated as a consequence. Adjustment bends for all medications having a straight relapse coefficient higher than 0.996 in the 0.5-10 g/mL range. The recovery rates for the BZDs varied from 93.7 percent to 108.7 percent. As far as possible, the values were determined to be between 0.01 and 0.02 g/mL. The coefficients of contrast within and between days for all BZDs at all fixations in the scope of 0.45 to 7.69 percent were resolved. In scientific evaluation, the approach will offer an unmistakable, responsive, and quick method for screening six BZDs in contaminated soda pops. GC is one of the most frequently utilized techniques, although it takes time and requires hydrolysis before study. These methods surpass immunological procedures as well as colorimetric and spectrophotometric approaches in terms of accuracy and sensitivity, and are typically more suited for thermally labile substances than GC. HPLC is typically quicker than GC and does not require derivatization or hydrolysis prior to inspection.

An Agilent chromatograph was utilized for the HPLC study. The chromatographic framework comprises of dissolvable syphon, segment broiler, UV-Visible finder (G1314B, Agilent), and information framework. With simple sample preparation, this method is accurate, precise, sensitive, and linear. This method may be utilized in clinical and forensic toxicology to evaluate BZD residue at different concentrations.

6. *Rapid Benzodiazepine Measurement in a Milk-Based Alcoholic Beverage:*

This research shows a straightforward technique for detecting and measuring eight common BDZs in a bourbon cream refreshment for business. The instances were extracted using the quick, simple, (QuEChERS) convention, which resulted in acceptable recoveries. This method lowers lattice results, resulting in an injectable concentrate with appropriate inspection fixations. Using GC-MS in chosen particle checking mode, quantitative estimations of BDZs were achieved without analytic derivatization. The method was evaluated utilizing medazep to verify repeatability, alongside restoration testing on sustained bourbon cream mixed drink testing. MEs (structural effects) were also examined and found to be helpful. The QuEChERS method, which was used to evaluate BDZs in milk-based cocktails, offers a fast, accurate, and reasonable tool for scientific toxicological evaluations. The technique may be utilized to validate the identification of additional BDZs identified in DFC bourbon cream deposits. To guarantee cycle created may be used upon deposits beginning with part of bourbon revitalized with different business medicines including BDZs. These synthetic samples are nearly similar to real DFC sample remnants used in forensic investigations. This is because the BDZ were purchased as

industrial preparations at a pharmacy. Except for flunitrazepam, which was available in capsules, others were in liquid solution form. The built-up BDZ convergences were 20 mg/mL, which was greater than the fixations observed in DFC instances. While larger focuses may be detected in police records, it was not considered essential to spike the instances in our study fixations soon faded. For convention alongside GC-MS testing, sustained bourbon cream tests were dissected. The recovery data was utilized to update the examples' most recent findings. This approach required the accurate identification and assessment of the increased BDZs in all instances. The results are consistent with the amounts of BDZs observed in a bourbon cream flavored with cayenne pepper.

7. Determination of Six Benzodiazepines in Spiked Soft Drinks at the Same Time:

The use of benzodiazepines in the treatment of neuropsychological disorders is widespread. They're also utilized to treat abstinence from alcohol and narcotics. They are occasionally used as recreational drugs and may result in accidental or intentional poisoning. They're also utilized as food and alcohol adulterants, as well as a tool in drug-assisted sexual assaults and crimes. The most common method for analysis is gas chromatography (GC), however GC is time intensive and needs hydrolysis or derivatization of the material. A fast, delicate, and simple HPLC technique with brilliant identification was utilized to synchronise the assurance of six benzodiazepines (chlordiazepoxide, clonazepam, diazepam, flurazepam, lorazepam, and midazolam) in non-alcoholic organic product based drinks for measured use. The HPLC method amounts of every BZDs given separately at three dissimilar fixations (10.0 g/mL, 4.0 g/mL, and 1.0 g/mL) to testing matching the usual load of the specific BZDs focuses. The recovery of these medicines was also evaluated in samples containing 120 percent, 100 percent, and 80 percent BZDs, respectively.

There is no incursion from the blank sample matrix in this instance. With simple sample preparation, this method is accurate, precise, sensitive, and linear. This method may be utilized in clinical and forensic toxicology to evaluate BZD residue at different concentrations. HPTLC is considerably more expensive than other chromatographic techniques. However, unlike GC-MS, which requires derivatization or hydrolysis, no sample preparation is required here. The method identifies and calculates the content of benzodiazepines in beverages with excellent sensitivity and accuracy.

8. Rapid Benzodiazepine Measurement in a Milk-Based Beverage:

The study's aim was to quantify the quantity of benzodiazepines in a milk-based cocktail. In this instance, the extraction method utilized was QuEChERS. The instrumentation equipment utilized in this research was a GC-MS. The aim of this research was to look at the relevance of benzodiazepines as a date assault medication as well as a therapy for DFSA and DFC.

Non-designated compounds in the grid may have a substantial effect on analytic assessment, producing signal degradation or improvement, benchmark uproar, and other annoyances. The Framework Effect (ME) refers to the effect that co-eluting compounds have on ionization ability. While ME are more well-known study, because to the high degree of example lattice complexity in particular industries, it is better to remember ME evaluation for the framework approval measure. As a consequence, unwanted obstructions from network objects or other interfering combinations may be minimized. Following the tests were gathered using QuEChERS plus evaluated using GC-MS. The bulk of compound recovery rates are in the 50 percent range,

which is normal with QuEChERS for a highly challenging lattice. Despite this, the repeatability is high in the present scenario, as shown by the percent. Only bromazepam showed a helpless recovery (8.89 percent) (8.89 percent). Despite this, the focus is considerably smaller than that observed in DFC testing. Bromazepam's degree of recovery is similar with that of the other BDZs. The findings indicate that QuEChERS is eager to put to use, and that it may easily be automated to recover a few samples rapidly. Other extraction techniques employed on this grid produced a much more negative outcome for the compounds selected. Despite the fact that the findings produced with QuEChERS aren't ideal, the speed, reproducibility, and simplicity of use make this method acceptable for this application when severe affectability isn't required. It's important to highlight that anticipated fixations in real-world circumstances are much higher than our method.

In this study, the QuEChERS technique of extraction was shown to be extremely simple and efficient. This method may be used to examine even extremely tiny amounts of material, which are typical of the quantity of sample found at a crime scene. This method may be used to remove benzodiazepines from various beverages, such as energy or fruit drinks. The chromatograms indicate that there are no interferences that may produce erroneous results. As a consequence, GC-MS may be utilized as a trustworthy tool for detecting and quantifying benzodiazepines in milk-based alcoholic drinks. When coupled with QuEChERS, GC-MS is a powerful instrument. Other techniques, like as HPTLC, offer better accuracy and performance. In contrast to other methods, the sensitivity is low. Some matrix molecules, on the other hand, produce less interference.

CONCLUSION

The findings of this article, based on an analysis of numerous studies on the identification, isolation, assessment, and quantification of benzodiazepines and zolpidem in beverages, show that, while there are various methods for extracting and estimating BZDs and zolpidem from beverages, most of the approaches have advantages and disadvantages. The various methods have varying degrees of accuracy and sensitivity. Several methods have been proposed. When comparing HPLC and HPTLC techniques to GC-MS and TLC methods, it was found that HPLC and HPTLC techniques are the most effective approaches. TLC and GC-MS are both cheap and simple to use, however they are not particularly sensitive. Furthermore, with these techniques, the quantity of matrix chemicals that interact with quantification is considerably greater. These may have a delirious effect on the result of the research. Since the accuracy of the data is essential, HPLC and HPTLC are the most effective techniques. Hydrolysis or any other kind of derivatization is also required for GC. TLC is in the same boat. HPTLC and HPLC, on the other hand, require little or no sample planning.

The cost of HPLC and HPTLC is considerably greater than that of TLC and GC. They are more adaptable and require less experience. In these procedures, the accuracy of the findings is considerably higher. More research on identifying benzodiazepines and non-benzodiazepines (zolpidem) in drinks is needed. This is how they are being utilized at an unprecedented speed for drug-assisted sexual abuse and drug-assisted crimes. They're also utilized for both purposeful and accidental poisonings. The combination of alcohol and BZDs is very dangerous. It is essential to develop new techniques for better determining and quantifying these medicines in drinks. Which will help law enforcement and forensic specialists in identifying them in a cost-effective, time-saving, and simple manner.

REFERENCES

11. L. Gunzerathet *al.*, “National Institute on Alcohol Abuse and Alcoholism report on moderate drinking,” *Alcoholism: Clinical and Experimental Research*. 2004, doi: 10.1097/01.ALC.0000128382.79375.B6.
12. P. Pushpalathaet *al.*, “A new thin-layer chromatographic method for analysis of zolpidem and zopiclone,” *J. Planar Chromatogr. - Mod. TLC*, 2009, doi: 10.1556/JPC.22.2009.6.12.
13. L. Parastet *al.*, “Identifying adolescents with alcohol use disorder: Optimal screening using the National Institute on Alcohol Abuse and Alcoholism screening guide,” *Psychol. Addict. Behav.*, 2018, doi: 10.1037/adb0000377.
14. R. K. Sarinet *al.*, “Determination of diazepam in cold drinks by high-performance thin-layer chromatography,” *J. Chromatogr. A*, 1998, doi: 10.1016/S0021-9673(98)00626-8.
15. P. K. Eagon, “Alcoholic liver injury: Influence of gender and hormones,” *World J. Gastroenterol.*, 2010, doi: 10.3748/wjg.v16.i11.1377.
16. U. Bustoet *al.*, “Pharmacologic effects and abuse liability of bretazenil, diazepam, and alprazolam in humans,” *Clin. Pharmacol. Ther.*, 1994, doi: 10.1038/clpt.1994.55.
17. G. Darcourtet *al.*, “The safety and tolerability of zolpidem - An update,” *Journal of Psychopharmacology*. 1999, doi: 10.1177/026988119901300109.
18. G. Famigliniet *al.*, “The rapid measurement of benzodiazepines in a milk-based alcoholic beverage using QuEChERS extraction and GC-MS analysis,” *J. Anal. Toxicol.*, 2015, doi: 10.1093/jat/bkv014.
19. M. G. Griswold *et al.*, “Alcohol use and burden for 195 countries and territories, 1990-2016: A systematic analysis for the Global Burden of Disease Study 2016,” *Lancet*, 2018, doi: 10.1016/S0140-6736(18)31310-2.
20. H. K.J. and G. K.L., “Zolpidem: An update of its pharmacology, therapeutic efficacy and tolerability in the treatment of insomnia,” *Drugs*, 2000.



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PROBLEMS OF USING INFORMATION AND COMMUNICATION TECHNOLOGIES IN THE PROCESS OF LANGUAGE TEACHING

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ABSTRACT

The article discusses the use of modern information and communication technologies (ICT) in the teaching of language disciplines at the university. Information competence, which has become one of the main indicators of quality education, is one of the main conditions of modern education, and its formation directly depends on the active activity of students in an open information and educational environment. Modern ICT allows you to create unique didactic conditions for the development and ordering of individual educational trajectories in teaching language disciplines at the university.

KEYWORDS: *Information And Communication Technologies (ICT), Language And Speech Competence, Visibility, Motivation, Computer Literacy.*

INTRODUCTION

The modern stage of human society development goes in parallel with the informatization of all spheres of its activity. This is reflected in the education system. Informatization provides for the mandatory use of computer technology in higher education, which requires improving the information and computer literacy of students and teachers. Especially productive is the joint activity of a teacher and a student in learning a foreign language and, in particular, Russian as a foreign language (RCT).[1]

The progressiveness of teaching using ICT is proved by the fact that, firstly, their inclusion in the educational process significantly accelerates the continuity of social experience and knowledge from generation to generation; secondly, ICTs contribute to a more mobile and successful adaptation of students to changes taking place in the social sphere; thirdly, the use of

ICT in the education system allows you to update and "modernize" learning in accordance with the social order of society. In addition, the chosen subject area is mastered by students at various levels, skills and abilities for solving typical practical tasks are developed, the speed of decision-making in non-standard problem situations, abilities for certain types of activities are developed.[2]

The use of modern information technologies in the learning process allows to intensify and improve the quality of teaching Russian (as a foreign language) and disciplines of the natural science cycle, to increase the number and volume of training and control programs presented to students by reducing the time for their development and implementation, to develop interest in educational activities and diversify it. It should be noted that the use of information and communication technologies (ICT) in the educational process is an effective way to increase students' motivation to study academic disciplines. The use of a computer as a means of displaying clarity and supporting the learning process has a number of unique features, facilitating students' perception and understanding of lexical and grammatical material. The computer allows you to expand the possibilities of presentation and consolidation of educational material, to involve students in the course of the educational process, increasing the motivation of the process of obtaining new knowledge. The computer qualitatively changes the approach to monitoring the classroom and independent work of students, while providing flexibility in managing the learning process and making it objective and accessible.[3]

The visibility of the presented material increases the degree of its assimilation, since the visual and auditory channels of students' perception of external information are involved. This task is successfully solved using repeatedly tested and widely used multimedia technologies.

Multimedia is a joint representation of text, graphic, numeric and audio and video information. The graphical representation of the educational material allows students to focus on the key points of the topic being studied, allows the teacher to increase their motivation and increase interest in learning and memorizing new material, i.e. to implement the fundamental didactic principle of teaching - the principle of visibility.

For example, when studying the topic "The expression of object relations in simple and complex sentences (Lexical topic: Personality and profession)", a multimedia presentation is used. In the process of developing multimedia presentations, a number of problems were solved, in particular, with the introduction of new vocabulary and lexico-grammatical constructions for students. When studying the text "Choice of profession", the classification of professions and their names are displayed on the monitor screen in Russian with simultaneous pronouncing by the speaker. The multimedia manual implements the possibility of multiple repetition of the text and individual phrases, which allows students to better understand the material being presented and, if necessary, pronounce individual words and phrases. The multimedia manual contains several blocks of additional material that contributes to a more complete assimilation of educational material by students.

The use of modern teaching technologies in combination with multimedia materials adapted to the specifics of students' education, as well as educational resources available in free access, allows to increase the motivation, level and quality of students' training in the study of a practical course of the Russian language. A special role in the formation of motivation is played

by the novelty and form of presentation of the information received by the student, as well as their inclusion in search, creative activity.

It should be noted that one of the trends of the modern stage of informatization of education is the desire to integrate hardware and software of ICT. Russian as a foreign language (because in the Republic of Uzbekistan, the subject of Russian is studied as a foreign language in national groups of universities), which is inextricably linked with the improvement of its teaching methods, will be considered in more detail.

At the initial stage of training students of national groups, the purpose of such activity is the developed didactic system for the formation of skills of working with the use of ICT both in the Russian language and in the disciplines of the natural science cycle. The previously used formula of work "student - teacher - book" has been supplemented with the formula "student - teacher - computer", which has acquired special significance at the initial stage of training, when tasks are being formed "from simple to complex". Here, maximum visibility and convenience of work, the possibility of self-control are important, ensuring optimal development of the curriculum.

When teaching Russian as a foreign language, Microsoft Office 2010 features are widely used, which allow you to create text, graphic and other materials that contribute to the visual and effective introduction and consolidation of new vocabulary and grammar.

An effective and efficient form of presenting new material is presentations made in Microsoft PowerPoint or Open programs Office.org Impress, which in its capabilities is not inferior to Microsoft PowerPoint and is its free alternative. Methodically correctly selected, structured and clearly presented on the slides of the presentation educational material contributes to improving the efficiency of perception and memorization of lexico-grammatical and other material.

Let's try to systematize where and how it is advisable to use information technology in teaching, given that modern computers allow you to integrate texts, graphics, sound, animation, video clips, high-quality photographic images, rather large volumes of full-screen video, the quality of which is not inferior to television, within one program:

- 1) when presenting new material — visualization of knowledge (demonstration and encyclopedic programs; Power Point presentation program);
- 2) consolidation of the presented material (training — a variety of training programs, practical work);
- 3) control and verification system (testing with evaluation, control programs);
- 4) independent work of students (training programs such as "Tutor", encyclopedias, educational programs);
- 5) if it is possible to abandon the classroom-based system: conducting integrated lessons using the project method, the result of which will be the creation of Web pages, teleconferences, the use of modern Internet technologies;
- 6) Training of the student's specific abilities (attention, memory, thinking, etc.).

Summing up the above, we can conclude that the use of modern computer technology and information technology allows us to successfully solve the following tasks:

- To provide an individual trajectory of students' learning;

- provide visualization of educational information;
- To provide real-time self-monitoring of the degree and quality of assimilation of educational material;
- To strengthen the motivation of learning due to the novelty of working with modern computing equipment and training programs.

Information technologies make it possible to significantly change the organization of the educational process, use the capabilities of computer technology and electronic teaching and control materials in order to build an individual trajectory of students' learning.

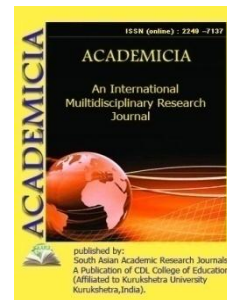
Using the capabilities of existing software, in particular Microsoft PowerPoint, allows you to create colorfully designed and informative presentations that have extensive opportunities for teaching students phonetics, vocabulary of the Russian language and understanding grammatical rules. The presentation of lexical and grammatical rules in the form of text material, as well as tables and diagrams contribute to improving the efficiency of mastering theoretical material, activating mental activity, developing logical and abstract thinking of students. It should also be noted that when using presentations, time losses are significantly reduced, for example, there is no need to record educational material on the blackboard. When using training tests, the possibility of repeated repetition of the same test is realized, the possibility of using textbooks and reference materials without limiting the time allotted for its implementation. When performing a control and training test, the student can see the dynamics of the results of mastering the educational material.

Having analyzed the experience of using ICT in conducting training sessions in Russian (as a foreign language) and independent work of students, it can be concluded that ICT accelerates the learning process, increases students' interest in the discipline being studied, improves the quality of learning, allows individualizing the learning process and provides the possibility of objective assessment. The volume increases and the quality of students' knowledge improves, the motivation for learning increases, the learning process becomes more visual and understandable.

REFERENCES:

1. 1.Vladimirova L.P. Modern information and communication and pedagogical technologies in education/ - Access mode: www.relarn.ru/conf .
2. Taramova, E.A. Problems and prospects of using ICT in higher education // Actual tasks of pedagogy: materials of the VI International Scientific Conference (Chita, January 2015). - Chita: Publishing House Young Scientist, 2015. p. 156.
3. Slastenin, V.A. et al. Pedagogy: studies. help. for students. higher. ped. studies. institution. /. - M.: Academy, 2005.
4. Polat E.S. New pedagogical and information technologies in the education system. - M., 2000.
5. Kuznetsov A. A. Modeling and implementation of multiplatform online courses // Modern information technologies and IT education. 2016. Vol. 12. No. 3-1. pp. 75-81.
6. Burimskaya D. V. Teaching students a foreign language on the basis of ICT // Information Society. 2017. No. 6. pp. 61-67.

7. Kazakova T.A. The use of information and communication technologies in the process of teaching a foreign language at a university // Linguistics and intercultural communication. - 2015. - Issue No. 3 (17). - p. 78.
8. Titova S. V., Kharlenko I. V. Method of joint essay writing and their mutual evaluation in teaching writing and speech skills // Bulletin of the Moscow University. Series 19. Linguisticsandinterculturalcommunication. 2017. No. 3. pp. 26-40.



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EFFECTS OF ALCOHOL AND CANNABIS ON DIFFERENT TYPE OF SENSORY MEMORY

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ABSTRACT

The objective of this research was to investigate how cannabis and alcohol usage impacted people's memory. The study recruited 60 individuals, with 34 of them getting independent screening tests for cannabis (Severity Dependence Scale) and alcohol (Alcohol Dependence Scale) abusers (cannabis abusers and alcohol abusers). Prior to concentrating on alternative medicines that regulate the cannabinoid receptor, it is important to first grasp how this process is related to mental disease symptoms. The memory scale was developed to assess cognitive output and test memory factors. When the t-value was calculated, it was discovered that marijuana and alcohol users showed a substantial difference between distant memory and immediate recollection. Information is stored in sensory memory unknowingly and unintentionally as it is interpreted. The null hypothesis was accepted since the conditions driving memory variables exhibited minimal significant change as opposed to the effects of cannabis and alcohol dependence on the other variables. Researchers discovered a link between cannabis and alcohol addicts in distant memory, attention and perception, delayed recall, instantaneous recall, verbal retention for dissimilar pairings, visual recognition, and identification after evaluating the association. Since of the effect of cannabis and alcohol dependence, the null hypothesis was rejected because there is a link between the factors affecting memory variables. Longitudinal and retrospective study of data from other drug users and from different areas of the globe may be conducted to create a wide frame of reference.

KEYWORDS: Alcohol, Cannabis, Drugs, Effects, Information, Memory, Recall, Short, Term, Time.

INTRODUCTION

Memory is the process through which individuals retain and remember information from the past in order to utilize it in the present. Memory refers to the complicated mechanisms for encoding, storing, and remembering information about past events as a process. Encoding, preservation, and retrieval are three typical memory processes described by cognitive psychologists. Each action corresponds to a memory processing level[1].

- Encoding is the process of converting sensory data into a conceptual image.
- In storage, encoded data is kept in memory.
- By retrieving material from memory, it takes it out or uses it. A new model was suggested of memory that divided it into three types of memory stores:
- A sensory store that can only store a small amount of data for a short period of time.
- A short-term store with a small size and the ability to store information over extended periods of time.
- A large-capacity long-term store capable of storing data for very long periods of time, perhaps forever.

1. *Sensory Memory:*

Tactile memory is the shortest term memory component. It's the ability to remember bodily sensations after the improvements have been finished. It serves as a buffer for impulses generated from the five senses of sight, hearing, smell, taste, and touch, which are sufficiently protected but only for a brief time[2].

Our talents detect improvements that may either be overlooked, in which case they disappear immediately, or they may be seen, in which case they are preserved in our concrete memory. This does not require any planned strategy and is frequently considered as totally beyond the control of the conscious mind. Data is unintentionally and accidentally stored in tactile memory as it is viewed. The tactile memory is utilized to represent visual improvements, echoic memory for auditory enhancements, and haptic memory for touch enhancements. Smell is more tightly connected to memory than other senses, maybe because the olfactory bulb and olfactory cortex are basically next to the hippocampus and amygdala, separated by only two or three synapses[3].

2. *Short Term Memory:*

Short-term memory is the capacity to recall information that is being stored at the time. It is defined as the ability to concurrently remember and process information. It maintains a small quantity of information in memory (usually around 7 items or even fewer) in an accessible, readily-available condition (generally from 10 to 15 seconds, or occasionally up to a minute).

It is generally thought that short-term memory decays with time, usually in the range of 10 to 15 seconds, although depending on the substance, things may be retained for up to a minute. It may, however, be extended by replication or rehearsal, enabling the information to re-enter the short-term storage and be retained for a longer length of time[4].

When multiple items are stored in short-term memory at the same time, they actively compete for recall. As a consequence, whether older information is intentionally protected from

interruption by rehearsal or by calling attention to it, new content ultimately pushes out older content. Every outside interaction threatens to interrupt short-term memory retrieval, which is why individuals also have a strong desire to complete activities stored in short-term memory as soon as feasible[5].

3. *Long Term Memory:*

Long-term memory is a type of memory that retains data, changing visual storage memories constantly. That a person performing almost any task, it is frequently called as reference memory. Long-term memory is split in two types: the implicit memory as well as the explicit memory [6].

4. *Semantic Memory:*

Stored in semantic memory, which is used to store information learned from books, education, locations, facts, and concepts on what is likely to occur in specific circumstances[7].

5. *Episodic memory:*

In roundabout memory, more contextualised memories are retained. They are typically recollections of actual occurrences or situations from a long time ago. As a consequence, they contain not only the "who, when, where, and why" of the case, but also the accompanying feelings and emotions.

Personal memory (remember for specific events in one's own life) is generally regarded as either a subset or an approximation of long-term memory. A flashbulb memory is a highly informative, stunningly vivid "preview" that survives independently of everything else and circumstances in which a digit of astounding and important (or really stirring) news was received[8].

LITERATURE REVIEW

I. M. Birnbaum *et al.* presented in the article that among non-alcoholic individuals, the impact of alcohol intoxication on the recovery of information from memory was investigated. Alcohol intoxication impaired free-recall learning of a 60-word, categorized list in Experiment 1. Intoxicated individuals recalled fewer categories and words within categories, and providing group cues after the third trial enhanced memory somewhat more for intoxicated than for sober respondents. It was found that although alcohol intoxication may have hindered retrieval processes, changes in the intensity of memory traces may also explain for observed disparities in recall. Experiment 2 equated storage in order to evaluate the effect of alcohol on retrieval processes alone. Free-recall and paired-associate lists were experienced sober and recovered in either a sober or intoxicated condition one week later. Alcohol intoxication had no impact on pace, accuracy, or the amount of gain given by prompts, but it did impair new learning. Alcohol has minimal effect on the retrieval stage of memory, according to the results[9].

S. R. Doyle *et al.* pointed to the fact in the article that the main aim of this study was to offer a comprehensive assessment Alcohol Dependence Scale's (ADS) underlying factor structure. Objectives evaluating the overall subscales as well as ADS resultant investigations of variables related to alcoholism, as well as ADS stages. Participants in two large randomised Behavioural Interventions Study were invited to complete the ADS. Validity coefficients were obtained using both exploratory and confirmatory factor testing. Analyses revealed a connected, three-factor answer that included lack of behavioural control and excessive drinking, psych observed across

both trials. Other indications of dependence intensity, confidence in one's desire to not drink circumstances, intensive habits, concerns about hazardous alcohol-related consequences, and impression of problems drinking were all significantly linked to the ADS. These findings support its ability to consistently and accurately assess the concept of alcohol dependence[10].

EFFECTS OF CANNABIS AND ALCOHOL ON MEMORY

1. *Cannabis:*

Cannabis was initially utilized in the third millennium BC, according to historical sources. Cannabis is currently utilized for medical reasons as well as religious and spiritual ceremonies. Cannabis has been subject to legislative restrictions since the early twentieth century, with possession, use, and sale of psychoactive cannabis products being banned in most nations. Memory isn't something that can be measured fast. There are many kinds of memory, each of which is examined in a distinct way. Second, there are transitory (short-term) memory symptoms as well as possible long-term consequences. Finally, how cannabis affects memory is affected by dosage, frequency, and strains. THC attaches to receptors on brain cells that usually respond to natural THC-like substances. This natural substances help the brain develop and operate properly. Marijuana over stimulates the neurons in the brain that contain the most of them. People feel a "high" as a consequence of this.

Cannabis use throughout years and decades tends to produce long-term memory and cognitive deficits, particularly when cannabis use begins in youth. Chronic THC use appears to reduce the amount of CB1 receptors (i.e. "down-regulates" these receptors) in brain areas involved in memory and perception, according to the neurobiology of the cannabinoid system. Early drug use has been related to the development of serious mental health issues later in life, including addiction, major depression, anxiety, and psychiatric illnesses like schizophrenia. High amounts of marijuana may cause short-term acute psychosis, which includes hallucinations, paranoia, and a loss of sense of self-identity. Cannabis is a very stimulating chemical that is nearly as addictive as alcohol and lasts even longer in the body.

2. *Alcohol:*

Ethyl alcohol, or ethanol, is the active component in beer, wine, and liquor. It is also known as alcohol. $\text{CH}_3\text{CH}_2\text{OH}$ or $\text{C}_2\text{H}_5\text{OH}$ are chemicals. Alkanol is the formal name for alcohol in terms of chemical consistency. The amount of carbon atoms present in the solution and the position of the "OH" bond in the formula determine the kind of alcohol that will develop. The most common source of alcohol is ethanol. Via gas bubbles, carbon dioxide exits the process, leaving behind a combination of water and ethanol.

Over the years, a lot of study has been done on alcohol and its effect on perception and general cognitive functioning. Alcohol is a depressant that impacts the whole central nervous system, but it also affects particular areas of the brain. When brain cells are destroyed as a consequence of excessive drinking, the damage may be permanent. As alcohol interferes with substances in the brain that help transmit signals from one neuron to another, information from both short and long-term memory is recalled with difficulty.

With a complete absence of drinking, most physical and mental health problems worsened by alcohol abuse vanish quickly. Speech and hearing difficulties, movement issues, reflex and

reaction slowdown, skin discoloration and slackening, fatigue, nausea, panic episodes, and blackouts are all signs of Parkinson's disease.

METHODOLOGY

To identify the influence of cannabis and alcohol abuse and its effect on human memory.

1. Objective:

- To identify the effect of drug abuse and alcohol abuse on human memory.
- To identify the variables that leads to memory deficits when influenced by cannabis and alcohol abuse.
- To estimate whether there is any significant difference existing among variables of memory due to the influence of cannabis and alcohol abuse.

2. Design:

2.1.Hypotheses:

There is no significant difference among the factors affecting the variables of memory due to the influence of cannabis and alcohol abuse. There is no relationship existing among the factors affecting the variables of memory due to the influence of cannabis and alcohol abuse

2.2.Variables:

- Independent variable: Memory
- Dependent variable: Cannabis and Alcohol.

2.3.Inclusion Criteria:

- Individuals who use cannabis everyday were considered after screening them using Severity Dependence Scale (SDS).
- Individuals who use alcohol everyday were considered after screening those using Alcohol Dependence Scale (ADS),
- Current residence of Bangalore.
- Individuals who can read and write Basic English language,
- Respondents between the ages 20-30 years.

2.4.Exclusion Criteria:

- Individuals who consume both alcohol and cannabis together were eliminated.

3. Sample Size:

- 17 cannabis abusers -7 females, 10 males
- 7 alcohol abusers - 5 females, 12 males

4. Sample Collection:

Two groups of 30 alcohol abusers and 30 cannabis abusers were selected via purposive sampling method. After obtaining their permission, Severity Dependence Scale was given on 30 cannabis

abusers as a screening test and only those who scored more than 5 were included for the research since this score indicated significant participation in misuse of substances. Only 17 individuals were determined to be suitable for the research and subsequently Post Graduate Institute (PGI) Memory Scale was given on the chosen 17 cannabis abusers.

Similarly, Alcohol Dependence Scale was given to 30 Alcohol abusers as a screening test. After obtaining assent, those who scored more than 22 indicated an indication of Substantial degree of alcohol dependency (3rd quartile) and those who scored more than 31 showed an indication of severe level of alcohol dependence. PGI Memory Scale was given to the chosen 17 alcohol addicts.

5. Tools:

- Severity dependence scale
- Alcohol dependence scale
- PGI memory scale

The test has been extensively utilized in the evaluation of cognitive functioning in drug abusers, yoga practitioners, depressives, psychotics, neurotics, and suffering from brain dysfunctions. It is equally applicable for all genders as well as the literate and the uneducated individuals. Thus, it is applicable to both research and clinical contexts.

6. Reliability and Validity for PGIMS:

For the validity, correlations with Boston Memory Scale and Wechsler Memory Scale were determined to be 0.71 and 0.85 respectively. Age wise older individuals got substantially lower scores than the younger ones. Cases suffering from organic brain disease and functional psychoses score considerably less than normal and neurotics. It has strong connection with education and low with Intelligence quotient (IQ). It has good cross validity and gives quartile norms and a profile. Scores of individuals suffering from organic disease, functional psychoses and neuroses fell in the lowest 2nd and middle quartiles accordingly. Separate norms are provided for three educational levels which is 0 to 5th, 6th to 9th, and above 10th years of schooling.

7. Administration and Scoring for PGIMS:

It consists of three components. First item is alphabet that are scored 3 if all correct within 15 seconds, scored 2 if all correct after 15 seconds, scored 1 irrespective of time needed with one error/omission and scored 0 if more than one error/omission. Second item is counting backward (20-1) and the score will be the same as in item 1. Third item is counted backward by subtraction. The score is 3 if all accurate within 30 seconds, scored 2 if all correct after 30 seconds, scored 1 irrespective of time needed with one error/omission and scored 0 if more than one error/omission. Thus, maximum score would be 9.

In Verbal Retention for Similar Pairings sub exam there are 5 noun-noun pairs. Second noun is to be questioned after reading first noun to the subject. 1 mark for each correction of the related word of the pair is to be provided. The overall maximum score on this subtest is 5.

RESULTS AND DISCUSSION

From the Table 1, we can infer that the mean value obtained for both cannabis and alcohol abusers for remote memory was found to be 5.47, recent memory was found to be 4.97, mental balance was found to be 5.74, attention and concentration was found to be 10.24, delayed recall was found to be 9.29, immediate recall was found to be 8.50, verbal retention for similar words was found to be 5.00, verbal retention for dissimilar words was found to be 12.71, visual retention was found to be 7.09 and recognition was found to be 8.56.

TABLE 1: MEAN VALUE OBTAINED FOR THE FACTORS OF MEMORY AMONG CANNABIS AND ALCOHOL ADDICTS. THE MEAN VALUE OBTAINED FOR BOTH CANNABIS AND ALCOHOL ABUSERS FOR REMOTE MEMORY WAS FOUND

Variables	N	Mean
Remote Memory	34	5.47
Recent Memory	34	4.97
Mental Balance	34	5.74
Attention and Concentration	34	10.24
Delayed Recall	34	9.29
Immediate Recall	34	8.5
Verbal Retention for Similar Words	34	5.00
Verbal Retention for Dissimilar Words	34	12.71
Visual Retention	34	7.09
Recognition	34	8.56

From the Table 2, we can infer that the Karl Pearson correlational value obtained for both cannabis and alcohol abusers for remote memory was found to be 0.556 and significance value obtained was found to be 0.00, since the significance value is less than 0.05 level of significance, we can infer that there is a positive correlation/relationship existing among cannabis and alcohol abusers with respect to remote memory at 0.01 level of significance. The Karl Pearson correlational value obtained for attention and concentration was found to be 0.453, and significance value obtained was found to be 0.00, since the significance value is less than 0.05 level of significance, we can infer that there is a positive correlation/relationship existing for both cannabis and alcohol abusers with respect to attention and concentration at 0.01 level of significance. The Karl Pearson correlational value obtained for delayed recall was found to be 0.433 and significance value obtained was found to be 0.01, since the significance value is less than 0.05 level of significance, we can infer that there is a positive correlation/relationship existing for both cannabis and alcohol abusers with respect to delayed recall at 0.01 level of significance.

TABLE 2: SHOWING KARL PEARSON CORRELATION VALUES FOR VARIABLES OF MEMORY AMONG CANNABIS AND ALCOHOL ABUSERS. THE KARL PEARSON CORRELATIONAL VALUE OBTAINED FOR BOTH CANNABIS AND ALCOHOL ABUSERS FOR REMOTE MEMORY WAS FOUND

Variables	Correlation value	Significance Value
Remote Memory	0.556	0.00

Recent Memory	0.263	0.13
Mental Balance	0.123	0.49
Attention and Concentration	0.453	0.00
Delayed Recall	0.433	0.01
Immediate Recall	0.681	0.00
Verbal Retention for Dissimilar Words	0.485	0.00
Visual Retention	0.672	0.00
Recognition	0.355	0.04

The Karl Pearson correlational value obtained for immediate recall was found to be 0.681, and significance value obtained was found to be 0.00, since the significance value is less than 0.05 level of significance, we can infer that there is a positive correlation/relationship existing for both cannabis and alcohol abusers with respect to immediate recall at 0.01 level of significance. The Karl Pearson correlational value for verbal retention for dissimilar words was found to be 0.485 and significance value obtained was found to be 0.00, since the significance value is less than 0.05 level of significance, we can infer that there is a positive correlation/relationship existing for both cannabis and alcohol abusers with respect to verbal retention for dissimilar words at 0.01 level of significance. The Karl Pearson correlational value for visual retention was found to be 0.675, and significance value obtained was found to be 0.00, since the significance value is less than 0.05 level of significance, we can infer that there is a positive correlation/relationship existing for both cannabis and alcohol abusers with respect to visual retention at 0.01 level of significance. The Karl Pearson correlation value for recognition was found to be 0.355, and significance value obtained was found to be 0.04, since the significance value is less than 0.05 level of significance, we can infer that there is a positive correlation/relationship existing among cannabis and alcohol abusers with respect to recognition at 0.01 level of significance. From the Karl Pearson Correlation it was discovered that recent memory (0.263) and mental balance (0.123) were shown to have no connection existent among cannabis and alcohol addicts. Since, there is connection existing among the factors influencing the variables of memory owing to the effect of cannabis and alcohol addiction, we reject the null hypothesis.

The objective of this study was to look at the factors that affect memory variables in 17 individuals who were under the influence of cannabis and 17 people who were under the influence of alcohol. The research found that there is a significant difference in memory characteristics such as distant memory and immediate recall between individuals under the influence of cannabis and alcohol after obtaining the t-value. Bad episodic memory is expected among cannabis and alcohol users, according to the results. During the intervention program, there was a significant shift in different areas of memory on the memory scale. Between the research and control groups, there was a significant difference in recent memory, distant memory, visual recall, and verbal retention. Cannabis was related to results of neurological diseases in a short-term and internally cued prospective study. Working memory and verbal episodic memory have been investigated lately for their poor transcription, preservation, manipulation, and retrieval processes of long-term cannabis memory.

The findings of this study provided insight on the effect of both alcohol and cannabis dependency on different elements of human memory. The findings revealed that while there is no substantial variation in human memory variables related to cannabis and alcohol dependence,

there is a significant association with memory variables such as previous memory, focus and concentration, delayed recall, immediate recall, verbal retention for dissimilar pairs, visual retention, and recognition.

CONCLUSION

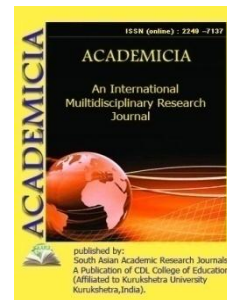
The objective of this study was to investigate the effect of cannabis and alcohol dependency on human memory. A total of 60 individuals were eligible for the research, with separate screening tests for cannabis (Severity Dependence Scale) and alcohol (Alcohol Dependence Scale) abusers administered to 34 people (17 cannabis abusers and 17 alcohol abusers) (17 cannabis abusers and 17 alcohol abusers). The Memory Scale was used to evaluate 10 memory variables and quantify cognitive output. It was found that marijuana and alcohol users had a significant gap between distant memory and immediate recall. The null hypothesis was accepted because there was no significant variance in the factors underpinning memory variables compared to the effects of cannabis and alcohol dependency in the other variables. After assessing the relationship, researchers found a connection between cannabis and alcohol abusers in distant memory, attention and awareness, delayed recall, instantaneous recall, verbal retention for dissimilar pairings, visual remembrance, and recognition. The null hypothesis was rejected because there is a connection between the components underpinning memory variables owing to the impacts of cannabis and alcohol dependency. Longitudinal and retrospective study should be conducted utilizing data from other alcohol abusers and from different areas of the globe in order to create a wide frame of reference.

REFERENCES

1. G. Singh, B. Chavan, P. Arun, and R. Bhargava, "Prevalence of alcohol and drug dependence in rural and slum population of Chandigarh: A community survey," *Indian J. Psychiatry*, 2007, doi: 10.4103/0019-5545.31517.
2. T. Sivakumar and P. Dalal, "Cognitive psychiatry in India," *Indian J. Psychiatry*, 2010, doi: 10.4103/0019-5545.69224.
3. E. V. Sullivan, R. A. Harris, and A. Pfefferbaum, "Alcohol's effects on brain and behavior," *Alcohol Res. Heal.*, 2010.
4. C. P. Ferri, J. Marsden, M. De Araujo, R. R. Laranjeira, and M. Gossop, "Validity and reliability of the Severity of Dependence Scale (SDS) in a Brazilian sample of drug users," *Drug Alcohol Rev.*, 2000, doi: 10.1080/713659418.
5. G. Galván, M. Guerrero-Martelo, and F. Vásquez De la Hoz, "Cannabis: A cognitive illusion," *Rev. Colomb. Psiquiatr. (English ed.)*, 2017, doi: 10.1016/j.rcpeng.2017.05.007.
6. R. Kumar, "Introduction to Psychology," in *Basic Psychology for Nurses*, 2018.
7. S. Khandelwal, A. Bhatia, and A. Mishra, "Psychological adaptation of Indian expeditioners during prolonged residence in Antarctica," *Indian J. Psychiatry*, 2017, doi: 10.4103/psychiatry.IndianJPsychiatry_296_16.
8. R. Mahi, A. Sharma, K. Sharma, and B. Sidhu, "An Epidemiological Survey of Alcohol and Drug Dependence in a Village of district Sangrur, Punjab," *Delhi Psychiatry J.*, 2011.
9. I. M. Birnbaum, E. S. Parker, J. T. Hartley, and E. P. Noble, "Alcohol and memory: Retrieval

processes,” *J. Verbal Learning Verbal Behav.*, 1978, doi: 10.1016/S0022-5371(78)90210-4.

10. S. R. Doyle and D. M. Donovan, “A validation study of the alcohol dependence scale,” *J. Stud. Alcohol Drugs*, 2009, doi: 10.15288/jsad.2009.70.689.



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A BRIEF REVIEW ON THE INDIAN HEALTH SYSTEM

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ABSTRACT

In the world more than 200,000 leprosy cases are being registered in every passing year. But the situation has changed from the past few years. In 1982 when multi-drug therapy was introduced then the leprosy cases started reducing from the popularity rate of 57.8/10000 population in 1983 to 1/10000 population in the year 2005 i.e. 296,499. Wherein the popularity state of leprosy was 219,826 in the starting of 2006 and by the year 2018 the percentage rate of leprosy reduced to 0.67/ 10, 000. Though India was highest saddle of leprosy, but with the World Health Organization instruction the National leprosy eradication programmer (NLEP) is interposing single-dose rifampicin for post-exposure prophylaxis in the entire high-autochthone localities of the nation. The main objective of this paper is to evaluate the cost-productiveness of single-dose rifampicin post-exposure prophylaxis in various leprosy ailment encumbrance circumstances. Wherein the cost-productiveness devolves on the measures by which the disability can be reduced. However, the medication is befitting cost-effective for the longer use, an everlasting perforation is being devoted.

Keywords: *Leprosy, Single-dose rifampicin (SDR), Post-Exposure Prophylaxis (PEP), Cost-effective.*

INTRODUCTION

Leprosy is a severe illness caused by Mycobacterium leprae. This disease mostly affects the exterior nerves and epidermis, and if not treated properly, it may cause long-term disability. There are three levels of impairment: category-0 (C0D), category-1 (C1D), and category-2 (C2D), with the latter being the costliest since it involves visual deformities. In 2018, a total of 208,619 cases of leprosy were identified throughout the world [1]. The Table 1 shows the below table represent the Leprosy case detected in various country in the below mentioned year.

TABLE 1: THE BELOW TABLE REPRESENT THE LEPROSY CASE DETECTED IN VARIOUS COUNTRY IN THE BELOW MENTIONED YEAR

Countries	Years				
	2014	2015	2016	2017	2018
India	11365	11389	11792	10287	9227
Brazil	2341	1942	1696	1718	1705
Bangladesh	197	327	166	235	220
Indonesia	1894	1930	1923	1755	1861
Nepal	3046	2751	3054	3215	3249
Myanmar	2877	2571	2609	2279	2214
Nigeria	2983	2892	2576	2500	2095
Ethiopia	482	563	360	351	292
DRC	407	486	436	373	334

Figure 1 depicts a bar graph of leprosy cases identified in different countries during the year in question. This bar graph depicts the highest number of leprosy cases identified in India in each year.

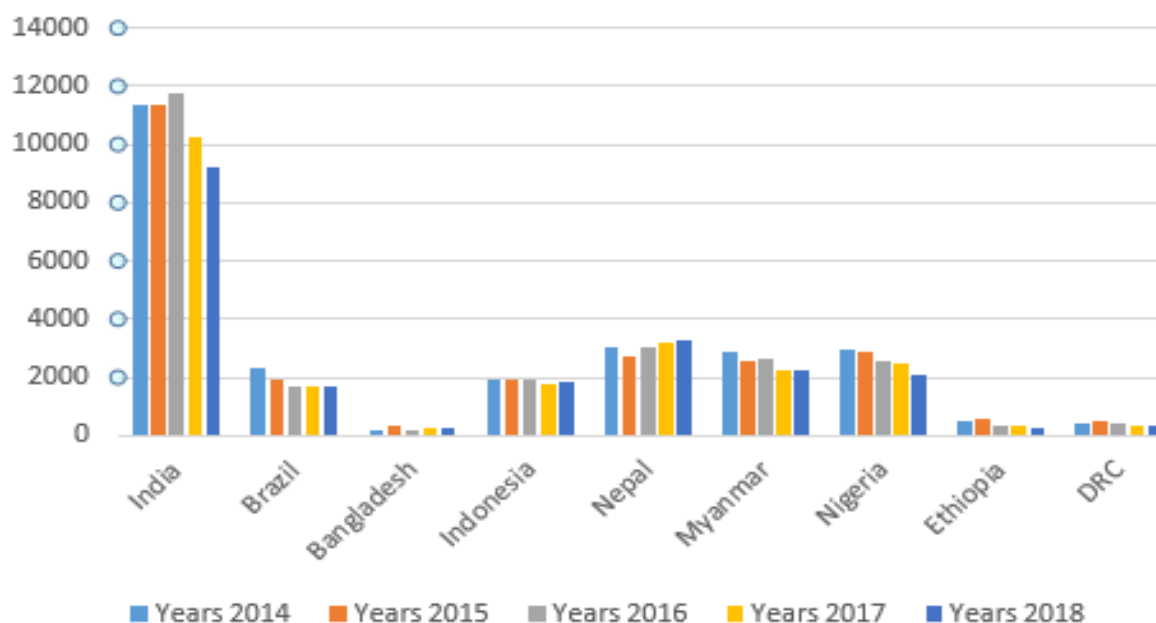


Figure 1: Bar Graph of the Leprosy Case Detected In Various Country in the Below Mentioned Year.

Germs may be transferred from one body to another because a diseased body stays symptomless and undiagnosed for a longer period of time owing to prolonged delitescence. In the 1980s, multi-drug therapy was developed, which effectively decreased the prevalence of condition, but the number of new cases remained stable. As a result, in this scenario, the goal of eliminating leprosy and previous endowment is jeopardized [2]. The districts in India continue to report an increasing number of leprosy cases on a daily basis, and the National Leprosy Eradication

Program is being conducted to eliminate the cases in these districts. On the other hand, there are a number of significant obstacles to preventing the spread of *Mycobacterium leprae* [3]. Present leprosy encumbrance is underrated thus it requires correct calculation by including the secluded cases.

The technique or procedure for the previous disclosure and recovery must be properly established in order to identify the current active instance. With its advancement, the procurable blockage method known as post-exposure prophylaxis with single-dose rifampicin (SDR-PEP) would be impacted. Some variables, such as expected results, cost-effectiveness, persistence of achievement, and obscurities, must be understood in order to create this method. Then, as part of the Leprosy Post-Exposure Prophylaxis (LPEP) method, single-dose rifampicin is used to treat post-exposure prophylaxis. LPEP procedure is pre-mediated to estimate the practicability along with the influence of identifying, assessing, and managing people who have been exposed to a disease to prevent onward infection transference [4] and SDR-PEP to symptomless connection of leprosy cases. The obligatory supplemental mechanism to the conventional leprosy curriculum is less contact, masking, and so forth. Furthermore, LPEP (Leprosy Post-Exposure Prophylaxis) also heightened the consequences of cases in the association [5].

The apportionment of post-exposure prophylaxis through single-dose rifampicin is presently uninterrupted, heretofore as a scheduled occupation subordinate National Leprosy Eradication Programmed (NLEP) [6]. The Leprosy Post-Exposure Prophylaxis (LPEP) technique methodically apprehended an appropriate information that can govern the enlargement of the arbitration. Despite the significant impact of single-dose rifampicin for post-exposure prophylaxis, it is difficult to include in a few year curriculum due to the surviving buildup of leprosy patients. As a result, arithmetical modeling is used to assess the long-term impact of single-dose rifampicin as a post-exposure prophylactic on the National Cardiovascular Data Registry (NCDR). The primary goal of the study is to determine the long-term cost-effectiveness of single-dose rifampicin for post-exposure prophylaxis in different leprosy disease encumbrance conditions. The result will then encourage both administrative and non-administrative institutions to forecast speculation for leprosy control. Finally, it presents the global speculative case for leprosy eradication.

Detection in Advance:

Prior disclosure is required to prevent additional infection transmission and to reduce the risk of permanent deterioration. The Leprosy Research Initiative will support the development of a curriculum that examines processes, methods, systems, or instruments in order to improve previous case disclosure. This system will include health-care processes to promote community knowledge, proper patient health-care behavior, and access to help, as well as the testing of laboratory-supported equipment for detecting an infection or illness at an early stage. If the following will be a barrier to previous disclosure in a consecution, this method also includes arbitration to minimize associated blemish.

NERVE FUNCTION Deterioration AND COUNTERACTION: Neurological and ocular destruction are the primary reasons why individuals suffer from leprosy-related problems. As a result, the Leprosy Research Initiative supports the curriculum of procedure and arbitration for earlier obstruction of neurological and ophthalmic destruction, technique to improve disclosure and arbitrations, and drug administration to improve nerve function destruction prediction and leprosy counteraction.

Incorporation:

The main worry and oppressive ramification of leprosy is exclusion from society. This condition arises when people are separated from their homes and must deal with divorce or other sensitive circumstances such as degradation, news mongering, cautiousness, and so on. The Leprosy Research Initiative supports studies that promote the inclusion and participation of individuals with leprosy in any part of the community. Relationships, as well as weddings and the elevation of biogenetic and conceptual fitness and stimulated people's freedoms, subsistence and labor contribution, erudition, and participation in civil organizations, such as handicapped people's groups, are the most common circumstances. The role of excited individuals in leprosy aid is gaining traction, and it deserves careful study.

Disease of the Obstructive System:

One of the most important aspects of leprosy assistance is disability prevention. Although certain appropriate methods and equipment have existed in the past, they have not been used often or adequately. In general, disability prevention adjudications or undertakings are carried out in a leprosy-like way, but comparable arbitrations and undertakings would benefit a variety of people facing similar problems. The Leprosy Research Initiative will support accomplishment studies that examine or contribute to opportunities to improve the utilization of current techniques and apparatus for disability prevention, consolidation of disability prevention arbitrations in the National Leprosy Eradication Program (NLEP), and consolidation of leprosy-related POD in imprecise injury and extremely conceited injury.

Years of disordered life: Fitness Disorder Adjusted Life Years are used to calculate paraphernalia (DALYs). The global burden of disease research (GBD) was used to calculate the burden of leprosy disorders, with a result of 0.011 for C1D and 0.067 for C2D. Because disorder is unchanging, leprosy does not cause impermanence; therefore, the definition of a DALY is the number of years spent living with disorder. The term DALYs is defined as follows: -

$$DALY(t) = \sum_{a=1}^{n_a} I_{C1D}(a, t) \cdot D_{C1D}(a) + (I_{C2D}(a, t) \cdot D_{C2D} \cdot L(a))$$

n_a = It is referred to as the number of generations (0–4, 5–14, 15–44, 45–59, 60+ years);

$I_{C1D}(a, t)/I_{C2D}(a, t)$ = It is referred to as number of cases with C1D / C2D per 100,000 in generation (a) at time (t);

D_{C1D}/D_{C2D} = D is determined as a Disorder burden for C1D/C2D;

$L(a)$ = Life anticipation of generation(a). Data calculated and resulted from SRS is dependent on Life Table 2011–15, enumeration of India.

The total count of new leprosy cases emitted with both the category C1D and C2D in the post-exposure prophylaxis through single-dose rifampicin (SDR-PEP) arbitration and ordinary circumstances were estimated using by utilizing multibacillary (MB) and paucibacillary (PB) leprosy cases every year. Subsequently, no data is present on the dimension of another cases with C1D and C2D surrounded by PB and MB leprosy cases, some of assumptions to measure the total number of leprosy cases with C1D and C2D are: -

- With the report statistics on leprosy in India C2D have 3.6% of leprosy cases; all C2D cases emerge from MB leprosy cases.
- Surviving MB leprosy cases have C1D.
- 50% of the total PB leprosy cases have C1D.
- Surviving PB leprosy cases have no disorder.

Though the post-exposure prophylaxis through single-dose rifampicin (SDR-PEP) arbitration circumstances involve present connection blue-print and masking, it seems that the time when the diseases will be decreased and prevent disorder. To account for this in the SDR-PEP arbitration, DALYs under three assumptions of disorder obstruction will be calculated such as: Obstruction of all C1D cases, Obstruction of C1D in PB cases only, no additional obstruction same as ordinary circumstances[8].

REVIEW OF LITERATURE

P. Narasimha Rao et. al. had reviews the present world-wide as well as Indian leprosy situation to bring out its achievements and successes. It is also including the influence of Leprosy Case Detection Campaigns (LCDC) on increasing of leprosy cases. The foundation and expected benefits of recent introduction of chemo and immune-prophylaxis in the programme are also discussed. It also discusses the shortcomings, the areas of concern, and the need for an inclusive strategy in the Indian leprosy programme that includes an intersect oral collaboration within the country for reaching the desired goal of leprosy eradication[7].

Seilan Anbu Scott Christian studies the physician, nurse, and allied health professions provide services for the prevention, treatment, and management of disease, as well as the maintenance of mental and physical well-being. According to the World Health Organization, health care includes "preventive, curative, and palliative treatments, either directed to people or populations," as well as "precautionary, curative, and palliative interventions, whether directed to individuals or populations." A health care system may be formed by the organized supply of such services.

M Choksh et. al. studies Health systems and policies have an important role in influencing how health services are provided, used, and impact health outcomes. Because health is a state issue, despite the federal government's recommendations, the states retain ultimate authority over the execution of infant care programs. This article provides a short overview of the country's public health system and chronicles the development of key health programs and initiatives, with an emphasis on infant health.

DISCUSSION

This paper discusses about the Mycobacterium leprae causes leprosy, which is a serious disease. This illness mostly affects the epidermis and nerves on the outside of the body, and if not treated correctly, it may result in long-term impairment. Category-0 (C0D), category-1 (C1D), and category-2 (C2D) are the three degrees of disability, with the latter being the most expensive due to visual abnormalities. In 2018, a total of 208,619 leprosy cases were reported throughout the globe. Because a sick body remains symptomless and undetected for a longer length of time due to prolonged delitescence, germs may be transmitted from one body to another. Multi-drug treatment was established in the 1980s, and it successfully reduced the prevalence of the disease,

but the number of new cases remained constant. As a consequence, the objective of eradicating leprosy and past endowment is endangered in this situation.

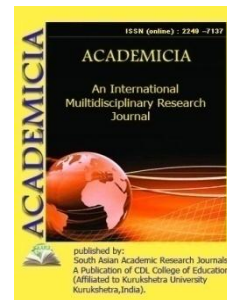
On a daily basis, India's districts report a growing number of leprosy cases, and the National Leprosy Eradication Program is working to eradicate the disease in these areas. On the other hand, limiting the spread of *Mycobacterium leprae* has a number of major challenges [3]. The current leprosy burden is underestimated, necessitating accurate calculations that include isolated patients. In order to identify the present active instance, the method or process for the prior discloser and recovery must be correctly developed. The readily available blocking technique called as post-exposure prophylaxis with single-dose rifampicin (SDR-PEP) might be affected by its development. In order to develop this technique, several factors must be understood, such as anticipated outcomes, cost-effectiveness, persistence of accomplishment, and obscurities. After then, single-dose rifampicin is used to treat post-exposure prophylaxis as part of the Leprosy Post-Exposure Prophylaxis (LPEP) technique.

CONCLUSION

The connection listing, selection, and prescription of post-exposure prophylaxis via single-dose rifampicin (SDR-PEP) is a cost-effective method in both provisional and permanent leprosy control, according to this study. The cost-effectiveness of single-dose rifampicin (SDR-PEP) post-exposure prophylaxis is determined by the degree to which disorder may be prevented. Despite the fact that the arbitration becomes more cost-effective over time, this article recommends a long-term commitment to the arbitration's completion.

REFERENCES

1. C. Jackson, "The General Health Questionnaire," *Occup. Med. (Chic. Ill.)*, 2006, doi: 10.1093/occmed/kql169.
2. S. K. Noordeen, "The role of WHO including TDR," .
3. H. S. Reforms, "Overview of the Health System in Ghana," *Kenya Serv. Provis. Assess. Surv.* 2004, 1999.
4. "New guidance on contact tracing." .
5. A. Tiwari, L. Mieras, K. Dhakal, M. Arif, S. Dandel, and J. H. Richardus, "Introducing leprosy post-exposure prophylaxis into the health systems of India, Nepal and Indonesia: A case study," *BMC Health Serv. Res.*, 2017, doi: 10.1186/s12913-017-2611-7.
6. A. Tiwari, D. J. Blok, M. Arif, and J. H. Richardus, "Leprosy post-exposure prophylaxis in the indian health system: A cost-effectiveness analysis," *PLoS Negl. Trop. Dis.*, 2020, doi: 10.1371/journal.pntd.0008521.
7. Pn. Rao and S. Suneetha, "Current situation of leprosy in India and its future implications," *Indian Dermatol. Online J.*, 2018, doi: 10.4103/idoj.idoj_282_17.
8. World Health Organization, "Mental Health Action Plan 2013-2020," *WHO Libr. Cat. DataLibrary Cat. Data*, 2013.



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SPIRITUALITY OF YOUTH IN SPEECH ACTIVITY

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ABSTRACT

Today it is important to study the features of speech, a language that is considered a means of communication. Currently, attention is being paid to the scientific study of the peculiarities of the national language. This article examines the jargons used by young people in the process of daily treatment in the Uzbek language. The slang words of representatives of the younger generation, who are considered the main stratum of society, as well as the importance and necessity of studying their jargon were also given. The psycholinguistic features inherent in jargon words are analyzed from a scientific point of view. It was also taken into account the fact that, in connection with the development of society, new words appear and, accordingly, jargons in the language increase.

KEYWORDS: *Language, Jargon, Psycholinguistics, Speech, Vocabulary, Social, Society, Functional, Communication, Speech Activity, Vocabulary, System, Youth, Identity, Civilization, Group.*

INTRODUCTION

It is known that the factor separating man from the animal world and turning him into a conscious higher being is language. The highest products of human mental activity, the "fruits" of contemplation, arise through language and speech.

Language is a blessing of nature, which is given to humanity, it carries out the interaction of members of society, accumulates and communicates from them knowledge about all events occurring in the material and spiritual life of a person; language is being formed and will exist for centuries in the same sense. This means that a person develops a feature of thinking by mastering his native language. If a person learns more different languages other than his native language, then the peculiarities of thinking, consciousness, contemplation are further improved.

Economic, socio-political, cultural and technical changes taking place in society lead to a sharp increase in the number of words included in our national language, that is, the Uzbek language, and some changes in the essence of the meaning.

The environment affects language, everyday speech, and this can lead to a decrease in their level. But even a high-level, pure, spiritual language, in turn, can and should influence the environment with its formation, improvement, spiritual enrichment and change.

In modern psycholinguistics and linguistics, the fact that the national language is a phenomenon with different characteristics and is realized in the form of the presence of language, the formation of a stratifying structure of nature is considered a social phenomenon. Each language serving a very diverse and socially developed community of people is represented in the form of various manifestations: basic - literary language, speech, general speech and territorial dialects; secondary - social dialects (argot, jargon, slang), professional languages are considered.

It is known that as a result of the rapid development of mass communications, a number of new words are being added, reflecting new political and social changes. It is not denied that in the conversational process, new incoming terms can be expressed in non-literary speech. It is known that non-standard words include "argo", "jargon", "slang", etc. These words have long been used in the process of communication. Usually new slang words appear to update old concepts. Jargon is used in everyday life, even in the educational process. It is especially often used in the speech of young people: students, schoolchildren.

Jargon (French jargon is a word of a certain group). Words and phrases characteristic of a certain social or professional group, only those who understand them themselves and differ from the literary language, are described in the Explanatory Dictionary of the Uzbek language [10.74].

Jargon contradicts the "right" life. Jargon tends to increase the speed of speech, for which abbreviations, abbreviations, abbreviations, etc. are used. Although argot and jargons are included in the lexicon with a limited volume of consumption, their value in enriching the Uzbek language is very important. But the word "slang" is not described in the literature of Uzbek linguistics [2.56].

L.A.Vvedenskaya, L.G.Pavlova, commenting on the uniqueness of youth jargon, warned against their broad definitions: "This colloquial phenomenon cannot be called jargon, because it has no social roots. Young people, especially teenagers, use words and phrases that differ from the generally accepted norm of speech in order to achieve "confirmation" of themselves without exception. In such speech, various elements of the language are used, words that are foreign, belong to the profession of a specialist, are specific to vulgarism, dialectics [4.120].

Slang words of young people are psychologically and socially justified, and for all linguistic communities they serve as a continuous form of completely independent speech. In addition, jargon forms a wide layer in the corresponding dictionaries.

The reasons for the appearance of youth jargon in the process of communication are their desire to demonstrate their independence, that is, to show their belonging to the same group, for example, to a group of fans of a musician, to sports fans, etc. Here is another function characteristic of social dialects in such conditions - the function of social solidarity: the use of slang units is a sign of the separation of interlocutors into "friends" and "strangers".

Psychologists note that slang "reduces the distance between interlocutors, introducing all members of the group with the help of common signs of communication", "we show the effect of feeling", it does not matter whether the speech of young people is completely slang or includes 5-7 units. The main thing is that these words exist in the group and become its wealth, go beyond the usual norms of morality, get rid of normative decency and give a sense of freedom in dialogue [8.367]. Since the slang here performs the function of "a sign (or password) of a certain socio-communicative status of speakers," E.N.Gut describes it as a function of determining this function, saying that when there is an intention to approach the heart, the same function of using jargonisms will prevail, "it will overcome the semantics of naming and evaluation [3.23].

In this regard, according to the results of the study, we pay attention to the jargon used when expressing the word man: harip - a stupid person; goat - a fool, lazy; bro - brother; latta - a soft person; lokh - an unsuspecting, simple person; gol - an inept person; somsa - a woman of easy character; soska (nipple) - a prostitute; Bratva - friends; asalm - a beloved, sweet girl; chumo - a fool, a person who does not understand the word; kaptar (pigeon) - a loved one; balbes - a blockhead is a stupid person, a fool; andi - is a cunning woman; tonka - is a lazy person; zhigar (liver) - is a relative; sutak - is a coward; churban (a blockhead) - is a stupid, uneducated person; chortkesar - is an evil person; uralman - is a nomadic people; turshak (dried apricots) - is a thin, skinny person; lagan - is a sycophant; stupid is crazy; galvars - is crazy; dub (oak) - is a stupid, unintelligent person; shoptoli (koki) - is a thin person; hoshim - is an independent person; piska - is narrow-eyed; chmochnik - is stingy, etc.

It is known that slang words are used both in a positive and negative sense. From the above examples, it can be concluded that words in which facial expressions in jargon mean a more negative meaning. They also have more pronounced comparative, comparative properties. Vocabulary borrowed from other languages is often found. To collect additional information about this, it would be desirable to seriously consider the social and age characteristics of national language jargons.

Jargon is not typical for people with a predisposition to depression. He shows life through his speech competition. And, of course, this is the most important factor of society: at the level of deviation from the norms of the language, including literature, it will be possible to immediately determine the main personality traits of the interlocutor.

In youth communication, as well as the reflection of the peculiarities of the national language directly depends on the individuality of the person who cares about. It is a part of a personal language in which one can express individuality in contrast to the semantic level of speech.

Thus, we can talk about the peculiarities of the linguistic characteristics of the world inherent in native speakers of the national language and identified as the linguistic characteristics of the individual world.

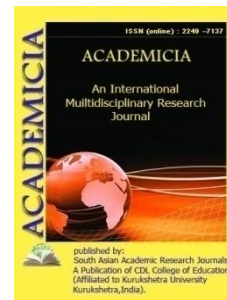
Linguistic features of the world the linguistic level of an individual's reflection in language, unlike oral speech, is at the semantic level, perhaps part of its inherent rarity in the manifestation of individuality. Also, the composition of the dictionary, in which a person clearly understands and can use the meaning of each word in his speech, shows how much this person's speech has grown.

In the process of education and training of the younger generation, teachers and specialists in the field of speech activity are mainly considered to be a model in all aspects: a linguist, a journalist, a psycholinguist. Therefore, they are not people who follow the students, but on the contrary, they will have to follow the teacher (as well as specialists) in particular. But the educator should be aware of the jargon of the school, university. Because none of their statements can remain incomprehensible. It is especially desirable that a word or phrase in the process of communication is not ignored.

The world of young people who are aware of their spirituality initially from their speech activity, deep penetration into their circle allows them to communicate effectively. It is advisable to bring teachers closer to yourself and be aware of all the words that are used in their communication in order to find the right way to their heart.

REFERENCES:

1. Arustamova A.A. Modern youth slang and features of its functioning: Based on the speech of students of the Republic of Adygea. Autoref. Maykop. 2006.
2. Akhmedova M.H. Psycholinguistic features of non-verbal communication. Bulletin of NUUZ. 2018. No. 4. pp. 55-57
3. Guts E.N. Abnormal vocabulary in the speech of a modern urban teenager in the light of the concept of linguistic personality. Abstract of the dissertation of the Candidate of Philology. - Barnaul, 1995. p. 23.
4. Vvedenskaya L. A., Pavlova L. G. Culture and the art of speech. Modern rhetoric. - R.- n/A: Phoenix, 1995.
5. Vezhbetskaya A. Language. Culture. Cognition. / Translated from English / Ed. by M.A.Krongauz. - M.: Russian dictionaries, 1996– - 411 p.
6. Kuchmenova Zh.M. Emotional concepts in the linguistic picture of the world. Autoref... Nalchik - 2005.
7. Leontiev A. N. Activity. Conscience. Personality. - M.: Politizdat, 1977. -304 p. p. 140.
8. Mukhina V. S. Age psychology: phenomenology of development, childhood, adolescence. - M.: Publishing house of the center "Academy", 1999. - 456 p. p. 367.
9. Sayfullayeva R., Sayfullaev Sh. Notes of F.S.Ubaeva on monolinguistic effect // Foreign Philology. Samarkand. 2017. No. 1. p.59
10. Explanatory dictionary of the Uzbek language. A. Edited by Madvaliev. Tashkent. National Encyclopedia of Uzbekistan. Electronic library. Letter C.74



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TECHNOLOGY OF PRACTICAL USE OF INTERACTIVE TEACHING METHODS IN RUSSIAN LANGUAGE CLASSES

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ABSTRACT

This article discusses the use of interactive methods in Russian language classes. Interactive teaching methods provide solutions to educational problems in various aspects. The interest in interactive methods is caused by the need to improve the modern system. The use of interactive methods makes it possible to organize independent cognitive activity of students during the lesson. The possession of interactive learning technology and its use in the educational process, including in Russian language lessons, will undoubtedly contribute to the development of students' qualities that correspond to the processes taking place in life today.

KEYWORDS: *Interactive, Technology, Creative Approach, Communication, Active Methods, Interaction, Game Method, Discussion.*

INTRODUCTION

The use of new technologies in the learning system is a prerequisite for the intellectual and creative development of students. New technologies include multimedia complexes and interactive learning with the use of gaming technologies.

Interactive learning is primarily a dialogue learning, during which the interaction of the teacher and his student is carried out. The concept of this technology is based on an understanding of the social interaction of people in interpersonal communication, the most important feature of which is the ability of a person to accept the role of another, to imagine how he is perceived by a communication partner[1]. The essence of interactive learning is that the learning process is organized in such a way that almost all students are involved in the process of cognition. In an organized environment (interactive environment), they have the opportunity to understand and reflect on what they study, learn, do, know and think.

Interactive training is aimed at the formation of communicative competence in Russian. Effective learning tools can be maps, slides, films, computer simulation (this is the closest to reality simulation of management and decision-making processes), role-playing (business) games, project methodology.

When teaching the Russian language, various business games are of no small importance.

Active teaching methods are divided into two large groups: group and individual.

Group ones are applicable simultaneously to a certain number of participants (group), individual ones - to a specific person who carries out his general, special, professional or other training outside of direct contact with other students.

Various authors classify active teaching methods (AMO) on different grounds, highlighting a different number of groups of active methods.

For example, Golubkova O.A. and Prilepo A.Yu. classify interactive teaching methods based on their communicative functions, dividing them into three groups[7]

1. Discussion methods:

- Dialogue;
- Group discussion;
- Analysis and analysis of life situations.

2. Game methods:

- Didactic games;
- Creative games, including business, role-playing games;
- Organizational and activity games;
- counterplay.

3. Psychological group of interactive methods:

- Sensitive and communicative training;
- Empathy.

According to experts, interactive methods used in the educational process should meet the following requirements:

- Active, creative, proactive participation of students in the process of obtaining knowledge;
- Formation, accumulation and development of skills in the process of group and individual classes;
- Maximum approximation of learning outcomes to the field of practical activity;
- Cooperation of students and the teacher in planning and implementing all stages of the learning process.

Yu.N. Emelyanov suggests conditionally combining active group methods into three main blocks: a) discussion methods (group discussion, analysis of incidents from practice, analysis of

situations of moral choice, etc.); b) game methods: didactic and creative games, including business (managerial) games, role-playing games (behavioral learning, game psychotherapy, psychodramatic correction); counterplay (transactional method of awareness of communicative behavior).[5]

S.V. Petrushin suggests the main methods of active learning to be divided into the main directions: [5]

By the nature of educational and cognitive activity, methods of active learning are divided into: imitation methods based on imitation of professional activity, and non-imitation. The peculiarity of simulation methods is their division into gaming and non—gaming. The methods in the implementation of which the trainees must play certain roles belong to the game. At the same time, non-gaming ones include analysis of specific situations (ACS), actions according to instructions, etc. The peculiarity of non-simulation methods is the absence of a model of the process or activity being studied.

According to the type of activity of participants in the search for solutions to problems, methods based on:

- ranking by various attributes of objects or actions;
- optimization of processes and structures;
- design and construction of objects;
- choosing tactics of actions in management, communication and conflict

Situations;

- Solving a research, managerial or socio-psychological task;
- demonstrations and training of attention skills, invention, originality, quick thinking and others.

According to the number of participants, there are: individual, group, collective methods.

Voronova A.A. identifies three main types of active learning methods: [6]

A method for analyzing specific situations. Situations can be different in didactic orientation and are used in accordance with the task that the presenter sets for the group: a situation is an illustration, a specific case proposed by the presenter to demonstrate theoretical material; a situation is an exercise where participants must highlight and memorize some elements; a situation is an assessment in which the proposed problem has already been solved, and participants are invited to evaluate it; a situation is a problem, a number of questions are posed to the group that need to be analyzed and solved.

Game simulation or simulation games. Games (simulation) are divided into business, where a simulation model is set in advance, and organizational, where participants themselves choose a system of solutions. There is also a classification of active teaching methods, which involves dividing them into four groups, combining group and individual forms of classes, with the primacy of the former.

Discussion methods (free and directed discussions, meetings of specialists, discussion of life and professional incidents, etc.), built on live and direct communication of participants, with a passively detached position of the moderator performing the function of organizing interaction, exchanging opinions, if necessary, managing the processes of developing and making a group decision.

Game methods (organizational-activity, imitation, role-playing games, psychodrama, sociadrama, etc.), using all or several of the most important elements of the game (game situations, roles, active playback, reconstruction of real events, etc.) and aimed at gaining a new experience that is inaccessible to a person for one reason or another.

Rating methods (efficiency ratings, popularity ratings) that activate the activity of students due to the effect of competition.

Each group of active teaching methods assumes a specific organization of interaction of participants who are in the position of students, and has its own specific features. Thus, there is currently no single view on the problem of classification of teaching methods, and any of the classifications considered has both advantages and disadvantages.

In modern society, the question of improving educational methods is becoming more acute. Modern children need a different approach to learning. Today's time requires a new level of education of students. Students should become, first of all, socially adapted personalities, and all the knowledge gained at school should have a practical outlet into adulthood. Therefore, it is right now to talk about improving education.

One of the ways of such improvement is the introduction of the Singapore methodology of education. Thanks to this method, we can:

- increase the level of knowledge acquisition by students;
- to introduce students to a new form of presentation of the material;
- increase students' interest in the subject.

New things are always perceived by students with special attention. The Singapore methodology is no exception. Its essence consists in group learning (Cooperative learning). For students, entertaining work in groups. Everyone feels the support of the team, and at the same time, individual responsibility is assigned to everyone. Students have more opportunities to show themselves, express their opinion, make their choice. They may be feeling the importance of their point of view for the first time. In the Singapore education system, students have more independence, and the teacher is no longer the center of the lesson. He only needs to be able to direct and organize the activities of students.

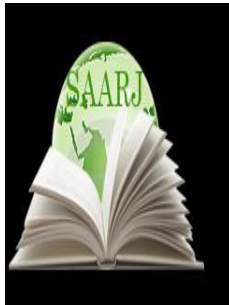
In order for our students to really become successful, we need to teach them the skills of effective communication, cooperation and teamwork. They also need to master the skills of critical and creative thinking to find solutions to the problems they will have to face in a world unlike ours. Lessons should be aimed at this. When working in groups, when they move around, everyone is involved in this process, they are interested and the information is easily remembered.

Interactive learning allows you to solve several tasks at the same time, the main of which is the development of communicative skills and abilities, helps to establish emotional contacts between students, provides an educational task, because it teaches you to work in a team, listen to the opinion of your friends. The use of interactive forms in the learning process, as practice shows, relieves the nervous load of students, makes it possible to change the forms of their activities, switch attention to the key issues of the topic of classes.

The combination of active methods, means and forms of education allows to optimize the educational process, improve the quality of education, provide conditions for self-education of students, organize joint activities of a student and a teacher aimed at self-realization of students. Active learning, which is carried out with the help of active methods, contributes to the formation of cognitive interest in the acquisition of knowledge and educational activities.

REFERENCES:

1. Passov E. I. The concept of communicative foreign language education: a methodological guide for Russian scholars. M., 2007. p. 145.
2. Starodubtseva V.K. Motivation of students to study // Modern problems of science and education. – 2014. – № 6
3. Petrova N. S. Videos in the practice of teaching RCT and new technologies // Russian language: historical destinies and modernity: international Congress 13.03-16.03.2001: proceedings and materials. M., 2001. 109 p.
4. Bimurzina I. V. Russian as a foreign language in the professional aspect: studies. handbook Vladivostok: Dalrybvtuz, 2013. 157 p.
5. M.V.Clarin. Interactive learning is a tool for learning new experiences.//Pedagogy No. 7. 2000.
6. Voloshina N.N. "Creativepedagogy", No. 3 2001.
7. Panina T.S., Vavilova L.N. Modern ways of activating learning. Textbook, M.: 2014, p.52.
8. Akhmedova M.H. Interactive technology in the system of teaching the Russian language // Philological sciences. Questions of theory and practice. - Tambov, 2017. No. 2(3), articles 245-249.
9. Privalova G.F. Active and interactive teaching methods as a factor of improving the educational and cognitive process at the university // Modern problems of science and education. – 2014. – № 3.
10. <https://www.science-education.ru/ru/article/view?id=15617>
11. https://innarusskova.ru/publ/interaktivnoe_obuchenie/1-1-0-6



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HANDWRITTEN DIGIT RECOGNITION BASED ON MACHINE LEARNING ALGORITHM

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ABSTRACT

OCR is a broad field of study that focuses on pattern recognition. Advanced structures that can identify unique typefaces and have high reliability and accuracy are becoming more popular, and they support a wide variety of report codecs and image formats. Handwriting movement analysis may be utilized as a source of information for handwriting recognition. This will improve the end-to-end process's correctness while also increasing its dependability. One of the most practical problems in pattern recognition is text recognition. Digit recognition is used in a variety of applications, including postal mail sorting, bank processing, and data input. The problem stems from the possibility of creating an algorithm that can identify handwritten numbers and send the data to a scanner, tablet, or other digital device. The article discusses different machine learning-based methods to off-line handwritten digits. The most essential aim of the article is to ensure that effective and reliable methods for recognizing handwritten numbers are developed. For digit recognition, many machine learning methods were employed, including Multilayer Perceptron, Support Vector Machine (SVM), Bayes Net, and Random Forest.

KEYWORDS: Digital processing, Digit Recognition, Machine Learning, SVM.

1. INTRODUCTION

Intelligent picture analysis is a fascinating area of Artificial Intelligence study, and it's also critical for a variety of different open studies issues. Handwritten digit recognition is a well-studied subfield that uses mastering models to distinguish pre-segmented handwritten digits. It is one of the most important problems in data mining, machine learning, pattern recognition, and many other artificial intelligence fields[1]. Over the last decade, the most common application of

device mastering strategies has proven effective in conforming decisive structures that compete with human overall performance and achieve far more than manually written classical artificial intelligence systems used in the early days of optical recognition technology. However, not all of the exact models' capabilities have been previously examined[2].

One of the most important jobs in the area of a digit machine is digit identification. In pattern recognition, specialized location sampling methods are utilized to identify such regions. The task of handwritten digit identification is complicated by the large number of different writing styles. To enhance the performance of a handwritten character recognition device, robust function extraction is essential. Because of its usefulness in a variety of areas, handwritten digit recognition has attracted a lot of attention in the world of pattern recognition devices. In the future, a human recognition system may be used to help create a paperless environment by scanning and processing existing paper documents[3].

In recent years, text detection and recognition has become a necessary annoyance. This trend has been fueled by advancements in the fields of computer vision and machine learning, as well as an increase in applications based on textual content identification and recognition. On a global scale, several workshops and seminars, such as the International Conference on Document Analysis and Recognition (ICDAR), are being held, providing a comparable boost to trends in the field of textual content processing from images. Text detection and identification from video subtitles and web pages are also gaining popularity. Text recognition and extraction from real-world situations and images have gotten a lot of attention. There are a variety of optical character recognition methods available as well. Text detection and identification is still a problem that hasn't been addressed completely. Text segmentation and extraction from natural situations are still challenging to do.

In the field of handwritten character identification, pattern recognition and image processing play an important role. The findings in cover a variety of function extraction strategy classifications, including structural function-based methods, statistical function-based strategies, and international transformation approaches[4]. Statistical methods are used to determine how records are chosen. It relies on the statistics of the image's statistical distribution of pixels. The article described an offline handwritten digit recognition device based on SVM[5].

1. Image Acquisition

The acquisition of images is the initial stage, as illustrated in Figure 1. The experiment is carried out on images of the shapes taken using a scanner or a camera on a mobile phone. Following scanning, the photo is subjected to pre-processing to remove historical noise and binarization to produce pixels in 0s and 1s.

2. Pre Processing

On color, grey-degree, or binary record pictures with textual content and/or images, pre-processing techniques are used. Size normalization is one of the stages in pre-processing, when interpolation is performed for the same old sized image. Binarization is the process of converting a grayscale image to a binary image via the use of thresholding. The pixels in a binary picture have both a 0 and a 1 value. White pixels make up the backdrop, while black pixels make up the foreground. The erosion and dilation techniques are used to smooth the edges of things. Dilation is used to monitor opening clean away erosion. To remove tiny objects from the foreground,

filtering is used. The final filter to dilate is the closing filter, which is accompanied by an erosion mechanism. It fills in tiny gaps in the foreground and moves small sections of background into the forefront. Because they remove the margins of characters, edge detection using morphological gradient operators is used in area detection.

3. Segmentation

To distinguish text from backdrop and retrieve bounded textual information from an image, the segmentation technique is employed. Integrated methods that concentrate on phrase matching/recognition often combine or replace sophisticated segmentation with recognition, while stepwise approaches utilize segmentation to extract characters that may then be fed to recognition algorithms. Character segmentation may be handled using horizontal histogram profiles (for line segmentation), vertical histogram profiles (for word segmentation), and associated problem analysis. The picture is broken down into its constituent parts. Handwritten sentences are scanned to find valid segmentation points between characters using a basic heuristic segmentation method. The segmentation is based on the discovery of minima or arcs between letters, which is not uncommon in handwritten cursive writing. Lines, words, and characters are separated from the pre-processed image.

To divide the textual content lines, line segmentation is used. Word Segmentation calculates the distance between words, whereas Character Recognition calculates the space between characters. For character recognition, a variety of neural network methods, including SVM (Support vector machine), are employed. Essentially, the output of both sets of rules produces nearly equal accuracy, and they may be used to educate and compare accuracy.

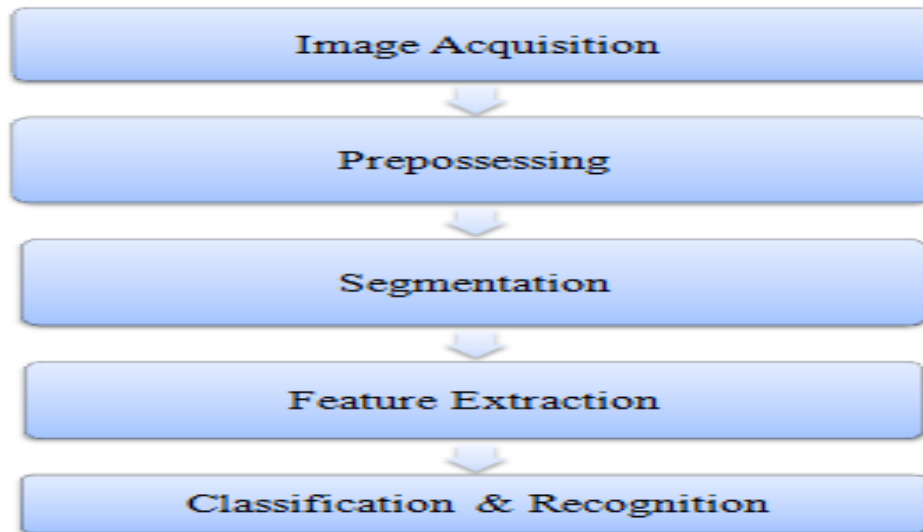


Figure 1: Illustrates the Processes involved for Digit recognition

4. Feature Extraction

Character Geometry-based Feature Extraction extracts the kind of line that creates a particular character. The picture is divided into windows of equal length, and a feature is applied to each window's starters—the pixel at the intersection of two windows has many neighbors. Gradient Feature Extraction. The Sobel operator is used to extract variations in depth of tiny neighbor

pixels. Each pixel's gradient vector is obtained, and the gradient picture is deconstructed using chain code. Crossings and Distances is a common statistical function that counts the number of times a contour is crossed by a line segment in a certain direction. The character's body is divided into a number of regions in different directions, and then characteristics from each are retrieved. Projections in which the characters are represented by projecting pixel gray values onto traces in a variety of ways. This depiction converts a two-dimensional photo into a one-dimensional signal that may be used to represent the character image in Figure 2.

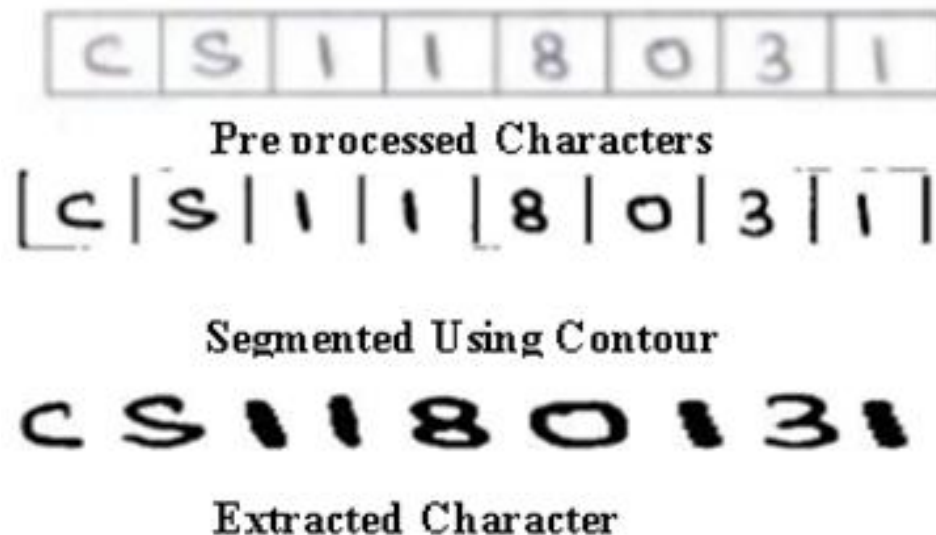


Figure 2: Illustrates the extraction of character processes

Border Transition Technique (BTT): In the border transition method, each character is assumed to be oriented vertically. Each character is divided into four identical quadrants. In each department, the scanning and computation of zero-to-one transitions in vertical and horizontal instructions takes place.

Graph Matching Technique: In a graph matching method, a structural feature of the man or woman is used. Altering the typeface or rotation is a helpful approach. These three characteristics are specified. First, a basic one-pixel endpoint is connected, which contains location statistics. Then a department factor with feature information linked to the branch is assigned to more than three pixels.

5. Classification

Non-text areas next to text regions may be included as positives after text detection and localization degree output. Using class algorithms, the classification step validates text areas and removes non-text parts. This level is also known as verification. Both supervised and unsupervised classification methods exist. The characteristics of text, such as color, size, texture, and so on, are elaborated by supervised algorithms. Unsupervised algorithms don't have any previous knowledge of text characteristics. Type algorithms that are supervised need to be educated before they can be used in class. These algorithms go through a procedure that enables them to extract functions from the text to categorize and utilize them in the category section.

Edge proximity restrictions, as well as area, top, and width limitations on the block obtained at the detection level, are utilized[6].

Unsupervised categorisation algorithms are no longer processed. In contrast to supervised categories, they only extract text functions during the class segment, and they reuse capabilities extracted in prior types for future types. This is similar to adaptive mastery. Wavelet transform, which provides successive approximation through low-bypass clean out and edge and feature information from an excessive-bypass filter. It splits an image into 1616 sized windows and extracts 36 characteristics from each windowed picture for unsupervised categorization of textual and non-textual information. Features like variation of stroke width, difference between contrast of text and historical past, and aspect ratio of bounding box are utilized in the method to create connected components that may be classified utilizing a k-means based entirely classifier. These are global functions taken from a picture that has been split into sub-areas[7].

An effective information modelling method capable of capturing and representing complicated input/output connections is an artificial neural network approach to be used. The desire to create an artificial machine that could do "intelligent" activities comparable to those performed by the human brain motivated the creation of neural community technology. Neural networks are similar to the human brain in that the neural network's information is stored in synaptic weights, which are the intensities of interneuron connections. Because the relative roles of the fields may vary in form, the characteristics of an image are extracted separately to educate the community. This allows it to split the picture into distinct blocks and monitor the neural community on each block.

5.1.Support Vector Machine (SVM)

Support vector machines (SVM) are supervised learning models with related algorithms that analyze data for classification and regression assessment in machine learning (ML). An SVM method creates a version that assigns fresh instances to one of two categories, making it a non-probabilistic binary linear classifier, given a collection of training examples tagged as belonging to at least one or the opposite of two classes (although techniques consisting of Platt scaling exist to apply SVM in a probabilistic type setting). An SVM version is a representation of the instances as points in space, mapped in such a way that the examples of the different classes are separated by as large a distance as feasible. New instances are mapped into the same space and assigned to a category depending on whatever feature of the space they fall into.

SVM (Support Vector Machine) is a kind of supervised machine learning method that aims to categorize data components by maximizing the margin between training in a high-dimensional space[8]. SVM is a representation of instances as components in space, mapped with the help of a reasonable gap as large as feasible between the examples of different courses. Following that, additional instances are mapped into the same space and assigned to a category depending on where they lie on the map. The technique is developed through a "training" phase in which training statistics are used to increase an effective set of rules for discriminating between companies previously described with the help of the operator (e.g. patients vs. controls), and a "testing" section in which the algorithm is used to blind-predict which organization a new belief belongs to. It also generates adequate search area for the right class of future data parameters and delivers a fully accurate class overall performance over the training information[9]. As a result, it

always guarantees a set of parameter combinations based on a realistic subset of the data. In SVM, it is usually preferable to scale the statistics, since this greatly improves the outcomes.

5.2. Multilayer Perceptions

The handwritten digits are classified using a neural community-based fully classifier known as Multilayer perception (MLP). Enter layer, hidden layer, and output layer are the three special layers of a multilayer perceptron. Every node in a layer is linked to all other nodes in the next layer, and each layer may contain a certain number of nodes, also known as neurons. As a result, it's often referred to as a feed forward community. The number of nodes in the input layer is determined by the number of characteristics in the dataset. The number of nodes in the output layer is determined by the dataset's broad range of evident classifications. It's difficult to identify the most practical range of hidden layers or the most practical number of nodes in a hidden layer for a certain annoyance. But, in general, these figures are arrived at via trial and error. The connection between nodes in a multilayer perceptron is based on a weight. It essentially learns the proper weight adjustment that corresponds to each link throughout the educational system. It employs a supervised learning technique known as Back propagation set of rules for the goal of acquiring information[10].

5.2.1. Random Forest (RF) Algorithm

Random forest is an ensemble of unpruned regression or category trees generated from bootstrap samples of the training data using the tree imitation technique's random characteristic selection. The forecast is produced by combining the ensemble's predictions for each category using superiority balloting. It generates a generalization error charge and is more noise-resistant. RF, like maximum classifiers, may be plagued by the curse of learning from a highly unbalanced training data set. It will tend to concentrate more on the prediction performance of the bulk class, which consistently results in poor accuracy for the minority class, since it was designed to reduce the overall mistake price.

5.2.2. Bayes Net

Bayesian networks are a powerful probabilistic depiction, and its use to categorization has gotten a lot of attention. It represents the states of a simulated portion of the world and explains how those states are linked via probability. The Bayesian community is a graphical representation of the probability connections between various variables. The graphical form offers many advantages for records assessment when used in combination with statistical methods. One, since the version encodes all variables' dependencies, it can easily manage circumstances when certain data entries are absent. Two, a Bayesian community may be used to learn causal connections and, as a result, can be utilized to acquire knowledge in a problem area and anticipate intervention outcomes. The conditional probability of each characteristic given the class label is learned from education statistics by this classifier. The comparison of different methods is shown in Table 1.

TABLE 1: COMPARISON OF CORRECT AND INCORRECT INSTANCES OF VARIOUS ALGORITHMS

ALGORITHM	CORRECT INSTANCES	INCORRECT INSTANCES
MULTILAYER PERCEPTRON	90.47	9.53
SUPPORT VECTOR MACHINE	87.87	12.13
RANDOM FOREST	85.77	14.23
BAYES NET	84.30	15.70

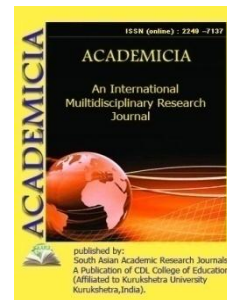
2. DISCUSSION & CONCLUSION

It is hypothesized that image processing expertise coupled with machine learning may be utilized to extend a system to recognize different types of handwritten writing. This solution may be used to automate data input systems, among other things. This may be advanced for a variety of benefits and applications with appropriate training and a huge quantity of data sets. The purpose of this article is to find a representation of handwritten digits that may be used to recognize them. Various remarkable machine learning techniques have been used and applied in this work for the recognition of handwritten digits. The most difficult issue in any recognition system is dealing with feature extraction and proper type strategies. The suggested method, which uses machine learning algorithms, attempts to deal with each of the components accurately and quickly. The recognition technique using Multilayer Perceptron has the best overall accuracy of 90.47 percent.

REFERENCES

1. J. Watada and W. Pedrycz, "A Fuzzy Regression Approach to Acquisition of Linguistic Rules," in *Handbook of Granular Computing*, 2008.
2. A. K. Seewald, "On the Brittleness of Handwritten Digit Recognition Models," *ISRN Mach. Vis.*, 2012, doi: 10.5402/2012/834127.
3. N. Das, R. Sarkar, S. Basu, M. Kundu, M. Nasipuri, and D. K. Basu, "A genetic algorithm based region sampling for selection of local features in handwritten digit recognition application," *Appl. Soft Comput. J.*, 2012, doi: 10.1016/j.asoc.2011.11.030.
4. E. Bhatia, "Optical character recognition techniques: a review," *Int. J. Adv. Res. Comput. Sci. Softw. Eng.*, 2014.
5. R. F. P. Neves, A. N. G. Lopes Filho, C. A. B. Mello, and C. Zanchettin, "A SVM based off-line handwritten digit recognizer," 2011, doi: 10.1109/ICSMC.2011.6083734.
6. A. Mittal, P. P. Roy, P. Singh, and B. Raman, "Rotation and script independent text detection from video frames using sub pixel mapping," *J. Vis. Commun. Image Represent.*, 2017, doi: 10.1016/j.jvcir.2017.03.002.
7. A. Mosleh, N. Bouguila, and A. Ben Hamza, "Image text detection using a bandlet-based edge detector and stroke width transform," 2012, doi: 10.5244/C.26.63.

8. F. Pereira, T. Mitchell, and M. Botvinick, "Machine learning classifiers and fMRI: a tutorial overview.," *Neuroimage*, 2009, doi: 10.1016/j.neuroimage.2008.11.007.
9. G. Orrù, W. Pettersson-Yeo, A. F. Marquand, G. Sartori, and A. Mechelli, "Using Support Vector Machine to identify imaging biomarkers of neurological and psychiatric disease: A critical review," *Neuroscience and Biobehavioral Reviews*. 2012, doi: 10.1016/j.neubiorev.2012.01.004.
10. R. Kruse, C. Borgelt, F. Klawonn, C. Moewes, M. Steinbrecher, and P. Held, "Multi-Layer Perceptrons," 2013.



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DRUG DISCOVERY: A COMPLETE REVIEW

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ABSTRACT

The drug business is one of the main actors driving the growth of the medicines, biotechnology & pharmacology sector. Drug discovery is the process through which medicines are discovered and developed. It is a technique which aims at finding a chemical therapeutically helpful in healing & treating illness. The process of drug discovery includes the identification of candidates, synthesis, characterisation, screening & tests for therapeutic effectiveness. Once a molecule has proven its usefulness in these tests, it will begin the process of medication development prior to clinical trials. Developing a new medication is a laborious & costly endeavor, despite exciting discoveries and multibillion dollar expenditures for new drug development is silently facing turmoil. Currently, all current treatments collectively reach only about 400 distinct pharmacological targets. It is predicted that there are at least 10 times as many potential pharmacological targets that could be explored for future therapeutic treatment in the future.

KEYWORDS: *Clinical trial, Clinical trials, Drug discovery, Drug development, Potential drug targets.*

1. INTRODUCTION

Drug discovery is a procedure, which aims at finding a compound therapeutically helpful in treating and curing a condition. Typically a drug discovery effort targets a biological target that has been shown to have a role in the development of the illness or begins from a molecule with intriguing biological activity[1].

The process of drug development includes the identification of candidates, synthesis, characterisation, screening, and tests for therapeutic effectiveness. Once a molecule has proven its usefulness in these tests, it will begin the process of medication development prior to clinical

trials. Drug discovery and development is a costly process due to the high expenses of R&D and human clinical testing. The average total cost of medication development ranges from US\$ 897 million to US\$ 1.9 billion. The average development period is 10-15 years. The developing world bears the main burden of infectious illness, but the range of medicines available for the treatment of many infectious diseases is restricted. In the past most medicines have been found either by identifying the active component from traditional treatments or by serendipitous discovery. At now a new strategy is being tried to understand how illness and infection are regulated at the molecular and physiological level and to target particular entities based on this information[2].

2. LITERATURE REVIEW

[Helmut Giersiefen](#) in his study discloses about present and future drug development techniques and tactics are reviewed in chronological sequence throughout the drug discovery process. Many of these methods are discussed in greater depth in the other chapters of this book. We refer only to tiny organic compounds and not therapeutic proteins ("biologicals"), for which the situation may be very different[3].

[J Drews](#) in another study discloses about the emergence of molecular biology and, in particular, of genomic sciences is having a profound effect on drug development. Recombinant proteins and monoclonal antibodies have significantly expanded our therapeutic armamentarium. Genome sciences, coupled with bioinformatic techniques, enable us to analyze the genetic foundation of complex illnesses and to identify the most appropriate areas of attack for future medications, thus expanding the number of therapy choices. The significant rise in the complexity of drug development is imposing changes in the institutional foundation of this multidisciplinary effort. The biotech sector is establishing itself as the discovery arm of the pharmaceutical industry. In bridging the gap between academia and big pharmaceutical corporations, the biotech firms have proven successful vehicles of knowledge transfer[4].

[Shenliang Wang](#) in yet another study discloses about reliable methods for addressing target identification and validation are the basis of effective medication development. Microarrays have been widely used in genomics/proteomics methods for gene/protein expression profiling and tissue/cell-scale target validation. Besides being used as an essential step in analyzing high-throughput experiments such as those involving microarrays, bioinformatics can also contribute to the processes of target identification and validation by providing functional information about target candidates and positioning information to biological networks. Antisense technologies (including RNA interference technology, which is lately extremely 'hot') allow sequence-based gene knockdown at the RNA level. Zinc finger proteins are a DNA transcription-targeting form of knockdown. Chemical genomics and proteomics are developing techniques for producing phenotypic alterations, thereby leading to target and hit identifications. NMR-based screening, as well as activity-based protein profiling, are attempting to fulfill the need of high-throughput target discovery[5].

3. DISCUSSION

1.1 Step 1: Target identification:

Target identification is the first important step in the drug discovery pipeline. Generally speaking, a drug target is the particular binding site of a drug in vivo via which the molecule performs its effect. A specific pharmacological target may have the following characteristics:

- The therapeutic target is a biomolecule(s), usually a protein that could exist in solitary or complex form.
- The biomolecules have unique places that match other.
- The biomolecular structure may alter when the biomolecule binds to tiny molecules and the changes in structure normally are reversible.
- Following the change in the biomolecule's structure various physiological reactions occur and cause control of the cell, organ, tissue, or body state.
- The physiological reactions produced by the changes in biomolecule structure play a significant part in complicated regulation and have a therapeutic impact on pathological diseases.
- The expression, activity, and structure of the biomolecule might change throughout the course of the disease process.
- Small molecules attaching to the biomolecules are medicines.

As is clear from the preceding explanation, a therapeutic target is a key molecule engaged in a particular metabolic or signal transduction pathway that is unique to a medical state or a specific illness. However, the phrase 'drug target' itself has many limits and is debated within the pharmaceutical industry. In this regard, several points should be kept in mind.

First, a drug target is a relative concept. For starters, a drug target is, just like other biomolecules, also a biomolecule involved in a transduction pathway. The difference between the two is only in their location and role in the transduction pathway. Another aspect is that a drug target is disease-dependent, that is, every target is involved in a special spectrum of diseases.

Second, most human diseases are rather complicated and involve many risk factors, so there are clearly many different drug targets with respect to a specific disease. Targeting a specific target could not conceivably cure a kind of disease. However, the involvement of many targets in a disease does not mean that each target shares equally in the pathogenesis of the disease and thus drugs targeting these targets would not be equally effective in the therapy of the disease.

Third, drug targets can change, which means that with the development of insights into biomolecules and their role in the pathogenesis of a certain disease, drug targets might be not as important as or may be much more important than currently believed. In fact, the establishment of drug targets is based on understanding of the pathogenesis of the disease.

Fourth, there are many drugs targeting the same target and one drug may have more than one target. The relationship between a drug and its target is not one-to-one but one-to-many or many-to-one.

Fifth, when a new drug target is discovered and validated, researchers usually hope to obtain more specific drugs targeting the target. However, a key understanding to keep in mind is that

the body is a subtle organism and a more specific drug might disrupt the homeostasis of the body. Compared to aspirin, rofecoxib is a specific COX-2 inhibitor. However, studies had shown that rofecoxib increases cardiovascular risks, resulting in rofecoxib's withdrawal from the drug market.

Sixth, a therapeutic target typically refers to a specific biomolecule. According to whether there are medicines available, a drug target can be divided into two classes: established drug targets and potential drug targets. The former are those for which there is a good scientific understanding, supported by a lengthy publication history regarding both how the target functions in normal physiology and how it is involved in human pathology. Furthermore, there are many medicines targeting this target. The latter are those biomolecules whose activities are not fully understood and which lack medicines targeting them. Potential targets offer possibilities for entirely new therapeutic development[6].

1.2 Step 2: Target Validation:

New target validation is the foundation of totally new drug exploration and the first stage of drug development.

New drug target validation may be of tremendous assistance not only to new drug research and development but also offer additional insight into the pathophysiology of target associated illnesses [3]. Basically, the target validation process can comprise six steps:

1. Discovering a biomolecule of interest.
2. Evaluating its potential as a target.
3. Designing a bioassay to assess biological activity.
4. Constructing a high-throughput screen.
5. Performing screening to discover hits.
6. Evaluating the hits.

The drug discovery process begins with the identification or growing evidence of, biological targets that are thought to be connected to a specific disease or pathology. Information supporting the involvement of these targets in disease modulation may come from a number of sources [4]. Traditionally, the targets have been researched and mainly found in university labs, and to a lesser degree in the laboratories of pharmaceutical and biotechnology companies. Primary research into understanding the fundamental, essential mechanisms for communication inside and between cells and their disruption in circumstances has been the basic method for establishing prospective targets appropriate for therapeutic intervention[7].

1.3 Step 3: Lead Discovery:

Once a disease- associated molecular target has been identified and validated in disease models, in the lead generation phase, compounds are identified which interact intact animals or disease-related cellbased models that can provide information about the integrative response of an organism to a pharmacological intervention and hereby help to predict the possible profile of new drugs in patients.

This is done mainly using knock-out or knock-in animal models; small molecule molecular target in vitro typically precedes the validation of the therapeutic idea in vivo; combined this defines its clinical potential. Validation includes research in molecular target in vitro typically progresses with the target protein and modify its activity. Libraries of substances that are either synthetic chemicals, peptides, natural or designed proteins, or antibodies are exposed to the target in a way that will identify and isolate those members of the library that interact with and, ideally, have an impact on the target [5-8]. The chemicals chosen are termed “leads”. Initially screening may be done by looking for compounds that bind to the target, however binding is not sufficient for therapeutic action. More recent screening methods incorporate an activity-based readout as part of the first screening test. For example, if the aim is to block a protein that is involved in triggering the expression of a particular gene or group of genes, the assay may include readout to determine whether the expression of the gene is decreased by the chemical. Such assays may be cell-based, but more frequently they are enzymatic assays that can be conducted in a high-throughput way for compounds that bind to the target, but binding is not sufficient for therapeutic action. More modern screening methods incorporate an activity-based readout as part of the first screening test. For example, if the goal is to block a protein that is involved in triggering the expression of a specific gene or group of genes, the assay may include readout to determine whether the expression of the gene is decreased by the chemical.

Such assays may be cell-based, but more frequently they are enzymatic assays that can be conducted in a high-throughput way[8].

1.4 Step 4: Lead Optimization:

Lead optimization is a procedure that starts with a compound that exhibits an intriguing biological activity and concludes with the identification of the best analog. Molecules are chemically modified and then analyzed in order to produce molecules with suitable characteristics to become a medication. Leads are evaluated with respect to pharmacodynamic characteristics such as effectiveness and potency in vitro and in vivo, Physiochemical properties, pharmacokinetic properties, and toxicological aspects.

Potency - refers to the quantity of medication needed for its specific effect to occur.

Efficacy - quantifies the maximal intensity of the effect itself, at saturating medication concentrations.

Pharmacokinetics - influences the destiny of xenobiotics. It explains about “What the body does to the drug”. It typically divided into sections evaluating the amount and rate of adsorption, distribution, metabolism, and excretion (ADME) (ADME).

Pharmacodynamics–It defines the biochemical and physiological effects of medicines, the mechanism of drug action and the relationship between drug concentration and effect. It talks about “What the medication does to the body”.

This procedure ideally involves the simultaneous optimization of multiple parameters and is therefore a time intensive and expensive phase.

This is typically the tightest bottleneck in drug discovery. However, by turning a physiologically active molecule into an effective and safe drug, lead optimization contributes significantly towards added value in the drug development process[9].

1.5 Step 5: Pre-clinical and clinical development:

Pre-clinical development: The pre-clinical development includes the following: create large scale synthesis; animal safety research; carcinogenicity testing; drug delivery; elimination and metabolism studies; drug formulation experiments; dose-ranging studies in animals. Wide range doses of the compounds are introduced to the cell line or animal in order to gather preliminary effectiveness and pharmacokinetic information.

The NIH divides clinical trials into 5 distinct types:

- Treatment trials: evaluate experimental therapies or a new combination of medicines.
- Prevention trials: seek for methods to prevent an illness or prevent it from recurring.
- Diagnostic trials: discover improved test or methods for diagnosing a disease.
- Screening trials: test ways of identifying illnesses.
- Quality of life trials: investigate methods to enhance comfort & quality of life for people with a chronic disease.

Pharmaceutical clinical trials are usually divided into 4 stages.

Phase 0-A recent classification for exploratory, first in human trials intended to accelerate the development of potential therapeutic agents by demonstrating early on whether the drug behaves in human subjects as was expected from preclinical research.

Phase 1-A small sample of healthy volunteers (20-80) are selected to evaluate the safety, tolerability, pharmacokinetics, & pharmacodynamics of a treatment. Normally include dosage ranging studies so that doses for clinical usage may be set adjusted.

Phase 2-Performed on bigger groups (20-300) & are designed to evaluate the activity of the treatment, & continue phase I safety assessments.

Phase 3-Randomized controlled trials on large patient groups (hundreds to thousands) aiming at becoming the final evaluation of the effectiveness of the new treatment, in contrast with conventional therapy.

Side effects are also examined. It is generally anticipated that there be at least two successful phase 3 clinical studies to gain approval from the FDA. Once a medication has proved acceptable, the trial results are manufacturing methods, formulation information, shelf life, etc.

This material is submitted to the FDA for evaluation.

Phase 4 - Post-launch safety monitoring & continuing technical support of a medication may be required or started by the pharmaceutical company intended to identify uncommon or long term side effects across a large patient population & timeframe than was feasible during clinical trials[10].

4. CONCLUSION

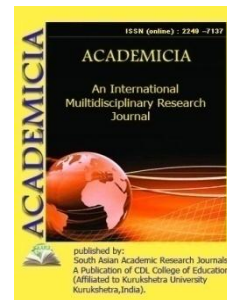
It is very challenging to discover novel chemicals that will lead to new medicines. Drug discovery is a time demanding and expensive process, the top twenty pharmaceutical firms spend ~ \$16 billion on research and development per year. But, recent discovery methods and techniques have decreased the bottleneck in finding high affinity ligands for therapeutic targets.

The availability of biological reagents, new techniques, technologies and computational tools is changing the way we conduct biological discovery and is allowing new ways to find novel targets for drug discovery and development.

Today, the pharmaceutical sector is under tremendous pressure to generate \sa robust medication pipeline characterized by improved productivity, variety and cost effectiveness. But conversion of biological information to disease knowledge, validated target mechanisms, & novel treatments will certainly make the coming century an age of biomedical revolution. Human creativity will again prove to be the pharmaceutical industry's ultimate engine in finding therapy for previously treatable illnesses.

REFERENCES

1. A. Mongia and A. Majumdar, "Drug-target interaction prediction using Multi Graph Regularized Nuclear Norm Minimization," *PLoS One*, 2020, doi: 10.1371/journal.pone.0226484.
2. H. Giersiefen, R. Hilgenfeld, and A. Hillisch, "Modern methods of drug discovery: an introduction.," *EXS*. 2003, doi: 10.1007/978-3-0348-7997-2_1.
3. T. R. Ngara and H. Zhang, "Recent Advances in Function-based Metagenomic Screening," *Genomics, Proteomics and Bioinformatics*. 2018, doi: 10.1016/j.gpb.2018.01.002.
4. Sandra V. B. Jardim*, "The Electronic Health Record and its Contribution to Healthcare Information Systems Interoperability," *Procedia Technol.*, 2013.
5. J. Eckstein, "ISOA / ARF Drug Development Tutorial," *Development*, 2006.
6. Y. Wang, J.-F. Chiu, and Q.-Y. He, "Proteomics in Computer-Aided Drug Design," *Curr. Comput. Aided-Drug Des.*, 2006, doi: 10.2174/1573409052952260.
7. V. S. Rao, S. K. Das, V. J. Rao, and G. Srinubabu, "Recent developments in life sciences research: Role of bioinformatics," *African Journal of Biotechnology*. 2008, doi: 10.4314/ajb.v7i5.58463.
8. S. C. Gad, "Introduction: Drug Discovery in the 21st Century," *Drug Discovery Handbook*. 2005, doi: 10.1002/0471728780.
9. S. Wang, T. B. Sim, Y. S. Kim, and Y. T. Chang, "Tools for target identification and validation," *Current Opinion in Chemical Biology*. 2004, doi: 10.1016/j.cbpa.2004.06.001.
10. J. Drews, "Drug discovery: A historical perspective," *Science*. 2000, doi: 10.1126/science.287.5460.1960.



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PROBLEMS OF TEACHING A SPECIALTY LANGUAGE IN TEACHING RUSSIAN AS A NON-NATIVE LANGUAGE

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ABSTRACT

Proficiency in the language of the chosen specialty in a non-native language provides foreign-language scientific and professional communication when studying at a university. The main idea of teaching the language of the specialty and professional scientific speech is based on the statement that one should study the language not for the sake of formal knowledge, but for practical mastery of it. To speak a language means to have skills and abilities in all types of speech activity.

KEYWORDS: *Specialty Language, Professional Speech, Text, Communication, Connectivity, Speech Units.*

INTRODUCTION

The concept of "specialty language" defines such an aspect of teaching Russian as a non-native language in modern conditions, which provides interethnic educational, scientific and professional communication and in-depth study of the chosen specialty while studying at a university. Naturally, the knowledge of the language of the chosen specialty in a non-native language is secondary for a first-year student and is based on general knowledge of the Russian language and knowledge of the specialty as such, obtained when studying at a university in their native language.

The main principle of modern methods of teaching Russian as a non-native language is the communicativeness of learning, chosen in this study as the basic direction of linguodidactics - a communicative-activity, as well as a personality-oriented approach and innovative technologies as the main means of achieving educational goals. A meaningful attitude to language is based on an understanding of the deep communicative mechanisms of language and orientation on the

ability, based on the communication situation, to choose language means, as well as to understand the intention of the author of the finished speech work and evaluate the content presented by him. It is possible to fully implement this principle of communicative learning only if the training is based on such linguistic provisions that, firstly, will allow to realize and typify the semantics of the structures that make up the text, and secondly, to assess their communicative potential in relation to the professional sphere and the specific situation of communication. Therefore, the approach to grouping, selection and description of language material should be recognized as the most important moment in the implementation of the communicative-activity approach in teaching and the creation of a methodological system based on the principles of innovative pedagogical technologies.

The main idea of teaching the language of the specialty and professional scientific speech is based on the statement that one should study the language not for the sake of formal knowledge, but for practical mastery of it. To speak a language means to have skills and abilities in all types of speech activity. Teaching productive (speaking) and receptive (listening) types of speech activity are presented in this paper in a ratio that depends on the initial level of students' proficiency in Russian. In practical grammar, which should ensure the active speech actions of students, we distinguish first of all the constitutive units of the language. At the main stage (in groups with poor language training) - this is a proposal and a training text (model), and at the advanced stage (in groups with fluent Russian) - a special text.

The idea of communicative learning, following a number of researchers (S.N.Rubinstein, A.N.Leontiev, I.A.Zimnaya (psychological foundations); (T.A. Ladyzhenskaya, M.T. Baranov, G.A.Kitaygorodskaya (methodological foundations); M.P. Aliyeva, A.A.Reshetarov, T.A.Teplyakova (domestic linguodidactics)), we understand as the orientation of learning to the end result. The final result of the training, we see an exit into speech, into a correctly formed statement or text, whether it is a sounding or written version of it. Thus, recognizing the key positions of the text in the developed coherent speech, as well as in the motivation and organization of educational and professional activities in the chosen technology, we logically come to the conclusion that it is the text that should be given the status of the main unit of training.

According to the structure of the new pedagogical teaching technology stated in the first paragraph, chosen by us for this study, in order to diagnose the level of assimilation of educational material and the selection of students into groups with a homogeneous level of language and professional knowledge and experience, we divide groups of students into those who speak Russian well and those who do not know it well, offering the appropriate methodology. The stages of work on the text as a key unit of learning are presented for linguistically weak groups as the main material for speech development, and for strong groups as advanced. At the main stage, according to the RCT methodologists, the main task is to form a view of the text as a linguistic unit, when, perceiving someone else's coherent statement on an educational or professional topic or creating his own, the student clearly sees and highlights textual characteristics, distinguishes the text from the context, is aware of the functional purpose of each category of text. At the advanced stage, attention is focused, on the one hand, on stylistic varieties of speech and genres (form), on the other - on the structure of the text content (subject competence plus identification of patterns of thought structuring).

The first stage is basic for the whole system. It is best provided linguistically. Here we have outlined a range of key concepts from the theory of text, the knowledge of which will ensure the success of training and will allow us to form a scientifically based system of work on the development of coherent and specific scientific speech.

Why is scientific speech and text in the specialty so important in modern conditions? In our opinion, in order to streamline the learning process, it is advisable to bring the educational situation closer to the situation of real communication, to ensure the similarity of educational material and educational speech activity with the real language and real speech professional activity of the student. Modeling the communication process and taking into account the specialty is only one side of the matter. The research of psychologists has proved the fact that a person's speech is an act of activity and therefore should be considered in the system of his activity in general; a specific act of activity, which includes specific speech acts, should end with the achievement of the goal. Speech is one of the means to achieve this main ultimate goal. [1] A high motivational level will be maintained and will greatly contribute to the adequacy of the transfer of the skill if the development of a certain speech skill in Russian language classes is part of larger units of educational action that allow such an orientation of goals that would be related to the goals of vocational training, and the speech act itself will be put in a clear connection with a larger functional unit of speech correlated with the specified educational action.

Once again, it should be emphasized that the strategic goal of teaching Russian as a language of science in modern conditions is to acquire and improve relevant knowledge for students, which is why it is necessary to study the language of the specialty. Future specialists need to know perfectly professional speech, scientific text with all the features of its functioning in scientific, educational, scientific and professional fields of activity. Therefore, a special text is taken as a unit of training.

What is an educational text as a linguodidactic concept? From our point of view, any didactic or methodical construction should be based on a solid theoretical foundation. For the correct orientation of the methodological system, we consider it necessary to analyze the main theoretical provisions concerning the text.

V.A.Bukhbinder and E.D.Rozzanov, researchers of text structure in theoretical linguistics, note that "an integral feature of a text is its coherence"[2]. Connectivity is understood as "the result of the interaction of several factors. This is primarily the logic of the presentation, reflecting the correlation of the phenomena of reality and the dialectic of their development; this is a special organization of phonetic, lexico-semantic and grammatical linguistic means, taking into account also their functional and stylistic load, this is a compositional structure - the sequence and proportionality of parts that contribute to the identification of the content; and, finally, the content of the text itself, its meaning. All these factors, harmoniously combined in a single whole, ensure the coherence of the text".[2]

Such an understanding of the coherence of the text, on the one hand, covers a system of factors, but on the other hand, these factors are not only linguistic. The most adequate for our work is the understanding of the coherence of the text, stated by Kotyurova M.P. The coherence of speech is considered here as a functional-semantic category that covers the content, logical, compositional

aspects of speech and expresses the connection of the elements of content and the logic of presentation through lexical-grammatical and functional-syntactic means.[3]

It is assumed that the elements of the content can be expressed by a sentence, a complex syntactic whole and such structural and compositional units of speech as a paragraph, paragraph, chapter, part, section. Each of these units, despite their diversity, can express a single thought. According to N.I. Zhinkin "ultimately, in any text, if it is relatively complete and consistent, one basic idea, one thesis, one position is expressed. Everything else leads to this idea, develops it, argues, develops".

Scientific creative thinking finds expression in the scientific text, in it all three aspects - logical, psychological and linguistic - are presented most clearly and clearly. Here scientific knowledge correlates with the structure and process of thinking. Therefore, as E.S. Troyanskaya writes, when reading the text, we seem to get into the sender's thinking laboratory, revealing step by step the course of his thoughts, which contributes to the "thinking" of the "recipient of information and its sender" at each stage of the presentation.[4] Communication constructs and functional-syntactic means of expressing the coherence of speech have such a contextual function. The expression of the coherence of speech in a scientific text is conditioned by two opposite tendencies - the completeness of the expression of the content and the conciseness of the expression of the thought process. In accordance with the prevailing manifestation of a particular trend, the content, compositional and logical aspects of speech coherence find expression. The more complex the units of speech, the more widely the relationship between them is expressed.

The expression of the content aspect of connectivity is characterized by significant stability in different types of science. At the same time, the compositional and logical aspects of connectivity, as shown by the analysis of theoretical sources, are characterized by a significant range of quantitative indicators characterizing the use of its means of expression. Scientists explain this by the degree of generality, abstractness of the content and the way of presentation (type of speech), which is mainly characteristic of a particular type of science.

We selected precisely these linguistic facts in the theoretical representation of a scientific text because, having identified formal indicators of coherence through lexico-grammatical and functional-syntactic means in a scientific legal text, it is possible to organize a methodology for studying the content side of the text on their basis and teaching the construction of a coherent statement on a professional topic. Having considered the theoretical provisions defining the scientific text, it is necessary to dwell in more detail on its linguodidactic interpretation as most fully meeting the objectives of this study. An educational scientific text or an educational text on a specialty in Russian linguodidactic science is defined as a certain segment (segment) a speech chain, which in its minimal limits consists of two sentences (phrases) connected in a certain way, going beyond the scope of one conclusion in content. [5] In classical linguistic literature, a text is defined as a sequence of sign units united by a semantic connection, the main property of which is coherence and integrity.[6]

As we can see, the methodological definition of the text is based on the theoretical one, while, for example, Motina puts forward the formal-nomological criterion, which in this work must be taken as a basis, since we are interested not just in the text, but in the scientific text. Another definition of the text deserves attention. Text is a product, a result of speech activity, a work of speech - oral or written. The text, as a rule, has a unity of theme and intent, relative

completeness, internal structure, syntactic, compositional and logical. The text implements the functionality of the language, the laws of its syntax, vocabulary, and stylistics. The text is always characterized by its relation to one or another style: scientific, journalistic, colloquial-everyday. The text should not be identified with a work of literature. Text is a term denoting the linguistic fabric of a literary work. [7] In our work, we will rely on the definition of the text given in the methodological and linguodidactic literature, since it most fully covers all aspects of the text as a linguodidactic concept. So, the subject of study at the university in the practical course of the Russian language should be a scientific text.

How are texts classified by specialty or special texts in linguodidactic science? There is no definite answer to this question yet. Different authors have different approaches to the differentiation of texts according to different criteria. Any one criterion (functional-semantic, etc.) is put forward as the basis. It is necessary to agree with L.P. Klobukova that the typology of texts in the specialty should meet the objectives of training and it is necessary to classify texts, taking into account both intra-textual and extralinguistic features.[8]

So, the academic scientific text in the specialty can be classified by types: description, narrative, reasoning.

The goals of teaching Russian in are, firstly, using it as a means of communication in a bilingual environment in the republic, and secondly, using it, as has already been said, as a means of obtaining special scientific information and, ultimately, improving one's professional level.

Communication is both a process and an activity, and an attitude in which interactions, mutual influences, mutual understanding of interlocutors are realized, one of whom speaks, the other listens or one writes, the other reads: in the first case, direct communication, in the second - mediated by graphic text.

In this regard, the main task of teaching gifted students the Russian language as a means of communication in the scientific and professional sphere of speech is to form their language skills of using certain language tools at the level of automated actions. At the same time, students should be well aware of the ways of expressing their thoughts and perceiving others' thoughts both orally and in written scientific speech.

The development of each type of speech activity is the unity of three components: language as a means of forming thoughts in the text, speech as a way of expressing thoughts in the text and extralinguistic factors (motive, situation, context).

Experience shows that trainees experience the greatest difficulties not when choosing the right word or sentence, but when expressing thoughts in coherent speech, i.e. at the level of a micro-thematic and thematic utterance, ideally, communication participants are only fully aware of the text when they understand and evaluate the communication situation from social, political, professional positions, as well as the motives for which the thought is expressed, the text is constructed.

A motive is something that motivates a person to work to achieve a certain goal. The actual basis of the motives that motivate a person to work in a certain direction, in this case, to learn a language, is called motivation. The development of cognitive motivation of students in teaching the Russian language largely depends on the pedagogical skills of the teacher, his ability to

encourage the mastery of speech. So the answer to the first question is closely interrelated and mutually conditioned by the answer to the following two.

In connection with the determination of the motives and effectiveness of teaching the Russian language in the new conditions, the problem of optimizing the learning process and creating a special methodology arises. An important role here is played by the systematization of the proposed didactic material, the allocation of stages and methods of work on each language unit. At the beginning of the course, as practice shows, it is advisable to offer specially selected microtexts with pronounced textual characteristics (integrity, coherence, structure, communicative goal setting, etc.). Then you need to proceed to the analysis of real texts from textbooks in the specialty or scientific periodicals.

REFERENCES:

1. Leontiev A.A. Psycholinguistic units and generation of speech utterance M., 1969, p. 195.
2. Bukhbinder V.A., Rozanov E.D. On the integrity and structure of the text, - VYA, 1975, No. 6, p.75.
3. Kotyurova M.P. On the connection of sentences and paragraphs in scientific speech // Linguostylistic studies of scientific speech, Moscow: Nauka , 1979 p. 177.
4. Troyanskaya E.S. Towards a general concept of Understanding functional Styles -In the book: Features of the Style of scientific Presentation. M., Nauka, 1976. p. 42.
5. Motina E.V. Language and specialty; linguistic methodological foundations of teaching Russian to non-philological students. M., 1988, p. 11.
6. Linguistic Encyclopedic dictionary. M., Soviet Encyclopedia, 1990, p. 507.
7. LvivM.Dictionary reference book on method. rus.language. Textbook for students of pedagogical institutes. M., Enlightenment, 1988, pp. 206-207.
8. Klobukova L.N. Teaching the language of the specialty. Textbook -Moscow: Moscow University Publishing House, 1987. page 35.



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PERSONALITY OF THE POETICS OF STORY A. P. CHEKHOV "LIFE IN QUESTIONS AND EXCLAMATIONS"

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ABSTRACT

This article analyzes the poetics of the story of A.P. Chekhov "Life in questions and exclamations." By disclosing the means and methods of the poetics of the story, conceptual semantic-forming dominants of the literary text, meaningful categories of the work.

KEYWORDS: *Story, Poetics, Dominant, Conceptuality, Methods And Means, Artistic Analysis Of The Text, Content And Form.*

INTRODUCTION

The peculiarity of the genre originality of A.P. Chekhov's work is the object of close attention of many critics and literary scholars. In particular, V.I. Tyupa, L.M. Gromov, E. Zenkevich, Esin B.I., V.B. Kataev and a number of other researchers addressed the problem of studying the specifics of Chekhov's stories. Hundreds of dissertations have been written. For example, in the dissertation of E.S. Afanasyev explores the formation of an ironic modus in Chekhov's prose, in the work of V. B. Kataev. the philosophical and artistic conceptuality of Chekhov's prose, in the study of Petrovskaya N.I. problems of intertextual inclusions in the writer's epic works, forms of the author's narration in the works of Chekhov Morgulova O.I. and you can list many more other works on the study of the work of the genius of Russian small prose. Our close attention was attracted by the work of VI Tyupa "The Artistry of Chekhov's Story", published in 1989. From our point of view, it was this study, carried out in the prism of new trends in literary science, that most fully presented and reflected the entire depth of Chekhov's stories. In the future, when analyzing the poetics of Chekhov's story "Life in Questions and Exclamations", we will adhere to the point of view of this researcher of Chekhov's work.

MAIN PART. It is well known that A.P. Chekhov is the consummate master of the short story. There are enough works devoted to the analysis of the writer's work on the modern literary platform. Our attention was drawn to one of the early stories of the great classic "Life in Questions and Exclamations." This one-sheet story is unique and original in terms of conceptual expression.

In 1882, a young, twenty-two-year-old Chekhov published a miniature story "Life in Questions and Exclamations" in the satirical magazine "Alarm Clock". Young, but already with a claim to genius, the narrator Chekhov puts the entire story of human life from beginning to end on one single sheet. Involuntarily, you wonder how a novice writer manages to do this? It is noteworthy that only simple interrogative and exclamation-type sentences are used in the miniature. Is this a coincidence? In a literary and artistic work, the master of the word never uses a single word or sign without a certain conceptual fullness, which will subsequently constitute the semantic structure of the text. Knowing the handwriting and writing style of the writer, we understand that in Chekhov's short stories, nothing is accidental! All this prompted us to try to understand the poetics of this work.

So, reading the reviews of literary critics and researchers about Chekhov's stories, in particular, the work of V.I. Tyups about the means and methods of depicting the artistic world by the writer, we are faced with the author's idea that Chekhov managed to reunite two mutually exclusive beginnings of the anecdotal and parable¹. In our opinion, these two principles are perfectly embodied in the story we are examining. Let's try to prove this idea.

First of all, there is a gravitation of the story to the genre of the short story. The story gravitates towards the short story, since the plot is dynamic, the plot itself, the event is important in it (not even the event, but the author's view of it). the result, which cannot end with "nothing", hence the intensity of the plot in terms of the dynamics of development. Human life in the prism of the writer's observations is divided into six significant episodes, which are united by a common plot and compositional component. That is, a person is born if a boy is a continuation of the family, according to religious rites, they must baptize or fulfill other conventions required by religion or mentality, adore, grow, receive criticism or punishment, go to school, and so on along a certain predetermined circle of human life. The story is characterized by brevity, accuracy, expressiveness, undeveloped individual psychology of characters, situational and at the same time generalized plot, uncomplicated composition. Here, the fusion of the very anecdotal and parable about which Tyupa speaks is clearly expressed: "The innovation of the genius storyteller consisted primarily in the interpenetration and mutual transformation of the anecdotal and parable beginnings - two seemingly mutually exclusive ways of understanding reality"².

Analyzing the poetics of this story, we come to the conclusion that the unusual style of presentation, episodic plot, originality, "momentary" situations, staging and at the same time deep reflection, reliability, persuasiveness, expressiveness of pseudo dialogues is an anecdotal beginning in the poetics of the work. The parable beginning is reflected in the ability and wisdom to grasp the most important and indicative elements of life, in the special philosophical observation expressed by interrogative sentences; in the depths of the statements conveyed by means of exclamation sentences, the universality, the universality of the story being told, the instructive meaning of which is long-lasting.

In the story, Chekhov uses colloquial speech ("don't drop it, mother!"), Which is distinguished by great semantic capacity, colorfulness, gives liveliness and expressiveness, naturalness, relaxedness and emotionality to the narration. The speech method is used for transmission,

spoken or internal speech. As the role of inner speech increases, the ways of its transmission become more diverse. As a result of this, the character's inner plane grows and the outer becomes immersed in the inner.

It is known that fragments of someone else's speech can be reflected in the character's inner speech. As observations of Chekhov's style show, the inner speech of the characters can also include non-personified (individual) speech, reflecting the collective point of view; external speech of another character, characterizing a third person; collective speech and so on. In the story "Life in Questions and Exclamations", where the organizing role belongs to one character, his inner speech includes echoes of someone else's speech. Thanks to the interaction of different points of view, Chekhov's story acquires that stereoscopicity that is characteristic of large narrative forms: (He already knows how to walk, You are not small !, It is a shame to cry out to such a big one, What will be the nominative plural? Add and subtract! When I stop you Get out of the classroom! In your years I didn't know anything like that, You're not enough! Already tore your boots? Borrow me a hundred rubles! !, Let's drink? Uraaaa, finished the course! Marry? Never, Nine without trump cards! Seven worms! Son or daughter? All in ... father! I assure you that I do not know her, I am bald? Do not itch, mother-in-law! Son or daughter? I'm drunk, Carolynchus, Are we going to the water? Marry him, my daughter! Stupid? Enough! Dancing badly, but lovely legs! One hundred rubles for ... a kiss, You, son, that ... immoral, Where are you , what time? Daddy, give me a watch! Dropsy? Really? Kingdom of heaven! Relatives crying? And mourning is coming to her! He smells of peace! to your ashes, honest worker!). Through succinct and concise phrases thrown by the character, the author conveys the very semantic and deep generalization that is characteristic of the above epic forms of narration.

The quote can be repeated in the inner speech of the speaker, rethought by another character, link the speech of two characters, as well as the speech of the character and the author. At the same time, it can be a fact of the spoken speech of another character and a means of assessing the situation. The following phrases can serve as a vivid confirmation of this: Son or daughter? I'm getting married, father! But I gave my word! Where did you spend the night? Marry? Never, Oh, if only you knew how I love her! She is a deity! Oh, if you only knew how much I love you! Yes or no? Yes? Oh my darling! To the neck! Leave a smoke! I get drunk after three glasses, I'm already drunk! I'm dying, doctor! I'm drunk, Carolinchen!, Champagne, Champagne).

The compositional technique of repetition creates the illusion of a vicious circle, when the son follows in the footsteps of his father, thereby repeating his fate. From a compositional point of view, in Chekhov's works an important role is played by the technique of repetition - plot and verbal: "the simplest, most widespread and obvious type of repetition in Chekhov's prose is the cross-cutting characteristics of the characters. With the help of repetitions, an external characteristic is given - a portrait detail, a gesture, and an internal characteristic, in particular, the psychological dominant of a certain scene"³. In this story, repetition is also used as a way to characterize characters, since it is he who is the most important principle of organizing the text. The technique of repetition is specific to the Chekhov story in principle. This principle is elaborated in detail in the early short stories of the writer and, in particular, "Life in questions and exclamations." Different types of repetitions can also be complicated by comparisons: a character with a character, a character with himself, a character with several characters, in our case a father and a son, the hero himself at different periods of life. Thanks to this technique, correspondences are established between different fragments of the text, not only immediately following each other, but also torn off from each other. In depicting the character in

the story, Chekhov uses not only repetition, but also contrast. The repetition of a quality or action gives the character's image stability and certainty. At the same time, the person in the image of Chekhov can be bifurcated, combining opposite traits or a property to change over time. In this regard, the idea is held that this Chekhovian character also contrasts with himself. Thus, the writer, through repetition and opposition, creates contamination, which leads to a circular composition, expressed in the reflection of the closed circle of life, a mirror image of the fate of Russian nobles in the fate of their descendants. A mirrored composition and plot are created that reliably and truthfully reflect Russian life and embody the author's intention.

The originality of Chekhov's repetition lies exclusively in the prosaic form. The transition from affirmation to denial is a stable method of organizing a given text, which remains throughout the entire content of the story.

At the same time, for the style of A.P. Chekhov and, in particular, the story "Life in Questions and Exclamations" is characterized by both intra-text and inter-text repetitions, which determine the connections between the parts separated from each other by chronological frames. This finds its expression in the text, namely, in the plot and composition. Reception helps to logically complete the work of an illogical and absurd human life.

Interrogative sentences in the given text act as motivating ones. Separate comments deserve statements, at the context-semantic level, close to prescriptive constructions, which, as you know, include such forms of motivation as order, order, permission, prohibition, instruction, prescription, threat: Don't cry! Read to me "Demyanov's ear"! Get a tailcoat! You, son, of that ... immoral!

The originality of the syntactic structure, namely the use of interrogative and exclamation sentences, allows us to conclude about the high degree of emotiveness of statements in the given text. Interrogative sentences are not so much a clarification of information received from the interlocutor, as expresses sincere surprise at a value judgment. This is evidenced by the lack of an adequate response to the questions. The semantics and structure of these sentences help to establish the expression of general emotionality, as well as to specify the emotion expressed by the given sentence. Emotional states of bewilderment and surprise most often accompany the main meaning of the question - the request for information. Perplexity, surprise signal mistrust, doubt, ignorance, etc., that is, the meanings that the question includes. In this regard, the communicative status of an emotionally evaluative interrogative sentence can be defined as intermediate, interrogative-narrative. Similar emotional states of surprise, bewilderment and exclamation are the most typical, since they are close to the meaning of the question. The text uses interrogative sentences to convey the hero's internal dialogue. The author uses them to display the polemical nature of the situation under consideration, or provides information in parts with the multidimensional nature of the problem. Usually, after such constructions, a direct answer does not follow, since in their semantics they approach an assertion, doubt, assumption or clarification. In this example, the narration is in the first person, and the inner world of the hero is revealed in the content of the internal dialogue. In the work, these sentences are used to give different emotional nuances to the story. They have a pronounced expression and in this they are similar to rhetorical sentences. As you know, rhetorical questions are one of the types of interrogative sentences. A rhetorical question does not require an answer. It is put in such a way that the answer to it follows from the question itself, and the answer is quite definite. The rhetorical question in the given text performs two main structuring functions: it is an expressive beginning and is realized in the form of the last sentence of syntactic unity, and at the same time it has the meaning of inference. The

rhetorical question at the end performs the function of deriving syntactic unity and conveys meaningful information in a reduced form. Such a question can be easily transformed into a declarative sentence. With the help of interrogative sentences in the monologue type of text, a stylistic effect of dialogic speech is created, they add expressiveness and emotionality to the content of the text. In the given text, interrogative sentences are also involved in question-answer unities, where their position is not rigidly fixed. In the story, interrogative sentences are the semantic center, have a resultant and causal meaning.

The exclamation points in this text are indicators of the emotional component. And this emotive state is expressed, firstly, through interjections, which, thanks to the property of directly indicating an emotion, without naming it, create the effect of a sincere emotional reaction, are an effective means of explicating emotivity. Interjections are a concentrated expression of the emotional and evaluative state and create vivid and convincing images of the characters.

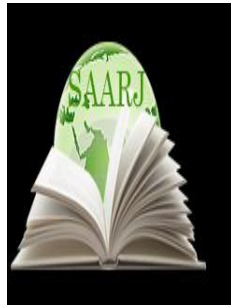
The writer also conveys emotiveness and dynamics with the help of verbs. The verb accumulates a huge potential power of expression, since it has wide possibilities for describing life in its development and movement. The verb in all the richness of its semantics, with its characteristic meanings of grammatical forms and the possibilities of syntactic connections, with a variety of stylistic methods of figurative use, is an inexhaustible source of expression. The verb is used in the story primarily to convey a movement that expresses the dynamics of the surrounding world and the spiritual life of a person. Chekhov wants to display a picture of human life in which spiritual development is reversed. The most important stylistic function of a verb is to add dynamism to descriptions. Using the verbs of movement, Chekhov manages to reveal the intersection of two oppositely moving principles of human life. Life goes forward, a person grows up, gets old, and spiritual development, on the contrary, does not progress over time, but degrades, and the soul itself is morally decayed. Such is the vicious circle of the Russian nobility and humanity as a whole. Depicting the hero through his actions, the writer not only creates a real image, but also penetrates into his psychology, the inner world, since individual actions form the behavior of a person, and feelings, desires and even secret thoughts are reflected in him.

CONCLUSION

Exploring the genre and stylistic features of the work of the genius writer A.P. Chekhov, using the example of the story "Life in Questions and Exclamations", we come to the conclusion that in this story, in an anecdotal aspect, the specificity of Chekhov's images is revealed, which are never fully revealed, in the non-typical nature of their actions and the unpredictability of the end. "The hero of Chekhov is fundamentally atypical," as Chudakov put it in the work "The Poet of Chekhov". This is a kind of personality in the beingness of the real world. Chekhov, creating an individual image, takes as a basis the ordinariness, everyday life, similarity to others, which is clearly reflected in the story we are analyzing. Reading and plunging into the artistic convention of the author, each reader sees first of all his own life, pieces of his biography. Here it is appropriate to end with the words of I.N. Sukhikh. that the form of manifestation of the hero becomes for him that which inevitably enters the life of everyone. This is the presence of the parable in the literary convention of the writer, about which Tyupa writes.

REFERENCES:

1. Aleksandrova O.V. Problems of expressive syntax. M.: Higher school, 1984.
2. Buyanova L. Yu., Nechai Yu. P. Emotiveness and emotigenicity of language: mechanisms of explication and conceptualization: monograph. Krasnodar: Kuban State un-t, 2006.
3. Sukhikh I.N. Problems of poetics of A.P. Chekhov. L., 1987
4. Tyupa V.I. The artistry of Chekhov's story. M.: Higher school, 1989
5. Chekhov A.P. Life in questions and exclamations. <https://ilibrary.ru/>
6. Chudakov A. P. Poetics of Chekhov. M., 1971.



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AN OVER VIEW OF SATELLITE COMMUNICATION

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ABSTRACT

With the introduction of satellites, communication throughout the whole world has been revolutionized. Satellite communication has benefited humanity in a variety of ways, including predicting weather, providing storm warnings, and providing a wide range of communication services in the fields of relaying television programs, digital data for a variety of business services, and, most recently, telephony and mobile communication. If satellite communication connections are utilized for voice and fax transmission to aircraft on international routes in the near future, it will not surprise the global community. Other uses of satellite communication include GPS navigation, global telephone, multimedia video and internet connection, Earth imaging through remote sensing satellites for resource monitoring, telemedicine, and tele-education services, among others. The satellite communication system is transitioning from high-cost, high-capacity trunk connectivity to low-cost multipoint-to-multipoint transmission. Satellite communication has progressed in various ways, including frequency reuse, linking numerous ground terminals across the globe, multiple spot beam communications, laser beam-based satellite communication, and the utilization of networks of tiny satellites in low earth orbit. Different application aspects, both current and future, are addressed in this article on satellite communication development. If we pool our efforts and come up with creative and low-cost solutions for the global community, satellite communication offers numerous applications and markets.

KEYWORDS: *Satellites, GPS Navigation, Remote Sensing, Telemedicine, Frequency Reuse.*

1. INTRODUCTION

The satellite communication service business has expanded at a faster rate than predicted in 1992. This expansion has been a worldwide phenomenon, as the world's economies have grown and developed to the point where more communication services are required for both corporate and consumer sectors. Consumer terrestrial mobile and internet communication services have created new possibilities for satellite communication as a result of increasing demand and recent big, fast growth of company[1]. The need for new multi-state satellite constellations to service this industry on a national and worldwide scale has been sparked by the growth of the mobile and Internet transport access industries[2]. The current and projected rise is due to growth in the aforementioned sectors, as well as an increase in worldwide TV viewership and high data rate transit. There is also a growing need for integrated satellite and terrestrial communications that will allow information to be sent smoothly between both modes of transportation.

Many countries' governments and industries have become interested in these huge and quickly expanding satellite-based commercial possibilities, and these countries are investing substantial additional money to allow them to participate in this developing market. To guarantee their long-term presence in the commercial satellite sector, several nations have set aside money for satellite R&D initiatives. The increasing worldwide demand for satellite communications services, as well as the development of satellites into new applications, has piqued the interest of the investing community. As a consequence, new satellite service providers have emerged, as well as mergers and acquisitions, the establishment of new businesses, worldwide partnerships, and the privatization of formerly public satellite service organizations. The satellite communication business has expanded dramatically, as has the number of experts and activities available[3]. Commercial communication satellite manufacturers and service providers have historically been cautious and reluctant to incorporate new technologies into spacecraft [2]. This has evolved in response to the urgent need to provide consumers' growing demand for entertainment content on television, mobile communications, and high-speed Internet access. Industry is rapidly integrating new technologies into satellites. Onboard processing and switching, more efficient solar cells, higher power components, more effective heat dissipation methods, electric-based station maintaining thrusters, inter satellite connections, huge antennas, and phased arrays are only a few examples of recent developments. antennas, antennas with multiple spot beams, and TWTAs that are better. Satellite is increasingly being seen as more than just a "bent pipe," but as an essential component of a huge global communications networking system that necessitates interoperability between satellite and terrestrial communication components, as well as compatible protocols and standards. The satellite business will have to undertake massive software operations and create new end-user services in order to integrate satellites into the global network. a larger geographic area, so that it may be received by a variety of consumers using suitable equipment Another use of satellites is observation, in which the satellite is outfitted with cameras and other sensors and simply downlinks whatever data it gathers from its vantage position[4].

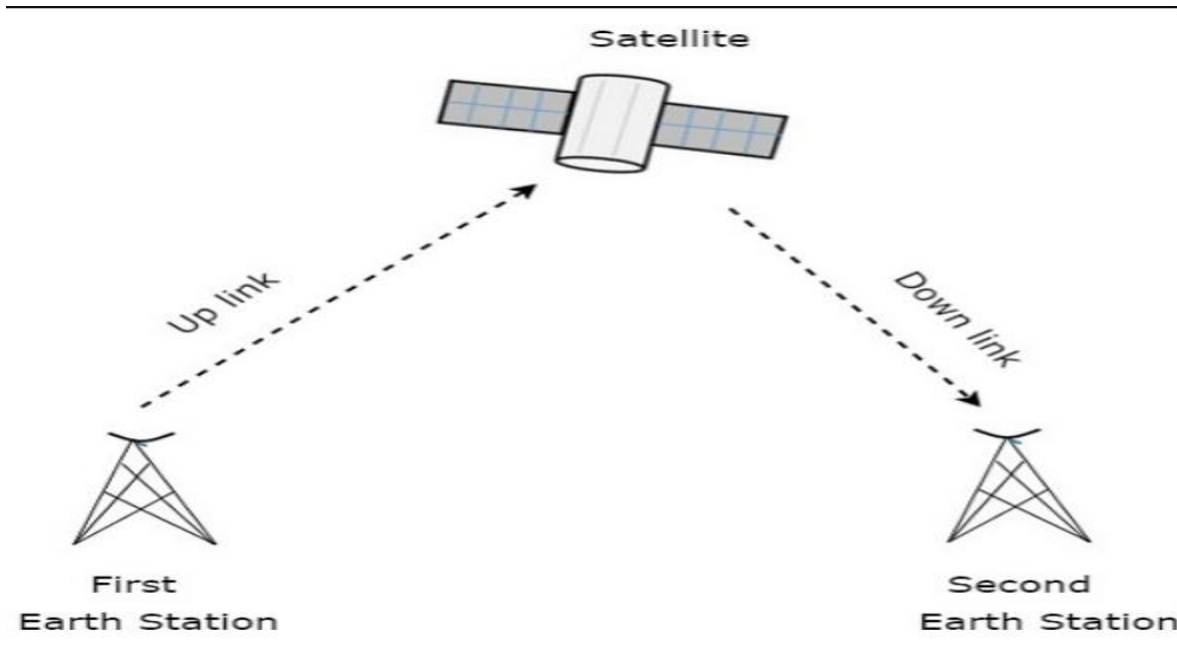


Figure 1: Diagrammatic Representation of Overview of Satellite Communication [ELECTRONIC HUB]

1.1 Advantages of Satellite Communication

- Satellite broadcasting provides extensive coverage across a wide geographic region, particularly in sparsely inhabited areas.
- The bandwidth is quite high.
- Satellite communication can quickly develop wireless and mobile communication applications regardless of location.
- It is used in a wide range of applications, including global mobile communication, private business networks, long-distance telephone transmission, weather forecasting, radio/TV signal broadcasting, military intelligence gathering, ship and aircraft navigation, connecting remote areas, and television distribution, among others.
- The coding and decoding technology in satellite transmissions generally offer security.
- It is simple to get service from a single supplier, and uniform service is accessible. It may be less expensive over large distances.
- Satellite communication is the ideal alternative since its installation and maintenance are simple and inexpensive.
- During a catastrophic situation, each Earth Station may be rapidly removed from its current position and placed somewhere.
- Ground station locations are simple to set up and maintain.

1.2 Disadvantages of Satellite Communication

- The expense of designing, developing, investing in, and insuring a satellite is greater.
- Time taken to reach the satellite from Earth may range from 270 milliseconds to 320 milliseconds. Over telephone lines, this propagation delay may produce an echo.
- Repairing and maintaining satellites is a difficult task.
- Some factors, such as weather or sunspots, may disrupt the satellite's signal, causing interference and making effective functioning difficult.
- It must be monitored and managed on a regular basis to ensure that it stays in orbit once launched.

1.2 Issue in Satellite Communication

- A new approach to satellite design, prototype, and production:

The old pattern of highly specialized, customised, developed and produced a few at a time in satellite production is currently shifting. The usage of common buses and the use of CAD tools to tailor communications payloads are currently being emphasized more. In an assembly line setting, a mass-manufactured system is used, and numerous satellites are created at once. Integration and testing are both automated to a large extent. After prototype and early production are completed, the scope and character of testing is decreased[5].

- New High-Performance Platform:

The construction of big aperture GEO systems with extremely high power systems has been one of the major technological developments in response to the deployment of LEO and MEO satellites. Commercial satellite power production was formerly restricted to 7 to 12 KW[6]. New generation designers, on the other hand, have started to propose huge flexible floppy solar arrays capable of producing 50-60 KW. Intensive attempts are also being made to enhance solar cell performance by utilizing gallium arsenide/germanium multi-junction cells, which have the potential to achieve solar cell efficiencies of above 30%. In order to build higher and higher powered satellites, simultaneous efforts are being made to enhance battery (lithium ion) and fuel cell technologies[7].

- Importance of Future Technologies

Batteries, devices, and structures for Phased Array and Multiple Spot Beam Antennas on the Ground and in Space Fuels and combustion structures for launch vehicles High frequency (>20GHz) devices Materials for electronics devices Solar cell materials and structures Network technology for high data rate, integrative satellite communications Materials for thermal dissipation Furthermore, experimental satellites are required to test new technologies that cannot be readily tested on the ground. At the system level, high altitude, long endurance platforms such as airships and loitering aircraft that fly between 65,000 and 1,00,000 feet may have an effect on satellites' future. In regional applications, such systems may be used to replace satellite communication, or they could be used in combination with satellites as a system capacity multiplier over populous regions[5].

- Issues with policies and regulations

Landing rights agreements, annual terminal licensing fees, non-tariff barriers, frequency and orbital slot allocation, adequacy and effectiveness of intersystem coordination procedures, security and privacy of information relayed on satellite systems, and other issues must be resolved in international satellite trade[8]. The necessity to create protocols for seamless connectivity of satellite, wireless, and terrestrial fiber networks is the most essential of all. Interconnection of satellite systems, especially inter-satellite connections, will be a major issue in the twenty-first century. It's a real difficulty to connect them to a low-latency terrestrial network[9].

1.3 Application of Satellite Communication

Satellites are ideal for certain applications. Broadcasting, service to mobile users such as ships, airplanes, land mobility, and emergency services, and delivering near-instant infrastructure in underserved regions are all examples of these[10]. The Internet's development has been a major role in these plans, and it shows no signs of slowing down, despite the inadequate access that most users presently have. As a result, the deployment of certain of these Ka-band systems may solve the issue of "last mile connectivity" that plagues most industrialized nations. This would be a significant application that has hitherto been overlooked by satellite systems. Other uses include:

- Traditional Telecommunication:

Direct-to-home television (DTH) or direct broadcast satellite (DBS), the enormous growth in wireless hand-held phone usage (cellular, personal communication services, and paging), and the growth in the number of personal computers in the world, increasing numbers of which are multimedia ready and are being used to internationally.

- Satellite-based atmospheric, oceanic, and terrestrial observation

- i) Atmospheric monitoring

Meteorological satellites from the region's main space-faring nations are utilized to gather atmospheric data for climate forecasting. The INSAT-3 series, MATSAT, China's Feng Yung-1C, and the European metrological satellite NOAA series, among others, are all active for this purpose.

- ii) Observations from the sea

In order to predict maritime storms, wind speed and direction near the ocean's surface are crucial. The operating satellites for oceanic observation include India's Oceansat-1 and Oceansat-2, China's QuikSat, KOMPSAT for monitoring ocean color, and Envisat for measuring pigment concentrations, suspended sediments, and soluble organic matter.

- iii) Observation on the ground

Crop management, fertility, pest and disease information to increase crop yields and profitability, flood forecast, forestry estimation, global change studies, land cover monitoring and assessment, large area mapping, cartography, search and rescue operations, emergency disaster communication and hazard mitigation are some of the terrestrial observations carried out by remote sensing satellites. India has a four-satellite Resourcesat constellation, as well as NASA's

Landsat-7, ALOS, IKONOS-2, Quickbird1, Orbview-3&4, and other satellites that provide terrestrial observation.

- Navigation and positioning using satellites

Advanced applications that need very accurate location and tracking, such as precision mapping and surveying or monitoring oil spills and dangerous icebergs, will be enabled by GPS satellites. The same satellites will also offer improved navigation services for airplanes and vessels, as well as moving-map displays for automobiles. The NAVSTAR and GLONASS constellations, as well as the GNSS-1 satellite, are all contributing to this goal.

- Space science and solar applications on the ground.

i) Application of space science

With the building of the International Space Station currently underway, a new door has opened to not just long-term studies of the space environment, but also research and industrial operations in microgravity. The International Space Station, known as Mir, will provide a more sophisticated platform for conducting space research and technological studies.

ii) Solar-terrestrial uses

Some nations are looking into the possibility of using solar electricity from space. The Solar Power System 2000 concept would use solar cells on board satellites in low equatorial orbits to generate electrical power, which would then be sent by microwave to specially built power receiving antennas in nations near the equator.

- Education and training through satellite

i) Teaching and learning at a distance

Open learning and distant education programs have been adopted by South-East Asian Ministries of Education in respective nations via satellite-based education and training in discipline open learning centers situated across the region. PEACESAT and other such satellites are utilized for education and training throughout Asia and the Pacific.

ii) Engineering

At least nine nations are undertaking small-scale experimental missions with human resource and industrial development as their goals. The Badr-B, FedSat, TMSat, and KITSAT series are among them.

- Military Relevance

In military operations, space is becoming more important. They're often employed to assist military or security-related operations like checking compliance with weapons control accords. Imagery, navigation, signal intelligence, telecommunications, early warning, and metrology are all examples of military applications. Over 270 military spacecraft, as well as 600 civil, commercial, and multifunctional satellites, are currently in orbit. These satellites are used for both military and civilian purposes.

2. DISCUSSION

Because satellite systems cover vast regions such as nations or continents, the available beam width must be shared by a large number of beams. To get around this, the frequency reuse [4] method is often used. This is based on spatially separated beams utilizing the same frequencies. As a result, the available bandwidth in the coverage region is split into a smaller number of beams. Cluster refers to a group of beams that share the entire available bandwidth. The cluster is then repeated throughout the coverage region, relying on the assumption that beams operating at the same bandwidth will be sufficiently distanced from one another to avoid interference. To allow a continuous coverage of hexagonal geometry, there is only a finite set of feasible cluster sizes. A communications satellite is a man-made spacecraft that uses a transponder to relay and amplify radio telecommunication signals, establishing a communication link between a source transmitter and a receiver at various places on Earth. Television, telephone, radio, internet, and military applications all utilize communications satellites. There are 2,224 communications satellites in Earth orbit as of January 1, 2021. Most communications satellites are in geostationary orbit, which is 22,236 miles (35,785 km) above the equator, and therefore look stationary in the sky; thus, ground station satellite dish antennas may be pointed at that location continuously and do not need to move to follow the satellite.

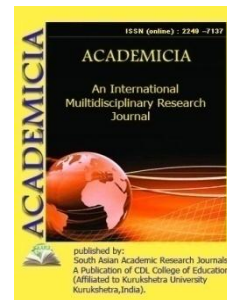
3. CONCLUSION

Satellite communication, its components, advancements in satellite communication, and current and prospective uses are briefly covered in this article. This is a one-time effort to provide a short overview of satellite communication applications. A thorough examination of the applications is still required. In our future research, we will look at the specifics of frequency reuse in satellite and mobile cellular systems. The high-frequency radio waves required for telecommunications connections move in a straight path and are therefore hindered by the Earth's curvature. The aim of communications satellites is to transmit signals around the Earth's curvature, enabling communication between geographically distant locations. A broad variety of radio and microwave frequencies are used by communications satellites. International organizations have rules governing the frequency ranges or "bands" particular organizations are permitted to utilize in order to prevent signal interference. This band assignment reduces the likelihood of signal interference.

REFERENCES

1. A. H. Lokman *et al.*, "A Review of Antennas for Picosatellite Applications," *International Journal of Antennas and Propagation*. 2017, doi: 10.1155/2017/4940656.
2. Y. Konishi, "Phased array antennas," *IEICE Trans. Commun.*, 2003, doi: 10.1201/b14904-23.
3. W. W. Wu, E. F. Miller, W. L. Pritchard, and R. L. Pickholtz, "Mobile Satellite Communications," *Proc. IEEE*, 1994, doi: 10.1109/5.317086.
4. S. S. Kamal and S. Saadat, "New advances in VSAT satellite systems networking technology support the multimedia requirements of tomorrow's business services," 1996, doi: 10.2514/6.1996-1085.
5. L. Wang, F. Li, X. Liu, K. Y. Lam, Z. Na, and H. Peng, "Spectrum Optimization for

- Cognitive Satellite Communications with Cournot Game Model,” *IEEE Access*, 2017, doi: 10.1109/ACCESS.2017.2779804.
6. R. Radhakrishnan, W. W. Edmonson, F. Afghah, R. M. Rodriguez-Orsorio, F. Pinto, and S. C. Burleigh, “Survey of Inter-Satellite Communication for Small Satellite Systems: Physical Layer to Network Layer View,” *IEEE Communications Surveys and Tutorials*. 2016, doi: 10.1109/COMST.2016.2564990.
 7. K. C. Yi, Y. Li, C. H. Sun, and C. G. Nan, “Recent development and its prospect of satellite communications,” *Tongxin Xuebao/Journal on Communications*. 2015, doi: 10.11959/j.issn.1000-436x.2015223.
 8. Y. Rahmat-Samii and A. C. Densmore, “Technology trends and challenges of antennas for satellite communication systems,” *IEEE Trans. Antennas Propag.*, 2015, doi: 10.1109/TAP.2014.2366784.
 9. B. I. Edelson and L. Pollack, “Satellite communications,” *Science* (80-.), 1977, doi: 10.1126/science.195.4283.1125.
 10. A. Kalantari, G. Zheng, Z. Gao, Z. Han, and B. Ottersten, “Secrecy analysis on network coding in bidirectional multibeam satellite communications,” *IEEE Trans. Inf. Forensics Secur.*, 2015, doi: 10.1109/TIFS.2015.2432732.



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CLIMATIC CHANGE AROUND THE WORLD: A REVIEW

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ABSTRACT

Climate change is one of the main problems of our day and puts significant stress to our society and to the environment. From changing weather patterns that endanger food production, to rising sea levels that raise the risk of catastrophic floods, the effects of climate change are global in scope and unparalleled in scale. Without significant action now, adjusting to these effects in the future will be more difficult and expensive. This review deals with the idea of Global Climate Change, the related terminology, causes, consequences, remedies and its possible health impact. It highlights the need to act quickly if we are to prevent an irreversible build-up of greenhouse gases (GHGs) and global warming at a potentially enormous cost to the economy and society globally. Therefore, tackling climate change needs a “unprecedented degree of collaboration, not only between nations, but also across various levels of Governments, private sector and people.

KEYWORDS: *Climatic Change, Global, Greenhouse gases, Weather.*

1. INTRODUCTION

The evidence of climate change is compelling: sea levels are rising, glaciers are retreating, precipitation patterns are changing, and the world is getting warmer. According to the Intergovernmental Panel on Climate Change (IPCC), the current rate of greenhouse gas emissions is likely to cause average temperatures to rise by 0.2°C per decade, reaching by 2050 the threshold of 2°C above pre-industrial levels. Recent evidence suggests even more rapid change, which will greatly, and in some cases irreversibly, affect not just people, but also species and ecosystems[1].

Climate change indeed is real. Super typhoon Haiyan is the latest natural disaster that has also led credence to the reality of climate change. This sad occurrence hit land and devastated the

Philippines. This record-breaking storm is the strongest storm in history to make landfall. It tore apart buildings and left entire provinces without power or communication. The 370-mile-wide storm packed winds 3.5 times as strong as Hurricane Katrina. Winds reached 195 mph and had gusts of up to 235 mph. Walls of water as high as fifteen feet swept over the country washing away towns on many islands and washed ships ashore where homes once stood. The U.N. says, "Around 920,000 people were displaced by the storm and a total of 11.8 million people have been affected. Officials said the deadly storm left more than 3850 injured and at least 77 people reported missing across the Philippines." Climate change is a serious risk to poverty reduction and could undo decades of development efforts. While climate change is global, its negative impacts are more severely felt by poor people and poor countries. They are more susceptible because of their heavy reliance on natural resources and low capability to deal with climate unpredictability and extremes. Restoring and sustaining important ecosystems may assist communities in their adaptation efforts and support livelihoods that rely upon the services of these ecosystems. Moving towards low-carbon society may help decrease greenhouse gas emissions, increasing human health and well-being and generating green jobs[2].

Climate change is a reality of life. We need to act quickly if we are to prevent an irreversible build-up of greenhouse gases (GHGs) and global warming at a potentially enormous cost to the economy and society globally. Organisation for Economic Co-operation and Development (OECD) research indicates that if we act now, we have 10 to 15 years' "breathing space" during which change is feasible at a very moderate cost. But every year of delay decreases this breathing room, while needing ever more severe efforts to make a difference. Current financial crisis is not a cause to wait. Indeed, its macroeconomic implications will be addressed in a relatively short period, after which growth will resume, whereas the costs of inactivity on global warming will continue to become more and more expensive over time[3].

This research provides an overview of Global Climate Change with a goal to assist understand the idea, its urgency and to give an insight to the ways it impacts society and the natural environment and proffering remedies.

2. LITERATURE REVIEW

Singer & Avery in his study discloses about the Climate change and global warming, terms that are sometimes used synonymously, but they have different meanings in the sense that a 'warming' is only one phase of the larger climate system on Earth that naturally features change. Physical evidence on Earth and in space has helped scientists understand that there are many factors that can contribute to the changing of the planet's climate on a long-term basis. Examples of these factors are solar radiation levels, Earth's orbit around the sun, volcanic activity, ocean currents, and even plate tectonics. The periods of warming and cooling are referred to as interglacials and glacials, respectively, with the latter being partly characterized by enormous sheets of ice extending from the poles. Recent periods of change within human history include the Medieval Warm Period (A.D.1000-1270) and the Little Ice Age (A. D. 1270-1850)[4].

Weart in his another study discusses about the history of climate change discussion among people goes farther back in time than one might think. Weart (2007) notes that climate change was conceptualized in ancient times, with knowledge of the subject growing as the technology to study it improved over time. An important figure in climate science history who warned of possible problems was Guy Stewart Callendar, whose idea of carbon dioxide as a heat \strapping

agent was indeed borne out by computer climate simulations in the 1970s- “Even subtle changes in the Earth's orbit could make a difference. To the surprise of many, studies of ancient climates showed that astronomical cycles had partly set the Research on Climate Change 13 timing of the ice ages. Apparently the climate was so delicately balanced that almost any small perturbation might set off a great shift”[5].

Leiserowitz, (2007) In a research published by him, the argument is made that people's understanding of climate change is important to resolving the problem since it is in the public arena that political pressure develops. “Public opinion is important because it is a major component of the socio-political environment in which policy maker function. Public opinion may fundamentally force or restrict political, economic, and social action to address specific dangers. Although there is not a significant quantity of evidence from which to make conclusions regarding American citizens' view of climate change risk, numerous polls in recent years may enlighten inquiries about current thinking in the nation[6].

3. DISCUSSION

3.1 Natural Consequences:

These are already apparent, for instance, temperatures are increasing, polar caps are melting, sea level is rising, the deserts grows and the winters in Europe get progressively wetter. It has been scientifically proven that Mount Kilimanjaro over the years contains less and less snow as a result of global heating. It is unclear if this peak in Tanzania will be covered with snow at all in 50 years. It is also determined that the number of natural catastrophes grows more and more. Tsunamis, floods and severe drought are more often than in times past. In the years 1950-1960 globally 13 natural catastrophes have been recorded, against 72 in the decade 1990-1998. Now the effects are plainly apparent and most likely they will only grow in size and frequency in the future. The IPCC forecasts that climate change will become evident in the following major ways:

- By approximately 2100 global temperatures will have increased by between 1.1°C and 6.4°C. The precise rise relies on future emissions of greenhouse gases and other pollutants and on the combined action of physical and chemical processes in the atmosphere.
- Some areas of the globe will get more precipitation, with others being drier.
- In the course of the current century sea levels will increase by between 18 and 59 cm. This is because warmer water takes more space than cold water and because of the retreat of glaciers and polar ice sheets. Our knowledge of the melting of the Greenland and Antarctic ice sheets is still inadequate. This, together with the fact that there may be significant regional differences in sea level rise, implies that in certain areas of the globe the effects may be much more severe than projected by IPCC.
- The Gulf Stream, which carries comparatively warm water from the Caribbean to Europe, is projected to decrease in intensity, leading temperatures in northwest Europe to increase less dramatically than elsewhere. Standard climate models, however, make no account for a sudden shift in the Gulf Stream[7].

3.2 Economic Consequences:

Changes in global climate will have significant implications for living nature as well as the economy. Even a modest increase in mean annual temperature may have a significant effect on a region's ecology and biological diversity. Biodiversity is of vital significance for the stability of ecosystems as well as for human health. The economic impact of drought, floods and other climate change effects will become quite substantial. Some researchers estimate that these costs are set to rise to between 5 percent and 20 percent of global income. The IPCC has not yet managed to provide a rock-solid cost estimate of the consequences of climate change. It has estimated the cost of limiting further change, though. If such action is taken, global income will grow by only slightly less than if nothing is done: overall economic growth up to the year 2030 would then be 3 percentage points lower (57 percent instead of 60 percent, for example) (57 percent instead of 60 percent, for example).

Avoiding extreme climate change is also important if the "Millennium Development Goals" are to be achieved, formulated by the United Nations as follows:

- Eradicate extreme poverty and hunger.
- Achieve universal primary education.
- Promote gender equality and empower women.
- Reduce child mortality.
- Improve maternal health.
- Combat HIV/AIDS, malaria and other diseases.
- Ensure environmental sustainability.
- Develop a global partnership for development.

That climate policy and the Millennium Goals go hand in hand is readily illustrated. In regions where climate change leads to more severe drought, for example, poverty and hunger will be exacerbated rather than eradicated. Climate change will mean that malaria spreads further round the globe rather than being effectively combated. The multiple impacts of climate change on biodiversity will mean less environmental sustainability, not more. The message is clear: if climate change is not halted, the Millennium Goals will simply not be achieved[8].

3.3 Potential Health Impacts of Climate Change:

The most immediate effects on health include those related to changes in exposure to weather extremes (heatwaves, winter cold); increases in other severe weather occurrences (floods, cyclones, storm-surges, droughts); and increased production of some air pollutants and aeroallergens (spores and moulds) (spores and moulds). Decreases in winter mortality owing to milder winters may compensate for increases in summer mortality due to the increasing frequency of heatwaves. In nations with a high incidence of excess winter mortality, such as the United Kingdom, the positive effect may outweigh the negative. The degree of change in the frequency, severity and location of severe weather events owing to climate change remains unclear. Climate change, operating through less direct processes, will influence the spread of numerous infectious illnesses (particularly water, food and vector-borne diseases) and regional food production (especially cereal grains) (especially cereal grains). In the longer run and with

significant heterogeneity across populations as a result of location and susceptibility, these indirect effects are likely to have larger magnitude than the more direct. For vector-borne infections, the distribution and abundance of vector organisms and intermediate hosts are affected by various physical (temperature, precipitation, humidity, surface water and wind) and biotic factors (vegetation, host species, predators, competitors, parasites and human interventions) (vegetation, host species, predators, competitors, parasites and human interventions).

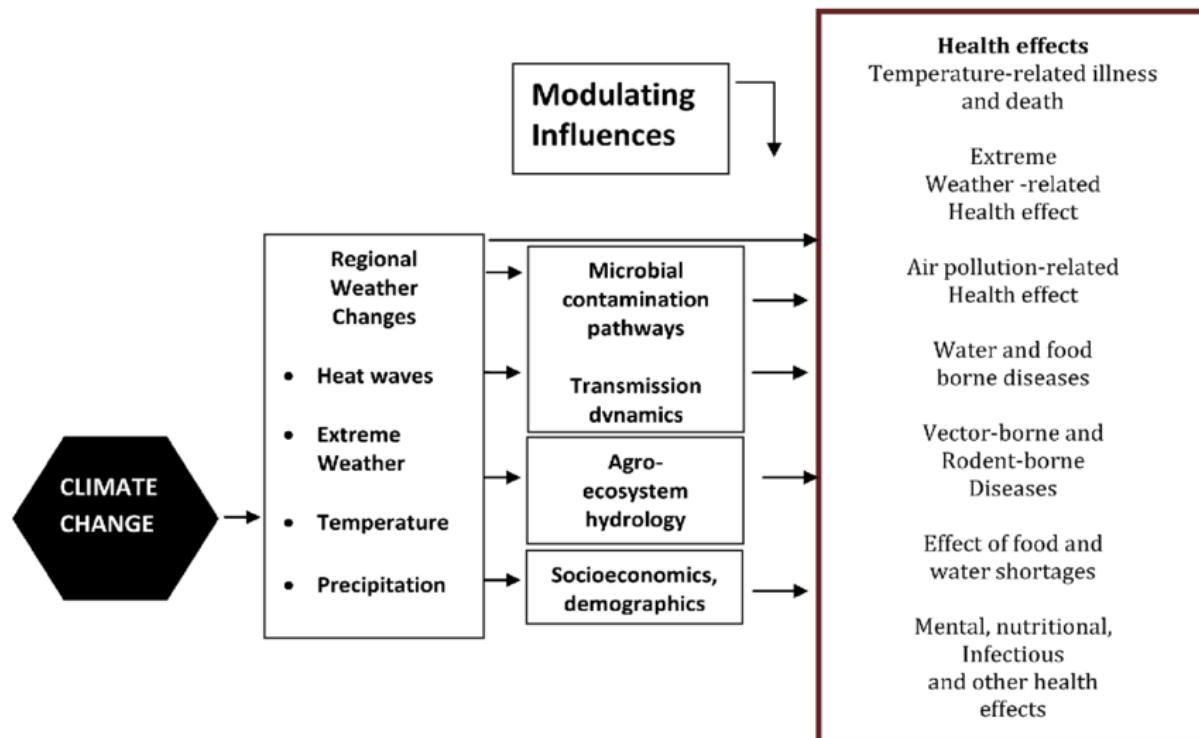


Figure 1: Pathways by which climate change affects human health including local modulating influences and the feedback influence of adaptation measures.

By reflecting the greater retention of heat energy in the lower atmosphere, global warming also impacts the atmospheric heat budget so as to enhance the cooling of the stratosphere. Should this cooling persist, the process of ozone depletion may continue even after chlorine and bromine loading (by human emission of ozone-destroying chemicals) begins to decrease. If so, the possible health implications of stratospheric ozone depletion (increase in frequency of skin cancer in fair-skinned people; eye diseases such as cataracts; and, possibly, inhibition of immunological function) would become a problem for climate change[9]. The main pathways and categories of health impact of climate change are shown in Figure 1.

3.4 Adaptation Solutions:

Adaptation is procedures by which civilizations make themselves better equipped to deal with an unpredictable future. Adapting to climate change involves adopting the proper steps to minimize the negative impacts of climate change (or exploit the favourable ones) by making the required modifications and changes. The Intergovernmental Panel on Climate Change (IPCC) defines adaptation as 'adjustment of natural or human systems in response to current or anticipated

climatic stimuli or their consequences, which moderates damage or exploits favourable possibilities. The effects of climate change may be observed all around the globe. Sea level rise, flooding, hotter summers and wetted winters are the image of present and future. The important issue is to what extent these changes will endure and how we should adjust to them. Contrary to mitigating methods, adaptive solutions do not contribute to a decrease of the climatological issues. Instead, we resign ourselves to the changes and adjust ourselves as best we can to the consequences. This implies that considerable infrastructure development will be needed: raising of dikes, upgrading of sewage systems, creating more room for water and similar measures. We must become aware of the reality that we will not always be secure any longer (from floods), but we must adjust ourselves to the changes:

- Sea level rising/floods/water nuisance.

When contemplating the rise of the sea level and the increasing potential of flooding in a nation, the Netherlands for example, there are two paths to a solution. On the one hand the Dutch can defend their nation even better by increasing the dikes and strengthening the coastal regions. But by doing this, the repercussions in case of a failure (the breaking of a dike) would only be greater. In reality, increasing dikes will only be like erecting a high protective wall around the nation, producing a sort of 'bath tub' at the same time. If the protection wall fails the consequences will be greater. Another adaptive approach is learning to live with floods. Instead of focusing on reinforcing the protective regions (dunes and dikes) we rather concentrate our efforts in minimizing the effects. This too will decrease the danger. After all, risk is defined as opportunity x consequence. If the opportunity stays the same, but the repercussions are less severe, the risk will drop. And precisely the limitation of the consequences can be started out on local government level. You might conceive of local regulations like "no constructions in lower parts of the country" or on the contrary "especially suited constructions in lower areas of the country"[10].

- Drought and desertification.

The UN-plan that was approved in 1994 emphasizes a "bottom-up"-approach, with which one aims to identify especially local solutions to avoid desertification along with the local people. One attempts to discover the answer in sustainable development, addressing social, economic and ecologic issues at one time. A comparable attitude requires quite a co-ordination and tight cooperation across regional, national and international authorities, but environmentalists are not persuaded that the political will to take steps is strong enough to reverse the trend. To resist the increasing desertification, in 1994 the Convention to Combat Desertification (CCD) was established, as a result of the Earth summit of 1992. The Convention, which in the meanwhile has been signed by 191 countries, came into effect in December 1996. To restore damaged ecosystems productive again is a long lasting process and needs an integrated strategy of rural development, extension of irrigation infrastructure and use of new technology. Still, it is conceivable. In China the amount of fertile soil disappearing annually decreased between 2000 and 2004. In February the Chinese government announced a plan to recover 250.000 square kilometres from the desert by 2020 by means of planting trees and grass. Also, the Chinese government intends to invest in arid areas in the effective use of water and renewable energy sources, such as wind and water. Furthermore it is the view of the UN-Environmental organization (UNEP) that when it is impossible to reverse the tide, one should make a virtue of necessity. The narrative of a report that was published 5 June read as: "As long as deserts

become more hostile and less suited for human settlement, we must be creative and take advantage of the current situation". UNEP sees a significant potential especially for the use of solar energy, fish-production, study of the therapeutic qualities of desert plants and the development of crops resistant to drought and salt. Also, new technology to create more effective irrigation systems and to desalinate estuaries may assist[3].

Heat

Temperature increase induced by climate change may in severe circumstances (hot) have a direct detrimental effect on the human health. Possible health consequences in Europe are: difficulties by heat stress, rise of the propagation of Lyme's disease, effects of poor air quality (summer smog) and an increase of allergies. Population groups at high risk (such as the elderly, children or asthmatic individuals) may suffer higher impacts (a greater illness load) (a greater sickness burden). Policy can play a significant role in the limitation of the health consequences of climate change. The Netherlands ought to be competent to resist some health consequences of climate change, by means of the maintaining/improving of existing policies or with new policy choices. Little is known regarding biological or passive adaptation of man to climate change (for example acclimatization, vaccination) (for example acclimatization, immunization). Possible policy options/adaptation possibilities are amongst others:

- Improving of living circumstances, e.g. air conditioning, ventilation.
- Improving of preventive/curative health care, e.g. people with specific educations, immunization.
- Monitoring/alarm systems.
- Public information/education.

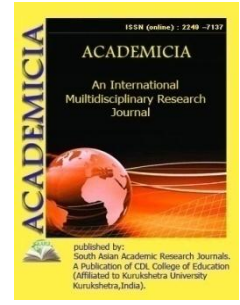
Some adaption options will be more successful and/or cost-efficient than others[4].

4. CONCLUSION

Climate change is occurring and it is driven mainly by human activities. Its effects are starting to be seen and will be exacerbated in the decades ahead unless we take action. The rising pace of global warming—courtesy of carbon dioxide and other greenhouse gas emissions from human activities—have led to climatic changes and environmental degradation, which in turn have resulted to significant difficulties in connection to illnesses and human health. Many illnesses which were previously unknown in particular climatic zones are now making their way to such regions, owing to changes in the weather circumstances. Further, several illnesses that had been believed extinct are re-emerging in regions with changed climatic circumstances that promote their return. It is therefore important that stakeholders and decision makers at industrial, government and international policy levels come up with stringent and workable means of cutting down on greenhouse gases emission to combat the spread of global warming effects, and the resultant climate change, which has produced devastating impacts especially among poorer nations. Further, there should be increased funding of adaptation and coping programs and projects in affected areas to minimize the impacts on human health and curtail the spread of diseases.

REFERENCES

1. E. O. of the S. General, "2014 Climate Change Summary - Chair's Summary," *UN Clim. Summit 2014*, 2014.
2. L. J. Manning, J. W. Hall, H. J. Fowler, C. G. Kilsby, and C. Tebaldi, "Using probabilistic climate change information from a multimodel ensemble for water resources assessment," *Water Resour. Res.*, 2009, doi: 10.1029/2007WR006674.
3. L. H. Ziska, P. R. Epstein, and W. H. Schlesinger, "Rising CO₂, climate change, and public health: Exploring the links to plant biology," *Environ. Health Perspect.*, 2009, doi: 10.1289/ehp.11501.
4. N. Stern, "STERN REVIEW: The Economics of Climate Change Executive Summary," *October*, 2006.
5. C. Rooney, A. J. McMichael, R. S. Kovats, and M. P. Coleman, "Excess mortality in England and Wales, and in Greater London, during the 1995 heatwave," *J. Epidemiol. Community Health*, 1998, doi: 10.1136/jech.52.8.482.
6. G. Feulner, "Global Challenges: Climate Change," *Glob. Challenges*, 2017, doi: 10.1002/gch2.1003.
7. "Climate change 2001: impacts, adaptation, and vulnerability," *Choice Rev. Online*, 2002, doi: 10.5860/choice.39-3433.
8. A. Mackay, "Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change," *J. Environ. Qual.*, 2008, doi: 10.2134/jeq2008.0015br.
9. I. H. Langford and G. Bentham, "The potential effects of climate change on winter mortality in England and Wales," *Int. J. Biometeorol.*, 1995, doi: 10.1007/BF01208491.
10. L. Hickman, "The IPCC in an age of social media," *Nature Climate Change*. 2015, doi: 10.1038/nclimate2528.



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TEACHING TEXTS IN THE SPECIALTY IN AN INTERACTIVE MODE OF MODERN PEDAGOGICAL TECHNOLOGIES

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ABSTRACT

"Inter" is "mutual", "act" is to act. . The discussion can be organized in two ways: either all the subgroups are analyzing the same question, or some large topic is broken up into separate tasks. This is a kind of public discussion of the participants in the debate, aiming at persuading a third party, and not each other, that they are right.

KEYWORDS: *subgroups, persuading*

INTRODUCTION

The competence-based approach to the organization of the educational process requires the teacher to change the learning process: its structure, forms of organization of activities, principles of interaction between subjects. And this means that priority in the work of a teacher is given to dialogical methods of communication, joint searches for truth, and various creative activities. All this is realized through the use of interactive teaching methods.

The word "interactive" came to us from English from the word "interact". "Inter" is "mutual", "act" is to act. Interactivity is the ability to interact or be in a conversation mode, dialogue with someone (person) or something (for example, a computer).

The educational process is organized in such a way that almost all students are involved in the learning process, they have the opportunity to understand and reflect on what they know and what they think. The peculiarity of interactive methods is a high level of mutually directed activity of the subjects of interaction, emotional, spiritual unity of the participants.

Compared to traditional forms of conducting classes, in interactive learning, the interaction of the teacher and the student changes: the teacher's activity gives way to the students' activity, and the teacher's task is to create conditions for their initiative.

In the course of interactive learning, students learn to think critically, solve complex problems based on the analysis of circumstances and relevant information, weigh alternative opinions, make thoughtful decisions, participate in discussions, and communicate with other people. For this, pair and group work is organized in the classroom, research projects, role-playing games are used, work is underway with documents and various sources of information, and creative work is used.

The student becomes a full participant in the educational process; his experience is the main source of educational knowledge. The teacher does not give ready-made knowledge, but encourages the participants to search for themselves and acts as an assistant in their work.

Interactive forms of conducting classes:

- arouse students' interest;
- encourage the active participation of everyone in the educational process;
- appeal to the feelings of each learner;
- contribute to the effective assimilation of educational material;
- have a multifaceted impact on students;
- provide feedback (audience response);
- form students' opinions and attitudes;
- form life skills;
- promote behavior change.

Note that the most important condition for this is the teacher's personal experience of participation in interactive training sessions. You can only learn them through personal participation in a game, "brainstorming" or discussion.

INTERACTIVE METHODS, FORMS AND TOOLS OF LEARNING

1. Binary lecture (lecture-dialogue).

Provides for the presentation of material in the form of a dialogue between two teachers, for example, a scientist and a practitioner, representatives of two scientific directions. Needed: demonstration of the culture of discussion, involvement of students in the discussion of the problem.

2. Briefing.

Briefing - (English briefing from English. Brief - short, short) - a short press conference devoted to one issue. The main difference: there is no presentation part. That is, almost immediately there are answers to the questions of journalists.

3. Webinar.

A webinar (from the words "web" and "seminar") is a "virtual" workshop organized through Internet technologies. The webinar is characterized by the main feature of the workshop - interactivity. You give a talk, listeners ask questions, and you answer them. The easiest way to organize a webinar is to use the services of companies specializing in the provision of these services.

4. Video conference.

Videoconference is a field of information technology that simultaneously provides two-way transmission, processing, transformation and presentation of interactive information at a distance in real time using hardware and software computing technology.

A video conferencing interaction is also called a video conferencing session. Videoconferencing (abbreviated name of videoconferencing) is a telecommunication technology of interactive interaction between two or more remote subscribers, in which it is possible between them to exchange audio and video information in real time, taking into account the transfer of control data.

5. Video lecture.

A filmed abridged lecture, supplemented with diagrams, tables, photographs and video clips illustrating the material presented in the lecture. A series of such lectures is well suited for both distance and distance learning, and for repetition of the material studied.

6. Virtual consultation.

Self-study of the student on the study of interactive teaching materials allows him to receive the bulk of educational information, and the implementation of written assignments - to develop skills in the practical use of the concepts of the course in the study of his own experience.

7. Virtual tutorial.

It is used to consolidate and correct independently acquired knowledge and skills, develop skills in group activities and exchange experience with other participants. Tutorials are conducted using active teaching methods (group discussions, business games, case solving, trainings and brainstorming sessions).

8. Group discussion (discussion in an undertone).

To conduct such a discussion, all students present at the practical lesson are divided into small subgroups that discuss certain issues included in the topic of the lesson. The discussion can be organized in two ways: either all the subgroups are analyzing the same question, or some large topic is broken up into separate tasks. Traditional material results of the discussion are as follows: drawing up a list of interesting thoughts, making presentations by one or two members of subgroups, drawing up methodological developments or instructions, drawing up an action plan.

9. Debate.

This is a clearly structured and specially organized public exchange of thoughts between two parties on current topics. This is a kind of public discussion of the participants in the debate, aiming at persuading a third party, and not each other, that they are right. Therefore, the verbal

and non-verbal means that are used by the participants in the debate have the goal of obtaining a certain result - to form a positive impression on the listeners from their own position.

10. Business game.

A business game is a tool for simulating various conditions of professional activity (including extreme ones) by searching for new ways to fulfill it. The business game simulates various aspects of human activity and social interaction. Play is also a method of effective teaching, since it removes the contradictions between the abstract nature of the academic subject (object) and the real nature of professional activity.

11. Discussion.

As an interactive teaching method means exploration or debriefing. An educational discussion is a purposeful, collective discussion of a specific problem (situation), accompanied by the exchange of ideas, experience, judgments, opinions within a group. Discussion involves the discussion of an issue or a group of related issues by competent persons with the intention of reaching a mutually acceptable solution. Discussion is a kind of controversy, close to polemics, and is a series of statements, expressed in turn by the participants. The statements of the latter should relate to the same subject or topic, which gives the discussion the necessary coherence.

12. Dispute.

Comes from the Latin *disputare* - to reason, to argue. In those situations when it comes to a dispute, we mean a collective discussion of moral, political, literary, scientific, professional and other problems that do not have a generally accepted, unambiguous solution. In the course of the dispute, its participants express various judgments, points of view, assessments on certain events, problems. An important feature of the dispute is strict adherence to the previously adopted regulations and topics.

13. Imitation games.

Also known as "microworlds", they are a kind of "simulators" that develop systems thinking, decision-making skills in a dynamically changing environment under conditions of stress and uncertainty. The microworlds make it possible to simulate situations lasting several months, years or decades in a few hours, which makes it possible to assess the long-term consequences of decision-making and the likely side effects.

Simulation games are a kind of "learning laboratory" in which a real situation from the field of jurisprudence or public administration is simulated, and the participants in the experiment can apply their decision-making skills to the simulated situation. These games are based on complex simulation models based on system dynamics, agent-based modeling, or a combined approach.

14. Interview.

The term "interview" comes from the English *interview* - conversation. According to the content of the interviews, they are divided into groups:

- documentary interviews;
- opinion interviews;
- Interview "press conference".

The subject of the interview can be both a lecturer and students who have prepared information on a given topic.

15. Interactive (problem) lecture.

An interactive (problematic) lecture is a presentation, as a rule, by an experienced teacher in front of a large audience of students for 2-4 academic hours using the following active forms of learning:

- guided (guided) discussion or conversation;
- moderation (the fullest involvement of all participants in the lecture in
- the process of the material being studied);
- demonstration of a slide presentation or fragments of educational films;
- brainstorming;
- Motivational speech.

16. Information-problematic lecture

It involves the presentation of material using problematic issues, tasks, situations. The process of cognition occurs through scientific research, dialogue, analysis, comparison of different points of view.

17. Case method (analysis of specific situations).

The case method (from the English case - case, situation) is an improved method for analyzing specific situations, a method of active problem-situational analysis based on learning by solving specific problems - situations (solving cases).

The case method is the study, analysis and decision-making on a situation (problem) that has arisen as a result of past events, real situations, or may arise under certain circumstances at one point or another. Thus, a distinction is made between field situations based on real factual material and chair (fictional) situations, cases. Students should analyze the situation, understand the essence of the problem, suggest possible solutions and choose the best one.

18. Collective solutions to creative problems.

Creative assignments are understood as educational assignments that require students not to simply reproduce information, but to be creative, since assignments contain a greater or lesser element of obscurity and, as a rule, have several approaches.

19. Colloquium.

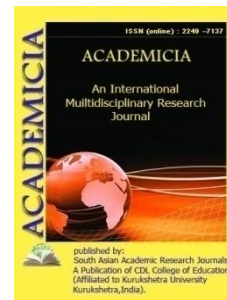
Colloquium is a type of educational and theoretical studies, which is a group discussion under the guidance of a teacher of a fairly wide range of problems (situations). At the same time, it is a form of control, a kind of oral examination, mass (frontal) survey, which allows the teacher in a relatively short time to find out the level of knowledge and skills of students of an entire academic group in this section of the course.

The colloquium, as a rule, takes place in the form of a discussion, during which students are given the opportunity to express their point of view on the problem (situation) under

consideration, to learn to justify and defend it. While arguing and defending their opinion, students at the same time demonstrate how deeply and consciously they have assimilated the studied material. The results are summed up at the end of any lesson, training. As a rule, this procedure is designed for the participants to share their impressions, feelings, and express their wishes. Summing up can be carried out in the form of filling in "sheets of revelation", questionnaires, questionnaires. The teacher can ask the participants of the seminar what new they learned, what was interesting for them, useful, suggest to remember what exercises they did, thus, consolidating the material passed. It is good if the training participants are constantly encouraged in various available ways: verbal or written gratitude is expressed, some brochures, booklets, souvenirs, etc. Or they trust those who have distinguished themselves with the most important tasks.

REFERENCES:

1. Kosolapova M.A. Technological approaches in the organization of professional training for pedagogical activity in higher education / Kosolapova M.A. ; Tomsk state ped. un-t. - Tomsk, 2007. -- 177 p. - Bibliography. : with. 104 - 110. Dep. INION RAS No. 60426
2. Zeer E.F., Pavlova A.M., Symanyuk E.E. Modernization of vocational education: Competence-based approach. - M.: MPSI, 2005. -- 216 p.
3. Zimnyaya I.A. Key competencies - a new paradigm of the result of education // Higher education today. - 2003. - No. 5. - P. 34-42; Competence approach ... // Higher education today. - 2006. - No. 6. - S. 20-26.
4. Karpenko M. A new paradigm of education in the XXI century. // Higher education in Russia.-2007.- No. 4. - P.93.
5. Kononets A.N. Pedagogical modeling: new questions / A. N. Kononets // Innovative approaches to the organization of the educational process in a modern technical university: collection of articles. method. tr. / ed. L. P. Lazareva; FVGUPS. - Khabarovsk: FVGUPS Publishing House, 2008. - S. 22-31.
6. Sozorov A.N. Flash-technologies in education // Abstracts of the All-Russian scientific and methodological conference with international participation "Improving the quality of continuing professional education" Krasnoyarsk: IPC KSTU, 2006. P. 233-234.
7. Dvulichanskaya NN Interactive teaching methods as a means of forming key competencies // Science and education: electronic scientific and technical publication, 2011 <http://technomag.edu.ru/doc/172651>
8. Kosolapova M.A., Efanov V.I. Development of professional competence of a teacher of a technical university with advanced training // Materials of the international scientific and methodological conference "Modern education: problems of ensuring the quality of training in the transition to a multi-level system of higher education" Tomsk: TUSUR, 2012, p. 161-162.



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CHARACTERISTICS OF THE FIRST TRILOGICAL UNIVERSALISM OF JOEY CAREY

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ABSTRACT

In this article is learned the universalism of the protagonists of Joyce Carey's first trilogy, "Herself Surprised," the second novel, "To Be a Pilgrim," and the third, "The Horse's Mouth". In the 30s and 40s of the twentieth century, the work of Joyce Carrey (1888–1957) was one of the brightest works of English literature. In recent years, his works have attracted the interest of literary scholars, translators and readers. For twenty-five years of work (1932-1957) Joyce Carey sixteen novels, more than thirty-five short stories and short stories, twenty-five literary essays, twenty-nine general education essays, four political brochures and a book on aesthetics published.

KEYWORDS: *Trilogy, Epic Series, Genre, Novel, Novel-Epic, Image, Character.*

INTRODUCTION

In the 30s and 40s of the twentieth century, the work of Joyce Carrey (1888–1957) was one of the brightest works of English literature. In recent years, his works have attracted the interest of literary scholars, translators and readers. For twenty-five years of work (1932-1957) Joyce Carey sixteen novels, more than thirty-five short stories and short stories, twenty-five literary essays, twenty-nine general education essays, four political brochures and a book on aesthetics published. Joyce Kerry volunteered for the Nigerian colonial administration in 1913, fighting against the German army in World War I. The events of this period become his first examples of creativity. In 1920 he returned to England from South Africa due to ill health [6]. Joyce Carey wrote her first trilogy in 1941-1944. The first book of the trilogy "I am surprised myself" (Herself Surprised, 1941), the second novel is called "From the path of the tourist pilgrim (To Be a Pilgrim, 1942), and the third is "From the original source" (The Horse's Mouth, 1944).

MAIN PART

We can say that Kerry's work has some objections, although it is generally accepted, after limitation, it seems universal: to have good creative qualities, but not in the form of a true literary direction. When you look at Kerry's work, it's strong around him there were protests, many contradictions. Alan and other critics of the depth of Kerry's worldview and his views on the seriousness of his theses, helped him create perfect and powerful works. 60-70 Many researchers of the years, respect the artist Kerry and Kerry's "uncertainty of understanding the world" noted. Such views are, first and foremost, R. Blum reflected in the monograph. Here's Kerry's politics The following opinion can be seen regarding the trilogy: "Heas it is, as it is taken, this is a deep uncertainty example and the desire to be happy in life under any circumstances." [3, c. 200].

Shereshevskaya M.A. (Prisoner of Grace, 1952) and (*The Horse's Mouth*, 1944), wrote the Russian edition of his novels in the preface, general information about the Kerry case, gave him a brief description of his philosophical views, where a person as a potential creative person, creator of basic ideas about conflict with the outside World highlights Researcher Carey's work is realistic in English notes his closeness to literary traditions. This has been pointed out by other authors as well. [2, c. 3-12]. In his works, the artist turns to the epic series. In general, an epic series can also arise as a result of the inability of many writers to create an epic novel, but in many cases an epic series is created as an independent and distinctive genre. Each division has its own functions and capabilities. Secular scenes from the epic series epic novel in demonstrating the integrity of the socio-philosophical concept, depth, lagging behind the criteria for the accumulation of genre features remains, but has a number of advantages, i.e. a complete variety of large and complex civilizations illuminate the realities of the area and the top ten community life Chronicle chronicles of the world's diversity can reflect the events taking place in their countries.

In general, the formula of Blum Kerry's "uncertain world" Alan Kennedy accused the author of the trilogy about "solipsism" and relativism of suspicion. The genre of the novel Point of View, that is, the cycle of novels with a large number of points of view in this case, according to Alan Kennedy, leads to the fact that the image of life, which is not far from them, belongs to external aspects. According to Kennedy, Kerry did not want to give up the opportunity to look at the world objectively, but showed that there is another concept in life that corresponds to the position of a person in society. [5, p.99].

In Joyce Carrey's novel "*Herself Surprised*", the protagonists Sarah and Jimson were happy early in their lives. With every minute they passed, every open day, he lived happily ever after. The spirit of the hero of the work The image of the sea is a lyrical companion of mood. "Even the calm sea shines on a hot day. The sun The light fell on the smooth, flat surface of the glistening water. When the waves rise, the sea becomes like people, like a spinning ballroom". The nautical theme in this novel is a free, bright and calm life that points to nature. In the days when Sarah lived by the sea he felt very happy. However, the image of the sea is slowly starting to fade. Passage with Jimson b happy days are not eternal: "Waves are sometimes unexpected, drops glisten and invade ... and again tries to run forward, but only when he reached a certain place, he broke away with a plaintive noise and turned back with a deep sigh. It was difficult for me to see this useless work and think that it will always be so; I was just glad the waves were always there. " Sarah loved Jimson, but she will never forget his cruelty, his cruelty. Sarah sees his rudeness in a cruel life, knowing that this life has driven him to madness. [1;106-107-6.]

In the words of Sarah, the author vividly described the life of the main character of the first novel by Jimson and his state of mind. He described the hardships and joys of life in connection with a natural phenomenon.

The author's second novel "*To Be a Pilgrim*", and the main character of the trilogy is a minister associated with the Liberal Party, but later during violent events, the story of Edward's life, ousted from the political arena. The image of Edward gives the author a range of insights into politics, history and revolutions. Edward intended to write a political novel in which he described "the political life How to depict war as Tolstoy described it, which is chaos and delusion, and that politics is always the same that the remaining work is the power of good people in it to be spent, and these people die by accident or from a bullet I wanted to describe. Of course, these words only described Tolstoy's legacy, not only to him, but also to him as a respected writer addressed to the genius writer of Russian and world literature is also worth noting as a tribute.

The character of Joyce Carey's second novel, Edward Wilcher, is one that reflects injustice in society through as well as Edward's political personality writing a novel and politics that are against him. Expressing hatred, innocent people suffer in the struggle means that he wanted to describe that he smoked. The last book of the trilogy - the novel "*From the Source*" - from the life of the artist Gally Jimson, as he himself said, provides an image of the plates. Jimson thinks less about the past than the other characters in the trilogy. There are neither long excursions into the past, nor extensive memories of a past life. Jimson is completely immersed in everyday worries and his own creativity.

J. Kerry tried to show universalism in his novels, describing the characters of the main characters of the three novels. He emphasized that they are creative individuals, no matter what field they work in. Although they appear to be contradictory in nature, they form a whole.

Kerry attached great importance to the integrity of the artwork. In his book *Art and Reality*, he writes: "In the book, all scenes and characters, all events must serve a common result, obey the essence of integrity. Otherwise, it will not find a response in the heart of the reader, will not affect his feelings. What Romannavis pays special attention to is the integrity of the forms, the emotional integrity of the entire book. "All these separate pages and chapters, like bars in a symphony, do not have complete meaning without integrity. We can say that they are waiting for their place in this wholeness, and, in the end, with the end of the last strip, the chapter, they suddenly cannot take their place. My point is that individual methods do not show their full content until the work is complete. The work as a whole is rich in parts and differs significantly from them." [4].

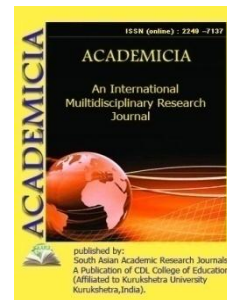
CONCLUSION

The Joyce Carey Trilogy is a triptych, that is, three works with the same general content and idea, the central part of which is the novel *To Be a Pilgrim*; the first and third novels form the sides of the triptych. The rhythm of the three parts, which is repeated in the process of narration and in the system of images, corresponds to the structure of the trilogy. Carey wanted to achieve something in the trilogy, which had not yet been done in the genre of the novel, namely, "not by comparing historical events, but by giving a deep appreciation of the three contributions in proportion to the changes."

It should be noted that in the typology of English novels of the twentieth century, the epic series ranks high in providing genre diversity. As an area with a large scale and wide angle of view of the depicted event or place, as well as striving to outline "centrifugal" novels, the epic preface is structured not only at the core of the epic genre, but in general. A special place is occupied by the system of poetic features, lyrical and dramatic prelude.

REFERENCES:

1. Mixalskaya N.P., Anikin G.V. English novel XX century. - M.: Vyssh. school, 1982. - 192 c.
2. Shereshevskaya M.A. Joyce Carey's novel "First Hand" - In the book: Carey J. First Hand. - L.: Khudozh.lit., 1971. - S. 3-12.
3. Bloom R. The indeterminate world: a study of the novels of Cary. Philadelphia: Univ. of Pennsylvania press, 1962. - 212 p.
4. Cary J. Art and Reality. Cambridge University, 1958. – 142 p.
5. Karl P.R. A reader's guide to the contemporary English novel. London: Thomas and Hudson, 1972. - 375 p.
6. <https://ru.wikipedia.org>. Cary.



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CURING GENETIC DISEASE WITH GENE THERAPY: A REVIEW

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ABSTRACT

Development of viral vectors that enable high efficiency gene transfer into mammalian cells in the early 1980s anticipated the treatment of severe monogenic illnesses in humans. The use of gene transfer utilizing viral vectors has proven effective in disorders of the blood and immune systems, although with many curative trials also revealing severe adverse effects (SAEs) (SAEs). In children with X-linked severe combined immunodeficiency (SCID-X1), chronic granulomatous disease, and Wiskott-Aldrich syndrome, these SAEs were induced by incorrect activation of oncogenes. Subsequent investigations have identified the vector sequences responsible for these changing processes. Members of the Transatlantic Gene Therapy Consortium [TAGTC] have jointly created novel vectors that have proved safer in preclinical tests and utilized these vectors in new clinical trials in SCID-X1. These studies have showed indications of early effectiveness and preliminary integration analysis results from the SCID-X1 trial indicate a better safety profile.

KEYWORDS: Diseases, Gene, Genetic, Therapy, Vectors.

1. INTRODUCTION

Genetic treatments employing viral vectors have increasingly been proven to have effectiveness in monogenic disorders of children. For successful gene therapy, it is necessary to create a product that enables an efficient transduction of target cells. Currently, this is done by utilizing cloned recombinant viruses to transmit genetic sequences with great efficiency. In addition, it is essential to guarantee appropriate expression of transgenes in those cells where it is physiologically required. Increasingly, modern vectors utilize chimeric promoters of mammalian genes coupled with endogenous cis-regulatory elements. Finally, the method must allow for long-term engraftment of changed gene (transduced) cells. Some of the most effective gene

therapy methods to date utilize ex vivo modification and hematopoietic stem cell (HSC) transplantation as a clinical platform to effect genetic treatments[1].

The approach for ex vivo alteration of HSC is strikingly similar to that established in the early 1980s, with some significant advances. Generally, HSCs are acquired via either bone marrow harvest, mobilized peripheral blood collection, or, less often, autologous umbilical cord blood. An HSC-enriched population of cells is produced via CD34 isolation. The resultant CD34+ cells are next cultured ex vivo in a cocktail of cytokines and then exposed to a safety-certified viral vector supernatant produced in specialist facilities according to good manufacturing practice (GMP) standards. The transduced cell product is subsequently given as an autologous hematopoietic stem cell transplant (HSCT) to the recipient. In certain procedures, the patient is subjected to preparative conditioning utilizing chemotherapy, radiation, or both as per normal HSCT transplantation protocols. In certain procedures, no conditioning is needed and these details are disease-specific. Two main benefits are achieved utilizing this gene therapy approach: 1) there is no need to seek for a histocompatible donor; and 2) there is no danger of graft-vs-host disease (GVHD) and thus no need for GVHD prevention or treatment of the patient[2].

As mentioned above, one potential illness for genetic treatment is X-linked severe combined immunodeficiency (SCID-X1). The illness is caused by loss-of-function mutations of the interleukin (IL) – 2 common gamma (γ) chain cytokine receptor. Phenotypically, infants born with this illness lack T and natural killer (NK) lymphocytes and have poorly functioning B cells leading to highly impaired immunity. The illness is deadly if neglected, frequently from otherwise very mild viral infections. Previous clinical work has demonstrated that allogeneic HSCT utilizing either matched related or matched unrelated donors (MUDs) may cure the illness frequently without any conditioning of the recipient. However, MUD transplantations in this illness are associated by higher risk of GVHD, graft failure and overall poor results of these transplants, especially when the recipient is infected at the time of transplantation. This is often the case, since individuals are commonly diagnosed owing to severe viral infections in the first year of life[3].

Previous studies have demonstrated successful gene therapy in SCID-X1. Two studies treated a total of 20 children with this illness utilizing a Moloney leukemia virus (MoLV) – based retrovirus vector producing the IL-2R γ cDNA from the viral long-terminal repeat (LTR) cis-regulatory region containing a strong enhancer element and a viral promoter (MFG- γ C). In these prior trials, effectiveness was demonstrated in 18 of 20 children treated with this vector with a restoration of T and NK cell numbers and functioning. However, 5 of 20 children in this study developed T cell leukemia linked to the insertion of the viral vector into the genome near proto-oncogenes (7) (7) These insertions resulted to dysregulated expression in four of five instances of the LMO-2 proto-oncogene involved in certain cases of de novo pediatric T cell acute lymphoblastic leukemia of these children, 4/5 were effectively treated for their leukemia with preservation of the gene-corrected immunologic function, while one kid died from therapy-resistant leukemia. Thus, although showing efficacy, these studies were also characterized by serious adverse events (SAEs) that led to the interim cessation of a number of trials worldwide and to the United States Food and Drug Administration (FDA) restriction of the use of gene therapy in SCID-X1 to rescue protocols in which eligibility would require previous failure of an allogeneic transplant[4].

2. LITERATURE REVIEW

[D. A. Williams](#) in his study discloses about aninfectious retrovirus vector that has been used to transfer a bacterial gene encoding resistance to the neomycin analogue G418 into pluripotent haematopoietic stem cells present in explanted murine bone marrow tissue. Subsequent transplantation of the cells into lethally irradiated mice results in engraftment of the animals with donor haematopoietic tissue containing the bacterial gene. This approach affords an efficient and rapid means of re-introducing genetically modified tissue into intact organisms and provides a system whereby the expression and regulation of cloned genes can be followed within the context of a well characterized developmental programme[5].

[A Joyner](#) in another study discloses about variety that seems to emerge from the commitment and maturity of stem cells, the molecular basis for this differentiation process is unclear. The insertion of cloned DNA sequences into haematopoietic progenitor cells would offer a new method for investigating this differentiating in vivo system. One laboratory has demonstrated DNA-mediated transfer of genes into mouse bone marrow cells. However, retroviruses provide a number of benefits over DNA-mediated gene transfer methods, including high efficiency infection of a broad variety of cell types in vitro and in vivo, stable and low copy integration into the host chromosome, and a specified integrated provirus structure. For these reasons recombinant DNA methods have been used to create high efficiency retrovirus vectors expressing foreign genes. We show here, employing such a retrovirus vector, the transfer of a dominant selectable drug-resistance gene into specified classes of mouse haematopoietic progenitor cells. These findings should assist the development of molecular genetic approaches to basic and clinical issues in haematopoiesis[6].

[A Fischer](#) in yet another study discusses about naturally occurring genetic diseases of the immune system offer numerous models for the study of its development and function. In a sense, their study complements the information given by the creation of genetic abnormalities in mice produced via homologous recombination methods. In this study, the latest discoveries produced in three areas are focused upon defects in T cell development and in T lymphocyte activation, and on the regulatory mechanism of peripheral immune response[7].

3. DISCUSSION

Shortly after the emergence of leukemias in the French SCID-X1 gene therapy study, a group of scientists formed the Transatlantic Gene Therapy Consortium (TAGTC) to encourage a coordinated approach in resolving the SAEs in this trial (10). This group began meeting annually in a planning retreat with goals to: 1) share expertise in addressing the SAEs of the gene therapy trial in SCID-X1; 2) collaborate on vector development and preclinical studies; 3) share the costs of GMP vector production and certification; 4) develop a common clinical protocol as a platform for a multi-institutional trial and subsequently implement this trial across multiple sites; and 5) seek funding for these efforts. Vector design was based on the molecular evidence implicating the MoLV U3 region enhancer in trans-activation of LMO2 locus. Preclinical effectiveness and safety data were produced at various locations utilizing a range of in vitro and in vivo tests using both murine and human cell lines and primary cells. These results eventually led to the preparation of regulatory papers required in the United States (US), United Kingdom, and France for initiation of a clinical phase I/II study. The criteria for each of these regulatory procedures vary according to particular governmental regulations. Vector GMP manufacturing was achieved at one location utilizing temporary transfection techniques and has previously been reported[8].

The institutions making up TAGTC are listed in Table 1. The vector suggested and eventually utilized in the experiment, SRS11-IL2RG, is illustrated in Figure 1. The vector is a self-inactivating (SIN) engineered γ -retrovirus in which the U3 enhancer is removed from the 3' LTR. In this SIN design, during reverse transcription of the viral genome, the 3' LTR is replicated so that the integrated provirus is devoid of both 5' and 3' U3 enhancer regions. A variety of preclinical studies were used to compare this vector to the MFG- γ C vector used in the previous trial, including: 1) efficacy in restoring IL2R signaling in vitro; 2) reduced propensity for immortalization of primary murine bone marrow in vitro (12); 3) reduced transactivation of the LMO2 locus in a plasmid reporter assays in Jurkat T cells (13); 4) reduced insertions in proto-oncogenes in mice transplanted with transduced HSC (manuscript in preparation) (manuscript in preparation)[9].

In the United States, extensive reviews by the National Institutes of Health Recombinant DNA Advisory Committee, the FDA, local international review boards, and a study section of the National Institute of Allergy and Infectious Diseases (NIAID) led to multiple — often conflicting — recommendations for changes in the protocol. The resulting approved protocol “Gene transfer for SCID-X1 using a self-inactivating (SIN) gamma retroviral vector, a multi-institutional phase I/II trial evaluating the treatment of SCID-X1 patients with retrovirus-mediated gene transfer” was ultimately approved by regulatory agencies for opening in five sites internationally (Table 2) and is listed on Clinicaltrials.gov. The trial is sponsored in the United States by the NIAID.

The study began for recruitment at the US locations in January 2011 and to far has recruited ~50 percent of its accrual goal (nine participants) (nine patients). The longest followed patients are currently >3 years after infusion of gene modified cells. There have been no SAEs directly linked to the vector or to insertional events. Analysis of T cells in several individuals revealed expression of IL-2RG on surface of T cells at levels somewhat below wild-type T cells, as anticipated based on the weaker nature of the promoter. Efficacy trials are ongoing, however to far the vector seems to operate as anticipated with a number of patients exhibiting restoration of peripheral T cell counts and T cell activities as assessed by in vitro stimulation index and return of NK cell numbers. Tracking of recent thymic immigrants through T cell receptor excision circles indicate the functioning of the thymus in many individuals. Integration studies are underway[10].

TABLE 1: TRANSATLANTIC GENE THERAPY CONSORTIUM[1].

Children's Hospital Boston, Harvard Medical School (Boston)
CIEMAT (Madrid)
Cincinnati Children's Hospital, U. of Cincinnati College of Medicine (Cincinnati)
Genethon (Paris)
Georg-Speyer-Haus (Frankfurt, Germany)
German Cancer Institute (Heidelberg)
Great Ormond Street, Institute for Child Health (London)
Hannover Medical School (Hannover)
Lund University (Sweden)
Mattel Children's Hospital, UCLA (Los Angeles)



Figure 1: The SRS11-IL2RG vector. The vector was derived from a murine MoloneyLeukemia virus (MoLV). The long terminal repeat (LTR) includes a deletion of the U3 region denoted by Δ, the R and U5 regions are shown. The IL-2 receptor γ cDNA (IL3RG) is expressed from an internal mammalian promoter made up of the elongation factor 1α (EF1α) sequences. Arrow denotes orientation of mRNA generated from integrated vector[2].

TABLE 2: PARTICIPATING INSTITUTION SITES IN SCID-X1 CLINICAL GENE THERAPY TRIAL[3].

Great Ormond Street, Institute for Child Health (London)
Hôpital Necker EnfantsMalades (Paris)
Children's Hospital Boston, Harvard Medical School (Boston)
Cincinnati Children's Hospital, U. of Cincinnati College of Medicine (Cincinnati)
Mattel Children's Hospital, UCLA (Los Angeles)

Collaborative effort across many universities making up the TAGTC has resulted to the creation of an enhancer-deleted vector expressing the IL-2RG. In preclinical investigations, the vector demonstrated better safety profile utilizing a range of in vitro and in vivo assays. This is a unique multinational cooperation with shared expenses, developmental effort, and eventual clinical testing. The clinical study, currently continuing and accumulating more participants, indicates early effectiveness. Although the follow-up is still too early to evaluate overall safety, no SAEs have yet been found linked to the vector[4].

These investigations are an example of so-called two-way translational research in which fundamental science first leads to clinical research studies, the findings of which then lead to fresh rounds of basic studies and future trials. The area of genetic treatments has continued to develop over ~25 years in a manner similar to many new technologies in which early triumphs are followed by a focus on side effects with successive new breakthroughs happening before widespread acceptance and uses. In this instance, the use of viral vectors for gene therapy applications demonstrated first results in the late 1990s and early 2000s. Vector insertional mutagenesis led to a tempering of excitement followed by studies to enhance safety, as reported in this article. The field has lately witnessed several breakthroughs in treating uncommon, monogenic illnesses utilizing novel vector technology. Ongoing study will be focused at expanding the indications and extending the uses outside highly specialized university research institutions[5].

In a Phase 1–2a trial (NCT02519036) supported by Ionis Pharmaceuticals and F Hoffmann–La Roche, published on June 13 in the New England Journal of Medicine, Sarah Tabrizi and colleagues from University College London (UK) tested an antisense oligonucleotide (IONISHTTRX) in adults with early Huntington's disease and found that the treatment reduced

the concentration of mutant huntingtin without serious adverse effects. In another Phase 1–2a clinical trial (NCT01512888), published on April 18 in the same journal, researchers from St Jude Children's Research Hospital in Memphis (TN, USA) tested a lentiviral gene therapy for babies with X-linked severe combination immunodeficiency. The findings indicated that the gene therapy combined with low-exposure, targeted busulfan conditioning had minimal acute \stoxic effects and resulted in enhanced immunity in each of the eight treated individuals.

These remarkable findings are giving fresh hope to individuals with rare and severe genetic disorders such as these. The US Food and Drug Administration (FDA) authorized three gene therapy products in 2017, including voretigeneparvovec-rzyl, the first licensed gene therapy treatment for individuals with proven biallelic RPE65 mutation that causes retinal degeneration. More than 25 gene treatments are presently in phase 3 or have shown therapeutic effectiveness in phase 1–2 studies in 2019. The FDA expects approving 10–20 cell and gene therapy products per year by 2025, which will most definitely include gene therapies targeting the illnesses listed above, as well as sickle cell anemia, heart disease, and cystic fibrosis[2].

4. CONCLUSION

Although we have reasons to be hopeful, obstacles remain before gene therapy can leap from lab to bedside for several reasons. To begin with, on-target delivery of the gene to the appropriate cells and tissues that are afflicted by the illness is essential to the success of gene therapy.

Most therapies currently being developed utilize inactivated viral vectors, such as AAV or lentiviruses, to transmit repaired genes or genomeediting machinery to fix the faulty gene. However, those vectors typically concentrate in the liver, possibly limiting the range of easily targetable illnesses. Remarkable efforts have been made to improve gene delivery vectors to transport transgenes to targeted cell populations. In their study published on March 6 in *Molecular Therapy*, Suh and colleagues from Rice University in Houston (TX, USA) created a protease-activatable AAV vector, called provector, that reacts to increased extracellular protease activity frequently observed in tissue microenvironments of heart disease. In an in-vivo model of myocardial infarction, provector may transport transgenes preferentially to areas of the injured heart with high matrix-metalloproteinases activity, with a corresponding decrease in delivery to numerous off-target organs, including the liver.

In addition, dangers of cutting-edge technology and the rarity of gene therapy for specific hereditary illnesses are the cause of many bioethical and economical problems. Off-target consequences of existing genomeediting technologies remain a significant worry and barrier to bring it into a clinical setting with acceptable and regulated safety. Even with authorized gene therapy, in the long term, treatment may produce adverse symptoms or organ damage and other side effects that haven't been documented yet in patients. Therefore, both health-care professionals and patients must weigh these dangers with the health benefit that gene therapy offers, particularly when it comes to treating a rare genetic condition that may have the potential to create serious difficulties over many decades. Furthermore, the high expenses of creating treatments tailored to a limited number of patients may make certain gene therapies prohibitively costly, and insurance coverage could be difficult to obtain.

To address these difficulties, all stakeholders—policymakers, pharmaceutical firms, scientific researchers, and health providers— must work together to guarantee that safe, effective, and inexpensive gene therapies become accessible to people in need. For scientific researchers, the

development of the best delivery systems and enhancement of the genome-editing technologies will lead to safer and more effective and cheaper gene treatments. EBioMedicine looks forward to publishing high-quality translational research on this front. For those who are suffering from severe genetic illnesses and in urgent need of efficient therapies, gene therapy is still one of the greatest possibilities for the ultimate cure.

REFERENCES

1. D. A. Williams, A. J. Thrasher, and C. Baum, "Transatlantic consortium spotlights need for changes in gene therapy trials," *Molecular Therapy*. 2010, doi: 10.1038/mt.2010.227.
2. S. Hacein-Bey-Abina *et al.*, "Efficacy of Gene Therapy for X-Linked Severe Combined Immunodeficiency," *N. Engl. J. Med.*, 2010, doi: 10.1056/nejmoa1000164.
3. S. Hacein-Bey-Abina *et al.*, "LMO2-Associated Clonal T Cell Proliferation in Two Patients after Gene Therapy for SCID-X1," *Science* (80-.), 2003, doi: 10.1126/science.1088547.
4. S. Hacein-Bey-Abina *et al.*, "Insertional oncogenesis in 4 patients after retrovirus-mediated gene therapy of SCID-X1," *J. Clin. Invest.*, 2008, doi: 10.1172/JCI35700.
5. H. B. Gaspar *et al.*, "Gene therapy of X-linked severe combined immunodeficiency by use of a pseudotyped gammaretroviral vector," *Lancet*, 2004, doi: 10.1016/S0140-6736(04)17590-9.
6. M. Cavazzana-Calvo *et al.*, "Gene therapy of human severe combined immunodeficiency (SCID)-X1 disease," *Science* (80-.), 2000, doi: 10.1126/science.288.5466.669.
7. A. Fischer *et al.*, "Naturally occurring primary deficiencies of the immune system," *Annual Review of Immunology*. 1997, doi: 10.1146/annurev.immunol.15.1.93.
8. A. D. Miller, "Retrovirus-mediated transfer and expression of drug resistance genes in human haematopoietic progenitor cells," *Nature*, 1986, doi: 10.1038/320275a0.
9. N. Ellison, "Hematology, Basic Principles and Practice, 2nd ed," *Anesth. Analg.*, 1995, doi: 10.1213/00000539-199507000-00069.
10. D. A. Williams, I. R. Lemischka, D. G. Nathan, and R. C. Mulligan, "Introduction of new genetic material into pluripotent haematopoietic stem cells of the mouse," *Nature*, 1984, doi: 10.1038/310476a0.



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AN OVERVIEW OF TYPICAL METHODS AND RESULTS FOR BIOSENSOR REGENERATION

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ABSTRACT

Biosensors are excellent low-cost, portable instruments for detecting infections, proteins, and other analytes quickly. The worldwide biosensor industry is now valued over ten billion dollars per year, and it is a rapidly growing area of multidisciplinary study that is being heralded as a possible revolution in consumer, healthcare, and industrial testing. However, the expense of biosensors is a major impediment to their broad use. Many systems have been validated in the laboratory, and biosensors for a variety of analysts have been proved at the concept level, but many have yet to establish a compelling business case for adoption. Though there is a downward pressure on prices due to the development of cheaper electrodes, circuits, and components, there is also an increasing trend toward the development of multi analyte biosensors that is pulling in the other direction. One method to decrease the cost of some items is to allow them to be reused, lowering the cost-per-test.

KEYWORDS: *Biosensors, Kinetic Energy, Potential Energy, Receptors, Regenerators.*

INTRODUCTION

When the analyte interacts with the bioreceptor, a quantifiable signal is produced. Biosensors are typically characterized as a three-part system consisting of a bioreceptor, a transducer, and a signal processing unit. Sensors have been created for a wide range of analytes in areas such as medicine, food testing, environmental sensing, and process control monitoring in research and industry[1]. These sensors were created to replace conventional testing methods, which are typically technical in nature and require specialized knowledge and time, resulting in a substantial expense in their respective sectors. Although more costly sensors are utilized in research, less priced sensors have the potential to reach a broader market. The present high prices may be ascribed to the specialized nature of the equipment needed, as well as the dependence on

high-grade analytical reagents and materials; a conventional system can cost thousands of dollars up front, while each sensor transducer assembly can cost up to eighty dollars. A variety of methods are presently being explored to reduce the cost of biosensors[2].

On the one hand, enhanced printing using conductive polymer inks is being used in the creation of low-cost, disposable transducers and biosensor assemblies. This has shown to be effective in displacing costlier components and lowering system expenses. These disposable biosensors may be helpful in medical applications where cross contamination and cleanliness are concerns. Disposable sensors, on the other hand, are inappropriate for certain systems; if, for example, time course measurements are required, chip to chip variation may become a source of inaccuracy[3]. Similarly, extremely precise high-grade transducers are needed for certain applications, and the accompanying expenses cannot be avoided. In such cases, regeneration may be a significant strategy for reducing test costs. When it comes to creating biosensors that meet the requirements of the poor world, cost reduction is very essential. Biosensors for assessing food safety, water sanitation, and environmental testing are examples of proven biosensors that cater specifically to these requirements. Another critical need in the developing world is healthcare and diagnostic tools for illnesses that are presently causing high rates of death and morbidity due to avoidable causes[4].

More recently, a trend toward the creation of multi-analyte arrays of biosensors has emerged. Multiple biomarker analyses may theoretically offer a greater level of diagnostic confidence. Multi-analyte arrays, on the other hand, have the intrinsic requirement for more sophisticated transducer systems and data processing, which makes cost a major obstacle to their commercialization. Because each receptor: analyte pair will have its own unique binding physics and buffer systems that are optimized for one receptor: analyte pair may be a poor option for others, these multi analyte arrays may offer a special challenge when regenerating. A technique for repeated sampling is made possible by allowing biosensor renewal. Sensor-to-sensor variation is eliminated as a result, which is especially helpful when monitoring across time or probing comparable amounts of analyte. The development of impedimetric immune sensors is one area where chip-to-chip variation still poses a significant challenge. This problem may be completely solved by allowing regeneration. While reviewing the research, it became clear that comparing the effectiveness of various regeneration plans was difficult[5]. This was owing to the fact that different definitions of regeneration were used across the literature. In our conclusion, we suggest a set of criteria for defining "biosensor regeneration" in order to establish a consensus across the field and guarantee that it is relevant to all fields of biosensor research.

Biosensors are categorized in one of two ways: by signal transduction technique (optical, mechanical, or electrochemical) or by bioreceptor type. Catalytic sensors, which utilize enzymes, and affinity sensors, which use binding proteins or nucleotides, which includes immune sensors, are the two main groups that by bioreceptors fall under. Immunesensors are affinity sensors that detect the target analyte using antibodies or their derivatives. When discussing biosensor regeneration, it's critical to examine the bioreceptor's molecular contact with the analyte via mediating a specific response[6]. Enzymes serve as the bioreceptor in catalytic sensors, which process an analyte to produce a signal. Some of these enzymatic sensors do not need to be actively regenerated during regeneration since the analyte is consumed and the baseline signal is ultimately restored. Though some studies have documented the re-use of these biosensors, this is not active regeneration, which is a critical difference to note in the field; this process is often

referred to as passive regeneration. Another difference to make between biosensors is whether the assays directly measure the analyte or are part of a competitive assay[7].

Competitive assay-based sensors don't get their data directly from the analyte, but rather through the competitive binding or inhibition of a secondary process. The suppression of analyte detection must be evaluated with the inhibition of other stages in the test method that may potentially influence the signal when considering regeneration. Regeneration has been shown in a variety of systems, but the methods, reagents, and circumstances used in each study differ considerably. The different processes of regeneration are described in the following sections, and the most effective regeneration agents are evaluated. The attraction forces between the bioreceptor and the analyte must be overcome in all instances for regeneration to occur. When considering these forces in terms of thermodynamics, both an enthalpy and an entropic contribution must be taken into account. Because these forces are affected by the solvent environment, a regeneration buffer may be used to change them[8]. The entire energy of a thermodynamic system is defined as enthalpy. This energy may be dispersed in a variety of ways, including heat (kinetic energy) and potential energy, which can be expressed in a variety of ways, including chemical bonds and ionic or polar charges. A system will equilibrate to decrease total potential energy, according to the first rule of thermodynamics. Potential energy differences are often a significant factor in bioreceptor: analyte binding when examining interactions involved in biosensor functioning. Charge-charge interactions are frequently used to moderate interactions[8].

Depending on the iso-electric point of the amino acid residue, different amino acids may be positively or negatively charged at a particular solution. Using blood as an example (pH 7.4), there are acidic positively charged amino acids like asparagine and glutamine, as well as equivalent basic or negatively charged residues like lysine, arginine, and histidine in this environment. The bioreceptor binding region's tertiary structure is formed by these charged side groups. The interaction of charges is natural and tends to the system's lowest potential energy. Because charge is affected by the solvent environment, factors like ionic strength, pH, and the presence of competitor ions in the solvent can change the relative strength of charge interactions, allowing for more effective screening of enthalpy interactions between the analyte and the bioreceptor and thus assisting in biosensor regeneration. Typical decreases in enthalpy following antibody: antigen binding vary from as little as 26 KJ.mol⁻¹ to more enthalpically driven interactions with changes as high as -130 KJ.mol⁻¹ in extreme cases²⁷. When compared to normal values for covalent bonds, which range from 200 to 400 KJ.mol⁻¹, this is a significant shift in enthalpy. It's essential to remember that at extremely low ionic strengths, an antibody's binding may be promiscuous since any charge difference facilitates less selective binding, potentially lowering the binding species' overall stringency. High ionic strength environments, on the other hand, may screen antigen-antibody interactions and decrease binding[9]. The intrinsic chaos or disorder of a system is characterized as entropy.

According to the second rule of thermodynamics, a system's entropy will always grow, resulting in a more disordered system. This lowers the system's total potential energy; according to Gibbs Law, a process is spontaneous if the Gibbs free energy is negative. Gibbs free energy is the difference between entropy and enthalpy. Though analyte binding is thought to reduce a system's entropy, entropic compensation occurs via mechanisms such as solvent displacement. The function of solvent molecules in the system must be considered to understand this. Because the

free analyte is extremely disordered, the unbound state has a high entropy; however, the reduction in entropy when the analyte attaches is exceeded by the change in enthalpy, resulting in a negative Gibbs energy change, which explains why this is a spontaneous process. Certain systems, especially when dealing with hydrophobic analytes, have higher entropy upon binding, but this is less common. Because hydrophobic analytes cause ordered water caging at the solvent interface, this is the case. After that, a biosensor is regenerated. Biosensors have been created at the protein level. The detection of hydrophobic analytes that have been regenerated, such as fibrin. With regard to the solvent, the creation of hydration shells results in a highly ordered low entropy system, particularly near the interface, where any less order would be energetically unfavorable[10].

DISCUSSION ON BIO SENSOR REGENERATION

The increase in entropy from released water molecules outweighs the slight decrease in entropy with regard to the analyte and receptor in these situations. Entropically driven binding must be minimized by negating the effects of hydrophobic areas in order to reverse these interactions; as a result, aliphatic detergents are often employed. In an aqueous solution, this allows for the disruption of water caging and the reduction of the hydrophobic effect at the analyte-bioreceptor interface, allowing regeneration. The solvent environment at a sensor interface is a crucial parameter that affects analyte: bioreceptor binding, as described above. The most common method for renewing biosensors is to change the liquid environment chemically. By withdrawing the transducer from any assembly and immersing it in a regeneration buffer, this may be done quickly. As a result, regeneration solutions are often made up of common chemicals, making sensor regeneration a low-cost option. Though it is a basic method, it may be improved with the use of a fluidic control system, or computerized control module; nevertheless, there is presently only little demonstration. This strategy may be crucial in the creation of a field-generable bio sensor. The following is a review of the most frequent chemical methods for biosensor regeneration that have been proven. In many cases, regeneration has been accomplished by using high or low pH buffers in the system. In order to avoid permanent damage to the bioreceptor, a low pH buffer will typically go no lower than pH. A high pH buffer, on the other hand, is often restricted to a pH of about 11 for the same reason. The system is affected in two ways as a result of this. To begin with, a change in pH affects the system's enthalpic state by altering the relative charges between the analyte and the bioreceptor. The charge distributions that preserve the bioreceptor's tertiary structure change when the side groups get ionized. Decoupling of the analyte from the bioreceptor is aided by structural denaturing.

Second, a change in pH causes a change in the environment's ionic strength, which may be used to screen receptor-analyte interactions. Strong electrolytes as Ca^{2+} and NaCl may also be used to change the ionic strength. If a system is especially sensitive to changes in pH, this may be a better option for preventing permanently denaturing sensor components like the bioreceptor or changing the transducer's electrical state. Although the use of acidic / basic regeneration has been extensively documented, it has one drawback: it can only be utilized in systems where the changed pH will not interfere with the sensor signal. This makes pH regeneration in electrochemical systems, where charge may influence the sensor's baseline output, especially challenging. Another important area where pH regeneration is not appropriate is the usage of extremely delicate bioreceptor proteins. If they are readily denatured, this would be a bad approach since the bioreceptor would be irreversibly damaged. The most significant benefit of

employing acidic or basic regeneration is its cheap cost and broad applicability. In the regeneration of biosensors, detergents are often employed at low quantities.

In terms of structure, detergents are hetero-bifunctional molecules with two different regions: a polar head that is highly soluble due to its charge and an aliphatic non-polar tail. Due to their hydrophobic nature, the tail portions of the bioreceptor or analyte associate with comparable areas of the bioreceptor or analyte in an entropic ally-driven process. The polar head group extends into the aqueous phase, reducing repulsion and promoting analyte solubility⁴⁵. Detergents may be a significant component of a regeneration buffer in some biosensor systems where hydrophobicity is a major factor in the interaction of the bioreceptor with the analyte, such as in the detection of hydrophobic analytes like 2-naphthol and 3-isobutyl-2-methoxypyrazin. Milder detergents, such as Tween®, are often employed, but low quantities of harsher detergents, such as SDS, have been utilized in the past. Detergents are helpful at low concentrations and to prevent pH extremes, but they may disrupt systems like self-assembled monolayers (SAMs) and should thus only be employed in systems with a solid transducer interface. The amino acid glycine is a commonly utilized regeneration agent for a variety of reasons, including assisting separation and minimizing harm to the bioreceptor. Glycine is a low-cost, widely accessible reagent with a pH buffering range of 2-7.54. This buffering range is suitable for an acidic buffer that avoids pH extremes in certain areas. Because glycine is the simplest amino acid, it dissolves effectively in both aqueous and more hydrophobic environments and may easily mediate forces at a particularly hydrophobic interface, lowering the bound state's entropic favorability. Glycine is zwitterionic in solution and serves as a moderate screening agent for charges at the interface, reducing enthalpic pressures between the bioreceptor and analyte once again. Because it is thermodynamically preferable, glycine prefers to attach to the surface of the bioreceptor and analyte. The bioreceptor is therefore partly shielded from harm induced by the changing pH environment when exposed to a regeneration buffer. While glycine is helpful in optical and mechanical sensor systems, it may have limited use in electrochemical sensor systems since the use of low pH may irreversibly alter the sensor output.

Another well-known chaotrope is urea, which is often used in pH-sensitive settings because of its ability to maintain a neutral pH in solution. Urea was utilized to renew sensors that acquired their data via cyclic techniques, avoiding any changes to the tethering layer and signal disruption. Changing the temperature has a big impact on the structure and behavior of biological molecules like proteins and oligonucleotides. Temperature increases the kinetic energy of molecules, which may enable binding forces to be overcome. Although warming causes permanent denaturing and aggregation in most proteins, some groupings of proteins, as well as oligonucleotide base pairs in general, may be dissociated by increasing the temperature in a process known as melting. Base pairing between the nucleotides holds double stranded DNA dsDNA together at room temperature. The number of base pairs used to join the strands is directly proportional to the temperature at which the individual DNA strands acquire enough kinetic energy to overcome base pairing and split. The use of DNA Melting as a feasible technique for the regeneration of nucleic acid biosensors has already been shown. Other DNA structures, such as aptamers, may be transiently denatured in the same way as double-stranded DNA can. This has been shown for sensor regeneration utilizing biosensors based on DNA:protein interactions. Though thermal regeneration has been shown to work with nucleotide-based bioreceptors, it is restricted to this

kind of sensor since heating would destroy or denaturize the biological components of many other sensors.

Biosensors have been regenerated utilizing direct electrochemical techniques in a small number of investigations. By providing a negative potential to the sensor surface, reductive desorption of surface species was accomplished in these experiments. Though under-represented in the literature at the moment, possibly owing to its restricted application, this is an excellent solution to the issue of regeneration since it creates a very localized regeneration environment that can be carefully regulated. In one example of electrochemical biosensor regeneration, indium tin oxide electrodes were exposed to an electro reductive current to renew antibodies on the sensor surface. The transducer surface is a key concern when building a biosensor, since it is the physical substrate on which the sensor is built and to which the bioreceptor is connected. The regeneration method used is often influenced by the transducer used. Here's a quick rundown of the most popular transducer materials. Silica is also especially helpful since it can be manufactured to have smooth microscale surfaces.

Its chemical inertness prevents the regeneration buffer from reacting with the transducer surface, and its flatness allows the buffer to be readily wiped away from the sensor surface. An electrically conductive substrate is required for electrochemical sensors. Many contemporary examples do so by screen-printing carbon or metallic electrodes, which, although cost-effective, may lead to quality problems owing to the wide range of micro and Nano-topologies produced during the printing process. When attempting regeneration, especially when washing the electrodes, this local variance becomes troublesome, with rougher areas proving more difficult to renew. Other techniques for electrode manufacturing have been used to get a flatter surface, such as sputtering and vapor deposition of the conductive layer, both of which produce flat layers at the nanoscale. Extra expenses are unavoidably incurred as a consequence of such additional pre-processing. Though certain kinds of biosensors allow for direct bioreceptor conjugation to the transducer surface, there is frequently a loss of biological activity as a result; this is especially true when working with metal surfaces. Despite the fact that electrochemical biosensors are often touted as having a large potential effect in a variety of analytical areas (as the glucose biosensor's success has shown), many electrochemical sensors have yet to reach widespread popularity. Although regeneration may help improve the economic feasibility of these sensors, research has so far been restricted.

Despite the limited study, several results have been reported, with aerometric and potentiometric sensors being successfully regenerated. The aerometric sensor, for example, has been claimed to be re-used 1000 times with little signal loss despite the fact that, as previously stated, this is not "regeneration" per se. In potentiometric sensors, the current or potential changes when the analyte is present, allowing for calibration. Liu et al. utilized urea, a powerful chaotrope, to renew the sensor through 10 cycles with little signal loss in their most effective regeneration research. More instances of regeneration in potentiometric biosensors are provided, which are used in many cases to prevent the impact of strong acids or bases, which may permanently change the sensor's electrochemical characteristics. Though it's possible that the usage of Urea influenced the signal over time by altering the charge properties of the biosensor surface. Due to its dependence on binding proteins, which have a considerably larger repertory than enzymes, electrochemical immune sensors may be designed for a far broader range of analytes. They're often tested impedimetrically, which is a highly sensitive technique that relies on the capacitive

and resistive characteristics of the transducer surface. These sensors may either look at the change in these characteristics immediately after analyte binding reagent less sensors or employ reagents such HRP-tagged secondary antibodies or nanoparticles to increase the signal seen after analyte binding (reagent-based sensors). In any case, charge transport characteristics are critical in this method, and any regeneration buffers employed may change these charge-related features. Using slightly acidic glycine or mildly alkali regeneration buffer before neutralizing to reestablish a stable baseline signal, there have been a few documented instances of effective regeneration that has prevented permanent modification of the biosensor.

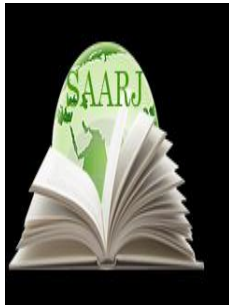
CONCLUSION AND IMPLICATION

While several other biosensors have successfully shown regeneration, optical sensors have had the most success. Optical sensors have proved to be the most effective since regeneration methods that do not alter the sensor's optical characteristics have shown to be very easy to design. Though this is also true with acoustic biosensors, regeneration has proven more effective on a smaller scale, both in terms of the number of studies and the amount of time that sensors may be reused. The use of pH is the most frequently utilized example for protein regeneration: protein interaction based sensors and low pH glycine buffer are the most widely employed agents. Low/high pH pulses are a promising option for optical and acoustic sensor regeneration. Other regeneration methods have been found to renew certain sensors, including changing the temperature, ionic strength, and using powerful detergents. These should only be used in situations when the biophysics of recognition is a driving factor, such as with hydrophobic or strongly ionic analytes. The comparison of various regeneration methods reveals how additional kinds of biosensors may be regenerated.

REFERENCES

1. F. Bibi, M. Villain, C. Guillaume, B. Sorli, and N. Gontard, "A review: Origins of the dielectric properties of proteins and potential development as bio-sensors," *Sensors (Switzerland)*, 2016, doi: 10.3390/s16081232.
2. R. Seitz, A. Hilger, and M. Heiden, "Bone Marrow, Peripheral Blood, or Umbilical Cord Blood: Does the Source of Allogeneic Hematopoietic Progenitor Cells Matter?," *J. Blood Disord. Transfus.*, 2012, doi: 10.4172/2155-9864.s1-007.
3. J. H. He and Y. Liu, "A hierarchy of motion in electrospinning process and e-infinity nanotechnology," *J. Polym. Eng.*, 2008, doi: 10.1515/POLYENG.2008.28.1-2.101.
4. D. Stephenson, D. A. Lockerby, M. K. Borg, and J. M. Reese, "Multiscale simulation of nanofluidic networks of arbitrary complexity," *Microfluid. Nanofluidics*, 2015, doi: 10.1007/s10404-014-1476-x.
5. P.-Y. Chiou, T.-H. Wu, S.-Y. Park, and Y. Chen, "Pulse laser driven ultrafast micro and nanofluidics system," 2010, doi: 10.1117/12.861757.
6. A. J. S. Ahammad, "Hydrogen Peroxide Biosensors Based on Horseradish Peroxidase and Hemoglobin," *J. Biosens. Bioelectron.*, 2012, doi: 10.4172/2155-6210.s9-001.
7. V. H. Liu, C. C. Vassiliou, S. M. Imaad, and M. J. Cima, "Solid MRI contrast agents for long-term, quantitative in vivo oxygen sensing," *Proc. Natl. Acad. Sci. U. S. A.*, 2014, doi: 10.1073/pnas.1400015111.

8. T. Jiang *et al.*, “Response to comment on ‘Interference-free determination of ischemia-modified albumin using quantum dot coupled X-ray fluorescence spectroscopy’ [Biosens. Bioelectron. 51 (2014) 136-142],” *Biosensors and Bioelectronics*. 2015, doi: 10.1016/j.bios.2014.08.042.
9. S. Sang, Y. Zhao, W. Zhang, P. Li, J. Hu, and G. Li, “Corrigendum to ‘Surface stress-based biosensors’ [Biosens. Bioelectron. 51 (2014) 124-135] DOI: 10.1016/j.bios.2013.07.033,” *Biosensors and Bioelectronics*. 2015, doi: 10.1016/j.bios.2015.06.035.
10. A. Kueng, C. Kranz, and B. Mizaikoff, “Erratum to ‘Amperometric ATP biosensor based on polymer entrapped enzymes’ [Biosens. Bioelectron. 19 (2004) 1301-1307] (DOI:10.1016/j.bios.2003.11.023),” *Biosensors and Bioelectronics*. 2007, doi: 10.1016/j.bios.2006.11.001.



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FOREIGN EXPERIENCE IN THE USE OF MODERN INFORMATION AND COMMUNICATION TECHNOLOGIES IN THE INVESTIGATION PROCESS OF THE CRIMINAL PROCEEDINGS

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ABSTRACT

The article reveals the best foreign experience in the implementation of pre-trial investigation in an electronic format. The purpose of studying this experience is to resolve the issue of the possibility of introducing positive results of foreign countries into the legislation of the Republic of Uzbekistan. The analysis of the law enforcement practice of foreign countries allows us to make a well-founded conclusion that the process of transition of the pre-trial investigation stage from paper to electronic format takes quite a long time and is accompanied by various kinds of difficulties.

KEYWORDS: *Pre-Trial Investigation, Investigation of Criminal Cases in Electronic Format, Electronic Criminal Case, Foreign Experience, Law Enforcement Practice.*

INTRODUCTION

The criminal procedural legislation of the Republic of Uzbekistan in recent years has undergone serious reform, one of the areas of which has become the possibility of carrying out pre-trial investigation in electronic format.

In accordance with the Concept of improving the criminal and criminal procedural legislation of the Republic of Uzbekistan, approved by the Decree of the President of the Republic of Uzbekistan dated May 14, 2018 no. PP-3723, as one of the tasks of introducing new forms and procedures of the criminal process, the task is to ensure the effective use of information and communication technologies in forensic activities, including the introduction of the "Electronic

Criminal Case" system and "remote interrogation" [1]. In this regard, the Law of the Republic of Uzbekistan dated May 23, 2019 no. ZRU-542 to the Criminal Procedure Code introduced a number of changes and additions regarding the introduction of electronic technologies into the criminal process. In particular, it is worth noting Articles 91¹ - 91⁴ of the CPC, which states that investigative actions (interrogation, identification of persons and objects, confrontation) with the participation of witnesses, victims, suspects and accused can be carried out using technical means in the mode of video conferencing [2]. In addition, the Criminal Procedure Code has introduced norms that imply the possibility of electronic document flow in criminal proceedings.

However, it should be recognized that the national criminal justice system is at the initial stage of digitalization. Do not forget that the electronic process should consist of the automation of the trial, as well as the implementation of the investigation in electronic format with the ability to exchange electronic procedural documents.

These changes make it possible to completely transfer the stage of pre-trial investigation to an electronic format, which in turn is one of the most urgent tasks in the development of the state mechanism. The solution to this problem is a response to the challenges of the modern information society and an integral component of the strategy for the future improvement of legislation and law enforcement practice in the field of organizing pre-trial investigation. The formation and implementation of such a strategy necessitate a clear understanding of the methodological foundations in criminal procedure legislation. Without their uniform and unambiguous establishment, it is impossible to carry out pre-trial investigation in electronic format at the proper level. Such uniformity is extremely important precisely in the field of organizing pre-trial investigation in order to comply with the constitutional principle of equality of all before the law and court.

In addition, do not forget that the efficiency of justice is currently a hot topic. The judicial system is expected to operate as efficiently and efficiently as possible, but in reality, this is not always the case. As a result, the trial takes more and more time, and the consequence of this is an increase in the workload of the pre-trial investigation bodies.

This lag indicates that our system is not yet sufficiently adapted to the needs of society in the 21st century. The electronic justice system is one of the elements of public administration, which is currently considered as a way of organizing state power using information networks, ensuring the effective functioning of government bodies in real time and making the daily communication of citizens with them as simple and accessible as possible. In this context, electronic court proceedings can be defined as the use of modern information technologies in court proceedings. It provides for the automation of criminal procedural legislation and the implementation of pre-trial investigation in electronic format.

The possibility of carrying out pre-trial investigation in electronic format can be considered as one of the manifestations of the processes of globalization, which also covered the legal sphere. The history of the formation of electronic justice in the world is inextricably linked with the

informatization of wide areas of public life and the penetration of computers into the everyday life of citizens and organizations. After all, law, as a universal social regulator, not only streamlines public perception, but also, often, fixes its main changes and, having caught promising trends, actualizes one or another direction of social development.

In support of the above, researcher Woolf H.K. believes that electronic support not only helps to optimize and improve existing systems and processes, but most likely, over time, it will itself become a catalyst for radical changes. Information technologies of this kind in the near future will become the basis of the judicial system and for this reason already now deserve special attention at the highest level [3].

According to O. Martyanova, like globalization, the introduction of advanced technologies is inexorable and inevitable. A society that tries to resist them will become a victim of it. They will fly far off the sidelines of the information society to do the dirtiest work for it [4].

The legislator in matters of regulation of the activities of pre-trial investigation bodies carrying out proceedings in electronic format should, in our opinion, borrow the most successful law enforcement practices of foreign countries.

In particular, we believe it necessary to consider the best practices of Singapore, where, to facilitate the adoption of judicial decisions, all judges have access to a comprehensive set of online legal information systems, such as:

- Law Net Legal Workbench, which provides smart searches in legal databases;
- Judicial Service Database (JODB), which contains court working papers and compilations, Sentencing Rules System (SINGS), which provides sentencing criteria and information;
- Resource Priority Management System (IMPRESS), which records all past decisions in cases brought before both the Supreme Court and the subordinate courts.

Researchers Bell Gordon and Gray N. Gray believe that “Singaporean courts take a strict and businesslike approach to technology. Technology is useless if it prevents the judiciary from better meeting the needs of its users or making it more efficient. Therefore, we consciously and persistently use technology, but only if it contributes to the achievement of the goals on which the courts are based” [5]. They see technology as a strategic leverage point in their quest to provide enhanced accessibility and convenience, as well as innovative application opportunities for all who seek legal advice from specialized bodies.

In Singapore's National Economic Plan for the 21st Century, information technology has been identified as the primary engine for sustaining the country's continued economic growth in a globalized knowledge economy.

Electronic justice in Singapore in terms of organizational and legal support is implemented by means of:

- Provision of services and applications for virtual ships;
- Computerization of business management processes;
- Joint development of interdepartmental systems;
- Computerization of judicial administration and corporate services [6].

Singapore is one of the first states to provide extensive virtual judicial services to the public through multimedia applications. For the first time in the courts of Singapore, videoconferencing was used, which is currently the most versatile and productive technology of our time.

In this regard, David F. Hill commented that "the introduction of video conferencing has made it possible to overcome physical distances. This has improved the organizational framework in the normal course of the courts, allowing us to optimize the use of our limited resources and achieve targeted results with less time and cost that would otherwise have to be incurred. Most importantly, it has expanded public access to justice" [7].

Singapore, in addressing the conduct of an investigation, proceeds from the position that good case management is fundamental to an effective and efficient judicial system. Electronic business management systems were reflected in the first wave of computerization of the country and are represented by the following systems:

- System of registration and information on criminal cases;
- System of subpoenas for regulatory offenses;
- System of electronic circulation in civil cases.

In June 1999 the TICKS 2000 system was introduced to manage the affairs. The TICKS 2000 system provides online interfaces for law enforcement agencies for electronic data exchange. For users who do not have their own case management systems, the courts provide them with remote access to TICKS 2000 so that they can register and receive information about their cases online.

The "TICKS 2000" system allows you to send court documents electronically using electronic documents instead of paper [8].

In the United States, the concept of filing documents in electronic format through the Internet resources originated in 1980 and was continued thanks to the pilot projects used at that time, which subsequently made it possible to strengthen and gain the proper potential for the introduction of electronic document management in Federal Courts (2003).

Electronic justice in the United States dates back to the creation of a multidisciplinary functional system "Public Access to Court Electronic Records" (hereinafter - PACER).

PACER is a public access system for US District Courts and Court of Appeals. One important feature of PACAR systems is its commercial component, that is, users can request information of interest to them for a fee.

Together with the PACER system, the “Case Management / Electronic Case Files” system (hereinafter - CM / ECF) began to operate. CM / ECF is a system that allows electronic filing and management of criminal cases.

Thus, in the United States, an electronic investigation is carried out through the functioning of two independent systems PACER and CM / ECF, where the PACER system is used for public access to electronic court records, while the CM / ECF system is used for case management and electronic filing of court records. Documents [9],

As the name suggests, the CM / ECF system is the result of a combination of tools that provide two functions: Case Management (CM) and Electronic Case File (ECF). The two elements of the system then form an integrated system, complemented by PACER, a system that provides access to electronic files via the Internet.

The list of functions provided by this system can be summarized as follows:

- keeping records (tracking requests, responses, deadlines and hearings);
- management of electronic documents, their storage, security and archiving;
- delivery of documents to the court, from it and within it;
- additional information from other parties when submitting documents [10].

Access to these systems is carried out by means of using the username and password assigned by the relevant federal court. In some courts, these data are formally equated with an individual electronic digital signature.

It is also important that the use of electronic justice systems operates around the clock, when sending criminal case materials in electronic format to the competent authorities (court, prosecutor's office, etc.) does not require any additional costs from users in comparison with sending documents on paper.

Taking into account the fact that the USA is a federal state, each court of the US state has implemented and uses its own local version of IT systems based on the common platforms PACER and CM / ECF [11], which in our opinion is a negative factor, since until now Since then, a single centralized organizational and methodological mechanism has not been developed to support the activities of the investigation bodies carrying out proceedings in electronic format, which, as a result, may negatively affect the entire e-justice system.

In addition to the positive experience in world practice, there are unsuccessful attempts to transfer criminal proceedings to an electronic format. For example, in 2005, Belgium took a step towards the digitalization of justice by introducing the PHENIX system. The PHENIX system was expected to increase efficiency and effectiveness, and to simplify and speed up the investigation process. The goal of the PHENIX system project was to transform the various

computer systems of crime investigation bodies and the judicial system into a structured, coherent whole [12].

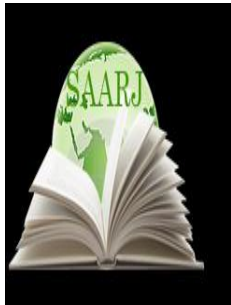
According to sources, this was one of the most ambitious projects, because the PHENIX system intended to digitize the entire legal system at once, but for objective reasons (high financial costs) it became clear that this was impossible [13]. The PHENIX project can be seen as a large-scale but unsuccessful attempt to move the investigation phase from paper to electronic format. Despite this costly setback, Belgium continues to try to bring the PHENIX project into action.

Based on the foregoing, it can be concluded that no state can be sure or even assert that its experience in administering justice in electronic format is the most technologically advanced in the world. Technologies are developing at a rapid pace and there are no prerequisites for weakening their development. In a growing and accelerating cycle of development, progressive technologies will stimulate the development of more and more innovative applications, which, in turn, will stimulate legislative bodies to develop a set of measures for organizational and methodological support of the activities of pre-trial investigation bodies that carry out production in electronic format.

LIST OF REFERENCES:

1. Постановление Президента Республики Узбекистан от 14 мая 2018 года № ПП-3723 // Национальная база данных законодательства, 15.05.2018 г., № 07/18/3723/1225, 01.10.2018 г., № 06/18/5547/1975.
2. Закон Республики Узбекистан «О внесении изменений и дополнения в Уголовно-процессуальный кодекс Республики Узбекистан, направленных на усиление охраны прав и свобод граждан, участвующих в уголовном процессе» от 14 мая 2020 года № ЗРУ-617 - Национальная база данных законодательства, 15.05.2020 г., № 03/20/617/0585.
3. Woolf H. K. Access to Justice: Final Report to the Lord Chancellor on the civil justice system in England and Wales. L., 1996. – Текст: непосредственный.
4. Мартянова О. Электронное правительство – цивилизационная неизбежность // Федеральная газета. 2009. № 1. – Текст: непосредственный.
5. Gordon B., Gray N. The Revolution Yet To Happen, Beyond Calculation: The Next Fifty Years Of Computing (1997), Springer-Verlag New York, Inc. – Текст: непосредственный.
6. Shapiro C., Hal R. Varian, Information Rules: A Strategic Guide to the Networked Economy (1999), Harvard Business School Press [Электронный ресурс]. URL: <http://yunus.hacettepe.edu.tr/~tonta/yayinlar/hal-varian-information-rules-chapter-1.pdf> (дата обращения: 14.05.2019). – Текст: электронный.
7. Hill, D. F. Under the Info Big Top, the Spotlight Shines Brightest on the High-Wire Acts, World Paper, Feb 22-Mar 7.

8. PS-Online Action Plan: Delivery of Electronic Public Services, jointly prepared by the Prime Minister's Office, the Ministry of Finance and the National Computer Board [Электронный ресурс]. URL: <http://npan1.un.org/intradoc/groups/public/documents/apcity/unpan012807.pdf> (дата обращения: 14.05.2019) – Текст: электронный.
9. PACER Coming Into Its Own at 20 [Электронный ресурс]. URL: <http://www.resourceshelf.com/2008/12/20/pacer-coming-into-its-ownat-20> (дата обращения: 10.05.2019). – Текст: электронный.
10. Административное управление судов США [Электронный ресурс]. URL: <http://www.uscit.gov/cmecf/PDF/cmecf.pdf> (дата обращения: 10.05.2019). – Текст: электронный.
11. «Simulated Legal Process», Texas Penal Code §32.48 [Электронный ресурс]. URL: <http://www.semanticscholar.org> (дата обращения: 10.05.2019). – Текст: электронный.
12. Toelichtingbij het wetsvoorstel tot introductie van nieuwetelecommunicatiemiddelen in de gerechtelijke en de buitengerechtelijke procedure, Parl. St., 1999–2000, nr. 38/1 [Электронный ресурс]. URL: https://www.researchgate.net/publication/320054975_bDe_elektronische_procesvoeringb (дата обращения: 10.05.2019). – Текст : электронный.
13. D. Scheers en P. Thiriar, “De moeilijkewegnaarenelektronisch dossier. Nieuweprocedureregelsvanaf 1 januari 2013”, RW nr. 31, 2012-2013. – Текст : непосредственный.



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SAMARKAND IS A TOURIST CITY WITH A GLORIOUS PAST

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ABSTRACT

The article tells about the rich history of the Samarkand region, the stages of the historical formation of the Samarkand region, the existing historical monuments in the region, and the origin of the geographical location of the region. Samarkand is one of the oldest cities in the world. Founded 2,750 years ago, the city was famous for its excellent climate, natural and material resources. In the 5th century BC Samarkand was included in the Achaemenid Empire, and later in 329 - in the state of Alexander the Great. From the 4th to the 5th century BC, Samarkand was the capital of Sogd, which was originally part of Greek Bactria and then part of the Kushan state. In the 6th century, it became part of the Turkish Khanate and was ruled by local authorities.

KEYWORDS: Karakhanids, Karakhitians, Registan Ensemble, Gori Amir Mausoleum, Bibikhanim (Amir Temur) Mosque, Aksarai Monuments, Rukhabad And Chorsu, Khoja Abdu Berun, Khoja Abdu Darun Monuments.

INTRODUCTION

Uzbekistan still remains a country of historical monuments that have preserved their beauty and splendor. The monuments created in our country by our creative people, preserved for centuries, fascinate the peoples of the world. Many of them are included in the UNESCO World Heritage List. Historical monuments are part of the cultural heritage of the country and the people, part of spiritual enlightenment.

The Republic of Uzbekistan the "Land of the Uzbeks" lies in the heart of Asia, between the two major rivers of Central Asia, the Syr Darya (Jaxartes) and the Amu Darya (Oxus), in the territory known since ancient times as Bactria, Maverannahr (The land beyond the river), and later on as Turkistan. Uzbekistan borders from Kazakhstan to the north, Krgyzstan and Tajikistan to the east and southeast, Turkmenistan to the southwest, as well as Afghanistan to the south.

MAIN PART

Samarkand region is one of the largest and most centralized tourist zones in Uzbekistan with a rich history. The city of Samarkand, located in the central part of the Zarafshan oasis, is one of the cultural centers of humanity in world history. This city, considered the most beautiful in the world, was called Samarkand in ancient Eastern sources, and Moroccan in Greek and Roman. In Morocco, the term Samarkand is a Greek pronunciation. In the Chinese sources of the 5th century, the name of the city is pronounced as Sivangin (Sakmangin).

Samarkand is one of the oldest cities in the world. Founded 2,750 years ago, the city was famous for its excellent climate, natural and material resources. In the 5th century BC Samarkand was included in the Achaemenid Empire, and later in 329 - in the state of Alexander the Great. From the 4th to the 5th century BC, Samarkand was the capital of Sogd, which was originally part of Greek Bactria and then part of the Kushan state. In the 6th century, it became part of the Turkish Khanate and was ruled by local authorities. Since the beginning of the 7th century, the Zarafshan Valley came under the rule of Samarkand governors. In 712, Samarkand was captured by Arab troops led by Kuteiba ibn Muslim. Beginning in the 1920s, local landowners became involved in governing Mavorounnahr and the provinces. In particular, control over Samarkand passed into the hands of the Samanids. Since then Samarkand has been the capital of the Samanid state. Samarkand, which was part of the Karakhanid state in the 11th century, was occupied by the Karakhanids in the 12th century.

In 1210, Samarkand, part of the state of Muhammad Khorezmshah, was occupied by the troops of Genghis Khan in 1220 and replaced the modern city of Samarkand.

The next period of Samarkand's rise is associated with the activities of Amir Temur. Samarkand, world renowned as the capital of the Timurid empire, has many luxurious buildings.

Although Samarkand lost its status as a capital during the Shaybanid period, it retained its status as a major economic and cultural center of the Bukhara Emirate.

After Uzbekistan gained independence in 1991, Samarkand became a major cultural center of Uzbekistan. At the same time, Samarkand was awarded the Order of Amir Temur for a great role in the history of our country and a great contribution to the development of our culture. The order was presented on October 18, 1996 by the first President of the Republic of Uzbekistan Islam Karimov. Various international conferences are currently being held in Samarkand. It is especially important to hold the International Music Festival "Sharq Taronalari" in Samarkand since 1997.

Several world-famous historical monuments have been erected in the Samarkand region, such as the Registan ensemble, the Gori Amir mausoleum, the Bibikhanim (Amir Temur) mosque and the Bibikhanim mausoleum, the Shokhi Zinda ensemble. In the central part of the city there are monuments Oksaray, Rukhobod and Chorsu. Also around the city are the monuments of Khoja Abdu Berun, Khoja Abdu Darun, Ishratkhan, Nadir Devonbegi Madrasah, Hazrati Khizr Prayer and Mosque, Sheikh Nuriddin Bashir Temple, Khoja Daniel's Tomb, Ulugbek Observatory situated.

Tourism in Samarkand is mainly centred on cultural, historical and religious sites. One of Samarkand's main historical attractions is the Registan, a UNESCO World Heritage Site. It was once "the main city square, full of markets and lined by caravanserai (roadside inns)" and the site

for royal proclamations, parades as well as executions. The square is surrounded on three sides by three madrasahs: Tilla-Qori Madrasah, Ulugbek Madrasah and Sher-Dor Madrasah.

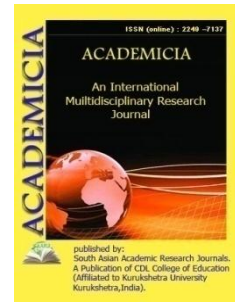
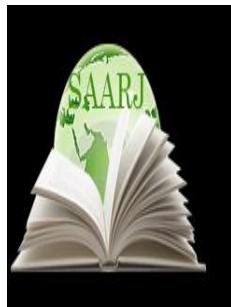
Undoubtedly, Samarkand reached the highest level of glory when it became the capital of the Tamerlane's Empire, greatest state that stretched to Bosfor. Tamerlane created strong and fearless state which was indestructible in the political sphere, but he also never forgot about the cultural and spiritual parts of life. During the rule of Amir Timur all the best architects and scientists worked in Samarkand to make this city the pearl of Eastern world of Muslims. When Tamerlane died, the power of the Empire faded; it was split and divided between Tamerlane's heirs. Ulugbek (Timur's grandson), the most famous of the heirs, was a very peace-loving person. He ruled Samarkand and its surroundings for about forty years. During his rule the science was on the highest level, many famous scientists were brought from abroad, and Ulugbek himself was a good scientist and astronomer.

CONCLUSION

Today in the region there are 1105 archaeological, 670 architectural, 37 monuments, 18 monumental, 21 memorials, a total of 1851 objects of material and cultural heritage. There are over 1000 tourist destinations in the region, of which about 400 are currently fully usable as tourist attractions.

REFERENCES:

1. Architectural monuments of Uzbekistan. M. Yunusov, M. Saidov / Toshkent-2011
2. Guide to Uzbekistan. / Global Study Publishing House. Tashkent-2011
3. Samarkand city: Investment opportunities. (2019). Samarkand Regional Government. Retrieved October 14, 2019, from <https://samarkand.uz> ⇐
4. Singapore-Samarkand IP OOO in packaged food (Uzbekistan). (2015, December 11). *Euromonitor*. Retrieved from Factiva database; Bedeil group of companies. (n.d.). Retrieved October 14, 2019, from <http://www.bedeil.com> ⇐
5. facebook.com



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SECURE IOT AND CLOUD COMPUTING INTEGRATION

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ABSTRACT

Mobile Cloud computing is a relatively new technology that refers to an infrastructure that stores and processes data outside of the mobile device. The Internet of Things is a relatively new technology. The Internet of Things (IoT) is a relatively new telecommunications technology that is quickly gaining traction. IoT is more particularly linked to wireless telecommunications. The primary aim of wireless network-based interaction and collaboration amongst things and objects is to achieve the goal established for them as a united entity. Furthermore, both Cloud Computing and the Internet of Things are rapidly developing technologies in the area of wireless communications. We provide a review of IoT and Cloud computing in this article, with an emphasis on the security concerns that both technologies face. We specifically integrate the two aforementioned technologies (Cloud Computing and IoT) in order to investigate the common characteristics and advantages of their integration. Finally, we will discuss Cloud Computing's contribution to IoT technologies. As a result, it demonstrates how Cloud Computing technology enhances IoT functionality. Finally, we look at the security issues that come with combining IoT with Cloud Computing.

KEYWORDS: *Internet of Things, Cloud Computing, Mobile Cloud Computing, Security, Privacy.*

1. INTRODUCTION

Mobile Cloud Computing is a relatively new technology that refers to an infrastructure that stores and processes data outside of the mobile device. The Internet of Things is a relatively new technology. The Internet of Things (IoT) is a relatively new telecommunications technology that is quickly gaining traction. IoT is more particularly linked to wireless telecommunications. The primary aim of wireless network-based interaction and collaboration amongst things and objects

is to achieve the goal established for them as a united entity. Furthermore, both Cloud Computing and the Internet of Things are rapidly developing technologies in the area of wireless communications. We provide a review of IoT and Cloud Computing in this article, with an emphasis on the security concerns that both technologies face. We specifically integrate the two aforementioned technologies (Cloud Computing and IoT) in order to investigate the common characteristics and advantages of their integration. Finally, we will discuss Cloud Computing's contribution to IoT technologies. As a result, it demonstrates how Cloud Computing technology enhances IoT functionality. Finally, we look at the security issues that come with combining IoT with Cloud Computing [1]. We study and analyze previous literature in the fields of cloud computing and Internet of Things, as well as their integration, for the purpose of this paper. The papers that made a significant contribution to our research are listed in the following paragraphs. To begin, provides an overview of the various security risks that pose a threat to the cloud. In addition, a survey was given in that was more specific to the various security issues that have arisen as a result of the nature of the service delivery models of a cloud computing system.

Moreover, an exploration of the roadblocks and solutions to provide a trustworthy cloud [2] computing environment presented in. Cloud computing is a rapidly evolving paradigm, but its unique characteristics exacerbating security and privacy concerns. Concerning the integration of Internet of Things and Cloud Computing, there have been made some previous studies. proposes a new platform for providing and supporting ubiquitous connectivity and real-time applications and services for smart city needs using cloud computing capacities. In addition, shows a framework for data collected from highly distributed, heterogeneous, decentralized, real and virtual devices (sensors, actuators, smart devices) that can be managed, analyzed, and controlled automatically by distributed cloud-based services. The applications of IoT and CC in manufacturing are investigated in order to realize full sharing, free circulation, on-demand use, and optimal allocation of various manufacturing resources and capabilities. Furthermore, a CC- and IoT-based cloud manufacturing [3] (CMfg) service system (i.e. CCIoT-CMfg) and its architecture are proposed, and the relationship among CMfg, IoT, and CC is analyzed. Finally, discusses the benefits, challenges, and future work for the application and implementation of CCIoT-CMfg. The focuses on the Cloud of Things architecture, which is a common approach to integrating the Internet of Things (IoT) and Cloud Computing. Also, in review the state of the art for integrating Cloud Computing and the Internet of Things, and examine an IoT-enabled smart home scenario to analyze the IoT application requirements.

At the end, the Cloud Things architecture, a Cloud-based Internet of Things platform which accommodates Cloud Things IaaS, PaaS and SaaS for accelerating IoT application, development, and management proposed in. In addition, includes a presentation and discussion of some of the IoT and Cloud Computing integration challenges that must be addressed in order to enable an intelligent transportation system to address issues such as high fuel prices, high CO₂ emissions, increasing traffic congestion, and improved road safety. is a demonstration of a method for developing Smart Home apps that integrates Internet of Things (IoT) with Web services and Cloud computing? [3]. The strategy focuses on four areas: embedding intelligence into sensors and actuators using the Arduino platform; networking smart things using ZigBee technology; facilitating interactions with smart things using Cloud services; and improving data exchange efficiency using the JSON data format. It also shows the implementation of three use cases, namely, assessing house conditions, monitoring home appliances, and regulating home access, to

illustrate the approach's practicality and efficiency. The offers a cloud-centric vision for global Internet of Things deployment. The most important enabling technologies and application areas that will likely drive IoT research in the near future are addressed. also shows a Cloud solution using Aneka that is built on the interplay between private and public Clouds.

Finally, it ends the IoT vision by emphasizing the need of bringing WSN, the Internet, and distributed computing together for the benefit of the technical research community. Because of the amount of data IoTs can generate and their requirement for virtual resource utilization and storage capacity, it's becoming increasingly important to integrate them with cloud computing, not only to make it possible to create more usefulness from the data generated by IoTs and develop smart applications for users, but also to make it possible to create more usefulness from the data generated by IoTs and develop smart applications for users. refers to this kind of connection as [2] Cloud of Things. Anything may become a part of the Internet and produce data with IoTs. Furthermore, in order to produce more useful services, the data created must be handled according to its requirements. Integration of IoTs with cloud computing is becoming more essential for the preceding aim. The Cloud of Things (CoTs) is the name given to this new paradigm. The authors' attention in is drawn to the combination of Cloud and IoT, which we refer to as the CloudIoT paradigm. In addition, numerous studies have looked at Cloud and IoT individually, as well as their major characteristics, features, underlying technology, and outstanding problems. These studies, on the other hand, lack a thorough examination of the new CloudIoT paradigm, which entails whole new applications, difficulties, and research concerns. focuses on some of the major problems in Cots and proposes smart gateway-based communication as a solution. Smart gateways are required for Cloud of Things to execute the sophisticated functions and preprocessing that sensors and light IoTs cannot. Finally, offers an overview of integration components, including cloud platforms, cloud infrastructures, and IoT middleware. There are also several integration ideas and data analytics methods discussed, as well as various difficulties and open research problems. Finally, we look at integration techniques and approaches for the technologies described above. The authors of concentrate [4] on Fuzzy C-Means based segmentation algorithms because of their high segmentation accuracy. Furthermore, the algorithms investigated need lengthy execution durations. In addition, the authors of use Graphics Process Unit (GPU) capabilities to speed up the execution time of these algorithms.

Finally, the authors obtain an increase in accomplishment performance of up to 8.9x without sacrificing segmentation accuracy. The primary goal of is to provide a review of the fundamental methodologies for such techniques and to identify new research trends in this field. The authors of describe several well-known techniques of face recognition in video sequences for biometric security applications and list new developments. In order to address the problem of a lack of research into effective and efficient evaluations and measurements for security and trustworthiness of various social media tools, platforms, and applications, surveys the state-of-the-art of social media network security and trustworthiness, particularly for the increasing sophistication and variety of attacks, as well as the reliability of various social media tools, platforms, and applications. In addition, the authors of emphasized a novel approach to assessing and monitoring basic and underlying platforms. Furthermore, based on signaling theory and crowd computing, the authors suggest a hierarchical design for crowd assessments, which is critical for the social media ecosystem. Each paper's results and ideas are included in Table 1.

More specifically, in Table 1, relevant information linked to the year in which the review was published, the precise authors, and as a conclusion for each article the issues and solutions that they deal with could be seen separately for each related review that was examined [3].

2. DISCUSSION

The Internet of Things (IoT) is a network of devices that communicate, exchange, and utilize data from the physical world to offer services to people, businesses, and society. The objects things have unique IDs and may operate alone or in conjunction with other items or people (identifiers). In addition, the Internet of Things has a variety of applications in health, transportation, the environment, and energy, as well as various kinds of devices: sensors, wearable devices (watches, glasses), and home automation (domestics). What exactly does it imply when devices and sensors are connected and interact with one another? What impact will the Internet of Things have on our everyday lives? GPS systems, alarm systems, and thermostats all transmit and receive continuous data in order to track and automate our everyday actions. And there's the less obvious: mosaic, mugs, clothing, and other commonplace items may all connect to a network and transmit and receive data via the Internet. Businesses explore opportunities where streaming data can generate new markets in order to drive good change or to improve current offerings. The following are some examples of sectors that are at the center of these changes

- a) Transportation-related smart solutions: Transportation-related smart solutions decrease traffic on the highways, reduce fuel consumption, prioritize car maintenance programs, and save lives.
- b) Smart power grids with more renewable: Smart power grids with more renewable enhance system dependability while lowering customer costs, resulting in cheaper energy.
- c) Patient monitoring through remote access: Patient monitoring by remote access enhances the quality of services, increases the number of individuals serviced, and saves money.
- d) Sensors in houses and airports: Sensors in homes and airports, as well as in your shoes and doors, enhance safety by transmitting signals when they are left unattended for a length of time or when they are utilized at the incorrect time.

Engine monitoring sensors that identify and anticipate maintenance problems, enhance inventory replenishment, and even set priorities in scheduling maintenance work, repairs, and regional operations are all examples of engine monitoring sensors. The field of IoT security is concerned with the protection of linked devices and networks in the Internet of Things. The Internet of Things refers to the growing number of items and entities – referred to as things in this context – that are equipped with unique IDs and the capacity to autonomously transmit data across a network. Computing devices and embedded sensor systems used in industrial machine-to-machine (M2M) communication, smart energy grids, home and building automation, vehicle-to-vehicle communication, and wearable computing devices account for a large portion of the growth in IoT communication. The primary issue is that, since networking appliances and other items are still a relatively new concept, security has not always been taken into account in product design. Embedded operating systems and software are often supplied alongside outdated and unpatched IoT devices[5]. Furthermore, buyers often forget to change the default passwords on smart gadgets, or if they do, do not use adequately secure passwords. An IoT device that has

to be directly accessible over the Internet should be segregated into its own network and network access should be limited to enhance security. The network segment should then be watched for possible abnormal traffic, and if there is an issue, action should be taken.

Since the IoT idea was originally suggested in the late 1990s, security experts have warned about the potential danger of huge numbers of unprotected devices connected to the Internet. The first IoT botnet was found in December 2013 by a researcher at Proofpoint, an enterprise security company. According to Proofpoint, devices other than PCs made up more than 25% of the botnet, including smart TVs, baby monitors, and other home gadgets.

2.1.APPLICATION

Cloud computing is the use of the Internet to offer computers, storage, services, and applications. In general, significant hardware and software improvements are needed to make smart phones more energy efficient and computationally competent. This necessitates collaboration between developers and manufacturers. Mobile cloud computing is described as the integration of cloud computing technologies with mobile devices in order to maximize the processing power, memory, storage, energy, and context awareness of the mobile devices. Mobile Cloud Computing technology is the result of multidisciplinary methods that combine mobile computing with cloud computing. As a result, mobile cloud computing is another name for this transdisciplinary area. The phrase Mobile Cloud may be seen from two perspectives: infrastructure-based and ad-hoc mobile cloud. The hardware architecture in an infrastructure-based mobile cloud stays static while providing services to mobile users. Nonetheless, many apps make use of cloud resources, but solely for storage and application-specific features like Apple's Siri (voice-activated personal assistant) and iCloud storage service. Figure 1 Shows The Cloud Computing Effect.



Figure 1 Shows The Cloud Computing Effect.

The Cloud Computing technology, like other technologies, has certain characteristics that define its operation. Following that, these characteristics are examined and described. Storage over the Internet (Storage over the Internet) is a technological framework that utilizes Transmission

Control Protocol/Internet Protocol (TCP/IP) networks to connect servers and storage devices, as well as to make storage solution implementation easier. Storage over Internet Protocol (SoIP) technology is another name for Storage over Internet technology. SoIP offers high-performance and scalable IP storage solutions by combining the finest storage and networking industry techniques. The primary goal of the Internet Service is to assist clients all over the globe in turning their dreams become realities by using the Internet's efficiency, speed, and ubiquity.

2.2.ADVANTAGES

Cloud Applications, or Applications over Internet as a scientific definition, are programs that can be written to do the job of a current manual task, or virtually anything, and which perform their job on a server (cloud server) via an internet connection rather than the traditional model of a program that must be installed and run on a local computer. Google apps, online banking, and Face book are some examples of sophisticated programs that operate in the cloud and accomplish amazing feats of computation for the unsuspecting user who just needs an internet connection and a browser. Efficiency in Energy efficiency is defined as a method of controlling and limiting the increase of energy use. It may be more energy efficient to provide more services for the same energy input or to give the same services for less energy input. When a Compact Florescent Light (CFL) bulb consumes 1/3 to 1/5% less energy to generate the same amount of light as an incandescent bulb, the Compact Florescent Light (CFL) is regarded to be more energy efficient. Computationally Capable Computational cloud services take use of computationally demanding and ubiquitous mobile applications made possible by Mobile Cloud Computing technologies. As a consequence, a system is deemed computationally competent when it fulfills the criteria for delivering the desired outcomes by doing the necessary computations. Mobile Cloud Computing has certain drawbacks and limits that need be addressed throughout time to create a better and more perfect application. Before using this technology, a lot of companies, particularly smaller ones, must be aware of the restrictions. The security problem is one of the main concerns with Mobile Cloud Computing. Before using this technology, it's important to understand that all of the company's sensitive data will be handed over to a third-party cloud service provider. This may put the company's future in jeopardy. As a result, one must be fully certain that they are selecting the most dependable service provider, one who will protect the information entirely. Internet connectivity is essential for Mobile Cloud Computing. As a consequence, before using these services, the user should be assured that the outcome is favorable. Mobile Cloud Computing has a huge potential user base since owning a mobile device that is linked to the internet has become the standard in today's wireless environment. Performance is another significant issue with Mobile Cloud Computing. Some users believe that performance is inferior to that of native apps. As a result, it's a good idea to verify with only one service provider and learn about their track record. Latency is a term that refers to the (Delay) Latency (also known as turnaround time) in mobile cloud computing refers to the time it takes to offload a calculation and get the results from a nearby infrastructure or cloud. Data privacy is essential, and it is one of the major barriers preventing customers from embracing mobile cloud computing. As a result, in order for customers to trust the mobile cloud, application models must enable app development that includes privacy protection and implicit authentication methods [6].

2.3.WORKING

Cloud computing security, often known as cloud security, is a growing sub-domain of computer, network, and information security. It refers to a collection of rules, tools, and controls used to safeguard data, applications, and the cloud computing infrastructure [7]. Users and businesses may store and process data in third-party data centers with the help of cloud computing and storage solutions. The Cloud is used in a number of service types (SaaS, PaaS, and IaaS) and deployment [8] patterns (Private, Public, Hybrid, and Community) by businesses. Cloud computing is linked with a variety of security issues. Security problems encountered by cloud providers (organizations that offer software, platform, or infrastructure-as-a-service through the cloud) and security issues faced by their clients fall into two categories (companies or organizations who host applications or store data on the cloud). However, the burden of proof is shared. The supplier must guarantee that its infrastructure is safe, as well as their customers' data and apps, while the user must take steps to secure their application and utilize strong passwords and authentication methods. Encryption algorithms serve a critical role in ensuring safe network communication [9]. It is an important and essential instrument for data protection. The encryption method scrambles the data using "a key," and only the user has the key to decode the data. Symmetric key encryption is an essential encryption method that has been discovered via study. Only one key is needed to encrypt and decode data in symmetric key encryption. The AES algorithm is the most often employed in this encryption method. NIST has suggested that AES (Advanced Encryption Standard) be used to replace the DES algorithm. The only known successful attack against it is a brute force assault, in which the attacker attempts all possible character combinations to break the encryption. Block ciphers based on the AES algorithm. It features a configurable key length of 128, 192, or 256 bits, with 256 being the default. It encrypts 128-bit data blocks in 10, 12, or 14 rounds, depending on the key size. AES encryption is quick and adaptable, and it may be used on a variety of platforms, including mobile devices. AES has also been thoroughly tested for a wide range of security applications. This work depicts a portion of the AES algorithm. This method utilizes the original key, which is a 4x4 matrix containing the number of bytes in either instance [10].

3. CONCLUSION

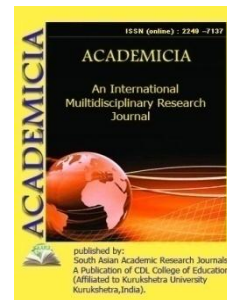
The Cloud Computing technology opens up a lot of opportunities, but it also has certain drawbacks. Cloud computing is a kind of infrastructure in which data storage and processing take place outside of the mobile device. In this article, we provide an overview of Internet of Things technology, as well as an explanation of how it works and how to utilize it. We also go through the key characteristics of Cloud Computing and the trade-offs that come with it. Cloud computing is a kind of infrastructure in which data is stored and processed outside of the mobile device. In addition, the Internet of Things is a relatively new technology that is quickly gaining traction in the telecommunications industry, particularly in the contemporary area of wireless telecommunications.

The primary aim of wireless network interactions and collaboration between things and objects is to achieve the goal set for them as a united entity. Furthermore, both Cloud Computing and the Internet of Things are fast developing technologies dependent on wireless network technology. We provide a review of IoT and Cloud Computing in this article, with an emphasis on the security concerns that both technologies face. We specifically integrate the two aforementioned technologies (Cloud Computing and IoT) in order to investigate the common characteristics and find the advantages of integrating them. Finally, the role of Cloud Computing to IoT technology

was discussed, as well as how Cloud Computing technology enhances IoT functionality. Finally, the suggested algorithm model was used to assess the security issues of the integration of IoT and Cloud Computing, as well as a presentation of how the two encryption algorithms that were employed contribute to the integration of IoT and Cloud Computing. Future study on the combination of those two technologies may be conducted in this area. In order to have a better integration model, the security problem must be addressed or reduced to a minimum due to the fast growth of both systems. These security issues discussed in this article may be used as a case study for future research with the aim of reducing them.

REFERENCES

1. M. A. Khan and K. Salah, "IoT security: Review, blockchain solutions, and open challenges," *Futur. Gener. Comput. Syst.*, 2018.
2. R. S. Sinha, Y. Wei, and S. H. Hwang, "A survey on LPWA technology: LoRa and NB-IoT," *ICT Express*. 2017.
3. A. Panarello, N. Tapas, G. Merlino, F. Longo, and A. Puliafito, "Blockchain and iot integration: A systematic survey," *Sensors (Switzerland)*. 2018.
4. M. Ammar, G. Russello, and B. Crispo, "Internet of Things: A survey on the security of IoT frameworks," *J. Inf. Secur. Appl.*, 2018.
5. A. H. Ngu, M. Gutierrez, V. Metsis, S. Nepal, and Q. Z. Sheng, "IoT Middleware: A Survey on Issues and Enabling Technologies," *IEEE Internet Things J.*, 2017.
6. R. A. Khan and A. S. K. Pathan, "The state-of-the-art wireless body area sensor networks: A survey," *Int. J. Distrib. Sens. Networks*, 2018.
7. H. M. Jawad, R. Nordin, S. K. Gharghan, A. M. Jawad, and M. Ismail, "Energy-efficient wireless sensor networks for precision agriculture: A review," *Sensors (Switzerland)*. 2017.
8. K. S. Mulyarchik and A. S. Polochanskiy, "Quality of service in wireless sensor networks," *Zhurnal Beloruss. Gos. Univ. Mat. Inform.*, 2017.
9. Y. Zou, J. Zhu, X. Wang, and L. Hanzo, "A Survey on Wireless Security: Technical Challenges, Recent Advances, and Future Trends," *Proceedings of the IEEE*. 2016.
10. O. Ur-Rehman and N. Zivic, "Wireless communications," in *Signals and Communication Technology*, 2018.



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A REVIEW ON GENE CLONING AND ITS APPLICATION

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ABSTRACT

A contemporary demand is for protein production in adequate quantity and quality. The use of cell cultures for protein synthesis seems to be becoming more common. Expression techniques based on mammalian cells can introduce proper protein folding, post-translational modifications, and product assembly for recombinant proteins, all of which are required for complete biological activity. This review article is completely based on a literature review. In this article, the mammalian gene sequence has attracted a lot of attention. The author focused on the expression of the gene in a variety of mammalian cell lines. Potential vector methods for transferring the gene into mammalian cells included plasmid-based expression vectors, retroviral vectors, adenovirus vectors, vaccinia vectors, and baculovirus vectors. The process of transmitting genes into mammalian cells was also investigated. The uses and limits of mammalian expression systems were also addressed. The purpose of this study and the publishing of this article is to improve the understanding of researchers who are just getting started in the area of mammalian cell gene expression. The primary goal of this article, as well as its conclusion, is to make molecular techniques, expression systems, including gene expression applications in human cell lines more accessible.

KEYWORDS: *Gene Cloning, Gene, Protein, Plasmid, Vector.*

INTRODUCTION

A gene is unique piece of genetic information that is needed for the synthesis of polypeptides. In the coding sequence, you'll find the promoter, terminator, and introns. The transcription and translation of a gene are both referred to as expression. The expression of a certain gene requires the presence of a specific host. For large-scale recombinant protein synthesis, a variety of translation methods are currently available. E. coli, sought to harness insect cell translation,

yeast, as well as a number of placental mammal systems are among the techniques used[1]. Each has its own set of benefits in terms of cost, usability, including post-translational alteration profiles. The recombinant DNA technique is shown in Figure 1.

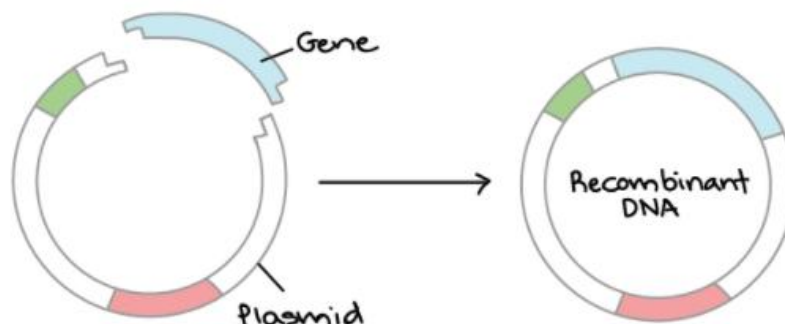


Figure 1: The recombinant plasmid is injected into bacteria in this illustration. Bacteria that contain the plasmid are chosen and cultivated.

E. coli, baculovirus-mediated insect cells expression, yeast, and numerous mammalian-based systems are among these expression systems. Each has its own set of benefits in terms of cost, usability, and post-translational modification profiles. Table 1 lists factors to consider when choosing an expression system for gene expression.

TABLE 1: SHOWS FACTORS FOR SELECTING AN EXPRESSION SYSTEM

Sl. No	Factors effecting gene expression
1.	Facilities of the laboratory and local expertise.
2.	Type of protein to be expressed.
3.	Whether the protein is toxic?
4.	Whether carbohydrate or other modification required?
5.	Requirement of large yield of protein.
6.	How to purify protein?
7.	Production cost

In contrast to insect cells, human cells' glycosylation results in the attachment of large, complex glycans to expressed proteins, which generally prevents crystallization. However, there are techniques for changing the glycosylation. As a consequence, glycoproteins produced in mammalian cells have been crystallized effectively. Protein expression has also been studied in mammalian cells[2]. This article is completely based on a literature review. The author looked at both modern and traditional techniques for doing a literature review. Search engines and data sources included Science Direct, PubMed, and Google. The literatures discussed in this article are not limited to a certain region, but rather come from all around the globe. The author tried to add to existing research on the topic. This paper included material from the preceding five years, up to and including 2012, as well as significant prior literature[3].

The main aim of this research is to look at the many mammalian cell lines that are used for transfection and, eventually, gene expression. The author investigated the vectors used in

transfection in mammalian cell lines. Furthermore, the author addressed several gene transfer techniques in mammalian cells. Gene expression in mammalian cell lines has gotten a lot of attention recently. The goal of this article is to provide new researchers with information on how to express genes in mammalian cell lines to get the desired protein. Readers who are new to biotechnology and interested in mammal tissue culture or gene expression may find this article helpful.

Requirements for Mammalian Expressing Systems:

The degree of expression of a gene is determined by the efficiency with which it is transcribed. Transcription begins when the RNA polymerase complex interacts with the promoter regions and moves from a 5 to 3 orientation along the gene. This produces an RNA transcript, which then separates from the gene at the transcribed signal, causing the transcript to be frozen until it can be translated. For gene expression in human cells, a good cell line and appropriate vectors are required. The vectors should be used to deliver the gene of interest into the appropriate cell lines[4].

Cellular lines:

In the past decade, protein treatments generated from human cells have revolutionized human healthcare. Protein treatments are becoming increasingly important, prompting a search for more cost-effective and efficient cell lines capable of producing high-quality protein products. Previously, viral vaccines, diagnostic, and therapeutic proteins were produced using bioprocesses based on mammalian cells. In the development of protein therapeutics, cells serve as hosts for the production of proteins. The most often used host mammalian cells are Chinese hamster ovary (CHO) cells and mouse myeloma cells, especially NS0 and Sp2/0 cells. DUKX-X11 as well as DG44, the two most often used cell lines in bioprocessing today, are two derivatives of the CHO cell line, CHO-K1 or CHO pro-3. These two cell lines were created with reduced dihydrofolatereductase (DHFR) activity. 7-8 A number of mammalian cell lines have been utilized to produce proteins, the most prominent of which being HEK 293 (Human embryonic kidney) and CHO (Chinese hamster ovary). These cell lines may be transfected with polyethyleneimine (PEI) or calcium phosphate. The Bac Mam system, for example, uses viral-mediated transduction to produce proteins in mammalian cells. This method utilizes recombinant baculoviruses for simple mammalian cell transduction, allowing for the production of milligram quantities of protein for structural studies. COS and Vero (both green African monkey kidneys), HeLa (human cervical malignancy), and NS0 (non-small cell lung cancer) are some of the other cell lines used for structural studies (mouse myeloma). Certain cell lines, such as NS0, are more difficult to transfect. The most frequent technique of transfection is electroporation, which is used solely to create stable cell lines[5].

The signals for eukaryotic synthesis of proteins, processing, and secretion are properly and efficiently transmitted when mammalian cell expressions are used. Mammalian cells recognize it. It is important to note, however, that there are variations across species.

Vectors:

Self-replicating DNA molecules known as vectors are capable of carrying foreign DNA fragments. It serves as a platform for cloning genes. After the DNA of interest has been cloned into an appropriate vector, the gene may be transfected into the host for expression. Mammalian

virus-derived vectors are often used to express heterologous genes in mammalian cells. They include viruses such as Simian Viruses 40 (SV40), polyomavirus, herpesvirus, as well as papovirus. You'll need an effective promoter as well as a selection marker to create a vector. In this article, the author has explored a wide range of vectors[6].

plasmid-based expression vectors:

An expression vector is a vector that allows the transcription and translation of a foreign gene that is inserted into it. Plasmids are self-contained circular DNA units that reside in bacterial cells. They are naturally occurring extra - chromosomal DNA fragments that are passed down from generation to generation in an extrachromosomal state. The majority of attempts to transiently generate recombinant proteins used "conventional" expression vectors with strong viral promoters, such as SV40 or adeno-associated virus (AAV) (CMV). Since it seems to be as potent as or stronger than some viral promoters, the elongation factor (EF)-1 promoter, a non-viral promoter, has received considerable support[7].

Vaccinia vectors are a kind of vaccination used to stop the spread of disease:

The vaccinia virus genome is around 200,000 base pairs of double-stranded DNA that multiplies in the host cell's cytoplasm. The vaccinia virus infects cells and produces up to 5000 virus particles per cell, yielding enormous amounts of recombinant protein. Both Pasteur-Merieux29 and Immuno AG30 have successfully used the vaccinia system to produce a range of proteins on a large scale (1000 L), including HIV-1 rgp160 as well as human pro-thrombin. Retroviruses are RNA viruses that replicate via a dsDNA intermediate. The reason for employing retrovirus as a vector is that most retroviruses do not kill the host and instead produce offspring virions over an indefinite period of time. As a result, retroviral vectors may be employed to generate stable cell lines. The second point is that viral gene expression is regulated by strong promoters, which may be controlled to govern transgenic expression. Another possibility is that certain retroviruses, including such amphotropic murine leukaemia viruses strains, have a broad host range and may infect a wide range of cell types. Exogenous gene expression systems that are based on retroviral vectors have been reported as a viable alternative for producing stable and high-expressing mammalian cell lines[8]. Many methods for transfecting mature osteoclasts and their precursors with lentiviruses and adenoviruses have been described. A retroviral vector was used to create the CD59 gene, which was then transfected into breast cells (MCF-7). Recombinant human factor was also made using the retroviral system.

As vectors, baculoviruses are employed.

Baculoviruses contain large double-stranded DNA genomes and capsids that are rod-shaped. They infect arthropods, particularly insects, in large numbers. Both the Autographacalifornica multiple nuclear polyhedrosis virus (AcMNPV) and the Bombyxmori nuclear polyhedrosis virus have been extensively used as vectors. The former is used to express proteins in insect cell lines, particularly those produced from Spodopterafrugiperda. The latter infects the silkworm in order to produce recombinant protein.

A bicistronic expression cassette has been developed and employed in a recombinant baculovirus that may be used for sustained protein synthesis in mammalian cells. The expression of a secreted protein in human cells was studied using baculovirus particles.

The process of transferring genes is as follows:

The method for introducing the foreign gene into mammalian cells, as well as the regulatory elements utilized to guarantee efficient mRNA expression and protein synthesis, define the vector used. There are two primary methods for introducing foreign DNA into human cells. Viral infection causes the first, whereas chemical liposomes, calcium phosphate, DEAE-de-xtran, and polybrene, as well as physical electroporation and microinjection methods, cause the second. It has been shown that calcium-phosphate, PEI, and electroporation may be used as vehicles/approaches for large-scale transient gene expression.

The bulk of commercially available DNA transfer products are offered in small quantities and are not designed for use in reactors or with large cell masses. Calcium phosphate and PEI transfer DNA by forming complexes with DNA that are subsequently taken up by cells through endocytosis when the conditions are appropriate. This author has also written on several cell transformation methods.

Mammalian expression system application:

The first biologic approved from a mammalian bioprocess platform was tissue plasminogen activator (tPA), which was created by Genentech Inc. in 1987. Mammalian cells now outnumber *E. coli*, yeast, transgenic animals, and insect cultures for biopharmaceutical products: biopharmaceuticals approved between 2006 or 2010 were made in cell cultures, in *E. coli*, four in yeast, three in transgenic animals, as well as two in insect cultures.

Production of monoclonal antibodies:

Therapeutic proteins, such as monoclonal antibodies, are now manufactured in mammalian cells for commercial purposes (mAbs). African green monkey kidney (COS) cells may be appropriate for producing modest quantities of mAbs, such as for exploratory study. They've been used to make active antibodies on a brief basis since 1987. However, since their ability to produce decreases with time, they are not the ideal cells for large-scale production processes. Actually, if large-scale production is the objective, CHO cells, which are gaining favor in the lab, are the most often used cells for this purpose. There were also cell engineering instructions for the production of mAbs. The use of heterologous promoters, enhancers, and amplifiable genetic markers may increase antibody and antibody fragment production. High amounts of chimeric antibodies and recombinant antibody fragments were generated using low copy number cell lines, much beyond those seen in parental hybridomas.

Production of urokinase:

Urokinase is a serine protease that activates plasminogen and converts it to plasmin to break fibrin clots. Urokinase, as a consequence, is an effective anti-thromboembolic agent. The demand for urokinase has increased significantly in recent years, and current production levels have not kept up. Mammalian cell lines are increasingly used for recombinant urokinase production because they allow for post-translational alterations. CHO cells are excellent hosts for the production of recombinant urokinase because they grow so well in the bioreactor.

Production of follicle stimulating hormone:

Follicle-stimulating hormone is produced by the anterior pituitary's gonadotropic cells (FSH). FSH is necessary for follicular growth and development in females. Men must start pubertal spermatogenesis and sustain adult human spermatogenesis quantitatively. The structure and

actions of glycoprotein hormones, as well as their therapeutic use in the treatment of infertility, have been studied using recombinant gonadotrophins. Because of their abundance, they are free of contaminating hormones, so their structure or function may be studied in great detail. Several groups have produced and reported on the effects of human recombinant (rec) FSH generated by transfected CHO cells. Recombinant rat FSH generated by CHO cells was purified and functionally characterized. The cynomolgus monkey was also used to study the cloning and expression of the gonadotropins luteinizing hormone and FSH.

The following are examples of other mammalian expression systems:

Using novel mammalian cell lines with reporter genes, researchers were able to detect environmental chemicals that activate endogenous aryl hydrocarbon receptors or estrogen receptors. Hemophilia B is a genetic coagulation system disease that affects one out of every 30,000 males worldwide. Recombinant human Factor IX has been used to treat hemophilia B. (rhFIX). The steady and high-level production of recombinant Factor IX in a human hepatic cell line was reported. The cytomegalovirus (CMV) promoter, for example, is used to induce high-level messenger RNA transcription. Codon optimization for the target cell type, GC/AT ratio balance, and signal sequence alteration have all been shown to improve mRNA processing as well as secretion. Gene-targeting technologies, chromatin opening elements, as well as attachment regions have all been included into vector optimization to improve end product output[9]

DISCUSSION

A contemporary demand is for protein production in adequate quantity and quality. The use of cell cultures for protein synthesis seems to be becoming more popular. Expression techniques based on mammalian cells can introduce proper protein folding, post-translational modifications, including product assembly for recombinant proteins, all of which are required for complete biological activity. To select an optimal expression system, just the productivity, purpose, bioactivity, and physicochemical characteristics of the target protein, as well as the cost, convenience, as well as safety of the system itself, should be considered. In order to get more efficient proteins with high biological activity, new mammalian cell lines, vector systems, and gene expression methods are now required. In this paper described the cell lines, vectors, including transfection method used in mammalian expression system, which is very helpful for researchers new to animal biotechnology. In the last two decades, mammalian cell protein levels have been the most common technique of recombinant protein synthesis for therapeutic use, accounting for more than half of all biopharmaceutical products on the market, including hundreds of clinical trial candidates. The discovery and production of new cell lines, as well as the entrance of novel genetic mechanisms in expression, gene control, and gene targeting, have all made significant progress.

CONCLUSION

Correct protein folding including post-translational alterations, which are often needed for full biological function, may be introduced via mammalian cell-based production techniques for recombinant proteins. The main conclusion reached by the author is that he has examined the most recent developments in the field of mammalian expression systems, which are significant in animal biotechnology. In this paper described the cell lines, vectors, including transfection method used in mammalian expression system, which is very helpful for researchers new to

animal biotechnology. In the last two decades, mammalian cell protein levels have been the most common technique of recombinant protein synthesis for therapeutic use, accounting for more than half of all biopharmaceutical products on the market, including hundreds of clinical trial candidates. The discovery and production of new cell lines, as well as the entrance of novel genetic mechanisms in expression, gene control, and gene targeting, have all made significant progress. Only the productivity, bioactivity, and purpose of the interest protein, including its physicochemical characteristics, as well as the cost, simplicity, and security of the system itself, may be utilized to choose an optimal expression system. In order to obtain more efficient protein with high biological activity, new human cell lines, vector methods, and gene expression methods are now required.

REFERENCES

1. S. D. Tanksley, M. W. Ganai, and G. B. Martin, "Chromosome landing: a paradigm for map-based gene cloning in plants with large genomes," *Trends Genet.*, vol. 11, no. 2, pp. 63–68, 1995, doi: 10.1016/S0168-9525(00)88999-4.
2. S. Emtenani, A. Asoodeh, and S. Emtenani, "Gene cloning and characterization of a thermostable organic-tolerant α -amylase from *Bacillus subtilis* DR8806," *Int. J. Biol. Macromol.*, vol. 72, pp. 290–298, 2015, doi: 10.1016/j.ijbiomac.2014.08.023.
3. J. Bettgenhaeuser and S. G. Krattinger, "Rapid gene cloning in cereals," *Theor. Appl. Genet.*, vol. 132, no. 3, pp. 699–711, 2016, doi: 10.1007/s00122-018-3210-7.
4. K. Witek, F. Jupe, A. I. Witek, D. Baker, M. D. Clark, and J. D. G. Jones, "Accelerated cloning of a potato late blight-resistance gene using RenSeq and SMRT sequencing," *Nat. Biotechnol.*, vol. 34, no. 6, pp. 656–660, 2016, doi: 10.1038/nbt.3540.
5. K. Uechi, G. Takata, Y. Fukai, A. Yoshihara, and K. Morimoto, "Gene cloning and characterization of l-ribulose 3-epimerase from *mesorhizobium loti* and its application to rare sugar production," *Biosci. Biotechnol. Biochem.*, vol. 77, no. 3, pp. 511–515, 2013, doi: 10.1271/bbb.120745.
6. B. Guo, X. L. Chen, C. Y. Sun, B. C. Zhou, and Y. Z. Zhang, "Gene cloning, expression and characterization of a new cold-active and salt-tolerant endo- β -1,4-xylanase from marine *Glaciecola mesophila* KMM 241," *Appl. Microbiol. Biotechnol.*, vol. 84, no. 6, pp. 1107–1115, 2009, doi: 10.1007/s00253-009-2056-y.
7. R. Khandeparker, P. Verma, and D. Deobagkar, "A novel halotolerant xylanase from marine isolate *Bacillus subtilis* cho40: Gene cloning and sequencing," *N. Biotechnol.*, vol. 28, no. 6, pp. 814–821, 2011, doi: 10.1016/j.nbt.2011.08.001.
8. W. M. De Vos and G. F. M. Simons, "Gene cloning and expression systems in Lactococci," *Genet. Biotechnol. Lact. Acid Bact.*, pp. 52–105, 1994, doi: 10.1007/978-94-011-1340-3_2.
9. E. Sakuradani, M. Kobayashi, and S. Shimizu, " $\Delta 6$ -Fatty acid desaturase from an arachidonic acid-producing *Mortierella* fungus: Gene cloning and its heterologous expression in a fungus, *Aspergillus*," *Gene*, vol. 238, no. 2, pp. 445–453, 1999, doi: 10.1016/S0378-1119(99)00359-5.



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METHOD OF EXPERIMENTAL STUDY OF SHEAR STIFFNESS OF PROFIED FLOORING DIAPHRAGM

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ABSTRACT

The article presents the methods of conducting experimental studies of the shear stiffness of diaphragms made of profiled flooring. The issues of testing for shear fragments of profiled flooring, as well as testing for cross-section connections of profiled sheets with each other and with the elements of the frame of buildings are considered.

KEYWORDS: *Rigidity, Diaphragm, Profiled Flooring, Horizontal Load, Wind Load, Experiment, Shearing, Joining, Frame.*

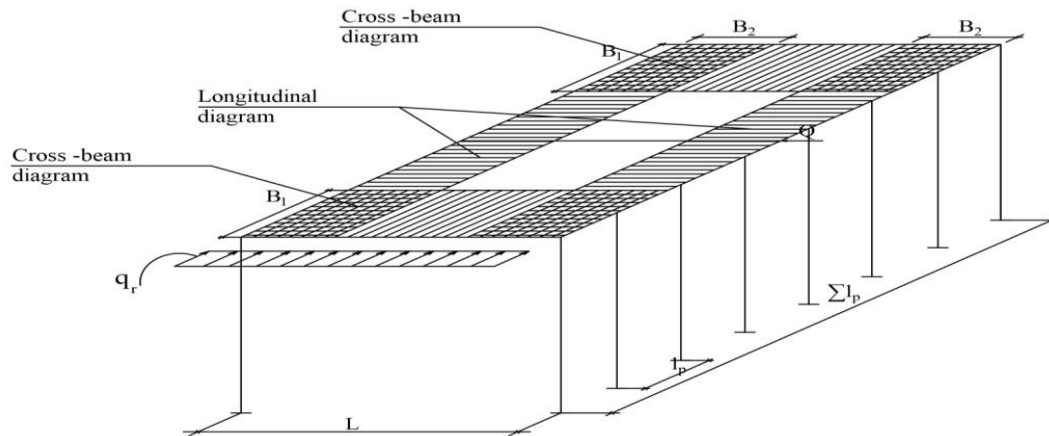
INTRODUCTION

The stiffness of a profiled floor diaphragm is characterized by the amount of shear forces generated by the horizontal forces acting on the building in the longitudinal and transverse directions. Such forces mainly include wind pressure force, force generated by bridge cranes, and seismic forces.

MATERIALS AND METHODS:

The stiffness of the profiled floor diaphragm is often due to the fact that its roof load-bearing elements are attached to the prongs (sarrov). Profiles to which the profiled bearings are fastened must have high strength against torsion. They are therefore fastened to the load-bearing structures using bolts and brackets. It is recommended to fasten the profiled lining to the load-bearing structures of the roof by means of self-drilling bolts in the connecting diaphragms, and

by using rivets combined to fasten the lining in the longitudinal direction along the corrugation. To assess the true displacement of the diaphragm in the profiled bed, it will be necessary to conduct experimental studies involving two types of tests.



1. Try to move the profiled floor fragments;
2. Trying to cut the joints of profiled roofing, forming a floor with the elements of the frame and the frame of the building;

RESULTS AND DISCUSSION:

The tests are carried out in a rectangular reinforcing frame made of high-strength steel elements, the size of which is 3x6 meters. On one side of the horizontally placed frame, the long side is firmly attached, and the other sides are in a free position. The long sides are joined by one or two transverse elements in the center or at a distance of one third (Fig. 1).

The long and short thighs of the ram are raised to the long thighs of the ram with the help of cylindrical hinges. The test specimen in the form of a 3x6 meter sloping frame should be attached to the elements of the reinforcement frame as shown in the actual obstruction design. All joints with the reinforcement frame must be arranged flat on the page.

Various types of corrugated profiled metal sheets and various bonding methods can be used to prepare the test sample. The frames are placed on the long side of the frame in a corrugated or transverse direction.

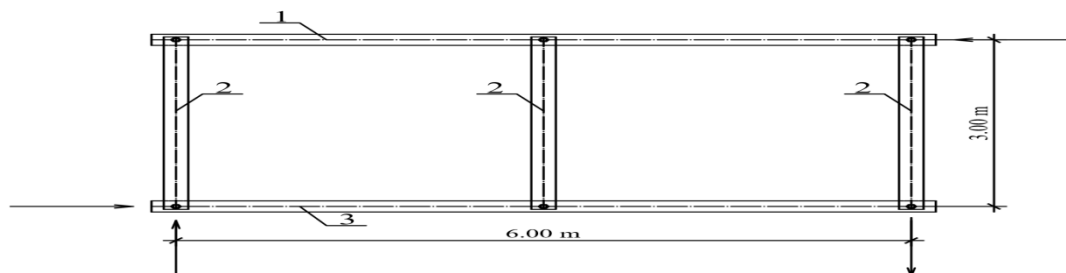


Fig. 1. Scheme of load equipment

1-moving part

2-cross-beam

3-unmoving part

The moving experimental loads are placed horizontally along the free longitudinal side of the reinforcement frame. Before closing the floor, the frame is stretched, that is, the specific resistance of the frame to slipping is determined. The first sample is tested by constantly increasing the load until it loses its carrying capacity.

The second sample is loaded step by step with a load equal to $1/10$ of the strength limit of the first sample, but not greater than 2.0 kN. At each stage, the load is held for 5 minutes, then the loads are completely removed and the load is increased to the amount of the next stage.

In the third sample, the first and second samples are tested with no variable sign (direction) equal to 0.4 of the average value of the average strength limit obtained according to the test results.

During the test, the probability that the free longitudinal side of the reinforcing frame slides in the direction of the shear force and the accidental displacement of the fixed longitudinal side of the frame is determined.

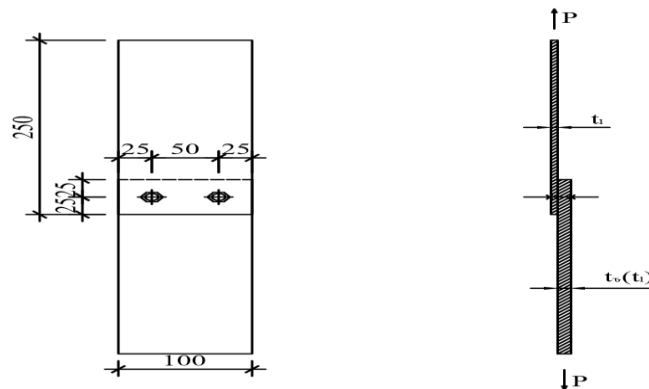


Fig.2. The sample for testing of joining flooring

t_1 -thickness of profiled flooring

t_2 -thickness of construction shelf, load-bearing

DISCUSSION:

Figure 2 Testing of profiled floor joints;

Screws, bolts and cracks are used to connect the profiled sheets to the construction and materials (Fig. 2).

Simple samples should be independently tested to determine the strength and stiffness characteristics of the floor joints affected by the moving loads. (Figure 2).

The thickness and quality of the sheets used for the samples must match the floor and the carcass elements that support it. Each type of compound is tested in at least 10 samples. The first sample is tested with a constant overload until a state of degradation occurs, while the remaining samples are tested step by step at $1/10$ of the same destructive force, but not more than 0.5 kN.

At each stage, the load is held for 5 minutes, then all the loads are removed and the loads are increased to the amount of the next stage. Testing of joints with different sign loads is possible only if the sign of the driving forces acting on the profiled floor is also different.

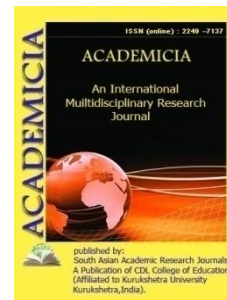
CONCLUSION:

In the process of sampling the joints, it is determined that the joints of the joints are displaced according to the amount corresponding to the test load and the load-bearing capacity of the joints.

The test results can be used in the design of frame structures and fastening systems of buildings, including floors and panels made of profiled metal sheets.

REFERENCES:

1. Yu. Kudishin "Metall construction" Textbook for higher education. M. Academy. 2011 .-680 p. (Ю.И.Кудишин "Металлический конструкции" Учебник для Вузов. М.Академия.2011 год.-680 ст.).
2. Ya. M. Lixtarnikov., D. V. Lodijenskiy and others. «Calculation of metal construction» M.1984. (Я.М.Лихтарников, Д.В.Лодыженский и др. «Расчет стальных конструкции» М.1984 г.).
3. Recommendation on account of acerbity of the diaphragms from steel profiled flooring. M.1980. (Рекомендации по учёту жёсткости диафрагм из стальных профилированного настила. М.1980г.).
4. Q. Saydullayev, K. Shukurova. Textbook "Metal structures" – T.: "Science and technology", 2010, 272 pages.
5. A.I.Budur, V.D.Belogurov. Constructor reference. Steel structures. Kiev publishing house "Steel" 2004 y. - 210 p.
6. Rakhimov A.K. "Development and implementation of cost-effective structural solutions for profiled decking made of high strength steel". UDK 624.073-42. Dissertation for the degree of candidate technical sciences. Moscow 1985 y. - 180 p.
7. review.uz/uz/nou



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THE IMPORTANCE OF THE INTERNATIONAL HASSP SYSTEM IN THE PRODUCTION OF QUALITY AND SAFE CONFECTIONERY PRODUCTS

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ABSTRACT

Nowadays, confectionery products in the European Union allow to fully satisfy the demand of the population for this product. However, to date, the negative effects of confectionery products in the oral cavity using the NASSR international system have been shown to reduce the threat to human health, as well as the effects of national types of confectionery products such as n ovvat, zarnovvat on oral cavity and dental caries. The effect has not been studied. It should be noted that bacterial poisoning from confectionery is one of the most important problems in the field of epidemiology and food hygiene.

KEYWORDS: *International System of Confectionery Products.*

INTRODUCTION

Food contamination has enormous economic consequences in all countries of the world and has a negative impact on human health.

One of the most pressing issues in bringing modern Uzbekistan to the world market is the production of quality and safe food products through the use of the international system HASSP [1].

Improving the system of quality and safety of food, confectionery, vegetables and melons is one of the priorities of state policy.

In this regard, the Action Strategy for the five priority areas of development of the Republic of Uzbekistan for 2017-2021, adopted by the President of the Republic of Uzbekistan Sh.M.Mirziyoev, is the most important policy document that defines the priorities of this state policy.

The Risk Analysis and Critical Checkpoints system is an excellent food quality management system focused on the production of safe food products.

Food production enterprises in the application of the international system (HACCP Hazards Analyzis and precise control of the Critikal Control Point - points of analysis to evaluate factors) [2], the confectionery industry is the most important agro- industry is one.

The Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) co-funded the Food Security Commission (Codex Aliementarius Commission) in 1993. A manual has been developed. HASSP defines the requirements of the entire chain of production, that is, the system of food safety, which can be applied from the initial raw material to the final product. These system requirements can be applied independently or in combination with quality management systems based on ISO 9000 standards. [6].

Research Objective: To develop and implement the XACCP international system in food enterprises by assessing risk factors for contamination of confectionery products, developing and implementing a modern critical control system to ensure and maintain their quality and safety at the required level . In addition, to study and reduce the risk factors for the problem of safety of confectionery products for human life and health.

Object and Methods of Research: Objects of research are hygienic and bacteriological methods, statistics, surveys on the results of physicochemical and microbiological examination of raw materials and finished products from confectionery enterprises in the determination of milk ration and contamination of food products.

Results Of The Study: Using the international system HASSP, critical control points were identified, taking into account the critical views in the work process, the characteristics of the technological process, equipment used, quality of raw materials and climatic conditions of the regions. In some cases, there has been an increase in the use of various additives, technological additives, and artificial flavorings, flavor enhancers to improve the appearance, taste characteristics, and sometimes the shelf life of food products. It became clear that according to SanPiN №0257-08 [4] in Uzbekistan, the existing hygiene requirements in the production of bread are not based on the assessment and analysis of the risk of contamination of confectionery products.

It should be noted that each product type has its own characteristics, they are in the process of processing the raw materials, as a result of a change in the chemical composition and structure may be made without taking into account the technological instructions provided by the manufacturer on the basis of areas of the recipes does not have a scientific basis and arbitrary was found to be included with .The use of such products among the population living in hot climates often leads to food poisoning.

Based on the results of radiological and laboratory studies , the toxic elements in raw materials and finished products did not differ from the standards specified in SanPiN № 0366-

19 "Hygienic requirements for food safety" [5]. Bacterial poisoning from perishable confectionery products is one of the most important problems in the field of epidemiology and food hygiene. It should be noted that the HASSP system also includes technical norms and rules, management principles and other recommendations. The HASSP concept involves the systematic identification, management and assessment of risk factors that have a significant impact on product safety. The HASSP system is one of the food safety systems adopted by international an organization that has proven its effectiveness. The use of the HASSP system allows the transition from testing the final product to the development of prevention methods in ensuring food safety. Codex Alimentarius the Commission's control of food products, according to technical norms and rules, the right hand - commemorating the regulatory requirements of each country, taking into account the importance for the future of the Code Alimentarius one of the main recommendations of the Commission of confectionery products aimed at guaranteeing the security of confectionery products under development and the application of the international HASSP system in cultivation.

This will open up new avenues of development for the manufacturer who has developed and implemented a food safety system.

CONCLUSIONS

1. At a time when there is a strong competitive environment, along with increasing the range of food products, it is necessary to focus on its quality and safety. Because quality and safe food will be convenient and safe for both domestic and foreign buyers.
2. The concept of HASSP allows carrying out controls to ensure the safety of food products in the transition from the preparation of food raw materials to the final consumer product through the entire food chain, to identify risk factors.
3. The use of the HASSP system allows developing methods to prevent the occurrence of various types of food poisoning, while ensuring food safety.

REFERENCES:

1. Commission Codex Alimentarius // Guide to the procedure. Nineteenth edition. WHO \ FAO. - Rome. 2010. - p. 213.
2. Hygiene of baked goods. Basic texts. Joint program FAO / WHO standards for bakery products. COMMISSION CODEX ALIMENTARIUS, second edition. Rome 2005, 245 p.
3. SanPiN №0257-08 «Hygienic requirements for the production of bread, bakery products and confectionery products» .www.minzdrav.uz
4. SanPiN №0366-19 «Hygienic normative safety of bakery products» .www.minzdrav.uz
5. MMTurdialieva, H. Ahmadjanov, Sh.E. Umidov "International standards in the field of food production and quality management"
6. Xudayberganov A.S. Factors shaping healthy eating in the population and existing problems. Sbornik nauchno-prakticheskoy konferentsii (s mezhdunarodnym uchastiem) «Sovremennyye dostizheniya i perspektivy razvitiya oxrany zdorov'ya naseleniya». - Tashkent, 2019. - S.194-196.



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AN OVERVIEW ON SOMA CLONAL VARIATION

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ABSTRACT

Plant breeders may use somaclonal variation as a technique. The study looks at the best places to use this technology and the variables that restrict or enhance its chances of success. (1) the degree of deviation from ordered development, (2) the genotype, (3) growth regulators, and (4) the tissue supply are the major variables that affect the variety produced by tissue culture. Despite growing knowledge of how these variables interact, it remains impossible to anticipate the result of a somaclonal breeding effort. Somaclonal variation has resulted in the creation of new varieties, but in many cases, better variants were not chosen because (1) the variance was all negative, (2) significant improvements were also greatly changed in negative ways, (3) the modifications were not novel, or (4) the modifications were not steady after selfing or crossing. Somaclonal variation is less expensive than other genetic modification techniques. It is also more generally applicable at the moment and does not require confinement measures. It's worked best in crops with restricted genetic systems or genetic bases, where it may offer a quick source of variety for crop development.

KEYWORDS: Genetic, Soma clonal variation, Tissue culture.

INTRODUCTION

Tissue culture is an enabling technique that has spawned a slew of new tools to aid plant breeders. These technologies may be used to enhance the speed or efficiency of the breeding process, expand the accessibility of existing germplasm, and generate novel crop variety. Micro-propagation, embryo rescue, another culture, in vitro selection, somaclonal variation, somatic hybridization, and transformation are some of the techniques used. Somaclonal variation has a special place among them since it is both a benefit and a drawback of tissue culture methods. It was not anticipated that the asexual culture process would result in variety. The uncontrolled generation of non-'true-to-type' plants continues to be a concern in almost all other applications

of plant tissue culture. Larkin and Scowcroft, who examined the topic in 1981 and were among many writers at the time to call attention to its potential applications for crop development, were the first to characterize soma clonal variation as such. Their predictions were mainly based on reports of widespread diversity in plants produced from potato protoplast or explant cultures. Soon after, a slew of reports appeared in a variety of species, indicating that somaclonal variation was ubiquitous and therefore presumably available to all plant breeders[1]. Since then, many genuine efforts to enhance crops via somaclonal variation have been undertaken, and although many have failed, there have been noteworthy triumphs (see below). As a result, our starting point is that somaclonal variation is a tool that plant breeders may utilize. The questions that will be answered here are about where this tool can be used most effectively and what variables restrict or enhance the instrument's ability to be used successfully[2]. This evaluation will be limited to the direct application of somaclonal variation for plant breeding due to a lack of space. The application of somaclonal variation for hybrid introgression and then in vitro selection of plants with better stress tolerances, such as temperature, is discussed elsewhere in the proceedings.

As a tool, how dependable is somaclonal variation?

The issue of somaclonal variation's reliability as a breeding technique may be divided into three parts: (a) Is there always variety in in vitro culture? (b) Is it always possible to restore useful variation? (c) Is somaclonal diversity in all crop species beneficial? Is there always variety in in vitro culture? It is impossible to say that in vitro cultivation will always result in variety. In reality, there are a lot of variables that affect whether or not variation is created, as well as how much variation is generated. (1) the degree of deviance from organized meristematic development, (2) the genetic makeup of the starting material, (3) the growth regulators in the medium, and (4) the tissue source are all variables to consider.

The degree to which growth is deviated from meristematic organized growth. In culture, growth may come from pre-existing meristems or from a disorganized form called a callus, from which organized structures emerge through somatic embryogenesis and organogenesis. Disorganization of development is a major component of somaclonal variation, implying that the restrictions that work to remove genetic variants in normal meristems are repressed or that processes of genetic instability are activated in disorganized growth. In general, the larger the deviation from organized growth and the longer the period spent in this condition, the higher the likelihood of somaclonal variation. It is more acceptable to use this criterion rather than making broad generalizations about the degree to which various tissue culture methods are linked to somaclonal variation. This is due to the fact that the amount of time spent in a disorganized state varies greatly from system to system and even from species to species. Cell suspension cultures, for example, are thought to be genetically unstable, whereas protoplast culture is linked to large levels of somaclonal variation. Nonetheless, since the cultures are extremely stable, spruce (*Picea mariana*) seedlings regenerated from protoplasts of embryogenic cell lines are expected to be devoid of somaclonal variation. Protoplasts produced from these embryogenic cultures may directly create embryos[3]. The individual's genetic makeup There is a growing body of data that suggests somaclonal variance is genotype-dependent. In reality, it may be difficult to distinguish genotype effects from variations in tissue culture response since the latter is also genetically controlled, although a number of studies have shown that genotype can affect somaclonal variation regardless of regeneration method. The genotypic element's precise nature must be

determined since plant breeders will want to utilize somaclonal variation as a tool in particular lines or cultivars and will want to know if their genotypes will respond to variability. Unfortunately, this is not a simple issue to address, since genotypic differences are caused by a variety of variables, which interact in complicated ways.

The cultural setting?

There's a lot of evidence that the medium you choose, and especially the concentration of growth regulators in it, has an impact on somaclonal variance. It's conceivable that growth regulators have mutagenic properties. 2,4-D, a synthetic auxin, has been found to enhance the frequency of blue to pink mutations in the Tradescantia stamen hair system and to cause substantial increases in the frequency of sister chromatid exchanges in Allium sativum root-tip cells. However, there are few instances of this kind, and the majority of data suggests that growth regulators influence somaclonal variation during the culture phase by affecting (1) cell division, (2) the degree of disorganized development, and (3) the selective proliferation of particular cell types.

Source of tissue

When regeneration is accomplished from various tissue sources, there may be differences in the frequency and type of somaclonal variation. In general, the older and/or more specialized the tissue, the better the odds of recovering diversity in the regenerated plants. Gross alterations in the genome, such as endopolyploidy, polyteny, and amplification or diminution of DNA sequences, often follow somatic differentiation in normal plant growth and development, resulting in these consequences. This issue is further confounded by genotype, since there seem to be two classes of plants depending on the amount of genomic diversity present in the soma (polysomatic or non-polysomatic plants, respectively). Differentiated cells in non-polysomatic plants are kept in the same ploidy state as the zygote, while differentiated cells in polysomatic plants may have polyploid, polytene, or even aneuploid constitutions. The impact of tissue source would be greatest in polysomatic species, however although there are certain plants that fit into this category, it is not always obvious which kind of plant is being utilized. In Solanum brevidens, 70 percent of plants regenerated from cotyledons were tetraploid, while only 20% of plants regenerated from leaf fragments were tetraploid. Plants grown from cultured petals were more floriferous and had a greater frequency of abnormalities than plants grown from pedicels in Chrysanthemum. Plants regenerated from stems did not vary from controls in fragrant Pelargonium, while regenerants from root and petiole parts had a wide range of shape[4].

It always possible to restore useful variation:

In almost every instance where comprehensive field experiments on somaclones have been conducted, there has been strong evidence that in vitro cultivation has caused alterations in agronomic characteristics. However, better variations have not been chosen for breeding purposes in the majority of instances, due to one or more of the following factors: The shift was in the wrong direction. For example, in a three-year field evaluation of seed progenies of tissue culture-derived spring wheat plants, researchers found that nearly all of the regenerated lines yielded less than the controls, concluding that the tissue culture process had produced "an array of agronomically inferior genotypes." Similarly, a field assessment of barley somaclones revealed that the little variation found was entirely negative in value[5].

When it comes to good improvements:

Other parts of the plants were also impacted. Higher grain protein levels in the seed progenies of regenerates were linked to poorer yields in the spring wheat field study mentioned above. Similarly, several of the potato plants reported as having increased disease resistance by Shepard and colleagues were subsequently shown to be aneuploidy. Not all of the modifications made were new. Variations in the inflorescence were among the most frequent types of alteration in a study of somaclonal variation generated in seven cultivars of plantains (*Musa* spp.). Reversion to a normal French plantain bunch form of inflorescence occurred at a frequency of 2.7% in the False Horn plantain 'Agbagba'. However, such 'French reversion' has been observed in conventional propagules as well, albeit at a considerably lower frequency (0.7 percent)

Is somaclonal variation as effective in all crops as it is in some?

It is true that somaclonal variation has resulted in the development of new varieties of Paulownia tomentosa tomato or celery, sugar cane,. It should also be noted that, despite so many intensive efforts, the technique has proven completely ineffective in many other crops, including wheat, maize, as well as barley. It may be able to predict which crops somaclonal variations is more likely to work as a crop enhancement technique by looking at some of the successful instances[6].

Stress and genetics have an impact.

Somaclonal variation may be induced by stress during tissue culture. Various genomes, on the other hand, react in different ways. stress-induced variation, implying that somaclonal There are genotypic components to variance. The distinctions in Differences in genetic make-up are linked to stability. where certain elements of the plant DNA cause them to grow During the cultural process, the environment becomes unstable. This may be a better option. Repeated DNA sequences may be explained by the repetitive DNA sequences, which can Plant species vary in quality and quantity (Lee). Phillips (1988) and others). A cultivar's inherent fragility was a significant issue. impacted the development of dwarf off-type banana tissue culture. The cv. 'New Guinea Cavendish', for example, possessed a In vitro, cv. 'Williams' has a greater degree of instability. In the same way, dwarf off-types remained stable in vitro. tissue culture, as well as the tissue culture conditions that resulted in advantages and disadvantages of somaclonal variation compared to other tools.

Many writers have argued that selecting for incremental improvements in existing varieties by running the best available lines through a tissue culture cycle is an obvious approach for using somaclonal variation in breeding. However, it will not be regarded an economically feasible technique until variations of a specific type can be produced more easily via somaclonal variation than from other approaches. One of the most significant drawbacks of somaclonal variation, which makes it relatively difficult to use, is that, despite the discovery of variables influencing a plant species' variation response, it is still impossible to anticipate the result of a somaclonal program. In reality, for many crop species where general molecular genetic information is inadequate, small scale pilot experiments are the only method to determine if a broad range of somaclonal variation will be produced under a given set of culture conditions. Even yet, there is no assurance that a particular characteristic of interest will be positively changed. Other significant issues include the huge number of inferior lines produced and the fact that some of the modifications are not stable. In contrast to these drawbacks, somaclonal variation has a number of benefits. It is a less expensive type of biotechnology than somatic

hybridisation and transformation, and it does not require any 'containment' processes. There are more plant species accessible in tissue culture systems than can be handled through somatic hybridisation and transformation at this moment. It is not required to have discovered the trait's genetic origin, or even to have isolated and cloned it in the case of transformation. Novel variations have been discovered among somaclones, but genetic cytogenetic data suggests that transit through tissue culture may change the frequency or distribution of genetic recombination events. This indicates that variation may come from places other than the regions of the genome that are accessible to conventional as well as mutant breeding[7].

Advantage

The benefits include:

- It is less expensive than other genetic modification techniques and does not need 'containment' processes.
- There are more plant species accessible in tissue culture systems than can be handled through somatic hybridization and transformation at this time.
- It is not required to have discovered the trait's genetic origin, or even to have isolated and cloned it in the case of transformation.
- Novel variations have been discovered among somaclones, and evidence suggests that transit through tissue culture may change the frequency and distribution of genetic recombination events. This means that variation may come from places in the genome other than those that are accessible to conventional and mutant breeding.
- If somaclones are produced via cell culture, there is no way to get chimeric expression Crops with restricted genetic systems (e.g., apomicts, vegetative reproducers) and/or narrow genetic bases have had the greatest success with somaclonal diversity. In the case of ornamental plants, for example, the use of in vitro-generated diversity has become standard practice in many commercial breeding operations.

Disadvantages

One of the major drawbacks of somaclonal variation that makes it relatively difficult to utilize is that, despite the discovery of variables influencing a particular plant species' variation response, the result of a somaclonal program cannot be predicted since it is random and unreliable. Furthermore, since many genetic alterations are caused by point mutations or chromosomal rearrangements, the majority of R1 segregates. As a result, selecting individuals with gains in the R1 generation for quantitative characteristics like yield is almost difficult. Though many horticultural crops have developed ways for selecting somaclones resistant to different biotic and abiotic stressors, there are currently no in vitro selection methods for complex characteristics like as yield, soluble solids, sweetness, texture, or shelf life.

LITERATURE REVIEW

Michael W. Bairu et al. studied about the plant tissue culture has become one of the most important techniques in plant science research. It's widely used in the cultivation, conservation, and enhancement of plant resources. The existence of somaclonal variation in populations generated from tissue culture has had a detrimental impact on tissue culture's usage and

continues to be a significant concern. It is, on the other hand, a source of new desirable clones/variants with improved agronomic characteristics. We describe the potential causes, detection techniques, and desirability of variations in this review. One of the most studied and discussed subjects is somaclonal variation. As a result, we limited ourselves to presenting a few instances that might serve as useful references for researchers looking to discover and/or describe somaclonal variations while conducting research and manufacturing utilizing tissue culture. The detrimental consequences of somaclonal variation are highlighted. This study does, however, contain instances of certain beneficial variations that arise from somaclonal variation[8].

M. Karppler et al. studied about the Somaclonal variation is expressed as cytological defects, frequent qualitative & quantitative phenotypic mutation, sequence alteration, and gene activation and silencing, activation of dormant transposable elements and retrotransposons suggests that epigenetic alterations occur during culture. Epigenetic activation of DNA elements also indicates that epigenetic alterations may be implicated in cytogenetic instability through heterochromatin modification, as well as phenotypic variance via gene function regulation. The fact that DNA methylation patterns are extremely varied across regenerated plants and their offspring suggests that DNA changes in culture are less permanent than in seed-grown plants. The relative significance of epigenetic vs sequence or chromosomal variation in regulating somaclonal variation in plants will be determined in future study[9].

Somaclonal variation, as defined by G. C. Mgbeze et al, refers to any phenotypic or genotypic changes that occur as a result of in vitro cultivation. Fruit mantling and irregular vegetative development are common symptoms in oil palms. Tissue culture is still the only way to micropropagate oil palms since their biological features prevent traditional vegetative propagation. The early success of plantlet generation prompted several oil palm groups to investigate the method of in vitro propagation. Despite the fact that oil palm tissue culture is highly established, it nevertheless faces many difficulties. Somaclonal variation, which was originally discovered in 1986, is one of the most prominent. They can only be detected after the palms begin to bloom, which occurs after two to three years in the field. Floral irregularity in the oil palm has not been completely eliminated or avoided. Several methods, such as lowering hormone levels, preventing fast-growing calluses, and shortening the culture time, have decreased the issue to tolerable levels of 5%. The reasons behind somaclonal variation in the oil palm are addressed, as well as the variables that influence it[10].

DISCUSSION

Tissue culture is an enabling method that has resulted in the development of a plethora of new tools to assist plant breeders. These technologies may be used to speed up or improve the breeding process, make current germplasm more accessible, and create new crop varieties. Some of the methods utilized include micropropagation, embryo rescue, another culture, in vitro selection, somaclonal variation, somatic hybridization, and transformation. Because it is both an advantage or drawback of tissue culture techniques, somaclonal variation has a unique position among them. Any phenotypic or genotypic changes that occur as a result of in vitro culture are referred to as Soma clonal variation. Fruit mantling and irregular vegetative development are common symptoms in oil palms. Tissue culture is still the only way to micro propagate oil palms since their biological features prevent traditional vegetative propagation. After selfing or crossing, the changes were not consistent. Other genetic alteration methods are more costly than

Soma clonal variation. It is also more widely applicable at the present and does not need the use of restraints. It has been most successful in crops with limited genetic systems or genetic bases, where it may provide a fast source of diversity for crop growth. In crops with restricted genetic systems and/or narrow genetic bases, it is most likely to be regarded a viable technique.

CONCLUSION

Tissue culture is an enabling method that has resulted in the development of a plethora of new tools to assist plant breeders. These technologies may be used to speed up or improve the breeding process, make current germplasm more accessible, and create new crop varieties. Based on these debates, the only conclusion that can be drawn at this time is that, although soma clonal variation is a tool that breeders may employ, it is not a precise instrument and can only be controlled to a limited extent. Despite this, it may provide a quick and easy source of variety for use in breeding programs. In crops with restricted genetic systems and/or narrow genetic bases, it is most likely to be regarded a viable technique.

REFERENCES

1. K. Y. Paek, E. J. Hahn, and S. Y. Park, "Micropropagation of Phalaenopsis Orchids via Protocorms and Chapter 20 Micropropagation of Phalaenopsis Orchids via Protocorms," *Plant Embryo Cult. Methods Protoc. Methods Mol. Biol.*, 2011.
2. L. A. Forsberg, D. Gisselsson, and J. P. Dumanski, "Mosaicism in health and disease-clones picking up speed," *Nature Reviews Genetics*. 2017, doi: 10.1038/nrg.2016.145.
3. K. Monro and A. G. B. Poore, "The potential for evolutionary responses to cell-lineage selection on growth form and its plasticity in a red seaweed," *Am. Nat.*, 2009, doi: 10.1086/595758.
4. L. A. Forsberg, D. Absher, and J. P. Dumanski, "Non-heritable genetics of human disease: Spotlight on post-zygotic genetic variation acquired during lifetime," *Journal of Medical Genetics*. 2013, doi: 10.1136/jmedgenet-2012-101322.
5. D. Shimojo *et al.*, "Rapid, efficient, and simple motor neuron differentiation from human pluripotent stem cells," *Mol. Brain*, 2015, doi: 10.1186/s13041-015-0172-4.
6. L. A. Forsberg, D. Absher, and J. P. Dumanski, "Non-heritable genetics of human disease: Spotlight on post-zygotic genetic variation acquired during lifetime," *Postgraduate Medical Journal*. 2013, doi: 10.1136/postgradmedj-2012-101322rep.
7. C. Monterrat, F. Boal, F. Grise, A. Hémar, and J. Lang, "Synaptotagmin 8 is expressed both as a calcium-insensitive soluble and membrane protein in neurons, neuroendocrine and endocrine cells," *Biochim. Biophys. Acta - Mol. Cell Res.*, 2006, doi: 10.1016/j.bbamcr.2005.11.008.
8. M. W. Bairu, A. O. Aremu, and J. van Staden, "Somaclonal variation in plants: Causes and detection methods," *Plant Growth Regul.*, vol. 63, no. 2, pp. 147–173, 2011, doi: 10.1007/s10725-010-9554-x.
9. A. Karp, "Somaclonal variation as a tool for crop improvement," *Euphytica*, vol. 85, no. 1–3, pp. 295–302, 1995, doi: 10.1007/BF00023959.
10. C. M. G. and I. A., "Somaclonal variation associated with oil palm (*Elaeis guineensis* Jacq.)

clonal propagation: A review,” *African J. Biotechnol.*, vol. 13, no. 9, pp. 989–997, 2014, doi: 10.5897/ajbx12.011.



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THE DEVELOPMENT OF INSECT FARMING

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ABSTRACT

Agriculture has developed separately in three insect orders: once in ants, once in termites, and seven times in ambrosia beetles. Agriculture has evolved independently in three insect orders. Despite the fact that these insect farmers are very distinct from one another in certain respects, they are surprisingly similar in many other aspects, which suggests that they have evolved via convergent evolution. All of them reproduce their cultivars as clonal monocultures inside their nests, and in the majority of instances, they propagate them clonally over several farmer generations as well. Despite the fact that long-term clonal monoculture presents unique challenges for disease control, insect farmers have developed a variety of strategies to manage crop diseases: they (a) isolate their gardens from the surrounding environment; (b) monitor gardens closely, controlling pathogens as soon as disease outbreaks occur; and (c) occasionally access population-level reservoirs of genetically variable cultivars, even while maintaining their own gardens. Rather of cultivating a single cultivar purely for nutrition, it seems that insect farmers produce, and potentially “artificially select” for, integrated crop-microbe consortia, which are then distributed across the field. It is possible that crop domestication occurred in the setting of coevolving microbial consortia, which may account for the agricultural success of insect farmers that has been documented for 50 million years.

KEYWORDS: Agriculture, Evolution, Insects, Microorganism, Termites.

1. INTRODUCTION

In the animal world, the cultivation of crops for food has occurred just a few times in the history of the species. The fungus-growing ants, the fungus-growing termites, the ambrosia beetles, and, of course, humans are among the most well-known and clear instances of this phenomenon. Agriculture has become increasingly important for humans, who began the transition from an

ancestral hunter-gatherer existence to farming only about 10,000 years ago. In a global economy with projected food shortages, sustainable, high-yield agriculture has become critical for survival, and numerous research programmes are currently dedicated to the optimization of agricultural productivity in the context of growing environmental challenges. People have made significant advances in agriculture via a mix of intelligence, innovative planning, and a healthy dose of chance and good fortune, among other factors. Although nonhuman agricultural systems, such as fungus-growing insects, have been studied in the past, humans have not looked at them for potential insights for improving agricultural methods[1].

This lack of applied interest in insect agriculture is most likely due to a widespread assumption that human agricultural systems operate in a fundamentally different way than insect agricultural systems, which is unfounded. Humans, on the other hand, have gained a great deal of practical knowledge by studying the adaptive characteristics of other species closely, and similar issues such as crop diseases afflict all farmers, regardless of their phylogenetic positions or the crops they grow. It may be fruitful to examine the short- and long-term solutions that have evolved convergent in insect agriculture for possible application to human agriculture due to the universality of crop diseases in both human and insect agriculture due to the universality of crop diseases in both human and insect agriculture. The purpose of this review is to provide such a synthesis[2].

1.1 Behavioral and Nutritional Characteristics:

Agricultural practices such as insect fungi-culture and human farming have many similarities, including (a) the routine planting of sessile cultivars in specific habitats or on specific substrates, including the seeding of new gardens with crop propagules that are selected by farmers from mature gardens and transferred to novel gardens; (b) cultivation aimed at improving the growth conditions for the crop, or (c) cultivation aimed at improving the yield of the crop. The insect farmers' obligate reliance on their cultivated crops may be easily shown via the experimental removal of their cultivated crops, which results in decreased reproductive output, higher mortality, or even the definite death of the cultivar-deprived insect (see Figure 1). Planting and harvesting are not required to be done with deliberate purpose according to our concept of agriculture. It is undeniably true that conscious planning, learning, and teaching have hastened the evolution of sophisticated agriculture in humans, but it seems unlikely that this has occurred in insects[3].

We have limited our review to fungi-culturists who specialize on ants, termites, and beetles. Aspects of hemipteran insect husbandry that are similar to human animal husbandry, such as the caring by ants of hemipteran insects, are not included in this study. Also excluded from consideration are cases that do not meet all four of the requirements of agriculture as defined above, such as the ant *Lasius fuliginosus*, which promotes fungal growth in the walls of its nest, because the fungus is apparently not grown for food, but rather for the purpose of strengthening the walls or providing antibiotic protection to the walls. On the same reasons, we rule out a number of potential instances of early agricultural development[4].

The snails of the genus *Littoria*, for example, may "proto-farm" fungus by producing plant wounds that get infected with fungal growth that is a component of their food supply, but they do not actively inoculate the plant wounds or otherwise cultivate the fungi. Invertebrates in particular are likely to have many more such proto-farming species yet to be discovered, and all

known insect agriculturists are likely to have descended from proto-agricultural predecessors who were similar in many ways. The comparison of these proto-farming insects to “primitive” human agriculture is outside the scope of this study.

1.2 Understanding Agriculture:

We will examine agriculture as a form of strong co-evolutionary interaction, as described by the nutritional and behavioral requirements listed above, in which natural selection operates on both farmers and crops as interdependent lineages that are mutually reinforcing each other's development. When it comes to agriculture, our co-evolutionary approach takes into account not only the interactions between a specific farming insect and a single cultivated crop, but also the interactions between the insect garden insect and other pathogenic and mutualistic microbes that have recently been discovered in insect gardens. Some of these microorganisms, like the cultivars, are also controlled by the insect farmers for particular reasons, just as they are with the cultivars. A more accurate description would be that an insect garden is not a pure monoculture, but rather an ecological community that has been sequestered and designed to include various interacting microorganisms, some of which are helpful to the farmers and others that are harmful. The nature of insect-microbe interactions in gardens, the evolutionary origins of these interactions, and the convergence and divergence of evolutionary trajectories that culminated in the extant insect agricultural systems will all need to be investigated in order to gain a comprehensive understanding of the principles of insect agriculture[5].

1.3 Introduction to The Insect-Agriculture Systems:

Ants, termites, and beetles are the only three insect families that have been studied for their ability to develop behaviorally sophisticated systems of insect agriculture.

1.3.1 Ant Fungi-culture:

The fungus-growing ants are a monophyletic group in the tribe Attini, consisting of about 220 known species and many more undiscovered species. Attine ants are found exclusively in the New World and are at their most diverse in the wet woods of tropical South America, where they are thought to have originated in their supposed evolutionary home. When it comes to food, ant larvae and adults are obligate agriculturists. Their produced fungus is the only source of nutrition for the larvae and a significant source of nutrition for the adults. Despite the fact that adults may augment their meals by consuming plant fluids, the grown fungus are nutritionally adequate to sustain the ants even in the absence of extra nutrients from other sources such as plants. When daughter queens carry tiny pellets of natal-nest mycelium inside their infrabuccal pockets, which are pouches found in the mouthparts of all ants, garden fungus are transferred vertically through generations. Worker castes of the evolved leafcutter ants consist of a diverse group of workers with differing sizes and physical characteristics, each of which is trained to perform a specific job[6].

A number of distinct ant lineages grow their fungus on a variety of diverse surfaces. While the leafcutting genera *Atta* and *Acromyrmex* mainly utilize freshly cut leaves and flowers as their primary gardening substrate, the ancestral gardening substrate used by the so-called lower attines includes flower parts, arthropod frass, seeds, wood pieces, and other similar plant detritus. Although each attine system has its own set of symbionts, all attine systems include at least four of them: (a) fungus-growing ants; (b) their fungal cultivars; (c) mutualistic antibiotic-producing

actinomycete bacteria; and (d) garden parasites from the ascomycete fungal genus *Escovopsis*. Additional bacteria and yeasts may be found in attine gardens, and they may work as mutualists, for example, by secreting digesting enzymes or antibiotics to benefit one another.

1.3.2 *Fungal Farming:*

Of the more than 2600 species of termite known, approximately 330 species of the Macrotermitinae subfamily grow for food a specific fungus of the genus *Termitomyces*. Nests are usually established by the future queen and a single reproductive pair. They firmly lock themselves in a hard clay cell where they bring the first sterile workers' brood. In most termite species, a new colony has a fungal strain from windy sexual activity *Termitomyces* spores soon after nest establishment and starts building the first gardens. These spores originate from fruiting organisms (mushrooms) originating from mature termite colonies. The production of the fungus seems to have been approximately timed with the period in which the first foraging workers emerge from a new nest a few months after the nesting phase. Termite gardens are developed on dead plants, which are only degraded partly, such as leaf litters, dead grass, dead woods, or dry leaves[7].

Termite Gardens are constructed of spore-containing faecal pellets in rooms constructed within the mound or distributed in the ground by the termites. Faecal pellets are continually added to the top of the comb and fungal mycelium quickly penetrates the new substratum. After many weeks, the fungus begins to form vegetative nodules, which the termites eat. These nodules are a rich nitrogen, sugar and enzyme source. The nodules are also coated with indigestible asexual spores (conidies), such that their consumption is used to inoculate the faeces with spores that pass through the intestine undamaged and are subsequently placed in new comb with the deposition of faecal material. Mature pebbles are also used, although nutritionally lower than nodules.

1.3.3 *Beetle Fungal Farming:*

About 3400 of the 7500 species in the weevil subfamily Scolytinae make up Ambrosia beetles. Although certain types are especially specialized in colonizing piths, big seeds, fruit and leaf petioles, most ambrosia beetles build tunnel networks in tissue of the plants. The word ambrosia refers to fungus grown by beetles on gallery walls, where they eat as a sole or almost exclusive source of sustenance. The beetles rely on the fungus from which vital vitamins, amino acids and sterols are obtained.

In Xyleborini, a huge monophyletic tribe of about 1300 species, the most sophisticated fungivores are among the ambrosia beetles. We concentrate mainly on this group of ambrosian beetles in our review. While the lives of the Xyleborini vary widely, most have a number of fungal features. In the Xyleborini, there is a gendered division of labor; only women do horticultural chores, while men are short-lived and flightless. After mating, women scatter to the new host substratum and carry the fungus in specific pockets called mycangia. Once inside a new host, founders lay eggs and tender the resultant garden and brood on the walls of the dug tunnels. They are able to regulate the development of the fungal crop and, in some cases, the composition of its various fungal species, in ways not completely understood. If the woman dies, the garden is soon overtaken by polluting fungus and bacteria, leading to the death of the brood[8].

The ambrosian xyleborin beetle gardens are not, as previously thought, pure monocultures, but are usually made up of a mixture of mycelial fungi, yeasts and bacteria. These combinations were called multi-species complex academics, who proposed that the beetles can utilize weak substrate such as wood rather than any particular microorganism, as a whole. However, majority of the studies that followed showed that one "principal" fungus always prevails in kite gardens. Moreover, beetles usually only contain the main *Mycangium* fungus, and the cultivation effort of the female beetles tends to prefer the primary fungus that gives the most nutritional advantage. Some auxiliary fungus also assists the growth of beetles, although their survival alone is frequently severely decreased. The main fungus as the intended crop is affected by these findings while secondary fungi, yes and bacteria are contaminated by "weeds" or may be furthermore used in the gardens, alongside the predicted function of auxiliary bacteria and Yeasts in attine gardens.

1.4 Insect Agriculture Evolutionary Origins:

Phylogenetic analyses show nine distinct insect farming origins. In Amezzo, fungal production occurred just once, presumably in the rainforest of the Amazon. In termites' fungal production also had a single genesis, in the African rainforest about Mya. In ambrosian beets, however, farming occurred seven times independently from Mya, six times in different nonxyleborin lines, and once in the Xyle-Borini ancestor around Mya. While macrotermitin and xyleborin common ancestors each domesticated a single, unique major cultivar clade to which their offspring have adhered throughout all subsequent development, attine ants have connections with numerous, independently domesticated crop lines. Interestingly, there are no documented instances of reversals in the nine agricultural insect lines from agricultural to non-agriculture, which suggests that the shift to fungal production is a dramatic, potentially permanent transformation that is very restrictive to future development.

For the autonomous development of insect agriculture, two major models have been proposed, the 'consumption first' vs the 'transmission first' models. In the first model of consumption, an insect lines start incorporating fungus into their more generalist diet, then become specialized fungi, and ultimately develop adaptations to grow fungi. In the first type of transmission, the insect lines begin to associate with a fungus as a carrier for the fungus and then nourishment is derived from it and then ultimately becomes a fungal cultivator. A third option is the development of an insect pulsation association, because the insects initially utilize fungus as a source of antibiotic substances, such as *Reticulitermes speratus*, which derives antibiotic protection against mixed-egg piles of fungal sclerotics. Finally, insect-associated fungi may undergo even more complex evolutionary processes from the exploitation of a pre-existing insect-pilon connection by one insect lineage in a common nest habitat. When these fungi adapted to insects are encountered. The evolutionary connections between beetle and ant fungi, however, are not supported in the latter theory and inconsistent with the estimated times of genesis of such insect fungal partnerships.

It is unknown for attine ants whether agriculture originated from a condition of ancestral fungal, antibiotic acquisition or fungal vectoring. The termite agriculture most probably came from the first consumption path, since many non-farming termed species seek and feed on fungal-infested wood, which indicates that non-farming predecessors of the farming termites may also have feed on fungi. Even before the formation of fungi, the non-agricultural ancestors of fungal beetles seem to have linked them, since many of their more primitive nongardening scolytines are fungal

vectors without any apparent reliance on their fungal companions. This indicates that the fungi are not nutritionally dependent on the roots of fungal production in the different lines of the ambrosia beetle. However, a lot of non-ambrosian scolytines carry in mycangias fungus and feed on ungardened mycelium like larvae which colonize host plants and feed as new adults on spore layers which line the pupal panes. Some of the seven agricultural origins in beetles therefore seem to have been following the first path of transmission, while others followed the first route of consumption[9].

Insect farming is confined to growing of fungus instead of plants, predominant in human farming. While it is true that certain insects are specialized in host plants which they defend from other herbivores, none of them have all four agricultural components mentioned above. One may question whether circumstances led insects to develop fungal instead of plant farming. Indeed, fungal agriculture has many benefits over plant farming, and plant features may even prohibit simple cultivation. Firstly, unlike fungus, plants usually have strict light and space needs, excluding them in underground or otherwise confined nests of insects from cultivation. Such nesting behaviors may promote fungal growth via the protection of food crops from undesirable consumers and wind-dispersed pathogens. In addition, fungus may be kept continuously in a non-sexual mycelial form, which provides a more constant food supply, as opposed to plants, which typically need frequent pollination for long-term culture. Thus, although seeds and plants may be collected easily, fungi are probably more cultivable, which explains the prevalence of fungal rather than plant agriculture among insects.

Ant, termite, and the vast majority of beetle agriculturists are gregarious creatures. Each and every one of the ants and termites is eusocial, as shown by the distribution of reproductive labor among workers, cooperative brood care, and generational overlap. In the known ambrosia beetle world, only one species is considered eusocial; the others are sub-social, in which a single female is responsible for her brood, or communal, in which multiple fertile females work together to care for their broods and garden. Sociality may have aided in the development of agriculture because of the natural benefit that agriculture has in the division of labor, which allows for the partitioning of agricultural duties and the enhancement of agricultural efficiency, which is advantageous to agriculture[10].

Farmers of ants and termites, for example, divide their agricultural tasks into a series of conveyor-belt-like stages that are divided among different worker castes, each of which is specialized in a single main task: foraging; processing and cleaning substrate before incorporation into the garden; planting mycelium onto new substrate; monitoring and weeding of the garden; or disposal of diseased or senescent garden. Because of the logistical challenges associated with researching beetle behaviour in their hidden tunnels, task partitioning has not been studied in ambrosia beetles too far. Task partitioning is expected to improve efficiency in a variety of situations, including protection against nest and garden thieves, disease monitoring in gardens, and modifying optimum growing conditions for crops.

2. DISCUSSION

The development of clonal monocultures over an extended period of time is perhaps the most remarkable characteristic of insect agriculture. Monoculture increases agricultural efficiency through economies of scale, and clonality preserves the desirable properties of the crop by preventing sexual recombination. However, these advantages come at a cost of two things: one is

the loss of genetic diversity, and the other is the loss of genetic diversity. Due to reduced genetic diversity in the crop, there is an increased susceptibility to the rapid spread of disease mutations, as well as a decreased resistance to fast-evolving diseases as a result of this increased vulnerability. Human and insect farmers are also subject to these economic trade-offs.

Instead of a single, “magic bullet” strategy, the insect farmers' solution to the monoculture-disease problem appears to be a combination of several strategies, including (a) crop sequestration, (b) intensive monitoring of crops for diseases, (c) access to a population-level reservoir of crop genetic variability, and (d) management of disease-suppressive fungi. Large-scale crop sequestration is the least practical of these techniques in human agriculture because human foods need exposure to sunlight and because greenhouse farming is prohibitively expensive in comparison to other methods. It is possible for some crops (for example, in greenhouse environments) to conduct intensive (e.g., daily) disease monitoring of every single crop plant; however, hourly monitoring of the kind carried out in insect agriculture appears to be prohibitively expensive for human agriculture as a whole, according to the authors.

Designing human agricultural systems that more effectively take use of microbial consortia that are known to have positive roles in crop nutrient absorption and disease resistance is a new strategy that is now being pursued. Microbes in the rhizosphere have long been recognized as important partners in the production of some crops and trees. Recent research has shown the existence of disease-suppressant bacteria that reside on the root exudates of crops and generate antibiotics that defend the crop against infections. Microorganisms from the phyllosphere and endophytic microbes have both been shown to have disease-suppressive effects on agricultural plants in studies. Research on rhizosphere, phyllosphere, and endophyte microorganisms of human crops is a relatively young area, and there are still many helpful microbes to be found and put to use in the agricultural sector in general.

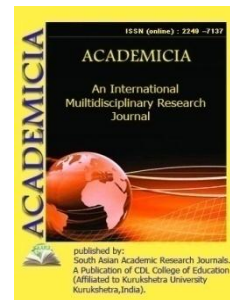
3. CONCLUSION

Perhaps it is through methods like these that humans can gain the greatest insight from insect farmers, especially if disease-suppressant microorganisms are ever to be introduced into human agriculture. When developing these strategies, agriculturists should keep in mind that current human crops were not necessarily selected for their abilities to interact with auxiliary microbes during the domestication process, i.e., the alleles in the wild ancestors that were optimally mediating such interactions may have been lost during the domestication process. It is possible that studying the microbial consortia associated with the wild populations from which the ancestors of human-domesticated crops were initially originated would be necessary to conduct a thorough assessment of the potential applications of auxiliary microorganisms in agriculture. This kind of domestication within the context of coevolving microbial consortia may very well be the main factor explaining the insect farmers' 50-million-year-old agricultural success.

REFERENCES

1. J. D. Evans *et al.*, “The i5K initiative: Advancing arthropod genomics for knowledge, human health, agriculture, and the environment,” *Journal of Heredity*. 2013, doi: 10.1093/jhered/est050.
2. E. Crotti *et al.*, “Microbial symbionts: A resource for the management of insect-related problems,” *Microbial Biotechnology*. 2012, doi: 10.1111/j.1751-7915.2011.00312.x.

3. A. Papanicolaou *et al.*, “The whole genome sequence of the Mediterranean fruit fly, *Ceratitis capitata* (Wiedemann), reveals insights into the biology and adaptive evolution of a highly invasive pest species,” *Genome Biol.*, 2016, doi: 10.1186/s13059-016-1049-2.
4. D. Vanderpool, R. R. Bracewell, and J. P. McCutcheon, “Know your farmer: Ancient origins and multiple independent domestications of ambrosia beetle fungal cultivars,” *Mol. Ecol.*, 2018, doi: 10.1111/mec.14394.
5. J. Gowdy and L. Krall, “The economic origins of ultrasociality,” *Behavioral and Brain Sciences*. 2015, doi: 10.1017/S0140525X1500059X.
6. A. van der Meij, S. F. Worsley, M. I. Hutchings, and G. P. van Wezel, “Chemical ecology of antibiotic production by actinomycetes,” *FEMS Microbiology Reviews*. 2017, doi: 10.1093/femsre/fox005.
7. F. O. Aylward *et al.*, “Convergent bacterial microbiotas in the fungal agricultural systems of insects,” *MBio*, 2014, doi: 10.1128/mBio.02077-14.
8. A. R. I. Lindsey *et al.*, “Comparative genomics of the miniature wasp and pest control agent *Trichogramma pretiosum*,” *BMC Biol.*, 2018, doi: 10.1186/s12915-018-0520-9.
9. L. M. Boykin, C. D. Bell, G. Evans, I. Small, and P. J. De Barro, “Is agriculture driving the diversification of the *Bemisia tabaci* species complex (Hemiptera: Sternorrhyncha: Aleyrodidae)? Dating, diversification and biogeographic evidence revealed,” *BMC Evol. Biol.*, 2013, doi: 10.1186/1471-2148-13-228.
10. C. J. Jackson *et al.*, “Structure and function of an insect α -carboxylesterase (α esterase7) associated with insecticide resistance,” *Proc. Natl. Acad. Sci. U. S. A.*, 2013, doi: 10.1073/pnas.1304097110.



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LEXOCO-SEMANTIC CHARACTERISTICS OF THE ADJECTIVE IN ITALIAN

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ABSTRACT

The structural and semantic criterion of differentiation of qualitative and relative adjectives in Italian is considered. It is argued that relative adjectives are derived from other words, which they are motivated by, whereas qualitative adjectives are primitive in the form of expression and polysemous in the language system.

KEYWORDS: *Semantic Criterion, Subject Attribute, Native Adjective, Modal Features, Motivation, Semantic Derivation.*

INTRODUCTION

An adjective is a linguistic category that serves to characterize objects and phenomena of reality and is associated with the anthropocentric paradigm in linguistics. An adjective, characterizing a noun, is "attached" to it and in some languages acquires its grammatical features, for example, gender and number in Russian, German and Romance languages. In other languages, for example, English, the adjective remains free from this agreement with the noun. At the same time, in both cases, the adjective, unlike the noun, does not have its own denotation. By characterizing a thing, an adjective informatively enriches a noun with its semantic or evaluative feature defined by the subject in relation to the object, subject, his actions or their description.

Based on the semantic criterion in Italian, different lexical and semantic groups of adjectives can be distinguished: adjectives of the form (rotondo - round, quadrato - square), colors (rosso - red, pego - black), parametric adjectives (basso - low, alto - high). A significant group is represented by evaluative adjectives (buono - good, malo - bad, intelligente - smart, stupido - stupid), they also include adjectives denoting the physical and mental properties of people or animals (vigiloso - strong, debole - weak, malato - painful, nervoso - nervous).

In this study, we will focus on two groups of adjectives: qualitative and relative, which have an evaluative character and assume an anthropocentric approach to the study of this lexical and grammatical category.

Qualitative adjectives denote the signs of objects and events inherent in the things themselves, including the properties of objects perceived by the senses: color, space, physical properties. And in this regard, qualitative adjectives are considered primitive in the form of expression, primary and at the same time complex in their content, since they are initially characterized by ambiguity. That is why the denotative component of the meaning of qualitative adjectives is leveled, tends to zero. For example, any object and any phenomenon can be beautiful: a person, a flower, a sunrise, a river, a forest. In other words, qualitative adjectives, characterizing the internal properties of objects, can also be comprehended in abstraction from the objects themselves. At the same time, in addition to the cognitive and semantic component of a qualitative adjective expressing the main feature of beauty, there is also its subjective assessment.

Qualitative adjectives are extremely diverse in semantic features. As we have already noted earlier, the denotative block of information of a polysemous word is associated with a typical image, and, consequently, its semantic space, growing out of the basic archetypal or prototypical meaning, is able to acquire a number of other meanings [2]. Such semantic features of the main meanings of the adjectives we study include adjectives with the meaning of a sign of shape, size, property, color, taste, smell, etc.

For example, the adjective *diritto* (direct) indicates the primary sign of the form.

In Italian, the adjective *diritto* has the following meanings: 1) straight in the form of a line (*via dritta* - a straight path); 2) straight, honest, fair (*rigare/filare diritto* - behave flawlessly); 3) right; 4) dexterous, resourceful; 5) literal (about the meaning of the word).

In Russian, the adjective *direct* has no meaning: 1) прямой по линии; 2) без сутулости, 3) имеющий поступательное направление; 4) осуществляемый без промежуточных этапов; 5) буквальный (о значении слова); 6) правдивый, откровенный, нелицемерный; 7) подлинный, настоящий, неподдельный.

Let's compare the meaningful volume of adjectives with the denotative value of the *stretto* (narrow) size.

In Italian: 1) narrow, tight (*scarpe strette* - narrow shoes), 2) compressed (*pugni stretti* - clenched fists), 3) strict, precise (*regola stretta* - strict rule), 4) urgent, urgent (*lo stretto necessario* - the most necessary), 5) close (*parente stretto* - close relative), 6) phonetic term *vocale stretta* "closed vowel".

In Russian: 1) небольшой по ширине; 2) тесный (об одежде, обуви и т. п.); 3) ограниченный; 4) лишенный широты взглядов, кругозора; 5) лингвистический термин узкий гласный звук.

Consider adjectives with a denotative property value using the example of *fragile*.

In Italian: 1) fragile, brittle (*merce fragile* - fragile goods), 2) weak, fragile (*salute fragile* - poor health), 3) weak, malleable (*la fragile natura umana* - weak human nature), 4) short-lived (*una fragile speranza* - weak hope).

In Russian: 1) ломкий; 2) недолговечный. 3) требующий бережного обращения; 4) нежный, изящный; 5) болезненный, слабый.

Unlike qualitative adjectives, relative adjectives express qualities and properties by indicating a relation to another subject.

Recall the semantic characteristic of a relative adjective given by E.M. Wolf: "the relation established between an object (or feature) and another object whose feature is indicated by an adjective" [3. p. 397]. A similar definition is found in the Italian linguist Marcello Marinucci: "Gli aggettivi di relazione non designano qualità, bensì esprimono la relazione che intercorre tra il nome a cui si riferiscono e il nome da cui derivano: popolo italiano, cucina francese, unione europea" (Relative adjectives do not mean qualities, but rather express the relationship that is introduced between the name, to which they belong and the name from which they are produced: Italian people, French cuisine, the European Union, etc.) [5. p. 111].

Indeed, the distinguishing feature between the meanings of qualitative and relative adjectives is the introduction of the following predicates for the definition of relative adjectives: "consisting of" or "made of", "similar to" or "related to", etc. Yu. D. Apresyan described in sufficient detail such types of relative adjectives in models of regular polysemy: 1) being X (military operations), 2) containing X (gold sand), 3) made of X (gold ring), 4) causing X (gold mine)..., 7) intended for X (military operation) [1. pp. 509-523].

M. Marinucci also gives a detailed description of relative adjectives, considering the types of relations between a noun and an adjective derived from it. This is a relation with the meaning of the territory: *zona periferica* (peripheral zone), *via centrale* (central street); the relationship between object and matter: *statua marmorea* (marble statue), *scultura lignea* (wooden sculpture)-, the relationship between the disease and the diseased organ *enfisema polmonare* (emphysema of the lungs or pulmonary)-, the relationship between the action and the organ that is subjected to it: *trapianto cardiaco* (heart transplant)-, the relationship between the individual and the institution: *studente liceale, universitario* (student of the lyceum, university) [5. p. 111].

As we can see, relative adjectives characterize objects and phenomena through a network of relationships and connections with objects of the real world. That is why relative adjectives are based on their motivation by other units of the language, that is why they are semantically, morphologically and syntactically derived, that is why they can be structurally and/or semantically segmented.

Thus, the differentiation of qualitative and relative adjectives is based on a certain difference in the semantic essence of each of the categories. Qualitative adjectives are most often native adjectives, characterizing, and relative adjectives are derived and specifying in content. And this is typical of both Russian and Italian adjectives.

In conclusion, we note that the semantic boundary between qualitative and relative adjectives is not always clearly expressed, because both tend to acquire each other's meanings. So, qualitative adjectives develop relative signs of meaning, for example, a deaf consonant, thumb, high fashion. And, accordingly, relative adjectives are able to acquire qualitative signs of meaning: a heart of stone, nerves of steel, a disservice. The similarity in meaning of qualitative and relative adjectives is explained by the fact that behind this class of words there is a single, fundamentally

indivisible concept of "quality", various conceptual features of which are reflected in the semantics of both qualitative and relative adjectives.

LIST OF LITERATURE:

1. Apresyan, Yu.D. On regular polysemy / Yu. D. Apresyan // Izvestiya AN SSSR. Department of Literature and Language. - T. XXX, no. 6. - M., 1971. - S. 509-523.
2. Wolf, E.M. Grammar and semantics of the adjective. On the material of the Ibero-Romance languages / E. M. Wolf. - M., 1978.
3. Wolf, E.M. Adjective / EM Wolf // Linguistics. Big Encyclopedic Dictionary / Ch. ed. V.N. Yartseva. - M.: Big Ros. encycl., 1998. - S. 397-398.
4. Popova, N.B. Conceptual representation of the semantic space of a polysemantic word / N.B. Popova // Vestn. Chelyab. state un-that. - 2011. - No. 10 (225). - S. 114-117.
5. Marinuci, M. L'aggettivo // M. Marinuci. La lingua italiana. Grammatica. – Torino: Edizioni Scolastiche, 2000. – P. 110-150.
6. Hoepli: Grande dizionario italiano di Aldo Gabrielli [Testo con CD-ROM per Windows]. – Milano, 2008. – 2799 p.



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PROFESSIONAL SOCIALIZATION OF YOUTH AS A PEDAGOGICAL PROBLEM

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ABSTRACT

The article discusses the problem of developing the foundations of the system of professional socialization of young people, presents the stages of professional-role socialization, and indicates the pedagogical and organizational actions of educational, scientific and industrial institutions aimed at solving the problems of continuous professional socialization of the individual.

KEYWORDS: *socialization, professional socialization, professional orientation, professional choice, consolidation of professional choice.*

INTRODUCTION

Currently, our country is developing in the context of the process of globalization, the essence of which researchers in this field define as the transformation of the world into a single whole, a complex of cross-border interactions between individuals, enterprises, institutions and markets, which manifests itself in the expansion of flows of goods, technologies and financial resources. , In the steady growth and strengthening of the influence of international institutions, in a significant expansion of the scale of communication and information exchanges.

The globalization process is accompanied by a number of negative trends:

- The loss of the identity of states;
- The political and economic influence of transnational corporations dictating their will to entire states and peoples;
- The toughening of the division of countries into leading and led in economic, political and cultural relations.

Educators should be aware of this and consider the negative impact that the process of globalization can have on the formation of students in the process of their socialization:

- Loss of identity of the individual, sense of citizenship and patriotism towards their homeland;
- The introduction of negative trends in the culture of relationships: aggressiveness and violence as a means of defending their interests;
- The cult of profit and enrichment in any way, etc.

Analysis of the new socio-economic conditions indicates the need to return the issues of upbringing and socialization of the younger generation to the circle of state priorities at all levels of education. However, in the absence of a national idea, amorphousness of goals, abstractness of value orientations, ideological vacuum in the context of the transformation of Uzbek society, destabilization of the economy and falling living standards of most of the population, the development of a new paradigm for educating young people is very problematic.

In these conditions, the way out consists in concentrating the attention of pedagogical science and practice on the social and professional formation and development of the younger generation, on the connection between the formation of socially significant personal qualities of young people with their professional training.

This idea was clearly reflected in the Concept of Modernization of Uzbek Education, which defines the strategic goals of vocational training of young people as follows: "The main goal of vocational education - preparation of a qualified employee of the appropriate level and profile, competitive in the labor market, competent, responsible, fluent in his profession and oriented in related fields of activity, capable of effective work in the specialty at the level of world standards, ready for continuous professional growth, social and professional mobility; satisfaction of the needs of the individual in obtaining appropriate education. Solving the problem of radically improving the system of vocational education, the quality of training of employees in close connection with the development of fundamental and applied science is of decisive importance for the future of the country" [1].

The achievement of this goal is closely connected with the creation of conditions for the socialization and professional and personal formation of students, consisting in the development of personality in the process of obtaining general education and ensuring its readiness for competent professional activity. At the same time, a very important psychological and pedagogical aspect is the optimal ratio of personal, social and professional development of future specialists.

In this regard, there is a problem of developing the basics of the system of professional socialization of young people.

A.V. Mudrik reveals the essence of socialization as follows: "Socialization is the development of a person throughout his life in interaction with the environment in the process of assimilation of social norms and cultural values, as well as self-development and self-realization in the society to which he belongs" [4, 15].

Socialization, formation and development of personality includes three interrelated processes: general socialization, professional role socialization (mastery of professional role functions,

norms, relationships), professionalization (a certain degree of mastery of professional activity, specialty, professional skill).

Some researchers attribute general socialization to the primary socialization that an individual undergoes in childhood and as a result becomes a member of society. Secondary socialization consists in the fact that an already socialized individual is included in new sectors of the objective world, in this regard, secondary socialization acts as "the acquisition of specific role-based knowledge when roles are directly or indirectly related to the division of labor" [4].

In this regard, in solving the question of a person's own place in society, the value attitude of young people to choosing and obtaining a profession is extremely important. For a person can determine and assert his place and role in the transformation of society only through his work related to a particular specialty. Professionalism is a stage of socialization, which is a continuation of professional role-based socialization. It is the result of mastering a certain skill and professionalism in practical activities. For a particular person, a profession is a socially fixed area of his possible labor actions, a source of existence and a means of personal self-realization.

Professional role-playing socialization is a time-stretched process that consists of the following stages:

- Vocational guidance on a wide range of employment of people and their professions;
- Formation of professional intentions;
- Choice of profession;
- Consolidation of professional choice;
- Active and conscious mastery of the profession;
- Productive creative labor activity in the acquired profession;
- Striving to expand their professional range through additional education;
- Setting to achieve a high level of professional excellence;
- Striving for promotion;
- Readiness to master a related profession;
- Active development of a new profession;
- Adaptation to a new profession in the event of a forced change of the previous one;
- Transfer of professional experience to colleagues and youth.

In the context of determining approaches to solving the problem formulated above, a number of difficulties that stand in its way should be noted. First of all, it should be noted that each of the above stages of professional socialization is a rather complex system, consisting of interrelated components, united by a common goal. For example, career guidance includes the following components:

- Professional education;
- Professional motivation, development of interests, inclinations of students for various types of activities;
- Professional advice;
- Professional diagnostics;
- Professional selection;
- Professional adaptation;
- Professional education, etc.

Another equally difficult factor standing in the way of developing a system of continuous professional socialization of the younger generation is that, for objective reasons, their implementation is called upon to be carried out not only by representatives of various levels of education (preschool, primary, secondary and higher), but also by various agents of socialization (parents, employees of various institutions, representatives of the media, etc.).

Among the factors complicating the solution of the problem, it should also be noted that the development of the theoretical foundations of the design and technology of the implementation of the above stages of the system of professional socialization of youth is conducted by teachers of various levels of education, representatives of different sciences (philosophy, sociology, cultural studies, psychology, didactics, economics, etc.) without sufficient mutual coordination.

The way out of the indicated and other difficulties in solving the problem, obviously, should be sought in a number of directions. First of all, on the basis of the achievements of the above and other sciences, it is necessary to determine the polytheoretical prerequisites and conceptual provisions, to design on their basis a system of professional socialization of young people. For experimental testing of the effectiveness of such a system, organize educational, scientific and production complexes, which include educational, scientific and industrial institutions of the microdistrict on the rights of autonomy, coordination and observance of the principle of unity and continuity of pedagogical and organizational actions. To carry out a coordinated implementation of the designed system and introduce its positive results into the practice of the region.

To begin the coordination of pedagogical actions, we will give a brief description of the directions before the labor professional socialization of young people, including the period of a person's life before the start of independent work in the profession. We hope that this characteristic will be the basis for coordinated actions of families, educators, enterprises and members of the public on the professional specialization of the younger generation.

Thus, the task of professional socialization of preschoolers consists in the labor education of children and familiarizing them with a wide variety of people's work activities related to the performance of physical work, the management of mechanisms and other actions understandable to them. During this period, children watch with interest the work of drivers of all types of transport, utility workers: electricians, plumbers, locksmiths, janitors, landscaping service workers, carpenters, painters, plasterers, etc. They are also interested in their parents' home classes. It is very important during this period to attract children to participate as much as

possible in the work of adults, the development of self-service skills. Professional socialization should also consist in organizing walks by parents or kindergarten teachers to a house under construction, a trolleybus depot, a river station, etc.

The main task of the primary school level in professional socialization is to instill in students' certain skills, a love of systematic academic work, reading books, and continuing their acquaintance with a wider range of professions. This is largely helped now by books. Schoolchildren are more widely acquainted with the work of people of intellectual labor. Now they observe the work of a teacher, have an idea of the work of a doctor, are interested in the content of the specialty of parents. During this period, parents need to take their children to their workplace, familiarize them with the work they are doing, with the content of the work of their colleagues. The professional and social work of the class teacher with students should be carried out in the form of small excursions to objects where you can introduce them to a wide variety of working and agricultural professions. It is useful to conduct during this period an excursion to the post office, telegraph office, printing house, machine repair shop, bakery, farm, working tractor, combine harvester, fruit and vegetable farming. Labor education in the family and school during this period should develop along the line of further improvement of self-service skills, participation in work at the school experimental site, in the garden, vegetable garden, in the collection of secondary raw materials, etc.

In grades 5-7 of the school, it is necessary to expand extensive work on professional socialization, related to familiarizing schoolchildren with all the variety of professions in service types of work (salesman, cook, tailor, waiter), workers of mass professions in industrial and agricultural enterprises: locksmith, turner, welder, electrician, builder, installer, field breeder, gardener, animal breeder, machine operator, engineer and technician. This work should be carried out by organizing excursions to various local enterprises: factories, construction sites, nearby cooperative enterprises, by inviting people to work lessons, in the process of holding meetings with specialists of various professions, entrepreneurs.

It should be borne in mind that the choice of profession at this time is significantly influenced by the nature of the work of parents, their attitude to their official duties, the degree of dedication of children to the content of their work.

In adolescence (grades 8-9), it is necessary to help students determine their future professional activity in a fairly specific direction based on the individual characteristics and abilities of students. After all, by the end of the ninth grade, a student must decide on the form of further education: whether to continue his education in secondary school, whether to enroll in a technical school or college, whether to go to work and continue studying in evening school. Since the question of choosing a profession at this time is moving from a theoretical to a practical plan, it is very important to organize pre-professional training in these two years so that students do not have mistaken in choosing their future life path. But just by this time, when students get acquainted with a wide range of specialties, they are experiencing significant difficulties in finally choosing their path, since they are already familiar with cases of young people's disappointment in choosing a profession.

During the period of study in grades 10-11, it is necessary to help high school students determine their final professional choice based on their individual abilities.

The teacher knows the abilities of his students better, and it is easier for him to help them develop and improve these abilities. To help one student choose the direction of specialized training, enroll in a radio engineering circle, instruct another to write an essay on a topic closely related to the specialty, a third to choose a book corresponding to his inclinations, etc. Of extremely great importance in determining the vocation, the touchstones of a well-chosen direction of study are school electives. It would be advisable to organize in schools not only electives in theoretical disciplines, but also to introduce technical and technological electives in working professions and specialties of service work. University collectives are called upon to provide great assistance to schools at this time. In the experience of the Samarkand region universities, such active forms of professional socialization of high school students as the organization of schools for young mathematicians, chemists, physicists, technicians, philologists, journalists, actors have justified themselves.

Open days at universities in individual profile departments and specialties have become very popular. Along with this, teachers and university students conduct conversations about specialties at school evenings, classroom meetings.

A particularly effective role in the professional socialization of high school students is played by traditional evenings of meeting school graduates with their pets. Many universities send special student propaganda teams to rural areas during the summer holidays to conduct vocational orientation and social work among rural youth. A lot of work in this direction is carried out during the summer holidays by fighters of student construction teams. With their work in construction, they show young people examples of a creative attitude to work.

The efforts of pedagogical collectives of professional educational institutions should be aimed at ensuring the professional stability of students, at actively mastering the profession they receive, at ensuring the creative return of young specialists from the first days of their independent production activity.

For further professional socialization, the collectives of industrial institutions are called upon to create conditions for the creative self-development of young professionals, to support them in achieving professional skills and subsequent professionalization.

THE LIST OF USED LITERATURE:

1. Ўзбекистон Республикасининг Қонуни "Таълим Тўғрисида" от 23.09.2020 № 637 // Lex.uz. 2020 г.
2. Ўзбекистон Республикасининг Қонуни "Ёшларга оид давлат сиёсати тўғрисида" от 14.09.2016 № 406 // Lex.uz. 2016 г.
3. Besedina I. Formirovanie social'noj kompetentnosti. <http://www.elitarium.ru/>
4. Mudrik, A.V. Social'naya pedagogika: ucheb. dlya stud. ped. vuzov / pod red. V.A. Slastenina. - M.: Akademiya, 1999. - 184 s.
5. Koncepciya modernizacii rossijskogo obrazovaniya na period do 2010 g.: Rasporyazhenie Pravitel'stva RF № 1756-R ot 29 dekabrya 2001 g. // Oficial'nye dokumenty v obrazovanii. - 2002. - № 4. - S. 3-31.



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GENETICALLY DISTINCT CULTIVAR HYBRIDS FOR THE TREATMENT OF INSECT PESTS AND INCREASED AGRICULTURAL PRODUCTIVITY

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ABSTRACT

Modern farming enables the easy migration of insect pests and illnesses from plant to plant, devastating cropping regions. According to the resistance and the theory of the adversary, increasing diversity of plants lowers quantity of plagues and damage. The growing diversity of plant species may improve the management of insects through bottom-up and top-down mechanisms, based on considerable study. Despite this support, logistical and financial constraints have precluded broad adoption of pesticide management and techniques for diversification of output. Intraspecific genetic diversity has been shown in both fundamental and practical research to enhance ecosystem stability and function. Planting cultivar mixtures may be a more viable way of enhancing genotypical variety of plants. Our aim is to combine data supporting intraspecific variation in order to achieve a viable pest management strategy for field insect pests. We have found important evidence that genotypical variety improved the fitness and productivity of plants in both wild and agricultural settings. Intra-specific variation may, according to many lines of research, assist to improve insect pest control. Empirical data or practical techniques of application in agricultural systems are seldom found. Limited usage of this method, therefore. Intraspecific varieties of plants enhance plant performance by decreasing pest population and promoting niche division. Further research is required to reduce the use of pesticides and increase production. Intraspecific crop diversity with low costs or changes to production may be introduced. Intraspecific diversity has been a popular and sustainable management approach because of the benefits of biodiversity for yield stability.

KEYWORDS: Agriculture, Cultivar, Genotypical, IPM, Pest Management.

1. INTRODUCTION

Many integrated pest management (IPM) academics and practitioners have aimed at developing sustainable management programmes that are more robust and less dependent on synthetic pesticides. Agricultural systems typically concentrate on sustainable insect pest management programmes utilizing crop types that are more tolerant to or resistant to pest attacks and methods to agriculture which enhance their natural enemies' efficacy in reducing pest populations. Various plant species combinations have been investigated, whether in agricultural fields or adjacent non-crop regions, in order to enhance both their impacts on bottom up and top down in crop fields. However, while there is potential to enhance the control of plagues, pest management techniques based on harnessing the diversity of plants, such as non-crop plants at field boundaries or intercrops within fields, are not commonly used by conventional farmers in developed countries because the mechanical production is costly, time consuming or logistically challenging. Given these constraints, an IPM strategy must be developed which increases the variety and the structural complexity of agro-ecosystems, but which does not demand exceptional changes in agricultural or monetary investment practices on the part of farmers[1].

An emerging corpus of natural system literature has shown that genotypic variety may play a significant part in the structure and fitness of arthropod populations. Fewer study has been done in agricultural environments to demonstrate, despite claims made to the contrary, the impact of intraspecific variation on pest control. However, many lines of research indicate that increasing genotypical variety in agricultural fields may significantly enhance the management of insect pests and crop outcomes in an economically and ecologically sustainable way. Our aim was to examine the literature on natural and agricultural systems within the framework of a conceptual framework which shows the many ways under which plant growth and output may improve on intraspecific or genotypical variation. We define 'genotypic diversity' as genetic variance across species variations and regard 'genetic diversity' as a population assessment of variation or associations within a variety. Although both words are interchangeable, we concentrate on the former[2].

1.1 Background:

In the United States and globally, the vast majority of agricultural fields are planted with single genetic variants. In the past, every plant in a field is almost genetically the same as its neighbor. These cultivars feature consistent agricultural characteristics, such as height, germination, period of development, seeds and protein content, so as to simplify agriculture logistics and optimize output. However, low genetic variability is a responsibility which leaves agricultural fields susceptible to insect invasion and breakdown. If all plants in a field are vulnerable to the same plague species, the plague populations expand quickly, once they enter a field. For example, when insect pests like the Mayetiola destructor hessian fly Say defeat resistant cultivars, agricultural fields may rapidly be devastated. In other instances, just one insect or disease may be resisted or resisted by the plants. The greatest crop production is thus obtained with frequent use of pesticide, which has detrimental impacts on non-target species and human and environmental health. To decrease the intensity of pests and insecticides, alternatives to single species/genotype planting are necessary[3].

As well as being less resistant to pest attacks, monotypic plant fields are particularly prone to spoilage due to a lack of natural enemies and biological control services. In general, monocrops

are less natural enemies than polycrops (or crops in non-crop plants), where the outbreaks of pests are rare. A shortage of overwintering sites implies that every year natural enemies have to invade agricultural fields to give pests a head start. In addition, agricultural areas are frequently poorly settled by natural enemies due to the absence of food from plants and prey, and other resources, such as suitable microclimates and oviposition. In addition, artificial selection for certain features has affected tritrophic interactions in some plant species, such that natural enemies cannot contribute to herbivorous control of agricultural variety as effectively as in the case of wild cousins. In conclusion, management activities such as the usage, cultivation and harvesting of pesticides further disrupt natural adverse populations in agricultural fields[4].

1.2 Associate Diversity:

A great deal of study has focused on the advantages of plant variety and its impact on insect diversity and herbivorous control. Our objective is not to examine this amount of research, but we will emphasize a few points on the advantages and difficulties of plant variety and the management of plagues. Firstly, species mixes or polycultures may adversely affect arthropod pests by limiting their capacity to search for preferred host plants, which means that they cannot simply migrate from host to host, delaying their propagation across agricultural areas. Second, increasing diversity in either cropland, adjacent crop areas or regional improvements through landscape scales can also enhance top-down control by providing floral resources, alternative prey and suitable microclimates to enhance enemy natural fitness, abundance, diversity and spring habitat. Third, despite the advantage of substantial pest control associated with some of the diversification methods, efficacy seems to be uneven and context-dependent. Fourthly, it should be noted that growing variety of plant species frequently involves significant logistical and/or economic difficulties. For example, producing more than one crop in one single field is not feasible with current agricultural equipment and diversification via non-crop areas may cut down on productive acreage. For example, with dubious economic advantages and considerable difficulties, farmers seldom adopt methods to enhance plant variety for better pest management[5].

1.3 Benefits of Genotypical Diversity:

A method to enhancing variety in agricultural systems that is more feasible and encouraged is to enhance genotypical diversity of plants within species. This strategy goes against large-scale monotypic crops dominating agriculture. But fundamental evolutionary theory implies that intra-specific variation is of tremendous importance. After all, genetic diversity is the foundation of natural selection and, without this selection, populations risk extinction since they cannot withstand the range of problems they encounter in their environment. In addition, it is evident that a lack of genetic diversity may lead to certain undesirable populations-level occurrences, such as inbreeding and bottlenecks. Maybe it is thus not unexpected that a growing corpus of empirical research in both animals and plants show the benefit of greater intraspecific variety.

For years, it has been known that intra-specific variety offers flexibility for populations in a number of situations to thrive. However, a recent collection of research has shown that genotypical diversity has an emerging impact on system productivity and resilience. Colonies formed by multiplying Queens of honeybees, for example, are much more productive than colonies produced by single-paired queens (more waggle dances, higher rates of drinking, foragers using further food sources). Similar autotrophic effects were observed. Genotypically

different mixes of the *Chlamydo-reinhardtii* Dangeard algae grew 10% higher than genetic monocultures of the same species in laboratory experiments. The pots planted with *Arabidopsis thaliana* (L.) genetic mixes were 17 percent more prolific than the monocultures under semi-natural circumstances. Boosted levels of intraspecific variation in field plots have also increased production of *Solidago altissima* L's above-ground biomass by 36%. In these instances of higher plant production, geno-typically diverse plants may use more of the available resources than monocults, possibly owing to the complementarity of varieties. Importantly, recent study has shown that genotype diversity's impact on primary output may be comparable to that of plant variety. The mechanism(s) underlying comparable effects of plant species and genotypic diversity are yet to be understood, although arthropods seem to be one of the contributing elements[6].

In addition, genotypically different groups are known to withstand diseases better. This is because a wider variety of genotypes in different populations will have decreased infections susceptibility. Diseases will therefore not spread so readily throughout the community. This enhanced disease resistance has been shown experimentally for a variety of species, including vertebrates (e.g. frogs), invertebrates (e.g. honeybees), and plants (e.g. willow).

A growing literature also shows that intrinsic variety in natural plant systems may have a significant impact on arthropod populations and herbivory, frequently spreading to plant production. Similar to the impacts of plant diversity, genotypical variety plays a significant role in structuring insect populations and generating many trophic level environmental interactions. In fact, some of the work has even led to conclusions that 'plant genotype can be one of the most important ecological factors in the formation of tritrophic groups' and that plant genotypic diverse influences arthropod communities, including natural enemy species, mostly in relation to soil microbes, fungi and the plants. For example, a genotypically diverse seedling of willow has suffered up to 50 percent less leaf beetles damage than willow monocultures as beetles are preferably grown in patches of more appropriate hosts (e.g. hypothesis for resource concentration) and have difficulty finding palatable willow varieties when grown in mixtures.

Likewise, two US-born plant species study has shown that genotypic plant variety may also lead to fewer herbivories, albeit via another method. In such instances, the increasing phenotypic variety linked to rising levels of genotypic diversity has improved the diversity of arthropods, particularly those of natural enemies that restrict herbivorous insect populations, leading to increased production of superficial biomass. Genotypic variation may significantly influence the quantity and conduct of the natural enemy. These effects are often caused by phenotypic variety which follows genotypic variation and may affect the number of natural enemies even in the case of identical herbivore populations. Examples of genotypic variety encourage huge populations of insect herbivores. Caterpillars that fed on *Arabidopsis* genotypically different plants produced a total biomass 19% higher than monoculture-grown caterpillars. Although it has not been clearly examined the mechanism driving high caterpillar biomass, a combination of food products with different nutritional quality may enhance caterpillar development rates. Similarly, several *S. altissima* plots enhanced the growth rate for the aphid population in comparison to monotypical plots. In this research, aphids migrated from highly populated, fewer resistant genotypes to less populated and more resistant genotypes where population growth may rise, thereby contributing to the findings among other processes of aphid migration between high and low-competitive hosts.

Research has shown that increasing genotypical variety in plant communities improves resilience to abiotic stress and stochastic events like higher temperatures or disturbances, along with bottom up and top down impacts on herbivorous abundance or plant health. Eelgrass biomass, for example, rose by as much as 30 percent in the face of severe temperatures, while planting variety expanded from one to six genotypes. This indicates that, in the face of abiotic stress, more genotypically varied populations may retain their production rather than monoculture. Genetically different populations may also rebound from perturbation more rapidly, such as vertebrate pasture, and even better withstand invasion. In this latter instance, weed biomass was 32 percent lower in *S. altissimago*-types, as a result of a combination of genotype diversity and identity effects, than in monotypical plots. This data indicates that genotypically varied populations may be more stable and robust to increasing stress, as anticipated under many global climate change scenarios[7].

The different data shows strongly that increasing genotypical variety in a broad range of systems may improve productivity and resilience. While there is still much to learn about the role of genotypical diversity in ecological interactions and ecosystem functions, the current evidence is particularly attractive for agriculture, as productivity, herbivorous resistance and resistance to abiotic stress are essential features of sustainable crop production. In addition, genotypical diversity may be introduced with very modest modifications in farming technique. If the theoretical and empirical findings continue to confirm the significant impact of genotypical variety on plant production, a simple new approach to agriculture may revolutionize planting and agricultural productivity methods.

1.4 Treatment of Diseases:

Monoculture has been created to optimize the potential for development of better genotypes and genetic uniformity (e.g. seedling, maturity) is related to harvesting and processing, but genetic uniformity is also disadvantaged by the uniform susceptibility to pests. Uniformity-related vulnerability may be reduced by increasing the number of cultivars in fields in order to enhance genotypical variation. The resultant 'cultivar mixes' are described as mixtures of genotypes "which differ for various characteristics, including illnesses, yet have adequate resilience to growing together." "Cultivar mixtures" Almost 50% of Europe's wheat fields and tens of thousands of hectares of China's rice are cultivar mixes. In the USA, 18% of soft winter wheat planted in the state of Washington in 2000 and 7% of Kansas planted in 2001 were cultivar mixes. Typically, these blends are random blends of five cultivars that are susceptible to significant illnesses and produce over 30 per cent better than monocultures when disease occurs while yield is maintained, or even slightly improved when the disease is absent. Most importantly, mixture-related logistics, in especially in tiny grains where cultivar mixes were most popular, did not impede output[8].

1.5 Other Advantages of Agroecosystem Genotypical Diversity:

In order to enhance output and other agronomic advantages, additional ecological mechanisms are being developed in genotypically diverse plants, as well as arthropod and disease control. Increased levels of genotypic variety may lead to increased floral abundance and greater diversity and quantity of floral visitors, which might lead to increased genotypical diversity. Similar to plant communities with abundant species, geno-typically diversified plants are abler to withstand invasions by other plant species. The types of wheat vary considerably in their fight

against weeds and mixing varieties with different competitive capabilities may substantially enhance weed removal and production[9].

Genetically varied fields tend to provide modest but substantial improvements in production as a consequence of intergenotypic light, soil and water interactions. This yield advantage was calculated at 5.4% and 11% correspondingly for wheat and soybeans. This impact is due partly to the complementarity of farmers, which means that the mixture as a whole is able to utilize resources in the field better since cultivars operate slightly different microniches in direct competition, because of distinct processes. Some wheat combinations were also more productive under low organic circumstances. Some oat combinations have yields up to 9 percent in the face of drought stress, indicating that genotypic diversity may contribute to buffer agriculture against climate change extremes[10].

Another significant advantage from cultivar mixes is the consistency of output, which enables farmers to better anticipate their yearly production and to minimize risk. Due to numerous biotic and abiotic variables, a specific monoculture may or may not be the highest performing variety, but these factors are likely to be changed next year. A crop mix reduces this yearly uncertainty because stability comes from complementing variations in crops that tend to balance. The impacts of biodiversity on 'portfolio' or 'insurance' may therefore stabilize agricultural yields in various biotic and abiotic situations.

2. DISCUSSION

It offers tremendous potential for improving disease resistance, decreasing insect abundance, and increasing crop production in agricultural fields by increasing the variety of genotypes within a field. Due to the over-reliance on synthetic pesticides, the development of resistance has triggered a vicious cycle of resistance that is unsustainable and laden with ramifications that include deterioration of human and ecological health. As a result, farmers need alternative pest control methods to preserve their crops and earnings while also reducing their dependence on pesticides. Consumer demand for agricultural goods produced more responsibly with little or no pesticide residue has also resulted in the fast expansion of the organic crop industry, which now includes crops grown for human and animal use. These farmers have few choices for pest control, and cultivar combinations would be very beneficial to them if they were planted.

When looking at things from an evolutionary standpoint, planting fields with more than one type of seed makes sense since mixed fields would be less susceptible to environmental disturbance, whether it is caused by humans or by nature. As a result, varied cultivar combinations are a popular and successful method of managing diseases in wheat, rice, and other crops throughout Europe, Asia, and a few areas of the United States. Research from natural systems also shows that insect herbivore populations may be significantly affected by intraspecific plant variety, which is consistent with previous findings. We now need to do applied research to see whether or not these many lines of evidence may lead to better insect pest management via the use of cultivar combinations. The following conceptual framework, which is based on interactions seen in some of the material examined here, is provided to assist in directing this research: a conceptual framework Interactions among plants, herbivores, and natural enemies that are anticipated to be affected by genotypic diversity are presented in the framework, as are some of the processes that may be driving these interactions. In order to encourage hypothesis-driven research into how these relationships affect insect pest management in agricultural systems, the

following vision is presented: These interactions, as shown in at least one crop species and a sea grass, may also serve to protect agricultural systems against abiotic extremes such as those anticipated to be imposed by climate change.

Efficacy of intraspecific crop variety as an insect control strategy is being investigated at all levels of the research process, from fundamental ecology through farmer application. Examples include determining the number of cultivars that provide the most yield while maintaining the highest level of stability, as well as determining if this number can be used across crop species and management methods (e.g. organic vs. conventional). Also required is investigation into how various pests and natural enemies react to intraspecific variation, as well as whether guilds of pests, such as aphids, behave in a comparable manner to one other. Due to the fact that the majority of natural-systems research has been conducted in very small plots, conducting large-scale experiments in field crops would not only be necessary to determine efficacy for growers, but it would also greatly advance our understanding of how intraspecific diversity affects the food web and trophic dynamics.

This research is particularly important since combining resistant and non-resistant varieties in the same field should prevent the development of resistance to resistant kinds (i.e. improve durability of resistance; Gould 1986a). This technique is credited with helping to reduce resistance to transgenic Bt crops in part because it involves planting susceptible varieties alongside insect-resistant Bt types to provide a safe haven for Bt-susceptible pests throughout the growing season. Because plant resistance characteristics are often among the only weapons available for controlling certain pest species, research is required to define levels of resistance to insect herbivores in different crop species, as well as to discover novel forms of resistance. New resistant types may then be created and integrated into cultivar mixes, which will aid in the preservation of the effectiveness and durability of such instruments.

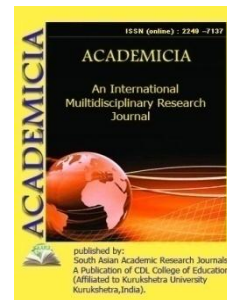
3.CONCLUSION

Many advantages appear to be gained from cultivar mixtures. As long as the agronomic characteristics of the varieties are similar, farmers should not be required to alter production practices such as planting and harvesting times, nor should they be required to make any financial investments in new equipment. Important because logistical and economic considerations are the main impediment to the adoption of innovative, environmentally friendly pest-farming methods in the first place. Using cultivar mixes does not seem to provide significant economic or logistical difficulties, and in fact, it may have positive effects on both the economy and output. Growers have a high possibility of reducing insect issues while maintaining or even boosting yields if they strategically increase genotypic variety. Such environmentally friendly pest control methods should be further investigated.

REFERENCES

1. I. M. Grettenberger and J. F. Tooker, "Moving beyond resistance management toward an expanded role for seed mixtures in agriculture," *Agriculture, Ecosystems and Environment*. 2015, doi: 10.1016/j.agee.2015.04.019.
2. L. B. Chanu, G. K. N. Chhetry, and G. D. Sharma, "Sustainable Indigenous Practices for the Management of Pest and Diseases of Upland Rice in Manipur, North East India," *Assam Univ. J. Sci. Technol. Biol. Environ. Sci.*, 2010.

3. J. F. Tooker and S. D. Frank, "Genotypically diverse cultivar mixtures for insect pest management and increased crop yields," *Journal of Applied Ecology*. 2012, doi: 10.1111/j.1365-2664.2012.02173.x.
4. A. V. Shoffner and J. F. Tooker, "The potential of genotypically diverse cultivar mixtures to moderate aphid populations in wheat (*Triticum aestivum* L.)," *Arthropod. Plant. Interact.*, 2013, doi: 10.1007/s11829-012-9226-z.
5. M. Lazzaro, A. Costanzo, and P. Bàrberi, "Single vs multiple agroecosystem services provided by common wheat cultivar mixtures: Weed suppression, grain yield and quality," *F. Crop. Res.*, 2018, doi: 10.1016/j.fcr.2017.10.006.
6. A. Kirmer, A. Baasch, and S. Tischew, "Sowing of low and high diversity seed mixtures in ecological restoration of surface mined-land," *Appl. Veg. Sci.*, 2012, doi: 10.1111/j.1654-109X.2011.01156.x.
7. K. Mody, J. Collatz, A. Bucharova, and S. Dorn, "Crop cultivar affects performance of herbivore enemies and may trigger enhanced pest control by coaction of different parasitoid species," *Agric. Ecosyst. Environ.*, 2017, doi: 10.1016/j.agee.2017.05.009.
8. R. Machida-Hirano, "Diversity of potato genetic resources," *Breeding Science*. 2015, doi: 10.1270/jsbbs.65.26.
9. M. J. Arturi, M. B. Aulicino, O. Ansín, G. Gallinger, and R. Signorio, "Combining Ability in Mixtures of Prairie Grass and Clovers," *Am. J. Plant Sci.*, 2012, doi: 10.4236/ajps.2012.310163.
10. A. R. Szumigalski and R. C. Van Acker, "The agronomic value of annual plant diversity in crop-weed systems," *Can. J. Plant Sci.*, 2006, doi: 10.4141/P05-074.



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THE BROWN PLANT HOPPER AS A RECURRENT DANGER TO HIGH-YIELDING RICE CULTIVATION

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ABSTRACT

The brown planthopper (BPH), Nilaparvatalugens, which erupted occasionally in tropical Asian rice in the sixties, became a great danger after the adoption of green revolution technology by farmers in the 1960s. In the 1980s and 1990s, management and regulatory reforms highlighted non-insecticide methods to prevent BPH epidemics. However, as main method for managing rice insect pests, pesticides have reappeared and recent planthopper outbreaks have occurred in record numbers in tropical Asian nations. Our examination of variables contributing to the epidemics shows that pesticides are mainly the most significant outbreak contributor in terms of their negative impact on natural enemies. BPH resistance to insecticides and particularly Imidacloprid enhanced the likelihood of outbreaks because farmers used increasing amounts of pesticide to fight resistant populations. Similarly, excessive use of nitrogen fertilizer in hybrid rice, in particular, has enhanced the epidemic risk. Other variables that are less established are causing outbreaks, however we explore the potential that high outbreak synchrony in geographically dispersed BPH populations may indicate a 'Moran effect' as a climate that favors the above-average growth in the populations of BPH. We further assume that BPH works as a meta population, and that recurrent outbreaks may thus constitute a natural occurrence which would need plant hoppers to return to the empty regions in order to maintain genetic interconnections between subpopulations. We finish by recommending a number of research and policy reforms to better understand the origin of BPH outbreaks and to create sustainable management methods to avoid repeat outbreaks.

KEYWORDS: Fertilizers, Green Revolution, Insecticide, IRRI, Planthopper.

1. INTRODUCTION

Starting in the 1960s, rice production in tropical Asia was developed from a low-yielding conventional system using farmers' rice lands produced with modest artificial input to a high yield scheme based on GM crops, synthetic fertilizers and synthesized insecticides. The first high-yielding rice variety for tropical farmers was IR8 created by the International Rice Research Institute (IRRI) and launched in the Philippines in 1966. IR8 generated 10 t ha⁻¹ in favorable growth conditions compared to 1 t ha⁻¹ for conventional rice. IR8 expanded rapidly throughout tropical Asia and helped substantially to rice output in regions facing food scarcity[1].

Technologies of the Green Revolution rapidly dislocated conventional techniques of rice production in several regions (Jennings, 1974). In the Philippines, within three years following the introduction of IR8 in 1966, 40 percent of Riceland was planted with enhanced cultivars. The Philippines' new-tech rice output grew an average of 12.4% each year from 1967–68 to 1971–72. Compared to conventional cultivars (160-200 days), new rice cultivars achieved maturity very fast. This meant that farmers using irrigation systems might harvest two or three plants of the same rice field per year. Monocultures in many irrigated regions of new high yielding cultivars emerged year round. Artificial fertilizers and pesticides were the high yield system's trademark characteristics. Genetically modified crops produced little better than conventional cultivars without fertilizers. Farmers viewed chemical pesticides as an insurance to preserve fertilizer and other investments. As seen in many Philippine regions, insecticide usage increases in high yield agricultural systems. About 60% of the Philippine farmers in the 1966 decade before IR8 was available were to use some pesticides; in the late 1970s about 70% of farmers who planted high-yielding rice varieties regularly used insecticidal treatments for rice. Researchers have discovered that farmers treat high yield rice (sowing seed beds and main crop) 1-10 times (average 1.4-3.2) in 40 different crops with pesticides, in the Philippine region of Nueva Ecija, the largest irrigated rice area of southeast Asia (comprising 64 distinct brands). The National Agricultural Research and Education Systems (NARES) and the green revolution-driven chemical corporations advised rice farmers with pesticides to increase crop yields and prevent catastrophic pesticide losses. Insect outbreaks, which paradoxically have frequently been caused by pesticides, have strengthened farmers' dread of insect pests and the necessity to use chemical substances. Even when breeders integrated pest resistance in high-yielding crops, farmers continued to treat rice regularly. Some governments have given low-cost pesticides to ensure that farmers spray rice crops frequently. In Indonesia, for example, government subsidies for pesticides amounted to 179 million dollars in 1986, which represented about 0.17% of the country's GDP and 0.8% of the government's overall expenses. Indonesian government spending on insecticides amounted to almost \$1.5 billion between 1976 and 1987. However, few farmers have been taught to correctly apply pesticides. In the Philippines rice farmers questioned by researchers sprayed around 80% of pesticide treatments to the incorrect pest or when pests were not an issue. Due to inadequate application equipment, N 75% of the active component of a pesticide was found in the water of the rice fields instead of the target region. Despite the conviction of farmers that pesticides are needed to preserve the rice crop, many assessments have shown that insecticides are seldom required for successful rice production[2].

1.1 The Brown Planthopper (BPH) Revolution:

An unexpected issue with the rice green revolution was the recurrent brown planthopper outbreak (BPH). This bug is made from grown rice, numerous wild *Oryza* and the herb *Leersia hexandra* Swartz. Diagnostic indicators and the study of genetic distance using RAPD – PCR showed the potential of BPH sibling species between the population of rice and *Leersia*. BPH eats into the vascular tissue of plant leaf blades and leaf sheaths and ingests the sap by inserting its styles. Populations concentrate at the base of the plant and following canopy closure achieve maximum density. Heavy infestations may cause rice plants, known as the "hopperburn," to dry and wilt completely. The pest also transmits ragged stunt virus and grassy stunt virus to plant diseases. BPH in tropics can complete around twelve generations per year, while in temperate regions only 3 generations per year. Around the Red River Delta of Vietnam is the northern geographical limit of winter breeding for the species. In Asian tropics and subtropics, it occurs throughout the year and extends its scope to the north when rice becomes accessible in temperate regions of China, India, Japan and Korea (Perfect and Cook, 1994). Weather-facing migration guarantees that part of the migratory population reaches a distance of several hundred km. However, BPH does not live in temperate regions during winter. BPH infestations in temperate settings are caused by annual migration from tropical Asia and China. Return migrations of BPH populations (north-south) were examined across China and India throughout the fall. Such movements may assist to explain how in the southern overwintering populations migrants are sustained over a great distance[3].

Planthopper epidemics in rice happened hundreds of years before the Green Revolution in the 1960s, according to experts. Outbreaks reportedly occurred about 18 AD in Korea and 701 AD in Japan. After the discovery in 1670 of whale oil as an insecticide, followed by slaked and bitter lime, leafhoppers and planthoppers were said to have been flourishing in Japan. Confirming early claims such as BPH epidemics poses taxonomic issues, since *N. lugens* species were not identified until 1854. However, before 1966, the year when IR8 was adopted, Fiji, Japan, Korea, Solomon Islands, Taiwan and perhaps more nations verified BPH occurrences. The most significant epidemics occurred in temperate regions, including Japan and Korea, before the green revolution. Tropical outbreaks were usually limited and happened seldom[4].

In 1977 IRRI organized an international meeting to address the danger posed by BPH outbreaks to the new high-yield tropical rice in order to evaluate the issue and to establish prioritized research and training initiatives for improved control of the pest. The conferences concluded that the intensification of rice crops and their related technologies had caused major changes to the rice environment, promoting BPH epidemics, especially in irrigated regions where farmers grow 2 or 3 rice crops year. The constant rotation of mono-crops across wide regions offered numerous BPH habitats that allowed the population to breed almost all year round and increased the reproductive capacity of the plague due to the excessive use of nitrogen fertilizer. The frequent use of pesticides worsened the issue by eliminating natural enemies which controlled the populations of BPH. The conferences stressed the need of creating rice cultivars that are genetically resistant to BPH while recognizing that the pesticide is able to adjust to the resistant cultivars. IR26 was the first high yield rice cultivar with BPH resistance introduced in 1974 by IRRI[5]

1.2 IPM Solution:

The IRRI (1979) emphasizes integrated pesticide control as a management approach to avoid outbreaks of BPH. A term established by the Environmental Quality Council from the former integrated pest control term, IPM utilizes several techniques for preventing pest populations from reaching harmful levels. IPM combines pest-resistant cultivars, fertilizer management, agronomic practices that conserve and increase the impact of predators and other natural biological control products and, when necessary, the cautious use of pesticides based on need rather than on prophylactic treatment instead of relying on one single pest control technique.

In 1980, the Food and Agriculture Organization of the United Nations (FAO) provided technical support for tropical Asian nations to start a large programme for rice IPM to improve economically and ecologically sound pesticide management. Between 1980 and 1989, the programme underlined pesticide monitoring, resistance of host plants, wise use of pesticides, natural enemies of pests and demonstrations on the ground that offered farmers first-hand experience with IPM techniques and environmental ideas. There was a working group headed by designated NARES in each component. In the mid-1980s, the Indian, Philip-pine and Indonesian governments proclaimed national IPM strategies. Indonesian authorities have prohibited 57 pesticides suspected to promote BPH breakdown and have also ceased subsidizing pesticides. The change in policy to restrict pesticides saved the Indonesian government approximately 100 million dollars per year and decreased the import of pesticides by two thirds. The FAO initiative cost about US\$650,000 in Indonesia between 1985 and 1988.

FAO-IPM highlighted intensive on-farm training at farm schools (FFS) in order to enable rice farmers to adopt IPM with little technical support. The IPM programme educated farmers in several nations from 1980 to 2002. Data from Malaysia and Myanmar is not available, but FFS-trained N2 million rice farmers from 1989 to 2000 in the other eleven countries. According to academics, just 1-5% of all farmer's homes in these nations were for FFS-trained farmers. More than 90 percent of all FFS graduates included six of the nation's participating in the FAO programme. IPM educated farmers decreased their usage of secticide by 50–80% while maintaining or increasing their rice production. The biggest effect was in Indonesia, where approximately 1.5 million farmers were trained in IPM. In combination with IPM training and pesticide regulations, the usage of insecticide on rice by IPM-trained farmers in the Java province has dropped 75 percent.

In 1991, IRRI started its complementary Pesticide Reduction Program (FPR) to address farmers' misunderstandings regarding leaf-keeper controls. IRRI studies have shown that leaffolders seldom affect the production of rice when untreated; nevertheless, rice farmers believe that if not managed, such insects would lead to significant yield losses. Surveys revealed that most insecticidal treatments were targeted at leaffolders during the first 30–40 days of rice cultivation. In the first 30–40 days of FPR trials, the participating farmers sprayed insecticide spray to the majority of their crops as they typically (usually 1–3 times) but left a section (around 1100 m²) of each crop unprocessed. During harvest, the farmer determined yields from both sides and then compared the findings with adjacent farmers who had carried out similar studies. Participating farmers typically experienced economic advantages immediately when they stopped early treatments and became ambassadors when they disseminated a message of "no spray" to other farms. In some regions, government authorities have started supplementary media efforts utilizing radio, TV, printed and other communication channels to urge more farmers to

discontinue rice pesticides early in the season. FPR initiatives at many places in Southeast Asia eradicated rice without loss of production of 50-80 per cent of pesticide usage. The biggest effect occurred in the Vietnam Mekong Delta. Surveys found that the average number of pesticide springs per rice crop was decreased from 3.1 to 1.0 between 1992 and 1997. The FPR initiatives have reduced pesticide usage by 50 percent in approximately 2 million rice fields across the Delta[6].

1.3 Hormesis Caused by Insecticide:

Not only can insecticides enhance the probability of pest breakout by disturbing natural enemy activities, they may also encourage the growth of pesticides via hormesis. Researchers demonstrated that in adults with BPH who evolved from the nymphs, sublethal dosages of methyl parathion and decamethrin had been given topically to 5th Instar BPH nymphs. Sublethal dosages of certain pesticides enhance female fertility of BPH by promoting changes in nutrients of rice crops. Researchers discovered that the reproductive stimulation caused by pesticide differed in rice cultivars, insecticides and the application rate of insecticides. Sublethal uses of deltamethrin insecticide resulted in substantially more brachypterous adults of (flightless) BPH compared to imidacloprid or triazophos in sublethal treatments. The greatest reproductive rate of BPH occurred on triazophos-treated plants. Treatments for both susceptible BPH (TN1) and resistant rice crops of all pesticides were tested at increased soluble levels of sucrose in 3rd and 5th-star nymphs and adults from the nymphs fed on insecticide treated rice plants. Adults from nymphs that have been fed on treated plants had substantially higher levels of crude fat than adults from non-treated plant-fed nymphs. In BPH-susceptible cultivars, reproductive stimulation due to pesticide treatment was more apparent.

The findings of this research show that theoretical applications of sublethal insecticide may enhance BPH migratory ability since the plant-hummers gain more fat and sugar for flight when fed rice plants treated with insecticide than if fed on untreated rice plants. Researchers discovered that Philippine rice farmers frequently use pesticides in large quantities and apply sprays at rates below the insecticide manufacturers advised in order to save time and money. In addition, since BPH populations develop near the base of the rice plant over time, the closed canopy may protect them from spray droplets. Study findings indicate that farmers' use of the sublethal rates of particular pesticides may both improve BPH's reproductive capacities and raise theoretically the risk of BPH outbreaks even when these insecticides did not damage natural enemies[7].

1.4 Resistance to Insecticides:

BHC genetic resistance emerged approximately 15 years after the pesticide was sprayed on the country's rice in 1967 in BPH populations in Japan. In the late 1960s and 1970s, researchers discovered resistance to BPH in the experimental farm of IRRI in the Philippines and resistance to organophosphorus or carbamate insecticides in Taiwan in the 1970s. BPH resistance to organochlorine, organophosphorus, carbamate and pyrethroid pesticides was recorded in many Asian nations in the early 1990's. Until recently, resistance reports were mostly produced in temperate regions in BPH populations. Widespread usage of neonicotinyl chemicals in tropical and temperate regions has increased problem resistance. Laboratory testing in China, India, Japan, Indonesia, Malaysia, Taiwan, Thailand and Vietnam have demonstrated imidacloprid resistance in 2008 in populations with BPH. The use of imidacloprid in order to manage BPH

was reported by rice growers in many countries. BPH imidacloprid resistance has caused particularly severe difficulties for Chinese rice growers.

From 1996 to 2006, 42 field samples of BPH from eight Chinese provinces were tested for imidacloprid resistance. Most of the BPH populations remained sensitive to imidacloprid between 1996 and 2003 except in Guilin where there was modest resistance in 1997. However, BPH populations from several regions showed high to very high levels of resistance in 2005. Within a just 2 years, the Nanning population grew by N 200 in resistance. BPH acquired N 800-fold resistance to imidacloprid in other places, particularly in southeast China. In several rice-growing regions with each BPH generation, farmers sprayed to avoid the emergence of the plague. The extended residual activity and excellent effectiveness of Imidacloprid make it a favorite insecticide for BPH treatment in many regions. Trends indicate that continuing extensive usage of pesticide in China and in other countries exacerbates the genetic resistance issue in BPH populations.

As BPH migrates over vast distances, it appears that the frequent influx of immigrants from regions of low pesticide use will slow down resistance to insecticides. In China, however, imidacloprid has been used extensively to reduce BPH both in the emigration region and in immigrant areas. Imidacloprid was also extensively utilized in Southeastern Asia where rice-year-round population BPH developed and in the next year it became the main source of northbound mid-gration for China. Therefore, when imidacloprid resistance develops, resistant BPH migrants may transmit their imidacloprid resistance over vast distances rapidly[8].

The issue of resurgence and subsequent outbreaks of BPH may be exacerbated by pesticide resistance, since farmers must use increasing amounts of insecticide to fight resistant populations. In addition, as stated, researchers have shown that imidaclopride foliar sprays for rice may enhance lipids and soluble sugar in BPH nymphs and adult plant feed. BPH populations that have survived treatments of imidacloprid may potentially travel across typical distances and thus serve as a particularly significant conduit for the transmission of the imidacloprid-resistance alone into other regions.

1.5 Usage of Fertilizers in Rice:

Crossing two inbred lines, the hybrid rice created occupies considerably more Asian Riceland. Hybrid rice currently accounts for 60% of the Chinese rice. Although hybrid seeds may cost twice as much as non-hybrid seeds, farmers' earnings may be much greater since hybrids produce 16–20 percent more than their income parents. Larger crop populations and frequent breakouts in farmers' fields of hybrid rice have been observed. The thick canopy of the hybrids, resulting from more robust vegetative growth, seems to make it easier to migrate or disperse insects. The hybrid plants are more effective at absorbing nitrogen and using nitrogen than their inbred parent lines. The increased intake of nitrogen and the efficiency of hybrid usage may lead to more nitrogen accessible for BPH and other pests. In addition, the total absence of or poor genetic resistance of hybrids makes plants more vulnerable to insects. The major hybrid rice varieties are vulnerable to WBPH in China, and only approximately 12% of newly created varieties have had resistance to BPH in field testing.

1.6 Cultivars Impact On BPH:

The development of better rice cultivars with resistance to insects and diseases is an important goal of rice breeding. High-yielding cultivars with BPH resistance, other insects and diseases greatly contributed to the rice production in tropical Asia. IRRI is the world's leading rice breeding institution and has provided rice producing nations with thousands of enhanced breeding lines. An estimated 50% of the world's rice acreage is planted in IRRI or its progeny[9].

IRRI began a rice breeding effort for BPH resistance shortly after researchers discovered pest resistance to rice sources in 1967. Many Asian nations have begun similar programmes. Bph1 and bph2 were the first two resistance genes. Twenty-one BPH resistance genes from farmed and wild *Oryza* species have already been discovered. The production of rice with a lasting resistance to BPH is a significant problem, given the history of the pesticide adaptation to resistant crops. Pesticides adapted to IR26, the first high producing BPH-resistant cultivar, within two to three years after distribution to farmers. For a relatively brief period, several BPH-resistant cultivars have remained viable. Although certain BPH-resistant cultivars, in particular IR36 and IR64, have shown increased durability, BPH continues to be a nemesis for plant breeders[10].

In addition, scientists have discovered many BPH toxins from non-rice sources which have promise for transgenic rice plants specially built to withstand BPH in addition to the natural sources of BPH resistance in *O. sativa* and its natural relatives. As far as we know, no transgenic rice types are being cultivated commercially although many modified kinds for marketing have been authorized. Plant breeders are particularly interested in *Galanthus nivalis* agglutinin (GNA), a transgenic rice plant that expresses the use of snowdrop lectin in plant hoppers. Transgenic GNA plants showed resistance to BPH and WBPH as well as green leafhoppers (*Nephotettix* sp.). GNA plants are the closest to marketing among the transgenic rice plants available.

2. DISCUSSION

Climate change predicts that interaction and combined effects of high temperature and humidity, drought, salt and submergence will have negative consequences on rice production. How BPH, other pests, natural enemies and ternate progeny are affected by such abiotic stressors is unclear while little study has given insight. In laboratory experiments, BPH eggs and adults' survival was reduced at temperatures of 35°C compared to 25–30°C. In addition, greater temperatures impacted BPH instars and populations differently, owing to their differing intracellular symbiotic death rates. The greatest rice pest fauna has moved from stem borers to dops, cycadellids and, more recently, to rice bugs and migratory populations of dops, such as BPH and WBPH, in Japan in the last half-century. In Japan, the average surface temperature increased by 1.0°C from 1961 to 2000. Researchers have forecast that global warming may benefit natural enemies by increasing the number of generations of their prey. However, some research has indicated that unique reactions to increasing temperatures may result by changing their phenologies, distribution ranges or migratory patterns in distinctions between pests and enemy population.

The assessment of reactions to large-scale impacts such as climate re-inquires information on local population dynamics in spatial scaling. Due to a hazy database of past outbreaks in tropics, it is difficult to test the idea that the climate may have caused a Moran effect for BPH populations in recent years. Data consistently documented over extended periods at representative sites is needed. During 1957–2009, researchers investigated the connection between ENSO occurrences and BPH outbreaks at the mid and lower levels of the Yangtze

River. In the years and outbreaks of La Niña, they found no obvious connection. BPH epidemics occurred, however, primarily in the El Niño and three years following El Niño.

3. CONCLUSION

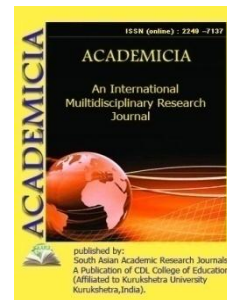
It is tempting to infer that inputs controlled by humans like pesticides or insecticides in conjunction with nitrogen fertilizers, for example, were fully responsible for the simultaneous tropical rice BPH epidemics in various parts of Asia soon after and even more recently. However, less visible natural governance elements may have produced an environment which favors a rise in pest populations that is higher than normal regardless of their human contribution. The high overall synchronization in BPH's geographically segregated populations may show that a "Moran effect" like the climate had an important impact. Researchers have anticipated that autocorrelation in population fluctuations will equate to autocorrelation in environmental noise, if population synchronization is driven by an environmental variable such as temperature. His prediction anticipated that all impacted populations would be subject to the same linear density regulation on a logarithmic scale and that the correlation in fluctuations between two population populations would always be the same regardless of the starting population sizes. Spatial correlations of ecological factors, generated, for example, by comparable temperatures, were originally proposed as sync agents for the size fluctuations of spatially separated populations. The Moran effect may play a significant role in driving sync in a number of ecological processes, irrespective of size. Natural enemies and BPH-resistant cultivars should be anticipated to have less influence on regulation of the density of the BPH in such an environment which will allow for more rapid BPH growth and natural enemy destroying pesticides would therefore have an above average negative impact.

REFERENCES

1. Y. Ling and Z. Weilin, "Genetic and biochemical mechanisms of rice resistance to planthopper," *Plant Cell Reports*. 2016, doi: 10.1007/s00299-016-1962-6.
2. B. A. R. Hadi, C. P. F. Garcia, and K. L. Heong, "Susceptibility of *Nilaparvata lugens* (Hemipteran: Delphacidae) populations in the Philippines to insecticides," *Crop Prot.*, 2015, doi: 10.1016/j.cropro.2015.07.002.
3. H. P. Lu *et al.*, "Resistance of rice to insect pests mediated by suppression of serotonin biosynthesis," *Nat. Plants*, 2018, doi: 10.1038/s41477-018-0152-7.
4. X. Shangguan *et al.*, "A mucin-like protein of planthopper is required for feeding and induces immunity response in plants," *Plant Physiol.*, 2018, doi: 10.1104/pp.17.00755.
5. J. Guo *et al.*, "Bph6 encodes an exocyst-localized protein and confers broad resistance to planthoppers in rice," *Nat. Genet.*, 2018, doi: 10.1038/s41588-018-0039-6.
6. B. Du *et al.*, "Identification and characterization of Bph14, a gene conferring resistance to brown planthopper in rice," *Proc. Natl. Acad. Sci. U. S. A.*, 2009, doi: 10.1073/pnas.0912139106.
7. Y. Liu *et al.*, "A gene cluster encoding lectin receptor kinases confers broad-spectrum and durable insect resistance in rice," *Nature Biotechnology*. 2015, doi: 10.1038/nbt.3069.
8. W. Ye *et al.*, "A salivary EF-hand calcium-binding protein of the brown planthopper

Nilaparvata lugens functions as an effector for defense responses in rice,” *Sci. Rep.*, 2017, doi: 10.1038/srep40498.

9. M. DIANAWATI, “Kajian berbagai varietas unggul terhadap serangan wereng batang coklat dan produksi padi di lahan sawah Kabupaten Garut, Jawa Barat,” 2015, doi: 10.13057/psnmmbi/m010437.
10. D. G. Bottrell and K. G. Schoenly, “Resurrecting the ghost of green revolutions past: The brown planthopper as a recurring threat to high-yielding rice production in tropical Asia,” *Journal of Asia-Pacific Entomology*. 2012, doi: 10.1016/j.aspen.2011.09.004.



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LINGUISTIC PERSONALITY AS AN OBJECT OF LINGUISTIC RESEARCH

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ABSTRACT

In modern linguistics, one of the central issues is the phenomenon of linguistic personality. The concept of a linguistic personality is in demand in humanitarian knowledge, since its development makes it possible to advance towards solving a number of theoretical and practical problems facing scientists. At the same time, despite the large number of references to this concept both in the framework of general linguistics and in other branches of linguistics, the problem of developing methods for analyzing a specific linguistic personality remains debatable. This requires researchers to theoretically substantiate the use of various general scientific and specifically linguistic methods and methods in the study of such an object as a linguistic personality.

KEYWORDS: *Linguistic Personality, Verbal-Semantic, Cognitive And Pragmatic Approach, Linguocultural Community, Linguocultural Approach.*

INTRODUCTION

Linguistic personality is one of the urgent and promising problems of modern cognitive and communicative linguistics. Recently, the problem of linguistic personality has been actively considered in various aspects, psycholinguistic, sociolinguistic, culturological, linguodidactic, functional, emotive, and pragmatic, text semantics, etc. [2, 41]. This problem is of particular interest to linguists in the light of the proposed Y.N. Karaulov's new approach is "there is a linguistic personality behind every text" (in contrast to the main thesis of linguistic research of the last half century "there is a language system behind every text") [5, 39].

The term "linguistic personality" was first used by V.V. Vinogradov in 1930. In the book "About fiction" he wrote: "... If we rise from the external grammatical forms of language to more internal ("ideological") and to more complex constructive forms of words and their combinations; if we

recognize that not only the elements of speech, but also the compositional techniques of their combinations associated with the peculiarities of verbal thinking are essential signs of linguistic associations, then the structure of the literary language appears in a much more complex form than the planar system of linguistic relations of Saussure. And the personality, included in different of these "subject" spheres and including them in itself, combines them into a special structure. In objective terms, all that has been said can be transferred to speech as a sphere of creative disclosure of the linguistic personality" (2, 41-43).

Modern linguistics considers a linguistic personality depending on the type of culture. In his work, N.I. Tolstoy suggests the following types: elite - based on literary language, folk - in dialect, traditional-professional - in argot, "third culture" - in vernacular. The works of O.B. Sirotinina and her students are also widely known, which justify the identification of a medium-literary type of linguistic personality as a person with higher education, which is characterized by individual violations of the qualities of good speech (2, 41-43).

Y.N. Karaulov distinguished three levels of linguistic personality: verbal-semantic, cognitive and pragmatic. The units of the first level are individual words as units of a verbally associative network. The units of the second are concepts, ideas, concepts that each linguistic personality develops into a more or less ordered picture of the world, reflecting the hierarchy of values. The units of the third are oriented towards pragmatics and manifest themselves, according to Y.N. Karaulov, "in the communicative and activity needs of the individual" [5, 30].

V.I. Karasik considers a linguistic personality as a basic national-cultural prototype of a native speaker of a certain language fixed mainly in the lexical system, a kind of "semantic sketch" compiled on the basis of worldview attitudes, value priorities and behavioral reactions reflected in the dictionary [6, 2-7]. Most linguistic concepts emphasize the relationship between language and speech activity. According to G.I. Bogin, a linguistic personality is understood as a person as a native speaker, taken from the side of his ability to speech activity [4, 3]. According to S.A. Sukhoi and V.V. Zelensky, a linguistic personality is a set of features of verbal behavior of a person using language as a means of communication [13, 44].

Skills characteristic of the highest level of speech ability of a linguistic personality can also be considered the ability to purposefully, competently compose texts that meet the pragmatic conditions of communication, stylistically and situationally relevant, expressive; the ability to understand hidden meanings, subtext and use it in one's own speech; the ability to adequately assess a specific situation of speech communication and implement the appropriate model of speech communication, correct in ethical and aesthetic terms.

It is no secret that in some countries there are cases when even fully grown, fully formed specialists with higher education do not know the forms of speech etiquette (even such simple cliched forms as greetings, expressions of sympathy, congratulations, compliments, etc. cause difficulty), do not know how to communicate with seniors by age and position (including by phone), do not consider it necessary to simply listen to another person, do not know how to read kinetic information. They are afraid or do not know how to resist the impoliteness and rudeness of opponents. This leads to stiffness, tightness, fear and avoidance of communication, inability not only to conduct a conversation in the right direction, calmly, adequately defend your point of view, but even just to present it in a form accessible to other people.

The study of a linguistic personality-a native speaker with a complex inner world, his own attitude to fate, the world of things and the people around him, is currently multidimensional, large-scale and attracts related sciences.

Thus, a linguistic personality is a personality that manifests itself in speech activity, a personality in the totality of the texts consumed and produced by it. Each linguistic personality is unique, has its own "knowledge" of the language and the peculiarities of its use. At the same time, a linguistic personality always belongs to a certain linguistic and cultural community.

At the moment, modern linguistics has developed many approaches to the study of linguistic personality; each approach has its own methodology of study. Thus, the linguoculturological approach considers a linguistic personality from the point of view of national-linguistic specificity, in other words, in its linguistic ethnography [3, 29].

Using this approach, the ethnospecific linguistic personality traits expressed in texts as products and signs of a certain culture are investigated. Linguoculturology is characterized by the study of a collective cultural-historical image or "national-cultural prototype of a native speaker" [10, 112]. Therefore, the subject of the study is the image of a linguistic personality formed by many incarnations of different individuals of the language. Accordingly, linguoculturology turns its attention to the relationship "language - culture - ethnicity", setting the researcher the task of studying the material and spiritual culture embodied in a living national language and manifested in linguistic processes, in which a linguistic personality is formed.

One of the most significant in this direction is the method of commenting. This method consists in the fact that additional information about the spheres of use and frequency of use of these units, about their various connotations, which are characteristic of this culture, is given to a word or phrase denoting the reality of any ethnoculture [7]. In our opinion, this approach can be useful when analyzing a specific linguistic personality, as it will allow to recreate the "national-cultural prototype of a native speaker".

The commenting method is an effective tool within the framework of the linguoculturological approach, since it allows us to determine how much the linguistic personality under study corresponds to the national-cultural prototype of a native speaker. However, such a reconstruction of the national-cultural prototype of a native speaker is somewhat one-sided. The limitation of this method is that the definition of the national-cultural prototype of a linguistic personality is based on texts that are always limited in genre, ideological-thematic, stylistic terms.

These limitations inevitably affect the appearance of the constructed linguistic personality. Another approach to the study of a linguistic personality is a sociolinguistic approach, in which a linguistic personality is considered as a carrier of linguistic features - phonetic, lexical, morphological, syntactic, correlating with its social characteristics, belonging to a particular language or speech collective, social status, role in a communication situation [1, 3].

At the same time, the main sociolinguistic method is the method of correlation analysis, accompanied by a comment evaluating the nature of such correlations. The text in this direction acts as a material that allows reconstructing socially conditioned linguistic and speech personality traits that are common to a language or speech collective [8, 109].

When conducting such an analysis, the specified social characteristics act as independent variables, and the communicative characteristics act as dependent ones. The relationship between these values is expressed in the mutual consistency of the observed changes [11, 256].

The main advantage of this method is the accuracy of measurements. The use of this method in the analysis of a specific linguistic personality allows us to determine how much speech personality traits correspond to the main characteristics of the social group to which the personality under study belongs.

The linguistic personality in the linguopragmatic approach is studied from the point of view of its interactive beginning, that is, the subject of research within this approach is the ability of a person to communicate as an activity [12, 216].

The lingovopragmatic approach offers a functional model of a linguistic personality, bringing to the fore its activity principle, manifested in the processes of selecting language signs according to the goals and objectives of communication. The main method of this approach is the method of linguistic modeling.

The task of linguistic modeling is "to establish certain structures, but not to search for new linguistic facts, to bring into the system empirically obtained linguistic data, which makes language categories clearer, more defined, as clearly formulated and systematized as possible" [9, 52].

The model is a specific object created for the purpose of obtaining information, reflecting the properties, characteristics and connections of the original object of arbitrary nature, essential for the task being solved by the subject.

Summing up, it should be said that each of the analyzed approaches presents effective methods of analyzing the linguistic personality only in specific aspects of its manifestation. Therefore, when studying a linguistic personality as an integral phenomenon, an integrated approach to its analysis is necessary, taking into account specific interrelated qualification features: linguoculturological, sociolinguistic and linguapragmatic. The application of an integrated approach to the analysis of the linguistic personality will allow you to get a complete and multifaceted idea of the studied linguistic personality.

LIST OF LITERATURE:

1. Avrorin V.A. Problems of studying the functional side of the language. - Leningrad: "Science", 1975. - 276 p.
2. Balyan A.M. Linguistic personality as an object of linguistic research // International Journal of Experimental Education. - 2013. - No. 4. - p. 41-43.
3. Bgazhnokov B.Kh. Circassian merrymaking: plot, semantics, mantle. - Nalchik: Goskomizdat KBASSR, 1991. --- 188 p.
4. Bogin G.I. Model of a linguistic personality in its relation to the varieties of text: dis dr. Filol. sciences. Leningrad ped. Institute, Leningad, 1984.
5. Karaulov Yu.N. Russian language and linguistic personality. - 7th ed. - Moscow: LKI Publishing House, 2010. --- 264 p.

6. Karasik V.I. Language circle: personality, concepts, discourse. - Volgograd: Change, 2002.-- 477 p.
7. Komissarov V.N. Modern translation studies. - M.: ETS, 2002.-- 424 p.
8. Kochetkova T.V. The linguistic personality of the bearer of the elite speech culture: dis ... dr. Filol. sciences. Saratov State University, Saratov, 1999.
9. Losev A.F. An introduction to the general theory of language models. - M.: Editorial, 2004.- - 296 p.
10. Maslova V.A. Linguoculturology. - M.: Publishing Center "Academy", 2001. - 208 p.
11. Susov IP History of linguistics. - Tver: Tver state. Un, 1999. - 295 p.
12. Sukhikh S.A. Pragmalinguistic dimension of the communicative process: dis ... dr. Filol. sciences. Krasnodar state un-t, Krasnodar, 1998.
13. Sukhikh S.A., Zelenskaya V.V. Representative essence of personality in the communicative aspect of realizations. - Krasnodar: Publishing house Cube. state University, 1997.-- 71 p.



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ASPECTS OF THE ENVIRONMENTAL POLICY OF UZBEKISTAN IN THE CONDITIONS OF THE ENVIRONMENTAL CRISIS IN THE SOUTH ARAL SEA REGION

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ABSTRACT

This article discusses aspects of Uzbekistan's environmental policy in the context of the environmental crisis in the South Aral Sea region. This document was adopted in order to further ensure a favorable state of the environment and the rational use of natural resources, the introduction of environmental foundations of sustainable development in the economic sector. The organization of work and control over the implementation of the Program is entrusted to the State Committee of the Republic of Uzbekistan for Nature Protection.

KEYWORDS: *Environmental Policy, Context, Environmental Crisis, South Aral Sea, Document, Favorable State, Environment, Natural Resources, Environmental Foundations, Sustainable Development, Economic Sector, State Committee, Nature Protection.*

INTRODUCTION

At present, the purposeful policy of any state to maintain ecological balance in the biosphere is ecological safety, which contributes to the creation of favorable living conditions for the population and their interaction with the natural environment. The system of environmental safety of the state presupposes the presence of certain protective mechanisms of a person against environmental threats caused by natural factors - natural elements and human intervention in the natural environment, leading to an imbalance in the ecological system [16].

At the Global International Forum "Johannesburg-2002" the Development Program for the XXI century was presented as a vector for active action of all countries in the field of environmental protection. The approved Program in world practice is a document aimed at ensuring environmentally safe sustainable development, taking into account the satisfaction of the needs of the present and ensuring the interests of future generations. In an official UN document, the

integral concept of “sustainable development” is proposed, which combines the main problems of preserving and restoring the natural environment and ensuring a decent life for all generations [26].

The main findings and results

An environmental assessment mechanism and, in a broader sense, an integrated analysis of the state, impact and protection of the environment, as well as the use of natural resources in the Republic of Uzbekistan.

The environmental safety policy of the Republic of Uzbekistan is carried out on the basis of the Constitution, documents of the Legislation of the Republic of Uzbekistan, the principles of the Declarations on the Environment and Sustainable Development, taking into account the obligations assumed arising from international conventions and agreements, as well as the legislative experience of foreign states [26,27].

Currently, in Uzbekistan, including the Republic of Karakalpakstan, continuous activities are carried out in the field of environmental protection, rational use of natural resources, improvement of sanitary and environmental conditions.

In accordance with the current regulatory and legal documents, the economic mechanism of environmental protection of the Republic of Karakalpakstan includes both incentive elements (positive motivation) and instruments of coercion (negative motivation), with the latter clearly prevailing. Some of the economic management instruments provided for by legislation are still not applied or are applied on an extremely limited scale.

The basis of the ecological and socio-economic mechanisms of environmental protection in the Republic of Karakalpakstan is made up of economic sanctions for environmental offenses.

Over the years of independence, Uzbekistan, including Karakalpakstan, has practically re-examined the legal framework of environmental legislation, which is fundamentally different from the previous one. Instead of the administrative-command principle of environmental management, a transition is made to ecologically-economically sound methods of rational environmental management.

The problem of the Aral Sea began to form in the 60s of the XX century. Intensive development of new lands, development of irrigated agriculture, construction of collector and irrigation systems throughout Central Asia, continued growth in water demand for domestic and industrial consumption, as well as systematically repeated dry years, created the conditions for one of the largest global environmental disasters in recent history - the drying up of one of the most beautiful bodies of water in the past on our planet [15, 18, 20].

The progressive process of desertification and soil degradation in the Aral Sea region is accompanied by the loss of land resources, deterioration of the quality of natural pastures and hayfields, where there is an active salinization of lands. In many territories, a large accumulation of salts has occurred in the soil and groundwater, which negatively affects the cultivation of various agricultural crops [13, 23].

In 1992, the Law of the Republic of Uzbekistan “On Nature Protection” was adopted, which established the legal, economic and organizational foundations for preserving the conditions of the natural environment, rational use of natural resources. The purpose of this Law is to ensure a

balanced harmonious development of relations between man and nature, to protect ecological systems, natural complexes and individual objects, to guarantee the rights of citizens to a favorable environment [1].

In October 1995, Uzbekistan joined the Convention on Biological Diversity and began to develop the National Strategy for the Conservation of Biological Diversity (NSCBD) [11] (1998). The Republic of Uzbekistan at a high official level declared its intention to protect and use biological resources of the environment without damage. However, the modern structure and management of protected natural areas have not undergone fundamental changes since 1990. Further development and improvement of the network is constrained by the lack of funds. Since the signing of the NSCBD on the conservation of biological diversity [28] (Resolution of the Cabinet of Ministers of the Republic of Uzbekistan № 139 dated April 1, 1998), the development and improvement of the network of protected areas is the country's top priority in the field of biological diversity conservation [3, 11].

The Cabinet of Ministers of the Republic of Uzbekistan adopted a Resolution dated May 27, 2013 "On the Program of Action for Environmental Protection of the Republic of Uzbekistan for 2013 -2017". This document was adopted in order to further ensure a favorable state of the environment and the rational use of natural resources, the introduction of environmental foundations of sustainable development in the economic sector [6, 7]. The organization of work and control over the implementation of the Program is entrusted to the State Committee of the Republic of Uzbekistan for Nature Protection.

This Program has been prepared on the basis of the National Action Plan for Environmental Protection of the Republic of Uzbekistan (NPEP) and is aimed at implementing environmental measures in terms of environmental support of economic reforms in Uzbekistan and creating conditions for socio-economic development and achieving the goals of sustainable development of the country. Based on the provisions of the new Program, the environmental policy of the republic is aimed at implementing the transition from the protection of individual elements of nature to the universal protection of ecological systems, guaranteeing optimal parameters of the human environment and harmonizing the relationship with the mechanisms of development of economic sectors according to the principles of "green economy" [4, 5, 21].

This Program provides:

- rational and comprehensive use of natural resources, including water, land, mineral and biological resources;
- phased reduction of air pollution, water and land resources through the introduction of environmentally friendly technologies and improvement of technological processes in production;
- improving the mechanism for monitoring the natural environment for regular assessment and forecasting of its socio-ecological state;
- implementation of a set of measures to restore and improve the ecological state in the ecological disaster zone - the Aral Sea region and in other ecologically unfavorable territories of the country;

- providing the population with clean drinking water and improving the system of sewerage networks and treatment facilities in large cities and towns;
- development of scientific and technical potential and the use of achievements of science and technology in the field of environmental protection;
- development and expansion of the network of protected natural areas;
- improvement of environmental legislation and the regulatory and methodological base in the field of environmental protection, environmental education and education for sustainable development, as well as the promotion of environmental knowledge;
- further development of regional and international cooperation in solving environmental problems [3, 10. 12].

One of the results of the environmental policy of the Republic of Uzbekistan is the stabilization of ecosystems and the improvement of the quality of the environment in areas with an increased risk to human health. Measures are being actively carried out to rehabilitate the consequences of the Aral Sea crisis, the ecological situation in the Aral Sea region - construction of small local reservoirs, drinking water supply lines is underway.

At the national level in Uzbekistan, the National Commission for Sustainable Development (NCSD) has been operating since 1997, which was then transformed into a working group under the coordination of the Government of the Republic of Uzbekistan. In 1998, experts from the ministries and departments of Uzbekistan developed the Concept of Sustainable Development of the Republic of Uzbekistan, approved by the NCSD.

On June 28, 2012 in the city of Nukus, Republic of Karakalpakstan, an introductory meeting and presentation of a new UN initiative in Uzbekistan - the Joint Program "Ensuring the livelihoods of the population affected by the Aral Sea crisis". The event was attended by national partners, representatives of regional and district authorities, representatives of communities and the media. The participants of the meeting discussed the main directions of the Program's activities and offered their recommendations for its successful implementation. The Aral Sea, located in the heart of Central Asia and formerly the fourth largest lake in the world, has become shallow and today is 30% of its former size. Such environmental changes in the region adversely affect the economy, social sphere and livelihoods of the population.

In the past, several initiatives have been successfully implemented in the region by the United Nations Development Program and the World Bank in close cooperation with the Government of the Republic of Uzbekistan. However, the living standards of the population of the most remote regions, such as Muynak, Shumanai and Kanlykul, need further improvement. During his visit to the Aral Sea region, UN Secretary General Ban Ki-moon emphasized the negative impact this crisis has on the human security of the population and called it "one of the worst environmental disasters in the world". In particular, it was decided to launch a Joint UN Program aimed at improving the well-being of the population through creating additional sources of income, improving the health care system, and developing infrastructure, by combining the efforts of 5 UN agencies in the Republic of Uzbekistan including the United Nations Development Program (UNDP), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Health Organization (WHO), the United Nations Population Fund (UNFPA) and UN Volunteers (UNV). The UN Joint Program was developed in close cooperation with the

Government of the Republic of Uzbekistan and is aimed at improving the well-being of the most vulnerable segments of the population in the region.

The program envisages providing support to local communities in improving their access to basic socially significant infrastructure, including access to clean water and gas through the development and implementation of community development plans. The program will assist in creating new sources of income for entrepreneurs and farmers through the introduction of advanced agricultural and pasture management practices, as well as planting new types of crops and trees. In addition, the Program will support women's and youth entrepreneurship through the development of local handicrafts and tourism areas.

It should be noted that the Joint Program is aimed at improving the human security of the population, which implies the creation of an effective management system, improved income, health care and environmental safety, for sustainable livelihoods and dignity of people. In this regard, to promote the concept of human security in all areas of the Joint Program, the UN Trust Fund for Human Security provided funds in the amount of US \$ 3.8 million.

Today, it is quite obvious that a complex of environmental, socio-economic and demographic problems has arisen in the Aral Sea region, which in origin and level of consequences are of an international, global nature.

This understanding was also confirmed in the 2005 UN Report on Human Development in Central Asia, which noted that the depletion of the Aral Sea has not only regional but also global significance [22, 23].

In order to stabilize the ecological state in the South Aral Sea zone, the Government of the Republic of Uzbekistan is taking measures, including to attract investments to restore the water infrastructure of the region and create conditions for the economic activity of the Aral Sea population [10]. The "Drainage project of Uzbekistan. Project for diverting drainage from South Karakalpakstan "with the participation of the World Bank in the amount of 75 million dollars US, which contributes to the improvement of the reclamation state of the lands of Karakalpakstan on an area of 100 thousand hectares and direct drainage water to the reservoirs of the Aral region.

The IFAS Agency is carrying out a number of projects in the Aral Sea area for the restoration of wetlands. One of them is the IFAS / GEF / World Bank Project "Water Resources and Environment Management", within the framework of which activities for the restoration of Lake Sudochoye were carried out in the amount of about 3 million US dollars.

The project "Creation of local reservoirs in the Amu Darya delta" is a continuation of the work begun on Lake Sudochoye. As a result of the project, the water area of the delta lakes reached 150 thousand hectares. Expansion of the water table of local reservoirs up to 230 thousand hectares is planned.

With the attraction of GEF / UNDP grant funds, projects are being implemented to restore forests in the Amu Darya delta, as well as to strengthen the sands on the drained bottom of the Aral Sea. Social and economic problems are also being addressed within the framework of these projects.

Rehabilitation of the water infrastructure in the Amu Darya delta is already yielding results. So, for example, the fish catch in 2009 amounted to about 1200 tons, the fodder base of animal

husbandry was strengthened, favorable conditions for the breeding of fur-bearing animals, marsh and waterfowl were created, the area of forest-tugai thickets increased [21].

In order to improve the ecological state in the Aral Sea zone, over the past 20 years, forest plantations have been carried out on an area of about 740 thousand hectares, incl. on the drained bottom of the Aral Sea 610 thousand hectares. For forest plantations, salt-tolerant crops are mainly used, which fix moving sands and significantly reduces salt-dust transfer [25].

Currently, a number of projects are being initiated for a total amount of US \$ 372 million, aimed at increasing water availability and improving the reclamation state of the lands of the Southern Aral Sea region. For the implementation of projects and programs aimed at the environmental improvement of the Aral Sea zone in Uzbekistan, over 1 billion US dollars have been spent in the last 10 years alone, including about 265 million dollars due to foreign loans, technical assistance and grants.

The success of the measures implemented by Uzbekistan entirely depends on the sustainable provision of water resources to the Southern Aral Sea region, which in turn depends on the water management policy of the countries located in the upper reaches of the Amu Darya transboundary river basin, the main source of water supply to the Aral Sea in general, and South Aral Sea region in particular [15].

In order to prevent further deepening of the ecological crisis, as well as to improve the existing ecological situation in the Aral Sea basin, by the decision of the Heads of the five states of Central Asia, the International Fund for Saving the Aral Sea (IFAS) was established in 1993 with the Executive Committee in Almaty (Kazakhstan).

The main tasks and goals of the IFAS activities are:

- financing and lending of joint interstate environmental and scientific-practical programs and projects aimed at saving the Aral Sea and improving the environmental situation in areas affected by the Aral disaster, as well as solving common social and environmental problems of the region;
- financing of joint fundamental and applied research, scientific and technical developments to restore ecological balance, rational use of natural resources and environmental protection;
- mobilization of funds for joint measures to protect the air basin, water and land resources, flora and fauna, etc.

The main directions of the IFAS activities to improve the ecological and socio-economic situation in the Aral Sea basin were determined by programs of specific actions approved by the Heads of State of Central Asia: ASBAM-1 (1994-99), ASBAM-2 (2003-10), ASBAM-3 (2011-15). The objectives of these programs included the creation of artificially watered landscape ecosystems on the territory of the Amu Darya and Syrdarya deltas and adjacent areas of the drained bottom of the Aral Sea, the development and implementation of programs to provide clean drinking water, improve the health of the population, implement programs to combat natural disasters, and contribute to solving social programs of the region, combating desertification, development of wetlands and other.

According to a number of researchers, environmentally sustainable development is development in which the well-being of people is ensured by the preservation of sources of raw materials and

the environment. The level of emissions should not exceed the assimilation capacity of nature, and the use of non-renewable resources should correspond to their reimbursement by replacing them with renewable components, as several approaches to environmental problems have been identified:

1. Inertial, which assumes “development as usual”, but more efficient, with continued growth and pollution control. Economic growth pays for pollution and technological development.
2. Technological transformation, in which technological development ensures a more complete development of resources and their conservation, as well as tight control of pollution.
3. Social transformation, implying a rapid awareness of the threats associated with the destruction of the environment, a breakthrough to a new worldview and a new system of values based on global collective action; transition from quantitative growth to qualitative development.

Recently, environmental management has been based on the Green Economy Concept. According to UNEP expert estimates, the “green economy” is interpreted as an economy that increases the well-being of people and ensures social justice and at the same time significantly reduces environmental risks and environmental degradation.

For the development of the Republic of Karakalpakstan on the principles of “green economy” it is necessary to implement a number of measures. The most important is the transition from environmental to environmental and economic management: if the first approach is associated with the formulation of tasks, including restrictions and framework conditions for their implementation, then environmental and economic management allows you to choose the most effective ways to solve them.

Taking into account the new conditions and historical realities of the state of nature, the problem of the evolution of the ecological environment interacts with the security of Uzbekistan, including Karakalpakstan. The approach to the practical implementation of this task determines the development strategy of the state. In these scientific developments, the role of state structures in the management of the ecological sphere is analyzed, the issues of increasing the efficiency of state management of the interaction of the “man-nature” system are raised [16, 17].

CONCLUSION

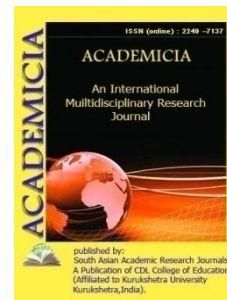
The existing ecological crisis in the South Aral Sea region testifies to the inextricable relationship of metamorphisms in nature and society. In this regard, a dilemma arises: will a repetition of this situation occur or whether there have been similar developments in the processes. In any case, in the presence of links between society and nature in the past, the existing relationships of the “society-nature” system will also help to achieve socio-ecological stability in the present and in the future. Until now, studies of the history of the development of human civilization and the history of nature in the Aral Sea region were in parallel development, independently of each other, such interrelationships of ecological processes in nature and in society were sometimes ignored.

REFERENCES

1. Law of the Republic of Uzbekistan “On Nature Protection”, Tashkent:1992.
2. Law of the Republic of Uzbekistan “On water and water use”, Tashkent:1993.

3. National strategy and action plan for the conservation of biological diversity of the Republic of Uzbekistan. Tashkent: 1998
4. National Strategy for Sustainable Development of the Republic of Uzbekistan. Tashkent: 1999
5. National report "On the state of the environment and the use of natural resources of the Republic of Uzbekistan" - Goskompriroda RUz, Tashkent, 1995, 1998, 2000
6. National Action Plan for Environmental Protection, Tashkent, Goskompriroda, 1998.
7. National Action Program for Environmental Protection 1999-2005.
8. National Action Program to Combat Desertification in the Republic of Uzbekistan, Tashkent: 1999.
9. National report on combating desertification in the Republic of Uzbekistan, Tashkent: 2000.
10. Strategy for improving the living standards of the population of the Republic of Uzbekistan for 2004-2006 and the period until 2010.
11. Conservation of biological diversity. National Strategy and Action Plan, Tashkent: 1998
12. National review to assess the progress made by the Republic of Uzbekistan on the implementation of the 21st century agenda, 2001.
13. Subregional Action Program of the Central Asian Countries to Combat Desertification in the Context of the BWC.
14. Akramov Z., Rafikov A. Past, present, future of the Aral Sea / Ed. ON. Krivonosov. Tashkent: WORK- 1990.- P. 144.
15. Aladin N.V., Gontar V.I., Zhakova L.V., Plotnikov I.S., Smurov A.O. 2018. Prospects for the biodiversity of the Aral Sea // Collection of materials of the international conference: "Joint actions to mitigate the consequences of the Aral disaster: new approaches, innovative solutions and investments. Tashkent: 2018. P. 114-120.
16. Babaev A.G. Nature protection of the Aral basin - a problem of state importance // Problems of the development of deserts. 1979.- № 2. P. 3-6.
17. Gerasimov I.P. Environmental problems in the past, present and future geography of the world. Moscow: Science. - 1985.- P. 247.
18. Glazovsky N.F. Aral crisis // Moscow: Science. 1990.- P. 136.
19. Gorodetskaya M.E., Kes A.S., Kuznetsov N.T. The state of the study of the Aral Sea // Problems of the development of deserts. 1979.- № 2. P. 12-17.
20. Integrated remote sensing and ground studies of the drained bottom of the Aral Sea. // Ed. V.A. Dukhovny, P. Navratila, I. Ruziev, G. Stulin, I. Roshchenko. Tashkent: SIC ICWC. 2008.- P. 190.
21. Interstate Commission for Water Coordination of Central Asia. 2018. [Electronic resource http://www.icwc-aral.uz/cmc_ru.htm (access date 23.07.2018)].
22. ICWC 1992/2002. 2002. Advertising brochure. P. 16.

-
23. Rafikov A.A., Tetyukhin G.F. A decrease in the level of the Aral Sea and a change in the natural conditions of the lower reaches of the Amu Darya. Tashkent: Science. 1981.-P. 199.
 24. Chub V.E. Climate change and its impact on the natural resource potential of the Republic of Uzbekistan, 2000, P. 252.
 25. Kuz'mina Zh.V., Treshkin S.Ye. 2013. Monitoring of Growth of Black Haloxylon (Haloxylon aphyllum) on Hydromorphic Salt Marches of Dried Bottom of Aral Sea // Arid Ecosystems. Vol. 3. №. 4. pp. 220-226.
 26. Rio de Janeiro Declaration on Environment and Development, adopted by the UN Conference on Environment and Development, Rio de Janeiro, June 3-14, 1992 [Electronic resource] / UN Official Site:
 27. Plan of Implementation of the World Summit on Sustainable Development. - Johannesburg, 2002 [Electronic resource] / UN Official Site - Access Mode: http://www.un.org/ru/events/pastevents/pdf/plan_wssd.pdf
 28. Resolution of the Cabinet of Ministers of the Republic of Uzbekistan № 139 from 1.04.1998



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CAMELINA AS A VIABLE ORGANIC CHEMICAL CROP

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ABSTRACT

Camelina is an underused Brassicaceae oilseed plant with significant agronomic potential in temperate areas for biofuel and vegetable oil production. Camelina is resistant to alternaria black spot and other diseases and pests, unlike other Brassicaceae. The camelina genome was sequenced and found to have an undifferentiated allohexaploid genome with a high number of genes and a low proportion of repetitive DNA. Because camelina and the genetic model plant Arabidopsis have a tight connection, this review will look at the possibility of converting fundamental Arabidopsis findings into a camelina oilseed crop for food and non-food uses. Recently, camelina has effectively expressed Arabidopsis genes for drought tolerance, enhanced photosynthesis, and overall productivity. Furthermore, gene constructs affecting lipid metabolism pathways have been engineered into camelina for the production of long-chain polyunsaturated fatty acids, hydroxy fatty acids, or high-oleic oils in specific camelina strains, which is of great interest in human food, industrial, or biofuel applications. These findings support camelina's promise as a biotechnology platform in biorefinery applications, indicating that further breeding and genetic research is needed to combine agronomic potential, distinctive oil quality characteristics, and biosafety in an agricultural production system.

KEYWORDS: Biofuel, Brassicaceae, Camelina, Genetic, Linolenic Acid.

1. INTRODUCTION

Camelina is a Brassicaceae family oilseed crop that grows well in temperate climates. Camelina is an East European/West Asian plant that has been used since the late Neolithic Era in South-East Europe, when it was domesticated. Cultivation of camelina was verified from West Asia through the European peninsula and northward to Scandinavia during the Iron Age. Camelina

agriculture has been reduced throughout time as a result of competition from a variety of other crops.

Camelina has reawakened interest in the 1980s as a result of increasing demand for both food and biofuel oils, and pilot-scale production facilities have been built in both Europe and North America. Camelina has also been described as a low-input oilseed crop that has exceptional resilience to common and widespread Brassicaceae diseases and pests. As a result, camelina-derived biofuels have been regarded as sustainable jet fuel or diesel replacements, decreasing greenhouse gas emissions by 75–80% when compared to petroleum-based products based on life cycle evaluation[1].

Camelina may be economically viable in on-farm biofuel generation under certain market conditions. Apart from biofuel and other non-food applications, camelina oil has a new potential as a vegetable oil for food applications: Camelina oil is a unique source of alpha-linolenic acid, an important omega-3 fatty acid with many health advantages. Because the amounts of linolenic acid in soybean and canola oils have been decreased to minimize the health concerns associated with the production of trans fatty acids during processing and to improve shelf life, camelina oil may be used instead to supplement linolenic acid in healthy diets.

Camelina is a self-pollinating crop with modest outcrossing rates in rows 20 to 60 cm apart, ranging from 0.01 to 0.28 percent. Seehuber studied the genetic diversity in agronomic and seed quality characteristics of camelina germplasm accessions in the 1980s and launched the first camelina breeding programme, which focused on the creation of base populations for future yield enhancement. Breeding operations were then conducted in a number of European nations, as well as the United States and Canada. Meanwhile, genetic engineering techniques have been effective in altering the fatty acid content of camelina oil in order to produce certain fatty acids of interest, such as fish oil-like long chain omega-3 fatty acids. Camelina is closely related to the genetic model plant *Arabidopsis thaliana* (L.) Heynh., implying that genetic and genomic techniques established in *Arabidopsis* may be used to Camelina. As a result, camelina seems to have the potential to serve as a biotechnology platform for a variety of food, health, biofuel, and non-food oilseed uses. As a consequence, the goal of this study is to summarize plant breeding and biotechnology findings in order to highlight potentials and future research requirements for expanding camelina's use as a sustainable oilseed crop[2].

1.1 Camelina Oil:

1.1.1 Camelina Grain Yield:

A new crop's ability to compete in terms of agronomic performance with existing oil crops is a critical element in its economic viability. Camelina oil and biofuel production would have a lower environmental effect if seed yields were higher. Camelina has been identified as one of the most promising new crops for oil production in temperate areas, owing to its broad adaptability, cheap input requirements, short crop cycle, and other benefits. Despite its recent breeding history, camelina trials have shown acceptable yield performance and other positive agronomic characteristics when compared to other new crops, which may be attributed to camelina's lengthy history of adaptability.

Low yields may suggest a poor crop establishment due to drought stress, non-optimal sowing timing, or other unfavorable environmental effects, while grain yields of over 3000 kg/ha have

been obtained using genebank accessions, newly created cultivars, and breeding lines in favorable conditions. There have been significant genetic variations in yield stability across genotypes over a greater number of trials, suggesting that breeding for particular environment adaption or wider stability may enhance yield performance[3].

Camelina oil content has also shown significant fluctuation, ranging from 30 to 49 percent, similar to grain yield. Significant genetic variation as well as genotype by environment interaction have been reported in specific studies for both grain yield and oil content, suggesting that selection for better yield or oil content might be effective. Significantly favorable relationships between grain yield and oil content have been found for various oilseeds. Researchers found negative correlations between the two characteristics across a group of camelina genotypes in certain settings, highlighting the need of tracking the grain yield/oil content connection of individual populations when breeding for oil production[4].

1.1.2 Camelina Oil Fatty Acid Composition:

A few main fatty acids, such as palmitic, oleic, or linoleic acid, predominate in most established oil crops. Medium-chain fatty acids, such as capric or lauric acid, are produced in a few new oilseeds, such as cuphea, while hydroxy fatty acids, such as lesquerolic acid, are discovered in lesquerella. Erucic acid is also produced in most Brassicaceae oilseeds, such as non-canola-quality rapeseed cultivars or crambe. When compared to conventional vegetable oils, such uncommon fatty acids have distinct physicochemical characteristics and a broader spectrum of oleochemical reactions for a variety of uses. Camelina seed oil is unusual in two ways: (i) the main fatty acid is polyunsaturated alpha-linolenic acid; and (ii) the concentration of erucic acid is low for a Brassicaceae species, while eicosenoic acid is produced as a long-chain fatty acid. Linolenic acid levels range from 30 to 43 percent, depending on genotype, agronomic treatment, and environmental factors. After earlier planting, at a greater N-fertilizer rate, and in seeds with a bigger 1000-seed weight, a winter-sown cultivar had higher linolenic acid content than a spring-sown cultivar. As with other oilseeds, the amount of linolenic acid seems to be lower in warmer regions like Spain than in colder climes like northern Germany. Linseed oil is the only vegetable oil that has a greater linolenic acid content than camelina oil. In most instances, camelina oil has less than 3% erucic acid, while eicosenoic acid levels vary from 11 to 19 percent, and saturated fatty acids are frequently found in quantities less than 10%. In mutant populations, there is a little more diversity in fatty acid composition[5].

Specific mutant genotypes could be used in crosses within selection programmes to change the concentration of individual fatty acids, similar to other oil crops: linolenic acid content could be increased for technical applications, but it should be reduced for camelina biodiesel applications due to a number of drawbacks associated with the chemical properties of linolenic acid methyl est. Furthermore, the amount of erucic acid in food may be decreased for food safety concerns, since greater erucic acid consumption has been linked to heart lipidosis in animal studies. Via conclusion, camelina oil's unique fatty acid composition suggests that it has significant fatty acid desaturase and elongase potential, both of which may be increased in genetic engineering methods to produce customised fatty acid profiles. Camelina also contains a seed protein, which seems to be a useful by-product but will not be discussed in this study.

Camelina can thus be grown as a winter or spring-sown crop in semi-arid, temperate, or even short-season environments such as Canada and the northern United States, as well as Central and

Northern Europe and Asia, for biofuel and food oil production, based on the agronomic and oil quality characteristics described above. Camelina has a similar response to nitrogen fertilizers as other oil crops, and its current yield level makes it competitive with other oil crops and for on-farm biofuel generation[6].

1.2 Camelina Disease:

Camelina, being a member of the Brassicaceae family, is susceptible to the same pests and diseases that threaten other cruciferous crops. Surprisingly, two fungal diseases that are critical to the global production of Brassica crops are entirely absent from the illness data. While no source of resistance has been identified within the Brassica genus, camelina resistance to *Alternaria* spp. has been reported by a number of writers. *Alternaria* spp. containment in *C. sativa* and *A. thaliana* has been linked to the synthesis of two indole phytoalexins, camalexin and methoxy-camalexin. Camalexin has structural similarities with the synthetic systemic fungicide thiabendazole, however it is not found in any other farmed crucifer species. Although camalexin has direct antimicrobial action against *Alternaria* spp. in vitro, it is possible that it also contributes to *Alternaria* resistance indirectly by inhibiting the synthesis of the *Alternaria* toxin destruxin B. It was also shown that *C. sativa* can detoxify destruxin B[7].

The economic significance of black spot disease for Brassica crop production throughout the globe, along with *C. sativa*'s full resilience, has made it an ideal option for intraspecific hybridizations with other Brassicas. However, significant cross-incompatibility and ploidy variations between *C. sativa* and farmed Brassica species make *Alternaria* resistance transfer problematic. Insufficient rhizogenesis and sterility of the hybrids hindered attempts to transfer camelina-derived *Alternaria* resistance to *B. carinata* and *B. oleracea* via protoplast fusions.

Furthermore, resistance transfer based on camalexin elicitation may not be as simple as one would think: detoxification of the phytoalexin brassinin in *L. maculans* cultures rose significantly in the presence of camalexin. This indicates that, while improving *Alternaria* resistance, adding the camalexin route into plants that produce brassinin, such as *B. napus*, may also increase sensitivity to *L. maculans*. Finally, the implications of expressing a phytoalexin in a new plant species must be thoroughly studied.

The most common disease of Brassica crops is *Leptosphaeria maculans*, which causes blackleg or stem canker. Despite the fact that camelina is essentially resistant to this disease, making it an appealing source of resistance for improving vulnerable Brassica crops, relatively little study has been done to explain the processes behind camelina's blackleg resistance. Phytoalexin production may be one of the key reasons once again.

Camelina shows diversity in resistance to damping-off and root-rot, sclerotinia stem rot (and downy mildew) in addition to full resistance to black spot and black leg disease, suggesting that the creation of resistant cultivars is possible. Camelina, on the other hand, is vulnerable to diseases such as clubroot, white rust, and aster yellows, which may represent a danger to increased camelina output unless resistant cultivars or appropriate management techniques can be developed.

Flea beetles are a major pest of canola and mustard crops in the northern Great Plains of the United States and Canada. Flea beetles may be seen on camelina plants in the wild, but they do not eat on them. Feeding on camelina does not begin until the beetles have been trapped to the

plants for many days. However, once feeding began, it tended to continue, suggesting that *C. sativa* resistance to *Phyllotreta* may be due to a lack of feeding signals rather than the presence of feeding deterrents. Insects' assessment of the chemical makeup of the plant's surface and volatile chemicals determines whether or not they would accept it as a host plant[8].

Glucosinolates are a class of compounds present in and on the surfaces of cruciferous plants that may function as insect pest repellents or attractants, and have been demonstrated to have a role in the identification of host plants by insects like the flea beetle. Because *C. sativa* has a low amount of glucosinolates, it may not provide enough chemosensory cues to stimulate eating. Second, none of the farmed Brassica species have three glucosinolates that *C. sativa* has. As a result, in addition to quantitative variation in glucosinolate concentration, qualitative variation in glucosinolate content may also play a role in host selection.

Only a few studies indicate camelina's resistance to other insect pests, and the camelina/flea beetle system is the best-studied relationship between this plant species and insects. Diamondback moth and mustard sawfly have been found to be deterred by *C. sativa*. Female cabbage root flies also did not lay eggs on *C. sativa* plants. The cabbage seedpod weevil seems to be resistant to Camelina as well. Although the second study's test findings were ambiguous owing to poor plant growth, they were backed up by the discovery of a significant decrease in *Ceutorhynchuspallidactylus* leaf area consumption in Camelina alyssum compared to *B. napus*. Camelina's unique features of insect pest resistance may aid in the modulation of feeding cues in crops such as *B. napus*, reducing the effect of insect pests on Brassica crops.

1.3 Genetic Resources and Applications in Genomics:

Several collecting institutes preserve camelinagenebank accessions, although the number of accessions accessible in most collections is relatively low, reflecting camelina's minor significance as a field crop in the past. As of June 2014, EURISCO, the European database of plant germplasm collections, has a total of 793 accessions of *C. sativa*. The majority of camelina accessions are kept in Germany, Poland, the Czech Republic, Bulgaria, and Austria, according to the EURISCO catalogue, although many accessions seem to be duplicated in national inventories. According on taxonomic searches as of June 2014, the Plant Gene Resources of Canada database has 137 *C. sativa* accessions, while the USDA National Plant Germplasm System holds 44 accessions[9].

The researchers examined the phenotypic variety of agronomic and seed quality characteristics in a group of camelinagenebank accessions, highlighting significant variance and high heritability for time to flowering, plant height, and 1000-seed weight, with less variation for fatty acid concentrations. Researchers divided 130 accessions into four groups based on seed size, seed oil, and protein content; they found 15 polymorphic RAPD markers for a sample of genotypes, however there was no correlation between genetic and phenotypic estimates of variety. From a camelina genomic DNA library, researchers created SSR markers. While the majority of their SSR primer pairs amplified multiple fragments, they were able to select a number of useful polymorphism primers for grouping 40 genebank accessions into different groups.

Scholars utilized sequence analysis of the ITS region as a marker system to distinguish between Camelina species and identify interspecific hybrids. Researchers used AFLP markers to create a genetic linkage map and found QTL areas for seed production, 1000-seed weight, plant height,

oil content, and individual fatty acid concentrations in a bi-parental population, showing the viability of marker-assisted selection.

However, future camelina breeding may benefit significantly from high-density genetic maps and genomic information obtained from modern genome and transcriptome sequencing methods, thanks to recent advances in sequencing and analytics. Transcriptome analysis of developing camelina seeds, for example, revealed several genes involved in seed storage protein and lipid biosynthesis metabolism; this information could be used in gene suppression or transgene expression approaches to improve camelina seed quality by targeting specific protein or lipid properties.

1.4 Camelina Breeding Methods:

Camelina flowers are tiny and seldom visited by insects. As previously stated, camelina outcrossing rates are extremely low, comparable to soybean outcrossing rates, and outcrossing occurs only over short distances. Honey bees, wild bees, and other insects visited the flowers, but seed set parameters did not vary substantially between open pollination and self-pollination. As a result, camelina may be classified as a mostly autogamous species.

Pure line breeding seems to be the technique of choice for cultivar creation based on camelina flowering biology. Segregating generations may be managed via pedigree or bulk breeding methods after artificial hybridization. The single-seed descent method has been used in camelina breeding and mapping experiments for rapid generation advancement to homozygosity; because spring-types of camelina do not require vernalization, three to four generations of a segregating population could be grown per year in a greenhouse, similar to rapid cycling brassicas.

In camelina, mutation induction techniques have been employed in addition to hybridization to create new genetic diversity. Seed treatment with EMS or seed irradiation with gamma rays from a ⁶⁰Co source have both been successful in changing the fatty acid content. Camelina was also effectively treated with EMS seed to decrease its susceptibility to acetolactate synthase inhibitor herbicides, giving resistance to imazethapyr, sulfosulfuron, and flucarbazone[10].

Another significant method for speeding breeding programmes is the generation of double haploids obtained from other cultures or isolated microspores. The best rate of embryogenesis was reported in the Camelina protocol for microspore embryogenesis, when small floral buds of <1 mm buds were used which looked like the late-uninucleate stage of the development of the microspore; some 70% of regenerating plants had spontaneous chromosome twinning with normal seed set but the efficiency of double-shaped production.

2. DISCUSSION

Camelina is considered a platform for the generation of bio-industrial petroleum. In addition to an adequate yield and processing capacity, fully established methods for breeding and enhancement of traits are available in genetic engineering because of the high gene sequence of genes between Arabidopsis and camelina. Genetic transformation methods based on the transformation of the agrobacterium-mediated floral dip have been established and in recent years have produced a series of effective transformation reports. In camelina, the genes for changing the fatty acid content, increased seed and oil production or dryness resistance were expressed in addition to selection markers.

RNAi removal of fatty acid desaturase (FAD2) and elongase (FAE1) genes has led to lower linoleic, linolenic and eicosaenoic acid concentrations, whereas the amount of oleic acid accumulated at 66%; camelina strains with high oils are of considerable value for biofuel production and further technical uses, as biodiesel with low oxygenation is of high linolenic acid. Compared to spontaneous genetic or environmental changes in the content of fatty acids, suppression lines have a significant effect on the adaptation of oils. Other types of camelina made from desaturase fatty acid and elongase cassette genes have generated up to 31% eicosapentaenoic acid, or up to 14% docosahexaenoic acid, both of which have a distinct medical and nutritional significance and are now supplied mainly by marine fish oils.

Camelina lines overexpressed the GTP-binding protein signalling AGG3 showed an increased efficiency in photosynthesis, associated with higher fruit, 1000-seed weight, seed yield and oil content than controls, showing that quantitative agribusiness can be developed through regulations on plant organ size. The increased resistance to the drought, which has been obtained via the overexpression of an arabidopsis gene for cuticular wax biosynthesis on camelina leaf surfaces, is an essential application with special importance for biofuel production at marginal soil.

The examples show the potential of camelina to translate fundamental genetic and biotechnological findings into various biorefinery applications for agricultural biofuel and other vegetable oils. In addition, because of the minimal danger of outcrossing, no crossing with common Brassicaceae species, and a limited potential for weeds compared to other Brassicaceae, genetically modified camelina also has a low level of biosecurity and is therefore ideal for platforming plants.

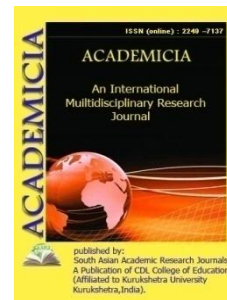
3. CONCLUSION

Although camelina has considerable agronomic potential and a unique composition of fatty acid, grain yield and oil content are important breeding objectives for making the crop more competitive to other widely known olive seeds. Due to the synthesis of phytoalexins, camelina is resistant to key Brassicaceae diseases and may also serve as a model for resistance to other significant species. Since the camelina genome is allohexaploid with many unquiet gene loci, genomic selection may speed up breeding progress with phenotypic selection, since it can deal with complicated epistatic effects more effectively. The sequence collinearity of Arabidopsis may be used in many genomic and transgenic methods such as lipid biosynthesis metabolic engineering. Further study is required to maximise the content of target fatty acids in transgenic camelina strains while avoiding unwanted metabolomic byproducts, seed protein engineering and problems of biosafety.

REFERENCES

1. C. Boyle, L. Hansen, C. Hinnenkamp, and B. P. Ismail, "Emerging Camelina Protein: Extraction, Modification, and Structural/Functional Characterization," *JAOCs, J. Am. Oil Chem. Soc.*, 2018, doi: 10.1002/aocs.12045.
2. L. H. Zhu *et al.*, "Dedicated Industrial Oilseed Crops as Metabolic Engineering Platforms for Sustainable Industrial Feedstock Production," *Sci. Rep.*, 2016, doi: 10.1038/srep22181.
3. G. Na, N. Aryal, A. Fatihi, J. Kang, and C. Lu, "Seed-specific suppression of ADP-glucose pyrophosphorylase in Camelina sativa increases seed size and weight 06 Biological Sciences

- 0607 Plant Biology,” *Biotechnol. Biofuels*, 2018, doi: 10.1186/s13068-018-1334-2.
4. M. Leclère, C. Loyce, and M. H. Jeuffroy, “Growing camelina as a second crop in France: A participatory design approach to produce actionable knowledge,” *Eur. J. Agron.*, 2018, doi: 10.1016/j.eja.2018.08.006.
 5. D. Moeller, H. L. Sieverding, and J. J. Stone, “Comparative Farm-Gate Life Cycle Assessment of Oilseed Feedstocks in the Northern Great Plains,” *Biophys. Econ. Resour. Qual.*, 2017, doi: 10.1007/s41247-017-0030-3.
 6. M. B. Betancor *et al.*, “Oil from transgenic *Camelina sativa* containing over 25 % n-3 long-chain PUFA as the major lipid source in feed for Atlantic salmon (*Salmo salar*),” *Br. J. Nutr.*, 2018, doi: 10.1017/S0007114518001125.
 7. A. L. Pilgeram *et al.*, “*Camelina sativa* , A Montana Omega-3 and Fuel Crop,” *Proc. sixth Natl. Symp. Creat. Mark. Econ. Dev. New Crop. New Uses.*, 2007.
 8. D. R. Shonnard, L. Williams, and T. N. Kalnes, “Camelina-derived jet fuel and diesel: Sustainable advanced biofuels,” *Environ. Prog. Sustain. Energy*, 2010, doi: 10.1002/ep.10461.
 9. B. Wittkop, R. J. Snowdon, and W. Friedt, “Status and perspectives of breeding for enhanced yield and quality of oilseed crops for Europe,” *Euphytica*, 2009, doi: 10.1007/s10681-009-9940-5.
 10. J. R. Petrie *et al.*, “Metabolic engineering *Camelina sativa* with fish oil-like levels of DHA,” *PLoS One*, 2014, doi: 10.1371/journal.pone.0085061.



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GENETIC IMPROVEMENTS IN MAIZE PRODUCTION

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ABSTRACT

Maize is the third most significant crop of nation after rice and wheat and is grown round the year. Its grain is utilized as feed, food and industrial raw material. Enormous progress has been achieved over past six decades to increase yield potential via genetic improvement and relieve impacts owing to different biotic- and abiotic-stresses. This study provides an overview of methods pursued in genetic improvement of maize and evaluates their effect on productivity and output of the crop. Development of cultivars with tolerance to abiotic-stresses and resistance to diseases has been a key issue in maize development. Improved goods have been provided to farmers by both governmental and commercial sectors engaged in maize seed manufacturing and distribution. As a consequence, area under better cultivars has been growing steadily, and now about 65 percent of maize land is under improved cultivars (mainly hybrids) (mostly hybrids). Adoption of high-yielding cultivars, better production techniques and increasing demand of maize resulted in higher output and productivity. Future possibilities of maize production and development techniques in context of climate change and in ensuring nutritional security are also addressed in this study.

KEYWORDS: *Crop, Germplasm, Genetic Improvement, Nutrition, Production.*

1. INTRODUCTION

Maize is planted in 184 million ha in 165 countries, producing 1016 million tonnes of maize worldwide and producing 5.52 tons/ha. It has become the grain which has the world's biggest output, which in 1996 exceeded rice and wheat in 1997, with production growing twice the annual pace of rice and three times the annual rate of wheat. India produces 9.0 million hectares of maize and is fourth behind the USA (35.5 million ha), China (35.3 million ha) and Brazil (15.4 million ha). Maize is the third largest rice and wheat crop in India. It uses its grain as feed,

food and industrial raw materials (Figure 1). It is planted in the nation throughout the year, although most (83%) of it is grown in rain or Kharif (July - October), followed by winter or rabi (November to April) (15%) and spring (February - May) (2%) seasons. Karnataka, Andhra Pradesh, Maharashtra, Tamil Nadu, Rajasthan, Bihar, Uttar Pradesh and Madhya Pradesh are among the major maize producing states and account for about 80 per cent of the country's total maize area and comparable output. As a food crop, maize is used more widely than other main crops, since a range of products are created from it and different kinds of maize such as quality protein maize (quality protein maize, pop maize, sweet maize, baby maize, etc.) are offered[1].

The area and maize output have increased continuously since 1950. (Figure 2). The area rose from 3.3 million to 9.0 million hectares and in 2013–2014 output grew from 1.7 million tonnes, to 24.4 million tonnes. The growth in production and extension of the area in Andhra Pradesh, Karnataka, Maharashtra and Tamil Nadu in the past 10 years has been extremely fast. The region, on the other hand, has seen a decreasing tendency in Madhya Pradesh, Uttar Pradesh, Jharkhand and Punjab in recent years. In India, maize by tradition is a kharif seasonal crop but currently grows in the rabi and spring seasons[2].

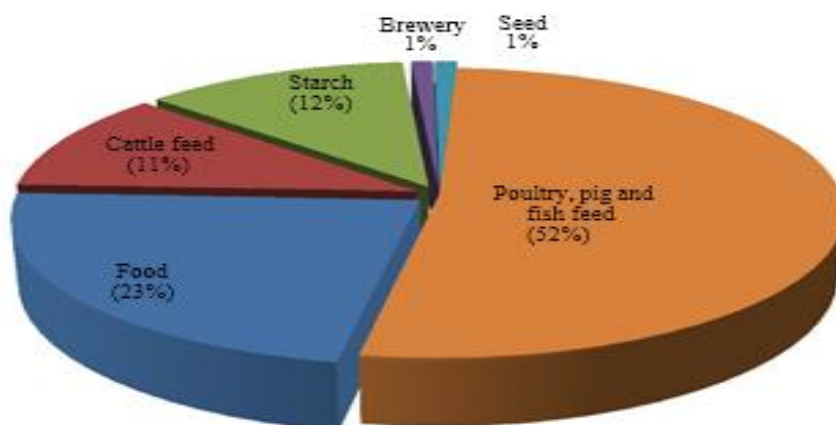


Fig. 1 Utilization pattern of maize grain in India

The production of maize in a variety of ecologies throughout the nation is susceptible to different abiotic and biotic stressors. These include high humidity and temperature, illnesses and insect pests. There have been concerted attempts to relieve the impacts of these stressors and to increase the yield potential through genetic improvement and better management. Consequently, huge progress in this area has been achieved during the last six decades. This study provides an overview of genetic enhancement methods pursued by maize in India and evaluates its effect on crop yield and output. In addition, possibilities for maize growing and improvement strategy are addressed in the context of climate change and nutritional security[3].

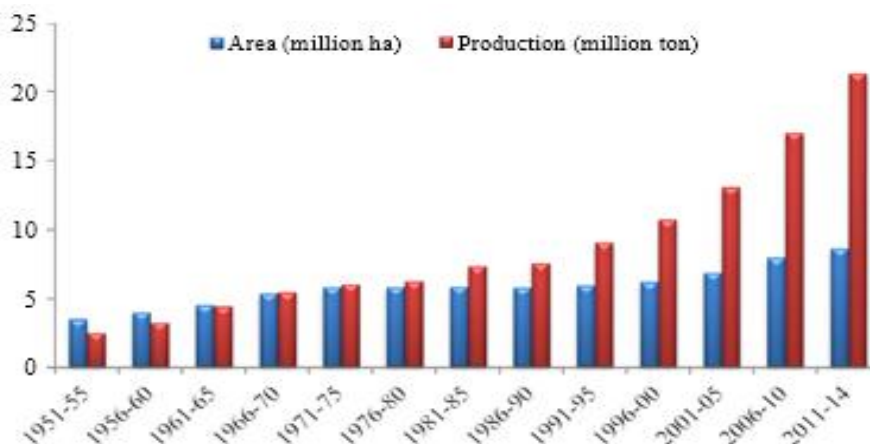


Fig. 2 Trends in area and production of maize in India since 1951

1.1 Genetic Enhancement:

1.1.1 Collection, Introduction and Use of Germplasm:

Different germplasms are a must for a successful crop enhancement programme. There have been intensive attempts to gather indigenous diversity and import alien germplasm. The studies have shown that in the Himalayan area there are land-races with primitive features called 'Sikkim Primitives' that are distinct from primitive Mexican races, e.g., Nal-Tel and Palomero. Therefore, considerable efforts have been undertaken to gather germplasm from the North East Himalayan NEH area. The Indian maize races have been categorized, based on the assessment of these and other collections, as primitive, advanced, recent introductions and hybrid races. In addition to races, many significant local variations were found, generally called according to the area in which they were mostly grown. The indigenous germplasm was big, poor yielder and mostly flint. Compared to foreign germplasm, it exhibited little diversity in Central and South America in particular. Still at that time, indigenous germplasm had a particular importance, since it developed in harmony with the prevailing agro-ecological factors and thus is anticipated to respond better to regional pressures. In the development of populations, heterotic pools and inbreds, indigenous germplasms have been utilized. The local germplasm's molecular characterization showed the varied nature of maize germplasm in India[4].

The Rockefeller Foundation also brought germplasms from various nations, notably the USA, Mexico, Colombia, Peru, Venezuela and Caribbean islands in the 1950s. Some introductions were utilized as commercial cultivars immediately. At the national genetic resources office in New Delhi, about 10,000 accessions (indigenous and exotic collections) are under long-term conservation at the National Gene Bank. Most exotic germplasms come from tropical and subtropical sources. Certain germplasms have been characterized for particular characteristics such as biotic and abiotic stressors, and nutritional quality criteria, such that over 30 sources with unique traits that are of enormous value in the breeding programme have been identified.

1.1.2 Improving The Quality of Nutrition:

The maize protein level of lysine and tryptophan is low, making it nutritionally inferior. The nutritional advantage of recessive opaque2 (o2) was discovered in India to improve the nutritional quality of maize by 2–3 times lysine and tryptophan as compared to normal maize.

The discovery led to the introduction of o2 alone into an elite genetic background. These efforts resulted to the successful creation and release throughout 1971 of three o2 composites, namely Shakti, Rattan and Protina. These enhanced maize varieties were not however popular, mainly because of the chalky look and unfavorable pleiotropic effects of o2, such as soft endosperm that rendered o2 growers more susceptible to attacking stored grain insect pests. Wishful mix of endosperm modifiers in the o2 backdrop. The outcome was hard endosperm-based genotyping of O2 in Mexico. In India, accumulation of CIMMYT germplasma modification in particular resulted in the introduction of Shakti-1 in 1997, the first harsh endosperm-based o2 composite. In 2001, the first QPM hybrid in India, 'Shaktiman-1' (a white three-way kernel cross), was launched and 'Shaktiman-2' (the white kernel-based SCH) was introduced in 2004. 'Shaktiman-3' and 'Shaktiman-4' were initially launched in the yellow kernel during 2006, followed by 'Shaktiman-5' in 2013. These QPM hybrids have been tailored to the state of Bihar. Later, many single-cross QPM hybrids with greater adaptation to the country's various agro ecologies have been produced.

The use of molecular markers to enhance maize in India resulted to the commercial release of the first marker aided selection (MAS) maize product (Vivek Quim-9) in 2008, combined with marker-based background selection. In 2012, a single cross QPM hybrid was published for the state of Uttarakhand from the MAS-derived Vivek QPM-21. Currently markers are used in quality breeding programmes for the faster production of QPM hybrids. The parental inbred QPM version of many commercial one-cross maize hybrids has been produced and experimental hybrids are being tested for agronomic performance assessment. Opaque16 (o16) is introduced into the o2 genetic background of a quality breeding programme to further enhance lysine and tryptophan in endosperm. The mutant o2 and o16 combinations provide a 40–80 percent improvement in lysine compared to just o2o2 genotypes[5].

The enhancement of maize vitamin A is a new emphasis in India. While conventional yellow maize has enormous natural diversity in carotenoids, lutein and zeaxanthine, which have little provitaminA action, are mostly carotenoids. The main carotenoid pro-vitamin A is b-carotene at minute concentrations. Multi-location assessment of a wide range of yellow corn infusions showed a 0.1–2.0 ppm level of b-carotene below the desired level of 15 ppm in the maize kernel. A unique b-carotene hydroxylase alone (crtRB1) which enhances b-carotene by preventing its conversion to other components was incorporated into seven elite inbred parents with MAS. The reconstituted hybrid form exhibited a huge increase in the b-carotene kernel with a mean of 17.5 ppm, whereas the original hybrids were 2.1 ppm. Research initiatives have also been started in India to produce multi-nutrient rich maize. A QPM hybrid form of provitamin-A-rich is presently being tested in multi-location locations. In addition, in conjunction with CrtRB1, uncommon allele lycopene epsilon cyclase (lcyE), which pushes the lycopene flow toward b-carotene, is also used for additional enrichment of b-carotene in the genetic background of commercially available QPM hybrids[6].

Research has also been started in India on the creation of maize with high iron (Fe) and zinc (Zn) mineral density. Analyses of large sets of indigenous and foreign maize inbreds showed significant potential to increase Fe and Zn levels via breeding. Identifying QPM inbreds with high Fe and Zn also offers further advantages in the use of endosperm for high lysine and tryptophan. Zn-transporters' genome-wide analyses may identify some important genes responsible for Zn build-up in maize kernel. In addition, a marker-assisted introduction of low-

phytate mutants into top normal inbreds of maize has been conducted to improve the bioavailability of Fe and Zn. The findings are promising since these MAS-derived lines are suitably low in phytate.

1.2 Corn Specialty:

In recent years, demand for specialized maize has risen by several folds. Sweet maize has evolved among many varieties as one of the most significant types of speciality maize, utilized mostly as fresh, processed vegetables and snacks. The first composite of sweet maize called 'Madhuri' was launched in 1990. Additional attempts to create various sweet maize cultivars resulted to the development of several additional sweet maize cultivars such as Priya, Win Orange and HSC 1. Sweet maize hybrids are currently being developed in the genetic field of *sucary1* (*su1*) or *shrink 2* (*sh2*). Identification of closely related SSR markers for *su1* and *sh2* has also given the elite genetic background a new dimension to the marker aided introgression of these genes.

Popcorn and baby corn are also cultivated, especially in the peri-urban region. In 2004 the first infant variety, VL-78, was launched. The public sector groups have also released a few pop maize collages. Quantitative characteristics loci (QTL) have been discovered for several appearance characteristics in maize, giving a possibility to integrate them into the elite flint genetic field via MAS.

Starch was one of the major by-products of maize grain and 12% of the maize produced now is utilized in the starch industry. A three-way, starch-rich hybrid 'Histarch Hybrid Makka' was launched in 1993. HM-13 just launched a SCH with increased starch content in grain. In addition, several waxy maize inbreds were also produced and utilized in the breeding effort. Genetically, many inbreds of high oil have been created and are significant in the variety development, since in chicken business high oil feed is desired.

Efforts to improve maize crops for fodder production to address the requirement for the mixed crop farming system resulted in the distribution of African Tall green feed to the whole nation in 1982. Composite APFM-8 was introduced in 1997 to cultivate in the country's southern area. In 1992 and 2008 respectively, J-1006 (for Punjab) and PratapMakka Chari 6 were published. The further popularization of sweet maize and baby maize varieties also gives the agricultural system a new dimension since they offer adequate feed after the ear harvest.

1.3 Improving Disease and Resistance to Insects:

Although there have been over 30 cases of illness recorded in various Indian areas, significant diseases include turquoise leaf blight, maydis leaf blight, complicated post-flowing stalks, leaf banding and sheath blight, sorghum downy mildew, bacterial stalk red and brown strip downy mildew. These diseases occur depending on the prevailing environment (temperature, precipitation and wetland), cultural practices (planting density) and maize crop variety in various agro-ecological areas. Such illnesses cause huge losses in both the amount and quality of grain produced under favorable circumstances. Resistance breeding of host plants has been focused, because resistance to host plants is sustainable and cost-effective. Following a thorough knowledge of the epidemiology of many diseases, field checking methods were developed, capable of distinguishing resistant and susceptible lines and utilized widely in breeding programmes for resistance. Cultural and chemical methods were also developed to manage these

diseases, in addition to the use of host plant resistance. However, chemical control methods are mainly limited to plots of seed production and to commercial hybrid seed treatment supplied to farmers[7].

Three insects - stem borer, pink stem borer and shooting fly - in India are the major problems. These are usually managed by the use of pesticides. In addition, germplasms under artificial infestation are continually assessed to discover resistant sources of these insect pests. Antigua Group 1 has attracted attention as a resistant source for a long time. It was also utilized as a hybrid ganga male parent (CM 500). Recent attempts via cyclic selection and artificial inbreeding in order to enhance moderately resistant sources have been fairly successful in minimizing leaf damage. Resistance to pink borer is also observed in inbreds. Maize grains are also infected by a broad variety of storage insect pests that have resulted as voracious feeders of cereal grains, including rice weevil and Angoumois grain moth. Grains are typically kept in jute bags in poor nations such as India that frequently absorb humidity during the rainy season and provide favorable circumstances for weevil infestations. A large screening of several inbreds, including QPM, pop maize and candy maize has led to the discovery of rice weevil-resistant sources. These sources of resistance are promising their objective use in the breeding programme. Furthermore, in recent years, biological control via *Trichogramma chilonis* has gained importance. Integrated pest management approach may also offer ways to control insect pests in a sustainable manner[8].

1.4 Improving The Tolerance of Abiotic Stress:

Maize is mainly cultivated (over 80 percent) during rainy season and the availability of moisture is seldom sufficient for maize of Kharif. The crop is also susceptible to dependent / intermittent excessive moisture / water recovery or drought at key development phases, often within the same season. Rabi maize acreage is frequently limited (15 percent) by protracted low-temperature regimes in most areas of India, with the exception of South India, in December and January. In crucial periods of development, particularly during early planting and blooming phases, cold stress may induce permanent physiological damage to maize plants, leading to significant production losses[9].

The impact of climate change, which is plainly shown by the increasing frequency of severe weather, presents additional difficulties for an already sub-optimal/challenging environment. Several climate modelling studies have shown a faster rise in daytime and night time, intense and concentrated rainfall within restricted days, which causes shorter-term water logging and leaves severe dry days in the Asian tropics for the remainder of the season. This is evident in a recent Indian Meteorological Department study based on previous 110 years, which showed that while the overall rainfall has not changed much in recent years, the frequency of wet days has dropped dramatically and this has resulted in the high availability of humidity. In various areas of maize production, such changes are already seen in many ways, in terms of changing seasons and increased rates of severe weather events, such as drought, water collecting and heat combined with new/complex diseases[10].

2. DISCUSSION

A well-organized seed production programme is vital in order to fully exploit the benefits of enhanced hybrid cultivars. Compared to hybrids and composites, inbred lines need a distinct package of production technologies, such as crop geometry and the reduction in fertilizer and water management. Previously, inbred parents' agronomy did not get much attention. During these last two decades the agronomy of inbred lines has received appropriate attention, as well as the creation of high-yielding inbred lines have made excellent progress. In addition, the modernization of seed processing and packaging has improved significantly.

Both the governmental and commercial sectors participate in the manufacturing and distribution of maize seeds. In addition to generating certified hybrid seed, the public sector provides the breeder and founding seed of parental hybrid lines to the private sector. The seed production activities are being conducted by the NSC, 15 State Seed Corporations (SSC), several State Departments of Agriculture and Agricultural Universities. Recently in Rajasthan and West Bengal, a seed village idea was established to grow certified seed in accordance with specific arrangements of government to enhance food safety and nutrition. The private sector, like always, has a significant stake in the seed business. Due to favorable growing conditions and sufficient seed processing facilities, the majority of seed production is carried out during the rabi season in Andhra Pradesh.

Public sector entities undertake hybrid seed manufacturing and sale of public-sector maize hybrids, but enough seed is not produced to satisfy demand. Therefore, public-private partnership (PPPs) has been formed between public-sector research institutes and small and medium-sized private seed businesses for development and commercialization of public-species hybrids. This is of tremendous assistance in prompt distribution and replacement of newly released cultivars. Another example of PPP is the assessment of hybrids in the private sector by coordinated project centers throughout India. Under addition to the existing tests of private-section hybrids in the All India Coordinated Research Project (AICRP) method and the seed production outsourcing and marketing by the private sector of public-species hybrids, the PPP model must nevertheless be strengthened. In the context of successful PPP models such as Germplasm Enhancement of Maize (GEM) in the United States and TAMNET in Asia, future partnerships must collaboratively increase the germplasm of different goals in order to promote the creation of better germplasm.

3. CONCLUSION

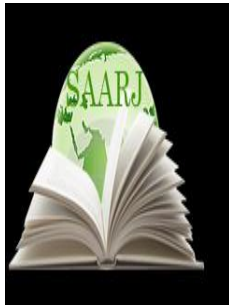
In future, demand for maize is projected to increase. The key drivers of maize demand in India are (a) increased demand by the poultry and piggy sector, consuming more than half of domestic production, (b) growing urbanization leading to increased demand for processed foodstuffs, such as corn flakes, bakers, etc., (c) increasing organized dairy sector, requiring more fine cereals and more concentrate from the maize sector and (d) increasing domestic prices. The anticipated development of feed-based industries suggests that maize consumption would increase in India from the present level of 25 million tonnes, to 45 million tonnes, by 2030. India should be able to achieve more than this goal by expanding the genetic improvement programme and by developing adequate agro-interventions and appropriate regulations.

Germplasm base diversification Only by constant infusion of more and more varied elite germplasm from temperate areas can the continual increase in production be accomplished. Only a portion of the broad genetic diversity in maize has been used thus far. Without disrupting

heterotic groups, recycling current elite lines may further improve output in the near run. However, extending the germplasm base to include characteristics such as drought and water tolerance, diseases and insect resistance, superior nutritional qualities, good standing and the required characteristics for climate resilience are particularly useful in order to sustain long-term genetic productivity and stability gains. To date, little emphasis has been paid to the exploitation of temperate germplasm. Temperate material is a potential source of hybrid-oriented germplasm diversity. The genetic basis for speciality maize and forage maize germplasm, accessible from Indian maize farmers, has to be extended quickly.

REFERENCES

1. W. Wen, Y. Brotman, L. Willmitzer, J. Yan, and A. R. Fernie, "Broadening Our Portfolio in the Genetic Improvement of Maize Chemical Composition," *Trends in Genetics*. 2016, doi: 10.1016/j.tig.2016.05.003.
2. W. A. Russell, "Genetic Improvement of Maize Yields," *Adv. Agron.*, 1991, doi: 10.1016/S0065-2113(08)60582-9.
3. Y. Li *et al.*, "Evaluation of ZmCCT haplotypes for genetic improvement of maize hybrids," *Theor. Appl. Genet.*, 2017, doi: 10.1007/s00122-017-2978-1.
4. Q. Ali, M. Elahi, B. Hussain, N. Hussain, F. Ali, and F. Elahi, "Genetic improvement of maize (*Zea mays* L.) against drought stress : An overview," *Agric. Sci. Res. Journals*, 2011.
5. B. Masuka *et al.*, "Gains in maize genetic improvement in eastern and southern Africa: I. CIMMYT hybrid breeding pipeline," *Crop Sci.*, 2017, doi: 10.2135/cropsci2016.05.0343.
6. W. Wen *et al.*, "Metabolome-based genome-wide association study of maize kernel leads to novel biochemical insights," *Nat. Commun.*, 2014, doi: 10.1038/ncomms4438.
7. C. M. Löffler, M. T. Salaberry, and J. C. Maggio, "Stability and genetic improvement of maize yield in Argentina," *Euphytica*, 1986, doi: 10.1007/BF00021853.
8. J. K. Muli, C. Mweu, M. C. Imbo, and S. E. Anami, "Genetic Improvement of African Maize towards Drought Tolerance : A Review," *Adv. Life Sci. Technol.*, 2016.
9. J. Y. Kim, J.-C. Moon, S.-B. Baek, Y.-U. Kwon, K. Song, and B.-M. Lee, "Genetic Improvement of Maize by Marker-Assisted Breeding," *Korean J. Crop Sci.*, 2014, doi: 10.7740/kjcs.2014.59.2.109.
10. X. Zhao, P. Fang, J. Zhang, and Y. Peng, "QTL mapping for six ear leaf architecture traits under water-stressed and well-watered conditions in maize (*Zea mays* L.)," *Plant Breed.*, 2018, doi: 10.1111/pbr.12559.



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CREATION OF 3D MODELS OF HISTORICAL MONUMENTS APPLICATION OF DIGITAL TECHNOLOGIES

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ABSTRACT

The article is devoted to the use of modern information and communication technologies in organizing virtual tours to places of interest and monuments, which describes the problems of developing virtual tourism. Also included are software for developing virtual travel experiences such as 3ds Max, Lumion 6.0, Adobe Photoshop, Adobe Premiere Pro and Adobe After Effect. The software complex was developed on the example of the complex "Shaikhovanda Tohur" which is located in the city of Tashkent.

KEYWORDS: IT, Education, Programming, Development, Scratch, Code.Org, 3ds Max, Lumion 6.0, Adobe Photoshop, Adobe Premiere Pro, Adobe After Effect. Islam, Digital Technology, Lan, Information And Communication Technology Education.

INTRODUCTION

As you know, today the process of integration and globalization is deepening and covering all areas. The unique treasures of the world treasury of science and culture are presented to the general public. This is especially true for today's young people, and for those who have a deeper knowledge. Education systems also play a role in this process. Digital technologies, especially modern information technologies, especially the widespread use and development of the Internet, are a topical issue today. Such technologies create unique opportunities for our young people to have open and wide access to the global information system, to develop their intelligence and professionalism.

LITERATURE REVIEW

The strategy we used to create the search strings was as follows [2] [21]: • Finding papers about creation of 3d models of historical monuments. • Listing keywords mentioned in primary studies which we knew about. • Use synonyms word (usage) and sub subjects of digital technology in

education such as (creation of 3d models, historical monuments). • Use the Boolean OR to incorporate alternative spellings and synonyms. • Use the Boolean AND to link the major terms from population, intervention, and outcome. The complete search string initially used for the searching of the literature was as follows: digital technology AND historical monuments. It has been highlighted in [5] [18] that there are two main issues on conducting an SLR search which are the sensitivity and specificity of the search. In our preliminary search, when we used the complete search string defined above we retrieved a very high number of articles. For instance, Google scholar, Scopus, ProQuest education, IEEEExplore, Science Direct, Springer Link retrieved more than two hundred results. Therefore, we have deepened our search and used this search string: (Adoption OR Usage) AND (historical monuments OR “3d models”) AND (2d, 3d models OR digital technologies). The revised search string has given us a reasonable number of studies and we finally selected relevant empirical studies

ANALYSES AND RESULTS

3D modeling or CAD (Computer-aided design) refers to the creative process of building a model in three dimensions (known as x,y,z) using a dedicated software package like Maya, Houdini, Blender, Cinema 4D, or many others. The major aim of this paper is to present a non-destructive GIS-based method for a frescoes and Icon analysis part of the cultural heritage [1].

CAD has been used for years in many industries to create a database for manufacturing, to improve the quality of design and communications through documentation. As a result, most brands find that 3D content already exists in their manufacturing process[2].

The first 3D models were created in 1960s. Back then, only those professionals in the field of computer engineering and automation who worked with mathematical models and data analysis were involved in 3D modeling.

A pioneer of 3D graphics is Ivan Sutherland, the creator of Sketchpad. This revolutionary program helped to create the first 3D objects – 3D is what it is today thanks to Sketchpad. Sutherland, along with his colleague David Evans, has opened the first ever department of computer technologies at the University of Utah. They attracted numerous talented professionals from all over the country who helped contribute to the development of the industry. Edwin Catmull, a current head of Pixar Animation Studios and Walt Disney Animation Studios, was one of Sutherland’s students [3].

Sutherland and Evans opened the first 3D graphics company in 1969, calling it simply “Evans & Sutherland”. Initially, 3D modeling and animation was used mostly on television and in advertisement, but with time, its presence in other areas of life increased greatly.

The proposed methodology is based on the combination of topographic surveys, digital photogrammetry and image processing techniques by means of four control points and one photography of the target at least, that become metric rectified image at any plane defined by the user. It is possible to quantify any physical characteristic of the surface of a fresco as well as alterations on its surface that produce deviations from flatness. The Bundle adjustment was applied to a 2D reconstruction algorithm instead to a 3D reconstruction algorithm to control fresco, from the Ramet Monastery[7].

There are many reasons and motives for digital modelling of real world objects, including: virtual reconstruction of historical artifacts icons and frescoes that no longer or only partially

exist, digital documentation of pictures for restoration purposes in case of fire, flood, etc.; ability for virtual interaction without the risk of damage; production of e-learning data for educational resources; virtual tourism; virtual museum exhibits; and interactive visualisation of the objects [1].

Conditions are being created for the free and creative work of people, especially young people, through innovative technologies in education and training based on science, technology, digital technologies and artificial intelligence systems.

The importance of innovative technologies in the education system largely depends on the development of information technology in the big picture. At present, as a result of the development of information technologies in our country, the prospects for the production of national programs are being developed. It is very important to bring up young people in the spirit of patriotism and to bring them up with high knowledge and morals like our ancestors [9].

In this regard, the role of modern virtual technologies in preserving the material and spiritual heritage, as well as their transmission to future generations is invaluable. Software developments based on virtual and augmented reality technologies are proof of our point. Nowadays, when we divide virtual technologies into two groups based on virtual reality, the first ones are appreciated by game developers and sellers. While the former uses virtual reality to achieve the full immersion effect of a game or virtual journey, the latter is prepared to invite customers to “try out” clothing or furniture [11].

Today, virtual reality technologies are spreading to other areas as well. For example, in education, a virtual environment helps to visually explore anatomy, architecture, or ancient civilizations. Virtual and augmented reality of digital technology now helps to better understand material and make learning more interactive. If we talk about the direction of multimedia technology to create three-dimensional graphic images, this direction is also relevant, including applications such as AutoCad, 3DMax, Blender, 4D CINEMA, Blender, Maya. The products of world-famous cinematography companies such as WarnerBrothers, Colambo Pictures, Sony Animation, Dream Works are produced in the three-dimensional graphics programs listed above. Currently, the widespread introduction of AutoCAD and 3D MAX programs in the process of creating a graphic model of historical monuments and artistic decorative elements is effective[18].

There is a technology of computer modeling, the purpose of which is to reflect in computer memory the process of understanding the nature around us, the events that take place in it, and changes in society, using modern methods. The use of programming languages in computers has made a serious breakthrough in mathematical modeling.

Different types of process models studied on computers (graphics, diagrams, animations, animations, etc.) can be created on a computer screen. An example of the work being done in this direction is a virtual model of the Minor Mosque in Tashkent (Figure 1).



Figure 1 Minor mosque project

A three-dimensional model of the object was created using the capabilities of 3D MAX software. Like all graphics programs, this program requires a high-quality computer. First of all, digital objects are 3D (three-dimensional) models created in a free space using computer software[21].

Today computer technology is used by 3D editors to create three-dimensional compositions. They have two distinct characteristics. First to properly control the interaction between the surface properties of the object and the light source to show the three-dimensional nature of the object being depicted. The second is that it allows you to create three-dimensional animations. That's why three-dimensional graphics editors are called 3D animators.

The rapid development of digital and information and communication technologies and the updating of its hardware and software, the application of 3D max modeling, three-dimensional image modeling, three-dimensional representation of space and objects, images, drawings and geometric figures Indicates that there are options for creating a 3D model [15].

Three-dimensional graphics are widely used in engineering design, architectural construction, construction of computer models of physical objects. Three-dimensional graphics is one of the most complex and comprehensive areas of computer graphics. Users working with three-dimensional graphics should have knowledge in one of the areas, such as designing, lighting, moving objects and cameras, using sound, applications, and using presentation effects [9].

The use of programming languages in computers has made a serious breakthrough in mathematical modeling. Different types of process models studied on computers (graphics, diagrams, animations, animations, etc.) can be created on a computer screen.

Looking back, it was hard to imagine the capabilities of today's computers. At the same time, three or more software developments are being developed in information technology, the visuals of which are astonishing. Modern forms of modeling began to emerge.

When creating a three-dimensional model of an object using the capabilities of the 3D MAX program, this program, like all graphics programs, requires a high-performance computer [17].

This process can be seen in the example of the historical monument of Sheikh Khovand Tokhur, one of the sacred places in Tashkent. Exports and stores the finished object in 3D MAX and imports it into Lumion. In this program, materials are provided to the object and made ready (Figure 2).



Figure 2. General view of Sheikhkhovanda Tohur Mosque

The main view of the Shaykhovanda Tohur complex created with the help of the Lmion program (Figure 3)



Figure 3 General view of the Shaykhovanda Tohur complex

The potential of multimedia technologies in the development of virtual models of historical monuments is also unique. Multimedia technologies provide information exchange between the user and the computer using sound (speech, music, noise), graphics (pictures, images, photos, drawings) and animation (videos, cartoons).

It is also gaining ground in a number of areas. The development of multimedia technologies is based on applications that work with objects of three or more sizes. Among various industries, these programs are used in architecture and construction, design and modeling. It was in these applications that only 2 sides of the object were represented, and now concepts such as 3D, 4D Cinema, 5D and even 7D are beginning to emerge. The following large-scale applications have the opportunity to learn more about the object than ever before. Spatial movements on the models, animations are performed in Blender, MAYA programs [21].

The development of the industry is the basis for tourism, as well as virtuality in all areas. In particular, architecture and design are unimaginable without modeling.

When creating three-dimensional models, a three-dimensional model of an object allows the user to have a better idea of the object.

Using models and algorithms, the created object will look like the original. Additional effects on the model will depend on the inner world and imagination of the designer. 3D effect models of travel routes will help to attract more tourists. The development of the multimedia industry can be seen in the example of these applications. We can also see the capabilities of 3D MAX in the example of LUMION 6.0, which can work in sync with this program. LUMION 6.0 is a great practical utility for the rendering part of a modeled object.

A number of computer applications play a key role in creating models of not only travel routes, but also any objects. Modeling is the visualization of an object in computer memory so that complete information about the object can be obtained [15].

Modelling accuracy depends on requirements such as level of detail; a sample of live survey data will be utilised as ground truths to evaluate the accuracy of the mapped parametric data both as individual models and integrated models. Mapped detail behind the surface of the structure, which is based on historic detail, will be compared for accuracy with existing survey data of the surveyed structure where detail is available from previously carried out destructive surveys and openings of buildings [19].

There is a growing interest in historical monuments and their visits. It is no exaggeration to say that the creation of 3D models of historical monuments and their introduction in travel itinerary will increase the interest in them. Visual models of historical monuments in our country can be created using 3D Max and other modern software (Figure 4).

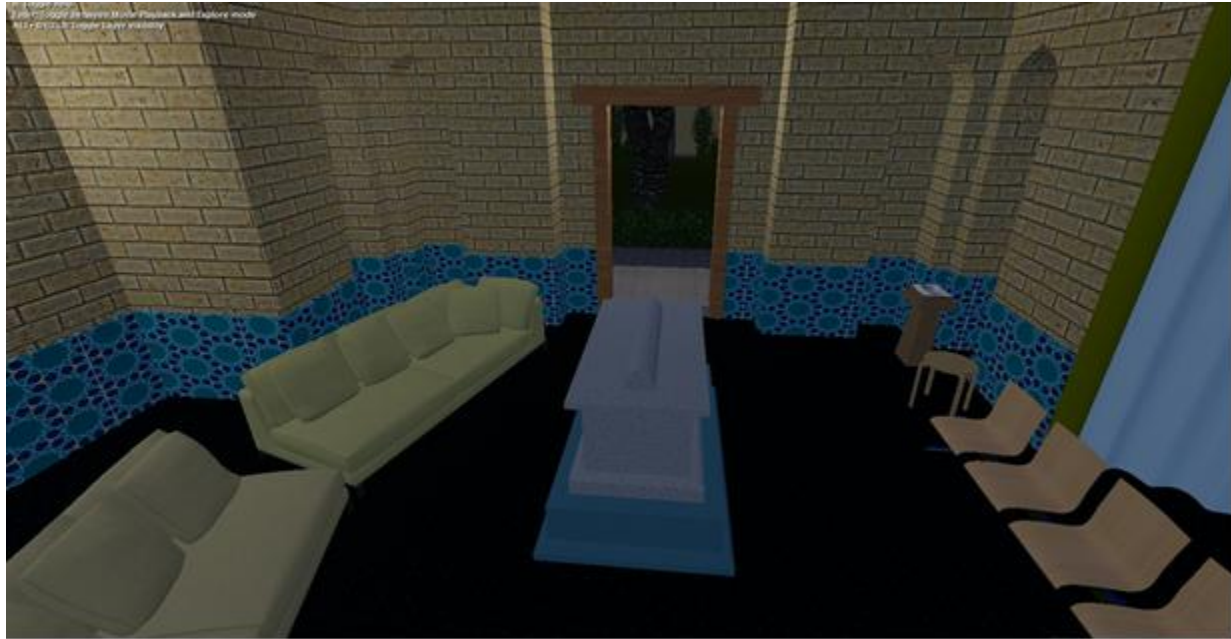


Figure 4. Sheykhovanda Tohur "complex interior

CONCLUSION

In the age of digital technology, especially virtual technology, people need to be constantly on the move. Constant physical exertion can lead to physical and mental exhaustion. The developed software helps a person to have a spiritual rest. The user can organize a virtual tour of the house, place of work, or otherwise to the site. The user will also have a basic understanding of step sets. The presentation of the studied processes and events through computer technology, the creation of models of sacred sites based on virtual reality and its presentation to the general public are important as they increase users' interest in historical monuments.

Today, with the help of such virtual reality, it is possible to visit other countries and attractions, museums and even sunken ships.

The use of digital technologies in various fields plays an important role in shaping the worldview of young people:

- The fact that the majority of the population of the country uses the opportunities of the Internet in the field of Internet and information technology;
- The ability to more accurately represent the image of a real object in the elements of multimedia design of historical monuments and monuments through graphic programs;
- The deep penetration of multimedia in all areas of information technology;
- That the state pays attention to measures aimed at understanding national identity and deepening the assimilation of religious values.

The implementation of the above goals and objectives will ensure the effectiveness of digital technologies, educational innovations, the positive impact on the worldview of young people, the revival of historical thinking of young people, the consolidation of national identity and values in the minds of our people, especially in youth.

REFERENCES

1. Dimen, L. & Borsan, T. & Gaban, Lucian. (2018). 3D modelling of historical monuments using photogrammetric and GIS software for restauration. Journal of Environmental Protection and Ecology. 19. 330-337.
2. К.А.Сурков, Д.А.Сурков. Программирование на языке PHP 1999.
3. Ю.М.Четирко Программирование на языке PHP. 2003.
4. Xodjayeva Mavluda ("Optimization of Web sites with the help of modern information technologies (on the example of the web site «Yeti pir».uz)," The Light of Islam: Vol. 2019 : Iss. 1, Article 16.
5. XODJAYEVA, Mavlyuda; Jumayev, Turdali; Dadamuhamedov, Alimjon; and Saydakhmedova, Barno (2020) "CREATION OF MOBILE APPLICATIONS FOR THE SHRINES OF AL-HAKIM AL-TERMIZI," The Light of Islam: Vol. 2020: Iss. 2 , Article 24. Available at: <https://uzjournals.edu.uz/iiu/vol2020/iss2/24>
6. Irgashevich, Alimjon Dadamuhamedov (2020) "CLOUD TECHNOLOGIES IN ISLAMIC EDUCATION INSTITUTIONS," The Light of Islam: Vol. 2020 : Iss. 2 , Article 23. Available at: <https://uzjournals.edu.uz/iiu/vol2020/iss2/23>
7. М.Ходжаева Буюк алломаларнинг ҳаёти ва ижодини ўрганишда замонавий ахборот-коммуникация технологияларидан фойжаланиш. Имом Бухорий сабоқлари. Маънавий –маърифий, илмий адабий журнал, №4, 2019 й. 143-144 бб.
8. А.И.Дадамухамедов .Зиёрат туризмида информаион коммуникация технологияларининг ўрни. Имом Бухорий сабоқлари. Маънавий –маърифий, илмий адабий журнал, №4, 2019 й. 144-145 бб.
9. Вайк Аллен и др. JavaScript. Энциклопедия пользователя: Пер.с англ./Аллен Вайк. –К.: ООО “ТИД ДС”, 2001. -480 с.
10. Mavlyuda, X., Rustam, K., Rano, D., Dadamuhamedov, A., & Alisher, M. (2019). Personality-Oriented Learning Technologies. International Journal of Recent Technology and Engineering (IJRTE) ISSN, 2277-3878.
11. Turdali, S. J., & Dadamuhamedov, I. A. (2020). Creation of electronic programs on the sanctuary of al-Hakim al-Termizi. The Light of Islam: 1 (30).
12. Alimjon, D. (2019). The role of information and communications technologies in pilgrimage tourism in Uzbekistan. The Light of Islam, 1 (17).
13. Zokirjon o'g'li, U. S., Mavlyuda, X., Turdali, J., & Dadamuhamedov, A. (2020). CREATION OF ELECTRONIC RELIGIOUS PROGRAMS ON ISLAMIC SUBJECTS. SCIENCE, RESEARCH, DEVELOPMENT, 2(26), 40-43.
14. Xodjayeva, M. (2019). Optimization of Web sites with the help of modern information technologies (on the example of the web site «Етти пир». uz). The Light of Islam, 2019(1), 16.

15. Dadamuxamedov, A., Mavlyuda, X., & Turdali, J. (2020). Cloud technologies in islamic education institutions. *ACADEMICIA: An International Multidisciplinary Research Journal*, 10(8), 542-557.
16. Дадамухамедов, А., Артикова, М., & Патуллоев, Н. (2020). THE ROLE OF MODERN INFORMATION AND COMMUNICATION TECHNOLOGIES IN TOURISM. *Актуальные научные исследования в современном мире*, (2-1), 15-24.
17. Xodjayeva, M., Kabulov, R., Djuraeva, R., Dadamuhamedov, A., & Mukhammadiev, A. (2019). Personality-oriented learning technologies. *International Journal of Recent Technology and Engineering*, 8(4), 7706-7708.
18. Sabirovna, K. M., Bozorov, A., & Dadamuxamedov, A. (2020). MOBILE APPS IN UZBEKISTAN MAKE A SIGNIFICANT CONTRIBUTION TO THE DEVELOPMENT OF TOURISM. *International Engineering Journal For Research & Development*, 5(Special Issue), 13-13.
19. Irgashevich, Alimjon Dadamuhamedov (2020) "SIGNIFICANT CONTRIBUTION OF MOBILE APPS TO THE DEVELOPMENT OF TOURISM IN UZBEKISTAN," *The Light of Islam: Vol. 2020 : Iss. 4* , Article 20.
20. Kamil Makku, Ph.D. (2019). "Coding for kids for Dummies" 2nd edition, NJ 07030-5774
21. Mary Slater, "Help your kids with computer coding", First American Edition, 2014, ISBN: 978-1-4654-1956-9



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IMPROVING THE METHODOLOGY FOR THE DEVELOPMENT OF ENVIRONMENTAL COMPETENCIES OF STUDENTS IN THE INTERDISCIPLINARY TEACHING OF PHYSICS

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ABSTRACT

The article discusses the improvement of the methodology for the development of environmental competencies of students and pedagogical aspects to improve the technology for the development of environmental competence of students in the interdisciplinary teaching of physics. There are also new integrative model of physical education and the algorithm of its organization for the development of environmental competence among students.

KEYWORDS: Ecological Competence, STEAM, Integrative Model, Ecology, Interdisciplinary Learning, Diagnostic Modules, Energy

INTRODUCTION

In our country, the advantage of training based on a competency-based approach to education is provided, teaching students to use effectively in various situations encountered in personal, professional and social life.

The draft state educational standards provides for the formation of students' general competencies concerning the support and the subject. Core competencies - special attention is paid to the abilities, skills and activities that a person must possess for successful prosperity in society, regardless of what profession he has. From the core competencies, the "Competence of Nature Protection and Ecological Culture" was created in the following order:

- Explanation of ecological processes taking place in living and inanimate nature by means of physical laws;
- Preservation of the environment (water, air, land), their economical use;

- The influence of physical fields (noise, electromagnet, radiation) and the improvement of methods and means of protection against them;
- Rational use of natural resources, human influence on nature, study of global and regional environmental problems;
- explanation of the use of electric energy obtained by traditional methods, natural resources, their economical use and the study of ways to obtain alternative energy;
- Analysis of physical methods and means and life examples in the development of environmental monitoring of the environment.

In order to achieve an effective solution to the above problems, a systematic approach should be used in the environmental education of teachers, specialists in the field of education of the system of interdisciplinary teaching of the student's environmental competence.

When studying the global environmental education system in Germany, a direction is given to the formation of the behavior of environmental responsibility among the younger generation, in Austria, the environmental education program is included in the school curriculum, in the United States of America, the issue of deep implementation of the content of educational subjects in the content of environmental education in general education schools is considered, in the People's Republic of China, the history of environmental education covers a period of more than 30 years, there is proposed the inclusion of an ecology course in all educational institutions.

Practical work is being carried out in our country on the basis of a number of laws, regulations, orders on the issue of nature protection in the environmental education system. An ecological party has been established in Uzbekistan, and the Ecosan movement has been organized on a voluntary basis. Faculties of ecology are being created in higher educational institutions, a plan of the national movement for environmental protection of nature and stable development of the Republic of Uzbekistan has been drawn up. It pays special attention to improving the ecological situation on the territory of Uzbekistan; protection and improvement of the environment; rational use of land and water resources in order to preserve for the future generation; development of non-traditional energy sources and renewable energy sources.

"Improving the methodology for the development of environmental competencies of students in the interdisciplinary teaching of physics" it is about a rapidly and intensively developing society, science and technology, compliance with new production requirements, the ability to anticipate, bring to students not only the theoretical foundations of knowledge and skills, but also on the basis of acquired knowledge to develop their personal qualities, guide their individual qualities to set goals, study environmental problems arising in the future in personal, professional and social activities and develop the necessary environmental competencies for them to take measures to eliminate them.

The ecological and pedagogical model of the development of ecological competence of students in interdisciplinary teaching of physics is as follows (see Figure.1).

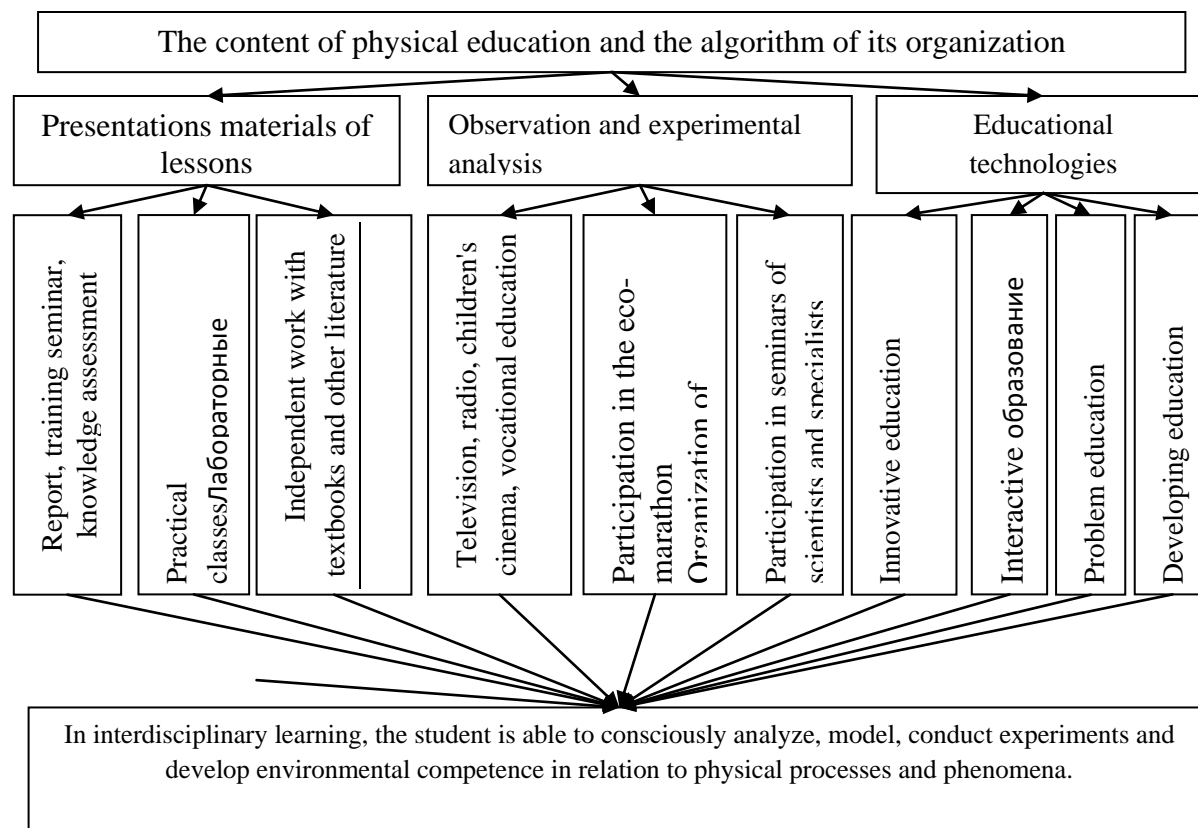


Fig. 1. Ecological and pedagogical model of the development of ecological competence of students in intersubject teaching of physics.

1. The first stage of the development of the student's ecological worldview is a lesson. In interdisciplinary teaching, a student can form knowledge of environmental competence through the following subjects: chemistry, biology, social studies, geography.

Students of grades VIII-IX have a very deep knowledge system in mathematics and physics. Especially the students of grades X-XI are in close active contact with the environment and society. Making reasonable use of these opportunities of students, a system of knowledge on their environmental competence has been created.

2. In observation and experimental analysis, the student uses the following sources: radio, television, Internet sites, international events and messages, events taking place in the country and the region, covered in newspapers and magazines; the logical structure of research works carried out in the field of ecotourism has been developed, changes in social life have been analyzed.

3. Pedagogical technologies - formed in the XVII century on the basis of the didactic tendencies of Ya.A. Komensky, are developing in the direction of the class-lesson system, which is currently most used in the countries of the world. The interdisciplinary teaching of physics uses "Developing educational technologies" and their types.

With the development of the student's environmental competence, when teaching physics with interdisciplinary communication, the requirement of training in direct connection with the

complex of the sphere of influence of physical fields on the environment, mechanisms, degree and methods and means of protection against them increases. Physical fields include the following: the development of technological progress, sound waves, noise generated during production, electromagnetic field, X-ray radiation, radioactive radiation, the flow of charged particles.

Examples of topics of the physics program in the development of environmental competence of students on the basis of integrability are given.

In lessons 61, 62, 63, 64, 65 about the "Sound phenomena" of Chapter VII of the physics textbook for the sixth grade. After a full explanation of the topics, the students are shown the negative effects of sound on living organisms. A sharp increase in the heart, cardiovascular system, gastrointestinal, hypertensive diseases of people is associated with noise, in the open air a person does not

In the IX class when explaining the topic to students "Evaporation and condensation": 1. The device, application and actions of the "Solar Water Desalination Plant", which turns salt water into fresh water, are described in detail. 2. Explains how evaporation occurs in plants, deterioration of the quality of consumption of vegetable products, carrots, potatoes and other vegetables, as a result of evaporation of moisture from their composition, it is indicated that in order to preserve useful properties, their constant storage at normal temperature is necessary. 3. When chemically solid and liquid substances evaporate, diffusion, spreading in the environment, pollutes the air. A person breathing such air can get poisoned, careful use of them is necessary.

In the physics program for the eighth grade on the topics "Power plants and their types", "Accidents of electrical networks", it is of great importance to explain to students traditional, non-traditional ways of generating electricity and new types of energy of the future.

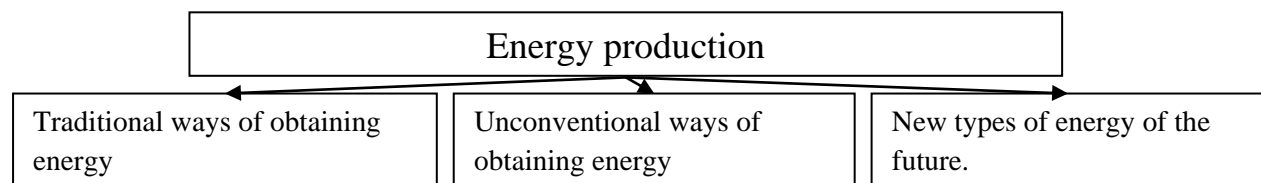


Fig. 2. Traditional, non-traditional ways of obtaining energy and new types of energy of the future

Currently, a nuclear power plant is being built in our country. Its total energy balance is the production of 2.4 GW of electricity. This will save more than $3 \cdot 10^9$ m³ of natural gas per year. The annual reduction of environmental pollution by harmful gases is explained to students, that is, up to $14 \cdot 10^6$ tons of carbon dioxide (CO₂), up to $36 \cdot 10^3$ tons of nitrogen dioxide (NO₂).

When explaining non-traditional methods of generating electricity to students, the limitlessness of raw materials for energy reserves is explained, unlike traditional methods by their ecological purity and restoration. Among these methods, solar panels and wind generators have been well studied and widely practiced in recent years, and energy production with their help has been established.

For our country, one of the promising non-traditional methods is bioenergy. Currently, many projects of biogas production plants have been developed. This installation.

When studying these topics, the environmental aspects related to this topic are explained in detail.

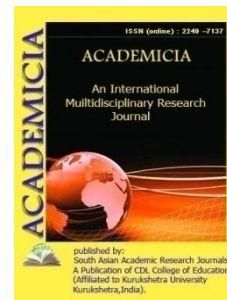
The concepts of students on the economical use of fuel reserves used in traditional methods of energy production; on solving environmental and safety problems related to energy production; on the development of non-traditional methods of energy production are analyzed and improved.

XI class chapter IV. In lessons 33,34,35,36 in the section "Electromagnetic waves and optical waves", after a full explanation to those students, the negative consequences of the constant use of cell phones in our daily activities and the danger to life of the waves emanating from them are explained on scientific and life examples, the concept of their biological and hygienic effects are related to the knowledge gained on the subject of biology.

The analysis of what to sit for a long time near a color TV, a long conversation on a cell phone, long-term use of information and communication technologies has been carried out and improved.

REFERENCES USED

1. Antropova L.V. Formation of a teacher's professional readiness for pedagogical activity in an adaptive school: dis... Candidate of Pedagogical Sciences. -Moscow:, 2004. -396 p . 2.
2. Joraev M., Akhmedov A.A., Ochilov Sh.B. Development of the teacher's competence in physics and ways of its improvement; // Zh.Pedagogy & Psychology. Theory and practice. - Volgograd, 2016. -No.6. -pp.14-16.
3. Maksimova V.N. Interdisciplinary connections and improvement of the learning process. - Moscow:, Enlightenment, -1991. -143 p.
4. Toshpulatova Sh.O., Fayzullayev J.J. Information security of teenage students// EPRA International Journal of Multidisciplinary Research, Volume-7, Issue-5, May-2021. Impact faktor-8,047.-p 524-525
5. Ochilov Sh.B. Forning Students Ekologikal Competence Physics Lessons // J. Eastern European Scientific. –Germany, Ausgabe, №6. 2018.–p 134-138.
6. Kutbedinov A.K., Karimov A.M., Sh.O. Toshpulatova., Ochilov Sh.B., Ashirbekova S.U Kanatbayev S.S. The main factors influencing the development of logical thinking skills of students in physics lessons// Solid State Technology. Volume:63.ISSUE:6.Publikationyear:2020.p 13904-13909.
7. Ochilov Sh.B. Formation of students' environmental competencies in physics lessons // STEMM. abstract. –T:, –2019. –p. 187-189.



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THE CULTIVAR SPECIALIZATION IN INSECTS AGRICULTURE

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ABSTRACT

In three insect orders, agriculture has developed independently: once in ants, once in termites, and seven times in ambrosia beetles. Despite the fact that these insect farmers are very distinct in some respects, they are strikingly similar in others, implying convergent evolution. Within their nests, all reproduce their cultivars as clonal monocultures, and in most instances, clonally over many farmer generations. Long-term clonal monoculture poses unique disease management challenges, but insect farmers have developed a variety of methods to combat crop diseases: They isolate their gardens from the rest of the world; they keep a close eye on them, controlling pathogens early in disease outbreaks; they occasionally access population-level storage tanks of genetically variable cultivars, while still propagating clonal monocultures across generations of farmers; and they manage, in addition to the primary cultivars, a variety of auxiliary microbes that provide disease suppression. Insect farmers seem to cultivate, and potentially “artificially select” for, integrated crop-microbe consortia rather than cultivating a single cultivar purely for nutrition. Crop domestication in the context of coevolving microbial consortia may, in fact, explain insect farmers' agricultural success.

KEYWORDS: Agriculture, Beetles, Cultivars, Escovopsis, Macrotermite.

4. INTRODUCTION

Crop cultivation for nutrition has only developed a few times in the animal world. Fungus-eating ants, fungus-eating termites, ambrosia beetles, and, of course, humans are the most well-known and clear examples. Sustainable, high-yield agriculture is becoming critical for survival in a global economy with projected food shortages for humans, who began the transition from an ancestral hunter-gatherer existence to farming only about 10,000 years ago. Various research programmes are currently devoted to the optimization of agricultural productivity in the era of

increasingly environmental challenges. Humans have progressed in agriculture via a mix of intelligence, innovative planning, and a fair amount of chance and luck. Humans, on the other hand, have not yet looked at nonhuman agricultural systems, such as fungus-growing insects, for potential ideas for bettering agricultural methods[1].

This dearth of applied interest in insect agriculture is most likely due to a widespread belief that human agricultural systems are fundamentally different from insect systems. Humans, on the other hand, have learnt a great deal by studying the adaptive characteristics of other species, and similar issues like crop diseases afflict all farmers, independent of their phylogenetic locations or the phylogenetic positions of their crops (plant, fungus, or otherwise). Because crop diseases affect both human and insect agriculture, it may be worthwhile to look at the short- and long-term remedies that have converged in insect agriculture for potential application in human agriculture. This review's aim is to create such a synthesis[2].

4.1 Agricultural Evolution:

A comparison of ant, termite, and beetle fungi-culture reveals a number of convergent and divergent aspects of agricultural development.

4.1.1 Cultivar Transmission:

Fungal cultivars are transferred vertically by trophophoresy from parent to child generations in attine ant and xyleborine beetle agriculture. Female reproductive ants and beetles obtain inocula from their natal gardens, transport it in specialized pockets during early life dispersion flights, and utilize it as a starting culture for their new gardens. Trophophoretic vertical transmission also occurs in two macrotermitine groups, with the exception that one of these two groups (the sole species *Macrotermes bellicosus*) transmits the fungus through the king, while the other group (the genus *Microtermes*) transmits the fungus by the queen. The remaining macrotermitines, in the rare instances where fungal transmission has been investigated, depend on horizontal absorption of fungal crops from the environment in each generation[3].

4.1.2 Crops Specialize:

The assumption of clade-clade communiques and topological congruence here between phylogenies of insect farmers as well as those of their cultivars is based on vertical transmission of cultivars. Indeed, significant groups of farmers (huge clades or paraphyletic classes, for example, the lower attine ants) rigidly specialize on major groupings of matching fungal cultivars in all insect farming systems. Higher (i.e., wide) phylogenetic levels show the anticipated farmer-cultivar congruence, perhaps due to ancient evolutionary codependencies that prevent farmers from switching to cultivars outside of their specialized main cultivar groupings.

However, phylogenetic patterns show that insect-farmer species sometimes move between fungal species or strains within these tightly restricted main cultivar groupings. This combination of lower-level, within-group switching and higher-level major-group specialization in insect farmers would be analogous to defined clades of specialized wheat-farmers, rice-farmers, potato-farmers, bean-farmers, etc. in humans, each of which is able to switch between varieties within their area of specialization (e.g., between wheat varieties and closely related species *suidae*). Switches to new main cultivar groupings among insect farmers have been very uncommon evolutionary occurrences[4].

4.1.3 *Cultivar Specialization:*

Though low-level switching between cultivar species and strains within major cultivar groups happens on occasion throughout evolutionary time, most insect farmer species interact with just a small subgroup of cultivars for long ecological periods (species or strains). For example, every attine ant species studied so far cultivates just a single phylogenetically restricted set of cultivars (e.g. a single fungus species), implying species specificity between ants and cultivars at relatively early stages of evolutionary diversification. Only one main cultivar of ambrosia beetles is linked with a certain beetle species within a geographic area, similar to ants.

Despite the fact that most beetles are linked with a species-specific main fungus across their entire geographic ranges, certain beetle species are associated with various primary cultivars in different geographic areas. There is a lot of diversity in cultivar specialization among macrotermitine species: Some macrotermitine species are restricted to a single, unique cultivar, while others grow a wide range of fungal cultivars, which they sometimes share with other macrotermitine species. Distinct cultivars may serve different main roles, supplying specialized, termite-adapted enzymes in some instances, while providing generalist food in other circumstances[5].

4.1.4 *Cultivar Sharing and Exchange:*

Even while each attine ant species specializes in a particular cultivar species, a given cultivar species may be cultivated by multiple sympatric ant species, and these sympatric ant species are not always closely related (e.g., they may represent different ant genera). Cultivar transfer between ant species may take place in a number of ways, both direct and indirect. Raids on adjacent colonies or, in polygynous organisms, cofounding of colonies by multiple queens who swap cultivars or recombine them in the cofounded garden are examples of direct routes. Cultivar breakouts from gardens, followed by a free-living (feral) life, and then reincorporation into a symbiosis when a separate attine colony imports the free-living strain into its nest, are examples of indirect routes.

The existing phylogenetic data for ambrosia beetles indicates to cultivar sharing across sympatric beetle species, although few studies have looked into this. As with the ants, distantly related ambrosia beetle species are occasionally linked with the same cultivar, implying fungal exchange, either direct or indirect. When various female beetles inhabit the same tree and the fungal companions cross-contaminate neighboring galleries, cultivar exchange across and among beetle species may occur. Most macrotermitine species acquire their fungus horizontally each generation, unlike attine ants and ambrosia beetles, which all transfer their cultivars vertically between generations. This means that novel termite-cultivar combinations emerge every generation, making cultivar interchange across species and lineages of the same species easier. Cultivar studies of sympatric macrotermitine communities show that cultivars are often exchanged across lineages via interspecific cultivar exchanges. In macrotermitines, intra-specific cultivar exchanges have not been studied yet[6].

4.1.5 *Sexual vs. Asexual Cultivar Propagation:*

All vertically transmitted insect cultivars, including attine ants, ambrosia beetles, and termites in the genus *Microtermes*, as well as the species *Macrotermes bellicosus*, seem to be reproduced asexually by their insect farmers over many farmer generations. Horizontally transmitted termite

cultivars, on the other hand (propagated by all other macrotermitine genera), go through normal meiosis and sexual recombination.

DNA fingerprinting studies in attine ants show that all gardens of a single leafcutter colony contain a single cultivar clone (monoculture); that identical cultivar clones occur in different colonies of the same geographically widespread attine ant species; and that different sympatric ant species share genetically identical culti on occasion. Attine cultivar clones, in contrast to popular belief, are not old. Although attine crops are clonally propagated over many ant generations, recombination events involving either sexual (meiosis, mating) or parasexual (e.g., mitotic recombination, exchange of haploid nuclei) activities occur on a regular basis. The following are examples of evidence supporting recombination on a rare basis:

- I. Fruiting structures (mushrooms), which are found in almost all species of attine ants, defying the assumption that fruiting capacity would be lost over millions of years of strict clonality;
- II. Allele sequence divergence rates in attine cultivars that are comparable to those seen in closely related, sexually reproducing fungus; and
- III. Lower attine ant cultivars with tight genetic ties to free-living fungal populations, implying that these fungi are capable of migrating in and out of the symbiosis, that cultivar and wild lineages may frequently interbreed, or both. The genetic and natural-history data combined indicate mostly asexual cultivar propagation inside ant nests and over several generations, with occasional genetic recombination events.

A single cultivar monoculture is cultivated in a single termite colony, similar to attine ants. The *Termitomyces* cultivar is reproduced asexually inside termite nests by inoculating new garden substrate with asexual spores and, most likely, by transferring mycelium from older to younger gardens. Although there are no known free-living populations of *Termitomyces* species that are completely independent of termite farmers, they have retained the ancestral (presymbiotic) condition of regular sexual reproduction, and most *Termitomyces* cultivars are spread horizontally via sexual spores produced by fruiting bodies (mushrooms) growing on the external surface. The termite *Macrotermes natalensis*, for example, exhibits an outcrossing mating system in its *Termitomyces* cultivar. Only termite species with vertical uniparental propagation have asexual cultivar propagation lasting many generations. Phylogenetic patterns suggest that horizontal cultivar exchange occurs across nests of the same and different termite species on occasion, but it's unclear if this horizontal exchange is linked to cultivar sexual reproduction[7].

The main fungus in xyleborine beetles are strictly asexual, while the less specialized, auxiliary fungi are often sexual. The main fungi of all other non-xyleborine ambrosia beetles show a predominance of asexual reproduction in fungal cultivars, while the more incidental fungi are frequently sexual, indicating that this may have been the original state at the beginning of the xyleborine beetle-fungus symbiosis.

4.2 Co-evolutionary Modifications:

Farmer-cultivar specialization increases the possibility for coadaptation, in which one partner's evolutionary alteration induces the other partner's reciprocal co-evolutionary modification. It is relatively easy to identify evolutionary modifications in farmer species, such as specialized morphological structures for trophophoretic transport of cultivars by females during dispersal

flight (e.g., mycangia in beetles, infrabuccal pocket in ants), modifications of mandibles and guts of beetle and ant larvae for fungus-feeding, or the suite of behavioral, glandular, and olfactory adaptations. However, since cultivated fungi are intrinsically more difficult to examine, examples of evolutionary changes in cultivars have been more difficult to find.

The hyphal-tip swellings (gongylidia) generated by higher attine cultivars and the similar nodules produced by macrotermite cultivars are the finest instances of cultivar changes. Both gongylidia and nodules are nutrient-rich structures that farmers may easily harvest, consume, and feed to larvae or nymphs. Although the ambrosia shape of the beetle cultivars indicates evolutionary adaptation intended especially for efficient intake and digestion by the beetle larvae, nutrient-rich structures are not known for beetle gardens. Ambrosial growth is made up of densely packed conidiophores with a large number of spores that can only be produced in the presence of beetles.

Nonsymbiotic fungal species have not been found to produce ambrosia. *Ambrosiella* and *Raffaella*, two of the most important fungus associated with ambrosia beetles, are both polyphyletic, and numerous lineages within each genus have converged on the same ambrosial form, implying evolutionary convergence owing to selection. Other possible co-evolutionary modifications that have yet to be investigated include insect cultivars' ability to reproduce predominantly asexually while under cultivation, as well as the cultivars' ability to survive storage in the dispersal pockets of beetles and ants, or passage through the alimentary canal of termites[8].

4.3 Cultivar Symbiont Selection:

Insect agriculture, from an evolutionary standpoint, is an example of cooperative interaction between farmer and cultivar lineages, with one utilizing the other for its own reproductive goals. When mutant over-exploiters (so-called cheater cultivars) enter a mutualism, such cooperative relationships are often fragile and may degrade over evolutionary time. Additional farmer-cultivar conflicts are expected, which may destabilize the mutualism, but at least two evolutionary processes protect the farmer-cultivar association's cooperative nature: Inherent in vertical cultivar transmission, partner feedback is an automatic feedback mechanism in which an uncooperative partner reduces the other partner's fitness to the extent that it reduces its own fitness; and, second, partner (symbiont) choice, in which farmers prefer associations with fruitful cultivars and discriminate against inadequate cultivars in specific situations. Partner choice is a particularly essential process when the evolutionary rates of two collaborating partners vary. The slower-evolving partner (e.g., the insect farmer) is expected to have a say in which variants of the faster-evolving partner (e.g., the fungal cultivar) are used, and thus the slower-evolving farmer imposes selection favoring beneficial symbiont variants and prevents the spread of non-beneficial cultivar mutants. Termite and beetle farmers have yet to investigate symbiont choice, but ant farmers can distinguish surprisingly fine genotypic differences between cultivars, suggesting that cultivar diversity in ant gardens may evolve through an analogue of "artificial selection," such as through mutation in the garden or the import of novel strains[9].

4.4 Disease's Impact on Insect Agriculture:

Ant, termite, and beetle gardens are often invaded by “weedy” fungus, which may cohabit with the crop at low or controllable levels. The garden is rapidly overtaken by these weeds if the gardening insects are removed or if their nests are abandoned. Wood-degrading fungi of the endophytic genus *Xylaria*, for example, are present in most fungus-growing ant and termite gardens, most likely because it is introduced with garden substrate. Though weeds such as *Xylaria* do not harm the cultivar directly, they compete for nutrients and therefore reduce crop production. *Escovopsis* species, ascomycete fungi found in fungus-growing ant colonies, are specialized para-sites that eat the cultivars directly and limit the nutrients available to the ants. In termite and beetle agriculture, weed fungi and bacteria are also recognized, although they have yet to be well investigated.

Garden output is reduced by *Escovopsis* infections, which lowers ant colony development and colony survival. *Escovopsis* is a taxonomic and geographically varied species. The parasite has been isolated from colonies of every attine species throughout their geographic ranges, and some *Escovopsis* lineages have evolved to parasitize certain cultivar lines. This high degree of host specificity suggests that *Escovopsis* has had a long history of host-parasite coevolution, in which cultivars, ants, and their mutualistic bacteria have likely co-adapted to defend against *Escovopsis* attack, and each *Escovopsis* species has become narrowly specialized to overcome the defenses of some hosts but not others[10].

5. DISCUSSION

Despite the fact that attine ants clonally reproduce their cultivars through generations over short evolutionary time periods, no ancient clone has been discovered. Instead, data suggests that lower attines acquire new cultivars from wild (sexually reproducing) fungal populations on sometimes, and that both lower and higher attines acquire new cultivars from other attines' nests on occasion. Higher attines cultivars that aren't known to have free-living populations nevertheless have the capacity to fruit and show patterns of DNA-sequence variation that indicate occasional genetic recombination via self-mating or genuine intercrossing across cultivar strains. While each attine ant colony's crop is a clonally propagated monoculture at any one moment, the fungal population outside the nest has the genetic diversity and resilience required for long-term disease control. As previously stated, sexual reproduction is the norm in termite cultivars that reacquire their cultivars horizontally each generation, and sexual reproduction may also occur in termite fungus that transfer their cultivars vertically between generations. It's unclear if the ambrosia beetles' principal cultivars can reproduce sexually on occasion. Access to a population-level pool of cultivar genetic diversity is a constant characteristic of insect agriculture that may offer alternate crops for coping with illness, at least for termites and ants, and probably for beetles as well.

All insect agriculturists check their gardens on a regular basis, and no area of the garden is left unattended for long enough to enable illnesses and fungivores to develop and proliferate. Because their societies include a non-reproducing worker caste, a significant percentage of which is devoted to garden maintenance, insect agriculturists, especially ants and termites, are able to engage in such extensive surveillance. The tiny size of the garden allows or intense surveillance by a single female or a small family of females in the case of beetles. Diseases are identified and eliminated in the early stages of infection, before they may spread and cause substantial crop loss, thanks to intensive surveillance. Early identification is an efficient protection against new disease mutations that may develop higher virulence if left untreated,

since these strains may be more easily managed with conventional therapies in the early stages of infection.

Garden treatment in attine ants involves the use of secretions from their meta-pleural and mandibular glands to clean substrate when it is carried into the nest, likely eliminating some or all weeds and pathogens from the surface before it is put to the fungal garden. Although antibiotic-producing glands in fungus-growing termites have not been investigated, certain nonfungus-growing termite secretions contain antibiotic characteristics. Antimicrobial glands in ambrosia beetles have yet to be discovered and investigated. Attine ants have additional antimicrobial defense in addition to glandular secretions. Actinomycete bacteria have colonized some or all of their integuments. These bacteria are known to hinder *Escovopsis* growth, and reducing actinomycetes in colonies has been shown to enhance *Escovopsis* infection in experiments. Antibiotics are produced by garden bacteria in the genus *Burkholderia*, which defend against the garden parasite *Escovopsis* as well as entomopathogenic illnesses of ants. Actinomycetes and other bacteria are found in termite gardens, and beetle gardens have a wide variety of bacterial secondary symbionts; nevertheless, the precise functions of these bacterial companions are unclear.

6. CONCLUSION

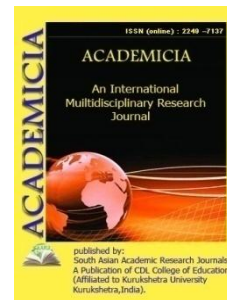
In contrast to insect farmers, secondary mutualistic microorganisms have the ability to develop at the same pace as coevolving garden pests, allowing mutualistic insect-microbe systems to react quickly to the introduction of new disease genotypes. Although the benefits of such fast microbial antibiotic resistance are apparent, their evolutionary maintenance is unknown. One option is that each farming civilization has access to a wide variety of microorganisms from which to choose specific, desirable kinds as required. This scenario begs the issue of how the insect farmers managed to keep such a varied variety of bacteria in their colonies in the face of both microbe competition and the frequent bottlenecking of the whole microbial "library" that probably happens at the start of every new insect colony.

Alternatively, the secondary bacteria may be naturally fast-mutating, allowing for the quick emergence of new beneficial genotypes to mount an adequate defensive response. This situation begs the issue of how insect farmers identify the most advantageous genotypes and select them for selective "amplification" against certain diseases. The lack of clear developmental processes for maintaining functional affiliations with coevolving, mutualistic microbes is not trivial, and future research should assess not only the diversity of microbial genotypes within individual farmer colonies, but also the mechanisms involved adaptive symbiont-choice selection of beneficial, novel microbial genotypes. Future study should look at whether the coevolution of many mutualistic-ally aligned partners, each mustering their own defense, results in a much more evolutionarily stable disease-management approach than if the insect farmers work alone in a co-evolutionary arms race against specific diseases.

REFERENCES

1. C. S. Prakash, "The genetically modified crop debate in the context of agricultural evolution," *Plant Physiology*. 2001, doi: 10.1104/pp.126.1.8.
2. J. E. Taylor and I. Adelman, "Agricultural Household Models: Genesis, Evolution, and Extensions," *Rev. Econ. Househ.*, 2003, doi: 10.1023/A:1021847430758.

3. P. F. Barlett, "Labor Efficiency and the Mechanism of Agricultural Evolution," *J. Anthropol. Res.*, 1976, doi: 10.1086/jar.32.2.3629659.
4. H. Takeshima, A. Nin-Pratt, and X. Diao, "Mechanization and agricultural technology evolution, agricultural intensification in Sub-Saharan Africa: Typology of agricultural mechanization in Nigeria," *Am. J. Agric. Econ.*, 2013, doi: 10.1093/ajae/aat045.
5. R. Ciampalini, S. Follain, and Y. Le Bissonnais, "LandSoil: A model for analysing the impact of erosion on agricultural landscape evolution," *Geomorphology*, 2012, doi: 10.1016/j.geomorph.2012.06.014.
6. A. E. Bless, F. Colin, A. Crabit, N. Devaux, O. Philippon, and S. Follain, "Landscape evolution and agricultural land salinization in coastal area: A conceptual model," *Sci. Total Environ.*, 2018, doi: 10.1016/j.scitotenv.2017.12.083.
7. A. A. Moghissi, S. Pei, and Y. Liu, "Golden rice: Scientific, regulatory and public information processes of a genetically modified organism," *Critical Reviews in Biotechnology*. 2016, doi: 10.3109/07388551.2014.993586.
8. E. Li, K. Coates, X. Li, X. Ye, and M. Leipnik, "Analyzing agricultural agglomeration in China," *Sustain.*, 2017, doi: 10.3390/su9020313.
9. D. A. Tefera, J. Bijman, and M. A. Slingerland, "Agricultural Co-Operatives in Ethiopia: Evolution, Functions and Impact," *Journal of International Development*. 2017, doi: 10.1002/jid.3240.
10. A. Abebe and M. Hailemariam, "Historical Evolution of Agricultural Extension Service Approach in Ethiopia - A Review," *J. Agric. Ext.*, 2018, doi: 10.22377/AEXTJ.V2I4.119.



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APPLICATION OF SATELLITE NAVIGATION SYSTEM FOR EMERGENCY WARNING

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ABSTRACT

In the event of an emergency, one of the most important duties of any government is to convey and distribute safety information and warnings to the general population. New media, mobile technologies, and the associated expectations of personalized warnings to personal mobile devices are challenging the old paradigm of a government monopoly system providing warnings via a broadcast method. In the provision of emergency warnings, location-based emergency services and smartphone notifications are becoming more common. Several nations across the globe, including Australia, have embraced these innovative emergency service models. The Australian National Emergency Alert (EA), for example, is a phone-based service with location-based features. The idea of using global satellite navigation systems, such as the Japanese satellite system, in the area of emergency warning and alerting is introduced in this article. The Japanese satellite warning system may be customized to send real-time location-based emergency alerts to people's mobile devices without being limited by ground-based communication technology. The great resilience of satellite-based communication against communication network overload and loss of ground systems and network infrastructure during a catastrophe is a significant benefit. During disasters, this allows individuals to receive critical information from anyplace (outdoor) and at any time. A satellite-based warning system may potentially be utilized in conjunction with current warning systems as a complementing technology. This paper looks at the benefits and drawbacks of utilizing satellite navigation systems to provide emergency and disaster alerts and security messaging.

KEYWORDS: System, Navigation, Alerting, Warning, Satellite.

1. INTRODUCTION

Emergency and catastrophes have severe personal, economic, and environmental effects that are widely acknowledged. The Indian Ocean Tsunami, Victorian bushfire disaster in Australia, and the Tohku Earthquake and Tsunami in Japan are just a few examples of tragedies that highlighted the critical importance of preparedness, early detection, and warning communications in reducing losses of life, property, and environmental damage[1]. A 'warning system' is a method of gathering information about an approaching emergency, the nature of the threat, conveying that information to those who are likely to be impacted by it, and allowing those in risk to make educated choices and respond quickly. Functional warning systems have been proven in many studies to be a valuable tool for saving lives and minimizing property damage. In the emergency management process, the early warning and preparation phase is critical for achieving a sufficient degree of preparedness to respond to possible threats. Emergency plans are created in this phase to define processes such as evacuation and emergency escape routes, among other things. The United Nations International Strategy for Disaster Reduction specifies four interdependent components for early warnings, including information distribution through communication networks that provide timely and accurate warning signals (United Nations International Strategy for Disaster. Warning systems must be backed by dependable communication networks with good interactions between important stakeholders, decision-makers, and the general public in order to operate successfully. State emergency response agencies have traditionally relied on one-way, top-down communication channels to convey warnings[2]. Warnings and safety information are often delivered through technologies such as sirens, radio, and television. A recent re-examination of emergency warning systems, on the other hand, shows a steady progression toward incorporating two-way participatory approaches leveraging new technologies and collaborative information sharing tools, such as the powerful combination of the Internet, mobile, crowd-sourcing, and social networking technologies[3]. In a growing number of nations across the globe, including Australia, mobile location-based emergency services have become an established component of government plans[4]. This significant shift in communication roles from command to conversation reflects the rapid rate of change in modern communication patterns and information sharing technologies. Satellite navigation systems are a novel and developing technology. There hasn't been much study done to see whether it's possible or useful. In critical circumstances when ground-based communication channels are restricted or unavailable, the importance of coordinating emergency procedures with location-awareness exercises cannot be overstated. The Japanese and Australian governments officially agreed in mid-2014 to collaborate to promote the use of information and communications technology (ICT) and to enhance collaboration for the development of geospatial information projects utilizing the Japanese satellite navigation system. One example of a satellite-based navigation system is the Japanese Quasi-Zenith Satellite System (QZSS). While the satellite trajectory design was mainly designed for Japanese consumers, it also benefits neighboring East Asian nations including Australia[5]. The use of a satellite navigation system for emergency warning and alerting is discussed in this article. The suggested system may provide real-time warnings with location-based information, allowing users to adopt appropriate risk mitigation measures during disasters.

1.1 Warning Systems on the Mobile:

For the transmission of essential safety information and warning messages to individuals about imminent hazards and catastrophe risks, several, redundant communication channels are needed. Multiple communication channels improve the efficacy of emergency alerts by expanding their reach, allowing others to get through if one fails. Additionally, having several ways to convey emergency information may serve as a kind of confirmation reinforcement. People often seek confirmation from various sources when they hear surprising news. Traditional communication methods including door-to-door, signs, sirens, loudspeakers, radio, television, fixed phone network, and the internet have long been used to warn people of imminent hazards and distribute safety information[6]. Outdoor sirens and loudspeakers are effective in terms of attracting attention, but they are ineffective in terms of conveying information. Radio, television, and the Internet offer information on emergency situations to a broad audience. These, on the other hand, can only fulfil the information role of warnings and transmit them passively. The people must tune in to particular communication channels. Although door-to-door notification and a fixed phone network can actively notify and warn people of impending danger, their coverage is limited to a local scale, making them ineffective operationally. In different physical and social settings, these different methods of communicating warning and safety information are not equally effective at providing an alert. In the last decade, new media and communication technologies have emerged as effective means for disseminating warning messages and safety information. In today's culture, mobile telephony or cellular network technologies have grown widespread, and the proliferation of mobile phones offers the potential to deliver "personalized" lifeline information during crises and catastrophes. Several governments around the world have embraced and effectively used mobile telephone warning systems as a supplement to traditional well-established warning channels[7].

The common Short Message Service (SMS) and Cell Broadcast Services are maybe the two most practicable mobile telecommunication technologies that meet the criteria of mobile phone emergency alert information service (CBS). Uniform text messages are delivered point-to-area to all users within a specified geographic region defined by cell towers using CBS. It may also be transmitted to all cells in a carrier network and offers a wide range of channels for broadcasting various types of service messages (such as weather updates, public health advice etc). Users of CBS, on the other hand, must set their mobile phones to a particular channel in order to receive messages, exactly like they would with a radio broadcast. As a consequence, CBS is immune to network saturation. The Netherlands was the first country in the world to implement a national emergency warning system (Netherlands Government, 2012). Another example of CBS is the United States' Wireless Emergency Alert (WEA).

1.2 Proliferation of Smartphones and Location-Based Services:

Not just in terms of communication, but also in terms of information acquisition, Australian society is becoming more mobile. According to a 2013 study, the number of Australians using cellphones has increased. In comparison to the previous year, 88percent of respondents possessed a smartphone this year, up from 76 percent. Smartphone ownership is expected to rise to 93 percent by August 2014, based on purchase intentions of mobile phone users (Mackay 2013). Almost all smartphones now come with a built-in GPS receiver and maps that allow users to pinpoint their exact position. Indeed, with the widespread use of smartphones, geospatial technology usage has skyrocketed. Smartphones are being hailed as the modern-day digital

"Swiss Army knives" of consumer electronics, capable of handling functions formerly reserved for specialist gear such as cameras, computers, and GPS receivers. People with active mobile devices who are situated within a specified geographic region of the disaster get notifications and pertinent safety information from location-based emergency warning systems. It may also be used to determine a mobile device's geographic position after the user has made an emergency phone call or sent a distress SMS seeking assistance. The Enhanced-911 (E911) location-based emergency call service in the United States is one example. For calls to 911, E911 requires telecommunications providers to identify a person and transmit the location of his or her mobile phone to the closest answering center. People in emergency situations may benefit from using location-based emergency warning systems. The Australian government enhanced EA in 2013, allowing location-based alerts to be broadcast based on the mobile handset's last known location at the time of the emergency as well as its registered address. Mobile phones with a registered address in the affected region, as well as users who are mobile but in the impacted area, will be informed of the emergency as a result of this improvement. A system like this is seen as a useful tool for rapidly delivering important information within a specified geographic region to the intended receivers of the messages. Mobile telecommunications services, on the other hand, are heavily reliant on network and underlying infrastructure, which may jeopardize their capacity and dependability. One drawback of such a system is that it loses effectiveness when a geographic region becomes bigger and/or in places where there is no mobile network. This method of communication works well in cities, but not so well in smaller rural areas where cell service is patchy or non-existent. Dareel, a Victorian village in the state's western region, was devastated by fire in 2013, destroying 16 houses and 18 structures. The emergency coordination operation during the fire was hampered by patchy cellphone service. The text message is delivered from point-to-point to a specified group of phone numbers using SMS. Unlike CBS, this channel is an individual addressable channel, which means that the messages are targeted to a specific person. However, if a large number of SMS messages and/or phone calls are sent at the same time, SMS is vulnerable to network congestion and message delivery failure. Delays may happen, and they might lead to delivery failure, particularly in an emergency. Despite this, SMS is a well-established and extensively used communication system. SMS offers the advantages of supporting delivery confirmation and having a 'store and forward' method. The message is kept in the Short Message Service Centre (SMSC) network during periods of unavailability network coverage or temporary breakdown and sent when the recipients become accessible.

1.3 Navigation Satellite Warning System:

Another method of communication utilized by many nations and organizations across the globe to broadcast emergency alerts is satellite-based communication. J-Alert, a national warning system in Japan, is an example of how Superbird-B2 is used. Warning messages will be transmitted through a communication satellite. COSPASSARSAT International The GNSS receiver included in smartphones, which provides accurate location information, may be used to correlate safety information received from the satellite, making the information relevant to intended users at a particular moment and within a specified geographic region. Existing warning systems may be supplemented and improved using GNSS. With the launch of the ALIVE (Alert interface through EGNOS) Concept in 2005, Europe has been working on emergency messaging services utilizing the EGNOS and Galileo satellite navigation systems. Following up studies have looked at the technical and non-technical benefits, as well as the advantages, of using

GNSS satellites for disaster warning. Another well-known satellite-based search and rescue program is the (SAR), System for detecting and disseminating distress alerts. The system is the most well-known name for it. that identifies and locates airplanes, ships, and backcountry emergency beacons hikers who are in trouble (COSPAS-SARSAT 2014).

In general, satellite communication services include resilient, and may be extended with geographic data to indicate which areas the system should be used in. The information is useful. The usage of a satellite phone, on the other hand, is not as popular as it once was. to cellular phones Furthermore, satellite communication service maintenance and Both service providers and users bear the costs of operation. The navigation satellite emergency system combines the advantages of both mobile and fixed systems. Satellite-based communication and communications services Satellites for Global Navigation The Global Navigation Satellite System (GNSS) is a generic name for satellite-based navigation systems, which include the GPS[8]. GPS in the United States, GLONASS in Russia, and many more new and upcoming constellations, including as The Galileo and BeiDou systems in Europe and China, respectively. These technologies offer accurate positioning in the environment. Using radio navigation signals, three dimensions, time, and velocity may be achieved. GNSS stands for Global Navigation Satellite System[9]. The receivers receive the signals in a one-way system, with no engagement from the receivers. relating to satellites Regional navigation satellite systems and satellite-based navigation systems are also available. SBAS, such as the United States' WAAS a Europe's European Geostationary Orbital or The European Navigation Overlay Service (EGNOS) and India's GAGAN are two systems that seek to supplement GNSS. In addition to increasing efficiency and lowering operational costs, GNSS adoption Many new location-based services have benefited from technological advancements (ACIL)[10].

Another SBAS created by Japan Aerospace Exploration Agency is the Japanese Quasi-Zenith Satellite System (QZSS). When fully operational in 2018, three QZSS satellites in highly inclined elliptical orbits (HEO) and one geostationary satellite will provide 24-hour coverage. The QZSS satellites' orbit design offers continuous coverage at a high elevation angle, improving satellite navigation in regions of Japan where conventional GNSS satellite positioning capabilities are challenged, such as central metropolitan areas. While the orbit design is mainly aimed for Japanese consumers, it also benefits neighboring East Asian nations including Australia.

The footprint of the QZSS satellite is launched on September 11, 2010, the first QZSS satellite was launched. QZSS has a unique feature in that it may transmit brief emergency messages in addition to the usual GNSS navigation signals used for Position, Navigation, and Timing (PNT). A GNSS/GPS receiver integrated in mobile phones or in in-car navigation systems can receive the signals straight from the satellite. The data would be interpreted and displayed by application software or an app. Given the near-universal usage of mobile phones and in-car navigation systems by virtually everyone, the potential coverage and reach of alerts delivered to these personal devices is expected to be considerably higher than existing methods could accomplish.

Another aspect of the QZSS alert messaging system is that, in addition to the broad area coverage given by the satellite system, the receivers also transmit accurate location information through their integrated GNSS/GPS capabilities. This manner, based on the nature and content of the catastrophe information, alarm messages may be delivered to a particular region, and only those receivers inside that area will be triggered. Knowing the approximate location of a

potential catastrophe, the targeted users might be informed, but those outside the disaster region would not be. In comparison to existing methods of delivering warnings through personal devices, the satellite-based system provides a number of benefits for real-time catastrophe notifications. The following are some of the benefits:

- In an emergency, GNSS with location-based information may be utilized. This allows high-priority and targeted messages to be sent to specific areas and groups;
- The service can cover a large area at once – for example, the entire country of Australia – due to its wide area broadcast footprint, and there is no limit to the number of people who can be warned at the same time within the broadcast area
- The messages can still be received even when terrestrial communications are disrupted. This provides redundancy
- Because the system is not reliant on mobile phone coverage, it can reach individuals wherever they are, regardless of whether or not they have access to a phone.

2. DISCUSSION

A satellite navigation system, often known as a satnav system, utilizes satellites to offer autonomous geospatial location. It uses time signals sent along a line of sight by satellites to enable tiny electronic receivers to calculate their position (longitude, latitude, and altitude/elevation) with great accuracy (within a few centimeters to metres). The system may be used to provide position, navigation, or track the location of anything that has a receiver attached to it (satellite tracking). The signals also enable the electronic receiver to determine the current local time to a high degree of accuracy, allowing for time synchronization. Positioning, Navigation, and Timing are the terms used to describe these functions (PNT). Satnav systems work without the need for a phone or internet connection, but these technologies may improve the accuracy of the location data. A global navigation satellite system is a satellite navigation system that has worldwide coverage (GNSS). The Global Positioning System (GPS) of the United States, Russia's Global Navigation Satellite System (GLONASS), China's BeiDou Navigation Satellite System (BDS), and the European Union's Galileo are all fully functioning GNSSs as of September 2020. The Quasi-Zenith Satellite System (QZSS) is a (US) GPS satellite-based augmentation system designed to improve GPS accuracy, with satellite navigation independent of GPS expected to be operational by 2023. In the long run, the Indian Regional Navigation Satellite System (IRNSS) intends to grow to a worldwide version.

3. CONCLUSION

The government has a major operational and logistical difficulty in providing an emergency warning system that can communicate time-critical safety information 'wherever to whoever it is required' during disasters due to Australia's enormous geography. It would require a significant financial investment in the network and supporting infrastructure, which may not be feasible. The provision of safety information through a GNSS-based system is possible because it combines the benefits of both mobile phone-based service and satellite communications while overcoming their shortcomings. The great resilience of satellite-based communication against communication network overload and collapse of ground systems and network infrastructure during a catastrophe is its main benefit. It also offers scalability of coverage for mass public warning, and its operation may be less expensive than existing warning systems. Despite the

widespread availability of GNSS-based technology, the use of GNSS in emergency warning and alerting in Australia is still in its early stages. Research on the feasibility and implications of GNSS technology inside the national emergency warning system is, for the most part, sparse. This is due to the satellite-based warning technology's partial immaturity, which will soon change with the arrival of additional GNSS satellites and augmentation systems. Thinking beyond the immediate obstacles, defining technical and non-technical needs, and comprehending the operational environment in which the technology may be utilized as "added value" to current warning systems remains a problem.

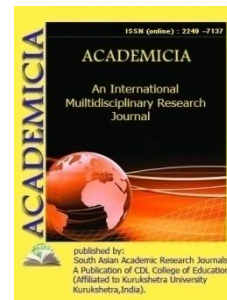
The Japanese satellite system, known as QZSS, is capable of sending warning messages to people's mobile phones. The gadgets may be programmed to receive emergency alerts depending on their position at a particular time and within a defined geographical region. As a result, it has the potential to solve some of the limitations of conventional warning systems. Although a GNSS-based warning system is unlikely to replace current systems, it may supplement and enhance them by offering an independent method of transmitting location-based alerts. Building effective methods that develop over time by adopting newer technology is a continuous requirement. As other GNSS systems, such as Galileo and BeiDou, mature and gain emergency alert capability, Australia will have the opportunity to be an excellent test bed for GNSS-based emergency services and be the first to innovate with new tools and products due to the continent's geographical location relative to all of these global navigation satellite systems.

REFERENCES

1. S. Choy, J. Handmer, J. Whittaker, Y. Shinohara, T. Hatori, and N. Kohtake, "Application of satellite navigation system for emergency warning and alerting," *Comput. Environ. Urban Syst.*, 2016, doi: 10.1016/j.compenvurbsys.2016.03.003.
2. Y. X. Yang, J. L. Li, J. Y. Xu, J. Tang, H. R. Guo, and H. B. He, "Contribution of the Compass satellite navigation system to global PNT users," *Chinese Sci. Bull.*, 2011, doi: 10.1007/s11434-011-4627-4.
3. J. N. Pelton and S. Camacho-Lara, "Introduction to satellite navigation systems," *Handbook of Satellite Applications*. 2013, doi: 10.1007/978-1-4419-7671-0_10.
4. J. Park, Y. J. Lee, M. Choi, J. G. Jang, and S. Sung, "Feasibility study on tropospheric attenuation effect of ku/V band signal for Korean satellite navigation system," *Int. J. Aeronaut. Sp. Sci.*, 2016, doi: 10.5139/IJASS.2016.17.1.80.
5. L. Zhang and B. Xu, "A universe light house - Candidate architectures of the libration point satellite navigation system," *J. Navig.*, 2014, doi: 10.1017/S0373463314000137.
6. W. Danqing, L. Ping, and W. S. Peng, "A novel design for a dual-mode triple-band communication terminal antenna based on the quadrifilar helix antenna and the BeiDou satellite navigation system," *Optik (Stuttg.)*, 2016, doi: 10.1016/j.ijleo.2016.05.048.
7. Y. Liu, S. Zhang, and Y. Gao, "A High-Temperature Stable Antenna Array for the Satellite Navigation System," *IEEE Antennas Wirel. Propag. Lett.*, 2017, doi: 10.1109/LAWP.2016.2639068.
8. C. H. Park and N. H. Kim, "Precise and reliable positioning based on the integration of navigation satellite system and vision system," *Int. J. Automot. Technol.*, 2014, doi:

10.1007/s12239-014-0009-7.

9. F. P. Sun, S. Liu, X. H. Zhu, and B. H. Men, "Research and progress of Beidou satellite navigation system," *Sci. China Inf. Sci.*, 2012, doi: 10.1007/s11432-012-4724-2.
10. K. M. Gayathri and N. Thangadurai, "Low noise amplifier selection for indian regional navigation satellite system," *Int. J. Appl. Eng. Res.*, 2016.



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CATALYTIC OXIDATION OF METHANE REACTION KINETICS

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ABSTRACT

The kinetic laws of the catalytic oxychlorination reaction of methane in the study (CuCl₂) x · (KCl) y · (ZnCl₂) z · (MnCl₂) k in the catalyst, in the ratio of starting materials N₂: CH₄: HCl: O₂ = 5: 12: 2: 1 mol, Studied at a pressure of 1 MPa. As a result of the study, the following optimal conditions for the oxidation of methane were determined: catalyst composition, (CuCl₂) x (KCl) y (ZnCl₂) z (MnCl₂) k, size of catalyst fractions 0.7 ÷ 1.2 mm, P = 0, 1MPa, gas flow rate 17.2 l / h, contact time 0.8 sec, linear flow rate 10.2 cm / sec. To calculate the activation energy

$$E_a = - (R \cdot \ln (k_-(T_1) / k_-(T_2)) \cdot T_1 \cdot T_2) / ((T_2 - T_1))$$

formula was used.

KEYWORDS: Widely, Product, Extraction, Production, And, From, Crystal, Practice, Methods, Thermal, Introduced, Selectivity

INTRODUCTION

Ethylene is the most widely used organic substance in the world and is widely used as a starting semi-finished product in the chemical and petrochemical industries. At present, the annual demand for ethylene is 180 mln. more than a ton. To date, the following methods of ethylene production in the world practice are of great interest to scientists:

- 1) Extraction of ethylene by oxycondensation of methane;
- 2) Extraction of ethylene by methyl chloride from methane and its pyrolysis;
- 3) Obtaining a synthesis gas from methane and extracting methanol and ethylene from methanol.

Among the above methods, the methane catalytic oxycondensation reaction is the simplest and single-step method, which has not been introduced into the industry due to the lack of a stable

catalyst with high activity and efficiency. To date, catalysts with high catalytic activity, selectivity, and efficiency have been developed for this reaction. Such catalysts include MeMnW / SiO₂ (Me = Li, Na, K) [1-3] and (MoO₃)_x · (ZnO)_y · (ZrO₂)_z [4-6].

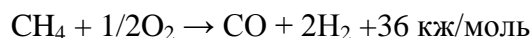
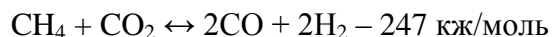
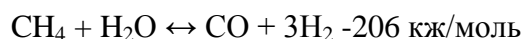
The second method involves the reaction of obtaining ethylene by pyrolysis of methyl chloride obtained by oxychlorination of methane. The main reactions that take place in this process are as follows:



The main catalysts in the pyrolysis of methyl chloride are SAPO-34 and SAPO-18 [7-13].

The process of obtaining ethylene from natural gas via methanol involves the following reactions:

1) Synthesis gas extraction:



Part of the experiment

YuKTs from kaolin in Pakhtachi district of the Republic of Uzbekistan [15-22] were used as porous carriers in the study. The catalyst was prepared as follows: a 30% solution of CuCl₂, KCl, ZnCl₂, MnCl₂ was injected into 100 g of YuKTs for 12 hours. The catalyst was then separated from the solution and dried at 350–400°C in a nitrogen stream for 3 h and reduced to a granule size of 5–7 mm.

Chromatographs LXM-80 (thermal detector) and Crystal 2000 (flame ionization detector) were used for the oxidation reaction of methane.

EXPERIMENTAL RESULTS AND THEIR DISCUSSION

Catalysts of various compositions were prepared for the catalytic oxychlorination reaction of methane and their catalytic activity was tested. The results obtained are presented in Table 1 below.

TABLE 1 INFLUENCE OF METHANE OXYCHLORINATION REACTION PRODUCT YIELD CATALYST COMPOSITION

№	Catalyst composition (in the ratio of goods)	% акт	Conversion rate, %			CH ₃ Cl ₂ , Sselectivity
			HCl	CH ₄	O ₂	
1	CuCl ₂ ·KCl·0,3LaCl ₃ /SiO ₂	8	76,3	36,8	45,4	96,2
2	CuCl ₂ ·KCl·0,3P3ЭCl ₃ /SiO ₂	8	80,3	42,5	56,8	96,8
3	CuCl ₂ ·KCl/SiO ₂	8	51,6	28,6	33,4	63,8
4	ZnCl ₂ ·KCl/IOKII	8	49,9	25,4	26,5	62,1
5	MnCl ₂ /IOKII	8	25,7	24,8	24,5	56,4
6	MnCl ₂ ·KCl/IOKII	8	30,6	30,4	21,2	60,2
7	CuCl ₂ ·KCl· ZnCl ₂ /IOKII	15	64,8	34,7	48,5	63,4

8	$\text{CuCl}_2 \cdot \text{KCl} \cdot \text{MnCl}_2 / \text{IOKI}$		55,1	42,0	32,6	74,6
9	$\text{CuCl}_2 \cdot \text{KCl} \cdot \text{ZnCl}_2 \cdot \text{MnCl}_2 / \text{IOKI}$	8	82,6	58,0	61,3	98,6

The effect of temperature on methane oxychlorination reaction The effect of temperature on methane oxidation reaction rate and product yield was studied in the range of 300-5000C. The results obtained are presented in Table 2 below.

TABLE 2 THE EFFECT OF TEMPERATURE ON THE OXYCHLORINATION REACTION OF METHANE (T = 1.5 SECONDS)

№	Temperat ure , °C	HCl conversion	CH ₄ conversi on	O ₂ conversion	Selectivity,%			
					Comb ustion	XM	XM	
(CuCl₂)_x · (KCl)_y · (ZnCl₂)_z · (MnCl₂)_k, N₂:CH₄:HCl: O₂ 5:12:2:1 0,1 MPa								
30	300	15,25	1,42	18,08	0,00	100,0	100,0	0,002
31	350	59,18	5,72	48,60	1,40	98,60	93,88	0,055
32	370	75,08	13,46	59,85	4,02	95,98	89,73	0,099
33	370	80,89	8,70	67,15	5,56	94,44	89,01	0,101
34	400	92,34	12,82	76,83	7,45	92,55	86,81	0,154
35	400	89,79	12,23	74,04	7,18	92,82	87,16	0,149
36	420	95,71	19,40	78,08	10,58	96,49	84,96	0,227

The results of the study on the selection of contact time are presented in Table 3 below.

TABLE 3 INFLUENCE OF REGANET CONTACT TIME ON PROCESS PARAMETERS IN METHANE OXYCHLORINATION REACTION (N₂:CH₄:HCl:O₂ = 5:14:2:1, P=0,1 МПа, T = 380⁰C)

№	Контакт вакти, с	HCl конверсияси	CH ₄ конверсияси	O ₂ конверсияси	Селективлик,%		
					Ёниш		XM
41	0,03	0,45	2,56	15,23	0,14	99,86	97,28
42	0,03	4,58	3,72	14,22	0,08	99,92	97,06
43	0,10	29,40	6,80	31,10	0,99	99,01	94,55
44	0,30	40,65	6,03	43,25	1,94	98,06	94,06
45	0,30	41,43	5,53	38,23	1,64	98,36	90,98
46	1,00	75,31	574	72,05	2,03	98,04	92,55
47	1,79	97,30	5,83	89,87	2,46	97,54	91,40
48	1,79	94,35	4,74	88,53	4,61	95,39	90,72

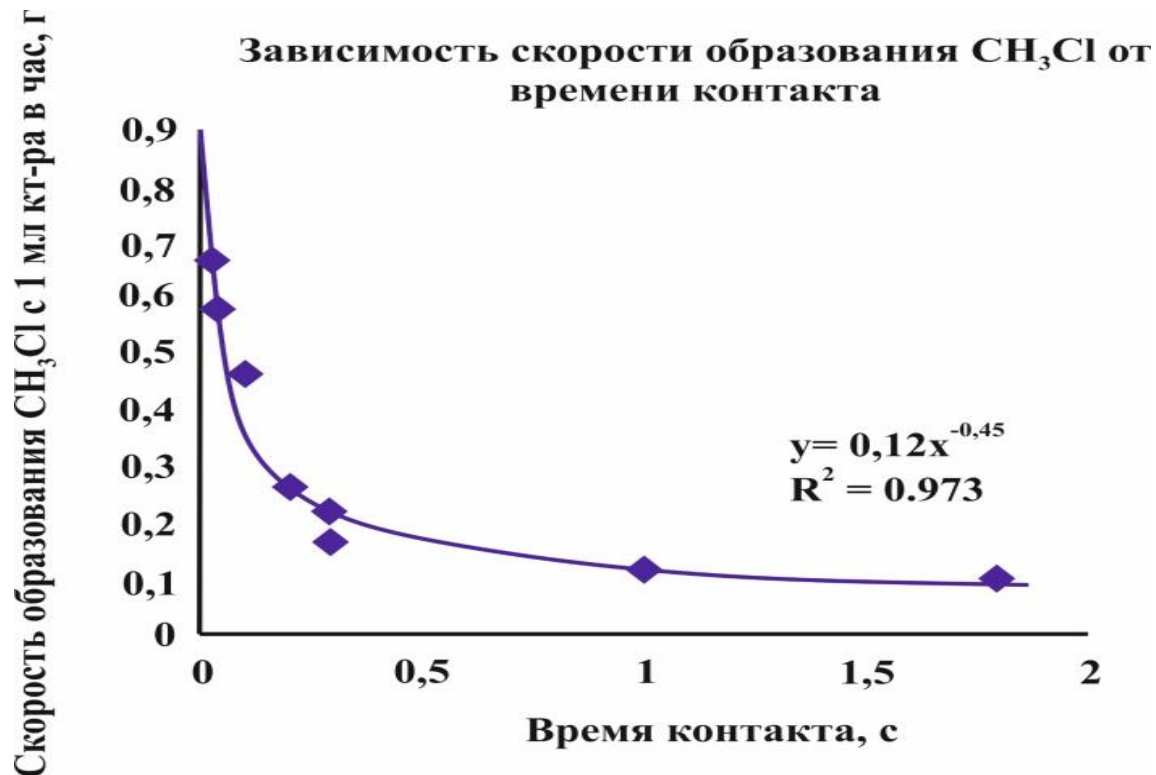
In selecting the contact time, we considered the amount of chloroorganic compounds to be formed at different contact time values, assuming that the formation of additives was one of the key factors. The results are presented in Table 4 below.

TABLE 4 FORMATION OF ORGANOCHLORINE PRODUCTS AT DIFFERENT CONTACT TIMES (T / (ML · KAT · H)

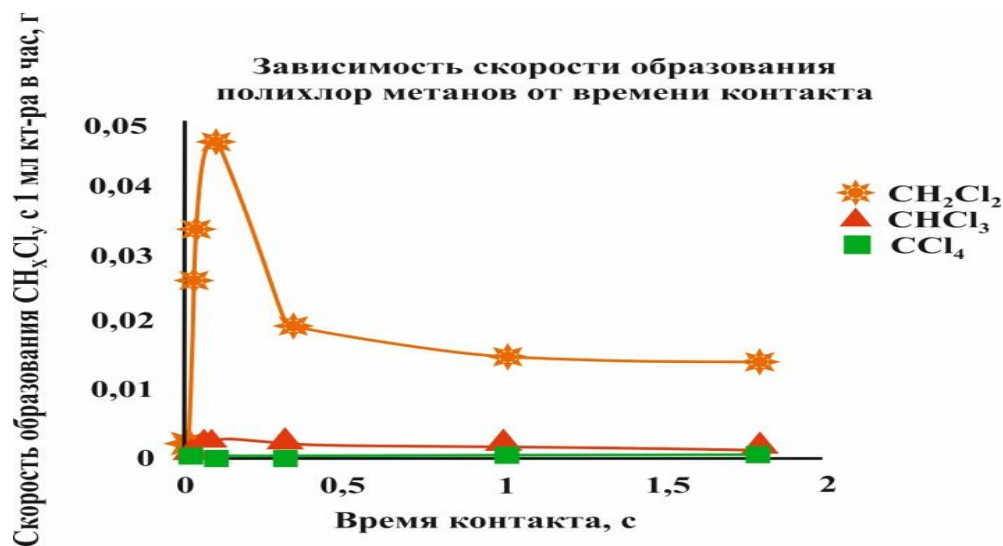
Модда номи	Контакт вакти,с							
	0,03	0,03	0,10	0,30	0,30	1,00	1,79	1,79
XM	0,587	0,663	0,464	0,214	0,167	0,115	0,0963	0,0898
Этил хлорид	0,002	0,001	0,001	0,001	0,000	0,0000	0,0000	0,0000
Метиленхлорид	0,025	0,032	0,040	0,028	0,019	0,0170	0,0143	0,0145
1,1-дихлорэтан	0,003	0,002	0,000	0,000	0,000	0,0000	0,0000	0,0000

Хлороформ	0,003	0,002	0,03	0,025	0,002	0,0017	0,0013	0,0012
ЧХУ	0,000	0,0000	0,00	0,001	0,001	0,0002	0,0002	0,0001

Based on the results obtained, the contact time methyl chloride (Pic. 1),

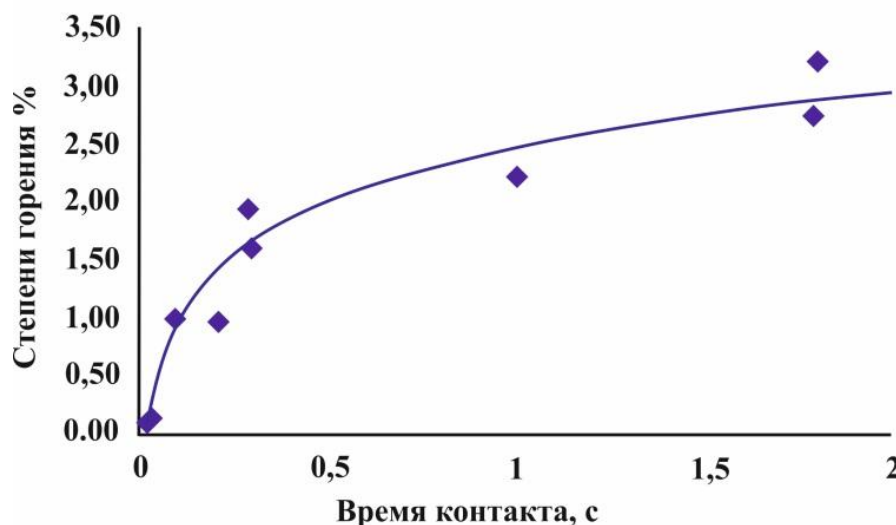


polychloromethanes (Figure 2)



and combustion products (Figure 3)

**Зависимость степени горения от
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graphs of dependence were formed.

When the contact time is less than 0.3 s, the amount of methyl chloride increases as the rate and selectivity of the methane oxychlorination reaction shifts towards methyl chloride formation. This is primarily due to a decrease in the rate of combustion. Second, the smaller the contact time, the less time it takes for the methyl chloride formed in the reaction to undergo a series of reactions with the formation of methylene chloride, chloroform, and carbon (IV) chloride. As can be seen from the table, the formation of carbon (IV) chloride is not observed in the range of 0.03-0.1 sec.

Kinetic laws of methane oxychlorination reaction

As a result of the study, the following optimal conditions for the oxidation of methane were determined: catalyst composition, $(\text{CuCl}_2) x \cdot (\text{KCl}) y \cdot (\text{ZnCl}_2) z \cdot (\text{MnCl}_2) k$, size of catalyst fractions $0.7 \div 1.2$ mm, $P = 0$, 1MPa, gas flow rate 17.2 l / h, contact time 0.8, linear flow rate 10.2 cm / sec.

The total gas flow rate in the reactor remained unchanged due to the change in the nitrogen flow rate. These conditions ensure that the reaction takes place in the kinetic field. The effect of additional products (methylene chloride, chloroform, carbon (IV) chloride, and products of complete oxidation reaction of methane) was not taken into account, as the selectivity of the process relative to methyl chloride under kinetic conditions is higher than 95%.

To calculate the activation energy

$$E_a = - \frac{R \cdot \ln \left(\frac{k_{T_1}}{k_{T_2}} \right) \cdot T_1 \cdot T_2}{(T_2 - T_1)}$$

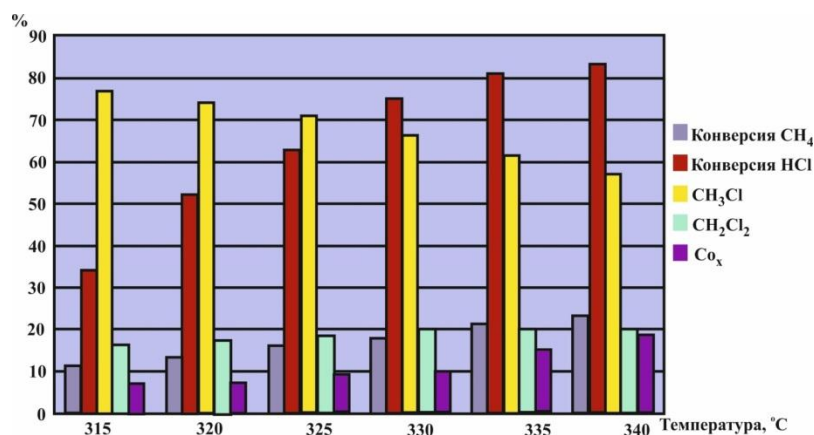
formula was used.

k_{T_1} was calculated according to the following formula:

$$k_{T_1} = \frac{R(CH_3Cl)}{P_{CH_2}^{0,7} \cdot P_{H_2O}^{0,44}}$$

We did not take into account the concentration of HCl in the calculation because its value is approximately 1. Thus, the activation energy is 96.74 kJ / mol

The selectivity of methyl chloride formation depends on the temperature at which the methane oxychlorination reaction takes place. the selectivity of methyl chloride formation decreases with increasing temperature, while the selectivity of methylene chloride formation increases. In the oxidation reaction of methane, the formation of products of the deep oxidation reaction of methane in the range of 315-3400C increases to 315-3400C. The results obtained are shown in Figure 4 below.



The texture characteristics of the catalyst were determined after 100 h of the methane oxychlorination reaction. The samples were dried in vacuum at 2500C before studying the sorption properties.

Nositel (YuKTs), a newly prepared catalyst (CuCl₂) x · (KCl) y · (ZnCl₂) z · (MnCl₂) k, and the mass loss of samples after hours of use were 0.56, respectively; 2.28; and 0.90%.

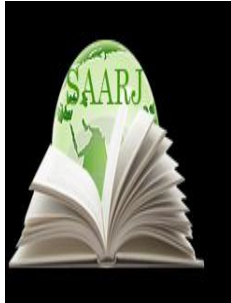
CONCLUSION

The kinetic laws of the catalytic oxychlorination reaction of methane (CuCl₂) x · (KCl) y · (ZnCl₂) z · (MnCl₂) k in the catalyst, the ratio of the starting materials N₂: CH₄: HCl: O₂ = 5: 12: 2: 1 mol and 0.1 MPa was studied at pressure.

REFERENCES

1. Арутюнов В.С. Окислительная конверсия природного газа. – М.: Красанд, 2011. – 640 с.
2. Arndt S., Otremba T., Simon U., Yildiz M., Schubert H., Schomäcker R. Mn–Na₂WO₄/SiO₂ as catalyst for the oxidative coupling of methane. What is really known? // Applied Catalysis A: General. – 2012. – V.425–426. – P. 53–61.
3. Исмагилов И.З., Матус Е.В., Васильев С.Д., Кузнецов В.В., Керженцев М.А., Исмагилов З.Р. Окислительная конденсация метана в присутствии модифицированных MnNaW/SiO₂-катализаторов // Кинетика и катализ. – 2015. – Т. 56. – No 4. – С. 459–469.

4. Tursunova, N.S., Fayzullaev, N.I. Kinetics of the reaction of oxidative dimerization of methane//International Journal of Control and Automation, 2020, 13(2), сtp. 440–446.
5. Zhao T.Sh., Takemoto T., Tsubaki N. Direct synthesis of propylene and light olefins from dimethyl ether catalyzed by modified H-ZSM-5 // Catalysis Communications. 2006. V. 7. ¹ 9. P. 647-650.
6. Aslanov, S.C., Buxorov, A.Q., Fayzullayev, N.I. Catalytic synthesis of C2-C4-alkenes from dimethyl ether// International Journal of Engineering Trends and Technology, 2021, 69(4), сtp. 67–75.
7. Mamadoliev, I.I., Fayzullaev, N.I. Optimization of the activation conditions of high silicon zeolite//International Journal of Advanced Science and Technology, 2020, 29(3), сtp. 6807–6813.
8. Bobomurodova, S.Y., Fayzullaev, N.I., Usmanova, K.A. Catalytic aromatization of oil satellite gases//International Journal of Advanced Science and Technology, 2020, 29(5), сtp. 3031–3039.
9. Mamadoliev, I.I., Fayzullaev, N.I., Khalikov, K.M. Synthesis of high silicon of zeolites and their sorption properties//International Journal of Control and Automation, 2020, 13(2), сtp. 703–709.
10. Fayzullaev, N.I., Bobomurodova, S.Y., Xolmuminova, D.A. Physico-chemical and texture characteristics of Zn-Zr/VKTS catalyst//Journal of Critical Reviews, 2020, 7(7), сtp. 917–920.
11. Khamroev, J.X., Fayzullaev, N.I., Haydarov, G.Sh., Temirov, F.N., Jalilov, M.X. Texture characteristics of modified and activated bentonite //Annals of the Romanian Society for Cell Biology, 2021, 25(4), сtp. 12160–12174



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METHODS OF USING GRAPHIC PROGRAMS IN THE FIELD OF CONSTRUCTION DRAWING

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ABSTRACT

Electronic form of assessment of students' knowledge in the field of construction drawing in higher education.

KEYWORDS: *Construction, Independent Learning, Test, Drawing, Computer Graphics, Graphics Software, Construction Drawing.*

INTRODUCTION

The current advances in science and technology have changed the requirements for graphic training of university students. The technology of teaching graphic sciences has developed significantly. The modern educational space is filled with the latest software and multimedia graphics packages and complexes. One of the main requirements for student competencies in the curriculum is the acquisition of computer graphics. Therefore, today there is a need to improve the teaching of graphic sciences, especially construction drawing.

MATERIALS AND METHODS

Yu.F. Katkhanova notes: "The high pace of development of computer technology leads to a natural reassessment of the attitude not only to the existing knowledge system, but also to the search for new ways to improve traditional teaching methods and techniques."

The difference between methodology and technology can be explained as follows:

- Methodology, in our opinion, is the content of education aimed at the goals of teaching, a joint set of teaching organization. Methods, techniques, and methods or methodological systems that have the same content can produce two different outcomes for two teachers;

- When using pedagogical technology, different teachers can achieve the same results, even if they use different approaches, different tools and methods.

Learning technology is a means of teaching in which the primary function of the task is to perform the task with the help of human management. In educational technology, the focus is on teaching aids: the educator does not teach students, but directs them to activities, acts as an incentive, and manages the educational tool. The teacher's pedagogical skills include the selection of relevant content, the use of effective teaching methods and tools in accordance with the program and pedagogical objectives.

One of the most effective ways to choose technology is through a multimedia approach. The following are important factors to consider when choosing a technology for your learning:

- ☐ The importance of using new technologies in the learning process to achieve the goals of education, not the technology itself;
- ☐ In addition to the most modern, expensive technologies, cheap and traditional technologies can be effective;
- ☐ learning outcomes do not depend on the type of information and communication or information technology, but on the quality of course creation and transmission;
- ☐ It is important to pay attention to the personal characteristics of students, the specifics of the field of study, the content of assignments and exercises in the selection of technologies.

Technology does not negate or replace methodology, didactics and educational theory. It develops specific algorithms, constructs the learning process, and identifies clear and definitive ways to achieve guaranteed results.

A modern lesson is a set of non-standard ways and means of teaching, in which the teacher mobilizes all his skills to achieve certain educational goals and engages students in the process. Their ability to focus on learning new things. It is the use of non-traditional forms of education.

According to LOMokresova, the use of innovative forms of education in the teaching of graphic sciences: teaching students to make product drawings using computer graphics, reading video lectures with the help of multimedia equipment, teaching science on electronic media for independent study. It is connected with the creation of a methodological fund, the use of existing methodological resources through the conversion of the main methodological developments of the department into electronic form, and others.

According to S.A. Freiberg, the search for answers to the traditional question of didactics determines the results of the search for teaching methods. But the teaching method is complex, multidimensional, and there are no "pure" methods. In any educational process, several methods are involved at the same time, complementing and interchanging.

Based on the analysis of LV Pavlova's experience of innovative teaching methods, the quality of learning materials in engineering and computer graphics depends on different teaching methods, for example, associative-cooperative method and descriptive analogy method increase the

success of teaching. The purpose of these methods is to develop spatial imagination, the formation of creative, cognitive and engineering-design maturity of students.

Researcher TVChernyakova, using the model teaching methodology of the subject "Computer Graphics", identified the level of teaching methods, all components, ie scientific advice, their interrelationships, principles, methods, tools and forms, and developed scientific recommendations for teaching science. This model provides psychological and pedagogical training of students in the teaching of "Computer Graphics" to university students, the need to master the subject, to determine the level of interest in science on the basis of levels, methods, tools and forms.

While OAKrainova developed a scientific and methodological basis for the design of a methodical system of teaching computer graphics in universities for the specialty "Computer Science", ANKostikov scientifically substantiated the methodology of teaching computer graphics to future teachers of computer science, providing them with in-depth knowledge and logic. Recommendations were given to ensure the connection of computer graphics with computer science, the development and preparation of educational and methodical complex of "Computer Graphics".

In his research, EI Roziev created an integrative course "Graphics" and developed a method of teaching it. It describes the problems of teaching Computer Graphics and its connection with other subjects, as well as the graphic requirements that a teacher of this subject must have.

Korean scientist Z.Zuo conducted research on the introduction of computer technology in the teaching process of "Computer Graphics" and the improvement of teaching. In his research, he argued that Computer Graphics should be integrated with the disciplines of Descriptive Geometry and Engineering Graphics.

In her research, AB Puzankova believes that the use of appropriate pedagogical technologies is required to significantly reduce the number of students with learning disabilities at all stages of education through the computerization of general technical subjects.

According to JJ Djanabaev, it is necessary to accelerate the educational process, purposeful information preparation and computerization. The use of new pedagogical technologies in teaching, computerization, provides the basis for accelerating the learning process.

All teaching methods have their strengths and weaknesses, so they need to be used in harmony, depending on the purpose, the circumstances, and the time available. The quality of education is the sum of the quality of teaching and upbringing.

RESULTS AND DISCUSSION

Yu.K. Babansky highlights the 7-step algorithm of "effective choice of teaching methods":

1. Decide whether the material will be mastered independently or under the guidance of a teacher. If the student is able to study the material independently and deeply enough without extra time and effort, the teacher's help will be superfluous.
2. Determining the compatibility of reproductive and productive methods. If conditions allow, attention will be paid to productive methods.

3. Determining the compatibility of inductive and deductive logic, analytical and synthetic ways of knowing. If an empirical basis for deduction and analysis has been developed, deductive and synthetic methods are fully suitable for adults.
4. Measures and means of compliance with oral, visual, practical methods.
5. Address the need to introduce incentive methods for students.
6. Methods of control and self-control, interval, definition of "points".
7. Develop resource options for deviations from the planned learning process.

We agree with Ye.Yu.Jokhova, taking into account the conditions of teaching engineering computer graphics, the time allocated to science and the specifics of graphics programs. In her research, Ye.Yu.Jokhova cites the peculiarities of computer-assisted teaching methods. According to the author, there are four main types of computer-assisted learning:

- Demonstration explanation;
- reproductive;
- problematic;
- research methods can be used.

The reproductive method of teaching using computer technology allows the teacher and the computer to master the knowledge transmitted to the student and to increase the material studied and apply it in similar situations, to organize the activities of the student. The use of this method with the help of a computer can significantly improve the quality of the organization of the educational process, but it does not allow to radically change the educational process compared to the traditional scheme (without a computer). The use of problem and research methods in this regard is more reasonable.

Problem-based learning uses the capabilities of a computer to describe and organize the learning process and to find solutions to a particular problem. The goal is to maximize student motivation. It involves solving different types of problems based on the knowledge gained in the learning process, as well as extracting and analyzing a number of additional knowledge needed to solve the problem. At the same time, special attention is paid to the skills of collecting, analyzing and transmitting information.

The research method of computer-assisted teaching provides students with independent creative activity in the process of conducting scientific and technical research on a particular topic. The use of this method is the result of active research, discovery and play. As a result, it is more successful than any of the other methods listed above. The research method of teaching involves the study of the ways in which objects and situations affect them. To be successful, you need an environment that responds to influences.

Undergraduate training requires the judicious use of classroom time to ensure that learning objectives are met in a context of reduced learning time.

In our opinion, it is appropriate to pay attention to the following factors that determine the effectiveness of education: the form of training;

- Selection of optimal combinations of teaching and control methods;

- Speed of training;
- Scientific, systematic and consistent connection of study with life;
- The optimal set of educational tools.

Modern pedagogy includes more than 20 organizational forms of teaching. Historically, as a method of communicating knowledge through communication, lecture is still one of the most intensive and important didactic systems, aimed at achieving the goals of the early and basic stages of education. The lecture began with a transition from individual to group training. The report lays the foundations for cognitive and cognitive activities such as attention, memory, imagination, and an adequate system of thinking. The lecture usually includes explanatory material that requires teaching methods such as proof and justification. Lectures are still the most common and important form of teaching.

There are two main types of cognition: verbal, speech-based, and visual. Some students have a tendency to accept verbal information, while others are required to convey information through images. At such times, it may be helpful to combine the two into a series of lectures. The demonstration method is a continuation of the historically established method of transmitting the experience of the older generation to the younger generation, which is based on the "do as I do" rule. Modern interpretations of this method include visual representations of events, processes, problem-solving methods, and ways to use a variety of tools. Demonstration does not involve unconsciously copying certain actions that lead to the desired result, but is one of the components in getting your opinion on the topic being studied. According to LB Grigorevsky, there are not enough textbooks and manuals on the subject of engineering computer graphics, which is one of the disciplines of engineering graphics, so lectures are one of the most important and basic means of conveying information to students. In addition, the teacher provides information on the new course in the form of separate topics and sections, which the student should collect from various sources.

The visual organization of the learning process in construction drawing also leads to the comprehension of the demonstration learning materials, their conscious and thorough mastery, and the stabilization of attention. Demonstration materials should be appropriate to the type and topic of the lesson, appropriate to the student's age and level of knowledge, and their use should be organized using effective methods and tools. Visual aids in Construction Drawing can vary depending on the type of lesson and the topic. Including:

Printed materials (posters, handouts, etc.).

Materials in electronic form (presentations, forms, pictures, etc.).

Animated materials (multimedia e-books, e-textbooks, etc.).

Vitrual models (details, house models, machine mechanisms and models).

You can use ArchiCAD, AutoCAD, 3ds Max, Revit, Sketchup to create virtual object models. Because these programs are designed for computer modeling. For teachers of construction drawing, it is recommended to create mainly in ArchiCAD. First of all, the ArchiCAD program is adapted to international standards and provides all-round convenience for the teacher. Second, the program is designed to work in accordance with the rules of the construction industry.

The visual model of the virtual model of the created object, that is, in terms of design, has a wide range of possibilities in the graphics program ArchiCAD itself, in which the material and color of the building is much more convenient than other graphics programs. The reason is that in the process of creating a model of the building, the program itself offers standard materials in accordance with the building components. This brings a number of conveniences to students. ArchiCAD has many advantages in working with virtual building models, making it interesting and understandable for the user.

MS Word, PhotoShop, CorelDraw can be used to make posters. It is recommended that construction design teachers use MS Word and PhotoShop. It is convenient for teachers to enter and design texts using MS Word. PhotoShop has the ability to process and design images.

MS Word, ArchiCAD, Revit, Paint NET can be used to prepare handouts. With the help of these programs, teachers have the opportunity to design the text, graphic assignments and drawings required for the handout, the quality of which is based on modern requirements.

Multimedia lesson plans can be created using Adobe Flash, ArchiCAD, Snagit. Adobe Flash is one of the most convenient programs for animating various drawings and tasks in the field of construction drawing. ArchiCAD helps you create building facades, building models, and view them from different angles, trim, color, and more. The Snagit program is designed to videotape the process on a computer screen. With the help of Snagit video recording of all activities performed in the ArchiCAD graphics program and its widespread use in all types of educational process, it is possible to set a high level of mastery of students.

In today's world of technology, there are e-books, textbooks, manuals, and more. They are mostly verbal and serve as a source of information for users. There is a need to create a multimedia e-book on the subject of construction drawing. In this case, the study of theoretical information on the subject will give students a clear idea of the graphic drawings in the form of animation. Based on this, it is possible to perform the tasks correctly based on this knowledge in the process of performing graphic tasks. If you encounter a problem while completing a graphic task, you can use problem-solving examples on the topics in the task set section of the multimedia e-book. The advantage of this is that when faced with a problem in the execution sequence, it is possible to have a clear understanding by going back.

The e-textbook covers the didactic cycle of the whole educational process: theoretical data, animation of problem-solving sequences, use in the educational process, control of the level of knowledge and the availability of information retrieval system. differs from other textbooks.

The use of color computer animation allows you to control the process of extracting and presenting the necessary information, high-quality graphics, video fragments, schemes, formulas, the subjects of the studied subject are presented in a series of presentations or connected in the form of a branched dynamic chain. .

The multimedia e-book is used for the following lesson purposes:

Learning objectives: to teach students the theoretical information on the subject through spatial imagination and to organize the implementation of graphic tasks on the basis of this knowledge in the course of practical lessons.

Educational goal: to gain a clear understanding of the sequence of theoretical and practical knowledge on the subject through spatial imagination and its application in real life as a necessary tool, to develop the skills of independent work and creativity.

Developmental Objective: To develop the ability to turn knowledge into a skill and a skill into a skill based on the spatial imagination developed on the topic being studied and to work independently.

The use of computers as a didactic tool in the development of design and technological creativity of students gives effective results. This is because a modern computer tool is a useful tool for the ability to apply theoretical knowledge in practice and to quickly and objectively determine the level of mastery of the acquired knowledge and skills.

A video lesson is a lesson plan that helps a user (student, specialist, etc.) to see and hear specific knowledge and skills in a video format, both visual and audio.

There are the following types of video lessons:

Directly observe the process of Lesson 1 and involve the educator (speaker-teacher), who will have the opportunity to see, hear, learn and master the information.

2 describes a process that can only be performed aloud or silently without the participation of the given educator.

Therefore, as mentioned above, the organization and application of video lessons in the educational process is relevant today.

There are video lectures on science in Uzbek. But there is not enough information about practical training. In particular, the lack of video tutorials for drawing a sequence, ie an algorithm, does not meet today's needs. This can be used as an example of drawing assignments. Because in each lesson, the teacher draws and explains to the students a sample assignment on the topic of the practical lesson. Observations and analysis show that students are given a variety of questions and problems in the process of completing the assignments independently. If the student is someone who gives insight or advice to complete the task, he or she will complete the task. Students are often at home during practical assignments, when there is no one to teach them. As a result, the student can find his teacher the next day (if he can find one) and ask him to draw places he does not understand. Otherwise the work will not be completed.

Video tutorials can be a positive solution to these problems. Students can download video lessons on computers, tablets and smartphones. This allows students to repeat the lesson as many times as they want (that is, until they have mastered it). This will ensure that the student's learning is at the required level.

Students should be able to draw and read drawings, graphs, and shapes in the technical sciences. This requires a good set of assignments. The need to redesign a set of quality graphic assignments is pending. To find an optimal solution to this problem, it is necessary to create an electronic version of a set of graphic tasks in science.

Level Graphic Task - Develop students' graphic assignments from simple to complex.

M. Sroka, B. Radovan, T. Jelena, H. Stachel, Zongyi Zuo, Kaiping Feng, Bing Chen, J.J. Djanabaev, A.K. Hamrakulov, N.D. Yadgorov, D.S. Saidakhmedova, A.A. Kakhkharov,

D.Sh.Dilshodbekov and others, TSBorichevsky, VPMatanov, LMPyjevich, P.Odilov, A.Ashirboev, T.Rixsiboev, A.Valiev gave scientific recommendations on creation of graphic tasks.

PV Zelyonny and Ye.I. Belyakova developed a set of tasks on engineering graphics, focusing mainly on the department of descriptive geometry. In addition, graphic tasks are not divided into levels of complexity.

PV Zelyonny and Ye.I. Belyakova developed a set of tasks from engineering graphics to projection drawing. They are also presented in the form of colored details, as well as isometric (clear) images. But the principle of simple to complex is not taken into account.

Written by Volkhinym K.A., Ilyushenko P.V. These options are available. But the tasks are not divided into levels of complexity.

The science of computer graphics, which is being studied today as part of the science of construction drawing, has such opportunities that it greatly contributes to the quality of the set of tasks being created in a short period of time. One of the best ways to handle this is to use ArchiCAD graphics software. This program makes it easier to develop science assignments than other programs.

For example, ArchiCAD graphics software can be used to create building design work, style part design, line types, building model, cuts and sections, and more.

Particular attention should be paid to their level when reorganizing the set of assignments on the topics. This results in an increase in spatial imagination and the development of creative and logical performance skills.

Creating assignments in the field of "Construction Drawing" from simple to complex and applying them to the learning process has a positive effect on the development of students' spatial imagination. Because as the level of the task increases, the student is required to have a strong spatial imagination. A student with a developed spatial imagination can think creatively. As a result, they develop creative skills based on their knowledge and have the opportunity to create and implement new ideas.

The work of Zorana Jelly, Branislav Popokostantinovic and Misa Stojicevic also mentions the use of virtual teaching methods in the teaching of engineering graphics. It is also recommended to provide drawings and a 3D model of it, as well as the possibility of creating virtual detail models. However, there is no approval for level assignments.

According to the experience of Zongyi Zuo, Kaiping Feng, Bing Chen, "... it is effective to use the possibility of 3D modeling of computer graphics to hand-drawn sketches. Students complete most of the assignments throughout the semester using computer graphics. Using ArchiCAD and other 3D software to create three-dimensional graphic tasks on a computer based on the design, seeing them directly will help students develop their imagination."

One of the main goals in teaching the subject "Construction Drawing" in our country is to re-analyze and group the topics and to distinguish those that are suitable for organization on the basis of computer graphics and to develop skills in computer drawing and modeling based on modern requirements. The use of a set of level assignments in the teaching of "Building Drawing" is effective and gives positive results.

Now let's look at the order in which a practical exercise is conducted.

The first phase of the training includes: the interfaces and basic toolbars of the ArchiCAD graphics program, which are related to the construction industry; coordinate systems; two- and three-dimensional drawing environments are re-explained and demonstrated to students using the comparison method. Students will be introduced to the graphics program. They try to understand the similarities and differences between the program's interface, toolbars, and commands. The teacher teaches the students, the students practice on the computer.

For example: Explain the choice of two-dimensional or three-dimensional media in applications. When you start ArchiCAD, you can select a two- or three-dimensional environment from the Info menu, or you can switch from the keyboard to the two-dimensional or three-dimensional state using the F2 and F3 keys. ArchiCAD software allows you to change the environment at any time (Figure 2).

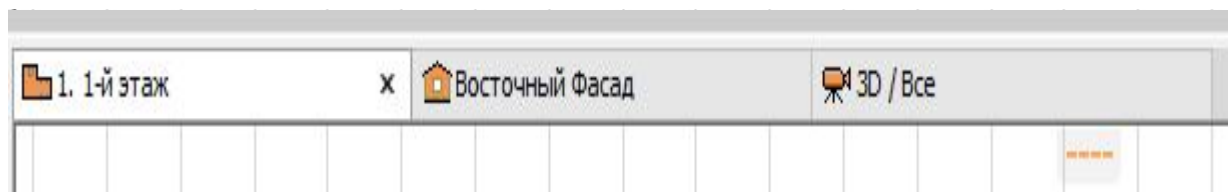


Figure 2. Selecting a working environment in Archi CAD

The second stage of the practical training includes: drawing two-dimensional (flat) drawings of different complexity; sizing; change line types, colors, and thicknesses; adjust the drawing font; drawing and saving graphics are taught by comparing the hardware and commands of graphics programs. The teacher shows an example and the students repeat it in a graphic program. Once the teacher has completed the sample, students will be able to complete a simple task on their own.

For example: explain how to do a three-room project work drawing.

The teacher will explain this task in ArchiCAD, which is one of the most convenient programs for the construction industry. Students follow the teacher's instructions on the computer one by one. In ArchiCAD, you can draw arrows (anywhere on the Constructions toolbar) using the Grid axis command to draw. The outer and inner walls of the project work on the arrows (using the command "Wall" in the toolbar "Construction") are drawn. Before drawing, the wall thicknesses and heights are adjusted by entering the dialog parameter command of the Wall command. When straightened, the outer and inner walls are drawn along the given axes. When the walls are finished, the frames and doors open. The frame and door are opened by the "Door" and "Window" commands in the "Constructions" panel.

In the third phase of the workshop, students will be taught how to build and trim three-dimensional virtual models of a building based on a drawing history by comparing the equipment and commands of graphics programs. The teacher shows an example and the students repeat it in a graphic program. Once the teacher has completed the sample, students will be able to complete a simple task on their own.

CONCLUSION

At the final stage of the practical training: the task is to create a clear picture of the project work. One of the advantages and disadvantages of the ArchiCAD graphics program is that it allows you to draw a clear image while drawing a two-dimensional drawing. The teacher does not take the time to draw a clear picture. Spends extra time simply making the necessary changes to the image.

Graphics programs allow students to expand and enrich their knowledge. In addition, students will be able to independently master the program by identifying the strengths and weaknesses, similarities and differences of the programs. The method used develops students' motivation to learn the subject and teaches them to compare other design programs in the modern graphics software market. In this way, they will be able to choose the most appropriate program for their activities.

LITERATURE

1. Freiberg S.A. Development of cognitive abilities and independence of students in the study of engineering graphics on the basis of the implementation of computer technologies. Diss ...
2. Madumarov K.Kh., Kakhkharov A.A. Factors of increasing spatial thinking. Problems of the integration of science and production. –Namangan. May 29-30, 2008 –S.399-400.
3. Titova M.P. Investigation of the formation of spatial representations, for example, some graphic problems. Dissertation, Candidate of Pedagogical Sciences, Moscow, 1980, 190p.
4. Shuvalova S.S. Spatial imagination and descriptive geometry. Innovative technologies in engineering graphics: problems and prospects. Proceedings of the International Scientific and Practical Conference. April 20, 2016. – Brest, Republic of Belarus. – Novosibirsk, Russian Federation. – C 175-176.
5. Yakimanskaya, IS Development of spatial thinking of schoolchildren / IS Yakimanskaya. - Scientific research. in-t obsch. and ped. Psychology, Academician of Pedagogical Sciences. - M.: Pedagogy, 1980. - 240p.
6. Sorby, S.A. (1999). Developing 3 Dspatialvisualizationskills. Engineering Design Graphics Journal, 63(2),21–32.
7. Olimov KT Theoretical and methodological bases of creating a new generation of textbooks on special subjects. Dis. ... ped.fan.dok.–T.: 2006. – 288 p.
8. Ning Qian. Computational neuroscience with an emphasis on stereovision, motionanalysis, andmotion stereointegration; visualpsychophysics. Binoculardisparity and the perception of depth.Neuron 18:359-68,1997.



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A REVIEW PAPER ON WORKFLOW SCHEDULING USING CRYPTOGRAPH

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ABSTRACT

Cloud computing is a fast-growing technology that allows businesses to use on-demand computer and data services on a daily basis. The most significant contribution is the development of a new genetic algorithm model for workflow planning. One of the major issues here is the scientific planning of large activities in a heterogeneous cloud environment. Other public cloud computing issues are equally significant. These include meeting customer service quality requirements including scalability and reliability, as well as optimizing resource user use rates. Workflow Scheduling is primarily concerned with job assignment in order to achieve the required workload balance while making the greatest use of available resources. Specific workflow planning problems in the cloud computing sector should be addressed by providing various pay-on-demand and cloud-based services that meet the relevant performance criteria and system structure distribution. This paper proposes a novel paradigm for combining cloud-computing resources with local computing components. The finished-time calendar algorithm is at the heart of this system, balancing the performance of the application schedule with the expenses of utilizing cloud resources. The testing and comparisons with other methods revealed the potential benefits of our proposed algorithm.

KEYWORDS: *Cloud computing, Cyber-Physical, Cloud Systems, Dependability, Workflow scheduling,*

1. INTRODUCTION

In recent years, cloud computing has been a growing field of research. A considerable variety of methods to distinct Workflow Scheduling issues have been presented. Due to its direct influence both on the customer and the supplier of services from diverse angles, the cost problem remains of importance (i.e. QoS, system functionality, and system architecture)[1].

Recent developments in computer, communication and control technology offer significant potential to connect physical processes to cyber space and to develop cyberspace systems. For example, automotive, industrial, social, production, smart home, construction, and community-based systems such as CPS applications[2]. CPS storage and calculation resources are often restricted, as (1) the size and embedding of cyber components is generally tiny in their surroundings; and (2) some CPS own resources which are suitable, but cost unbeatable for larger usage. Fortunately, cloud computing and IoT technologies would assist the CPS in addressing this problem, because integrating CPS in cloud computing infrastructures may not only enhance cyber-physical device interaction, but also facilitate large-scale data analysis and storages[3]. Cyber-physical cloud systems have therefore garnered considerable interest, both in academia and business, as a viable paradigm.

Cloud computing might in many ways increase system performance. Migration from an internal cybernet to the cloud can, however, lead to a range of security and dependability problems. Due to the complexity of cloud systems, on the one hand, Cyber-Physical Cloud Systems hardware and software are more susceptible to permanent (driven to severe) mistakes and transitory errors (leading to soft errors). On the other hand, owing to the usage of external calculation, communication, and storage resources which cannot be trusted, the security threats to cyber-physical cloud systems are raised. It is therefore very important to create new methodology in cyber-physical cloud systems to solve dependability and security problems[4].

Cloud computing might in many ways increase system performance. Migration from an internal cabernet to the cloud can, however, lead to a range of security and dependability problems. Due to the complexity of cloud systems, on the one hand, Cyber-Physical Cloud Systems hardware and software are more susceptible to permanent (driven to severe) mistakes and transitory errors (leading to soft errors)[5]. Cyber-Physical Cloud Systems' security vulnerabilities are raised because of the utilization of external and unsustainable compute, communication, and stocking resources. It is therefore very important to create new methodology in cyber-physical cloud systems to solve dependability and security problems. Workflow has been a successful and widely recognized paradigm for describing data-intensive applications used in cyber-physical cloud systems. There are a number of tasks and dependences of data/control between tasks that create an application for working flow. Directed acyclic graphs that may be used to define workflow applications with tasks and edges that represent data/control interdependence[6].

Typically, a time limit (i.e., in real time need) to ensure the quality of the service is linked with each Workflow application. The objective of this article is to address dependability and safety issues in order to plan workflows on cyber physical cloud systems in real time. Given that transient defects are more frequent than permanent defects, and that real-world systems are generally needed to meet certain levels of protection[7], we are specifically looking for problems in maximizing soft-error reliability for Cyber-Physical Cloud Systems workflow applications while respecting lifetime constraints and safety requirements.

1.1 Slack-Aware Fault Tolerance:

Slack is inactive as duties for the workflow application are completed early. The illustration of slack is shown in Fig. 1. The four tasks τ_1 - τ_4 are performed at instance 10 and time is instance 15 of the application deadline. The slack produced is thus 5. This study largely uses the system slack to allocate recoveries to unsuccessful jobs to improve dependability of the system soft error. In order to assign slack, we utilize the First-coming rule to a core that may be shared via all tasks assigned to this core[8]. Moreover, recuperation is only allocated to a job when there is no lower amount of time available to finish a task which is explained by

$$p_i^{rec} = \begin{cases} R_i(F_{max}) \times \sum_{l=1}^k P(\mathcal{M}_{i,l}), & \text{if } K > 0 \\ 0, & \text{otherwise} \end{cases} \quad \dots (1)$$

Where K is the number of schedule modes meeting the slack constraint that

$$wc_i/f_i + RT(\mathcal{M}_{i,l}) \leq \Omega \quad \dots (2)$$

For Prec it is essential to calculate the $RT(\mathcal{M}_{i,l})$ as well as $P(\mathcal{M}_{i,l})$ retrieval times of each schedule M mode. Note that slack may only be utilised to retrieve a failed task if the slack is available more than the recovery time for the job[9]. The slack cannot be used for a failed job with a longer recovery time. Therefore, we may search in M-mode and determine RT using an iterative method for the failing tasks $RT(\mathcal{M}_{i,l})$. The $P(\mathcal{M}_{i,l})$ probability is defined by the soft-error reliability of the M-mode tasks are given by

$$P(\mathcal{M}_{i,l}) = \prod_{\tau \in P(\mathcal{M}_{i,l})} (1 - R\zeta) \times \prod_{\tau \in P(\mathcal{M}_{i,l})} R\zeta. \quad \dots (3)$$

```

1 initialization:  $RT(\mathcal{M}_{i,\ell}) = 0$ ;
2 for each failed task  $\tau_{\zeta}$  in  $\mathcal{M}_{i,\ell}$  do
3   if  $\frac{wc_{\zeta}}{f_{\zeta}} \leq \bar{U}$  then
4      $RT(\mathcal{M}_{i,\ell}) = RT(\mathcal{M}_{i,\ell}) + \frac{wc_{\zeta}}{f_{\zeta}}$ ;
5      $\bar{U} = \bar{U} - \frac{wc_{\zeta}}{f_{\zeta}}$ ;
6   end
7 end
```

Figure 1: Algorithmic Step By Step Explanation of the Calculation of the Recovery Time RT

1.2 Determine the Priority of Tasks

The suggested workflow planning algorithm that determines jealously the priority of activities in order to improve soft-error system dependability is given. The algorithm is based on the following findings.

- Due to slack limitations, it is impossible to constantly provide better system soft-error reliability for additional jobs with short run time to get recovery. Instead, it might severely affect the dependability of the soft-error system. This is because jobs with high execution times may not slow down to rework and so reduce the soft-mistake dependability of the system significantly.

- The fact that additional jobs are allowed to recover is only useful when the workflow schedule meets in order to increase system dependability.

Theorem 1.

Input: A workflow meeting the conditions in Theorem 1;
 1 use a DAG $G = (T, E)$ to represent this workflow;
 2 **if** $(\tau_i, \tau_j) \in E$ **then**
 3 | set $p_i > p_j$;
 4 **end**
 5 **else**
 6 | **if** $\frac{wc_i}{F_{\max}} > \frac{wc_j}{F_{\max}}$ **then**
 7 | | set $p_i < p_j$;
 8 | **end**
 9 **end**

Figure 2: Algorithm Explaining Step by Step Implementation of Deciding the Priority of Tasks in the Workflow.

1.3 Lifetime Reliability-aware Frequency Scaling

Tasks are required for increasing system soft error reliability and slackness at the highest frequency scaling in this job. The highest frequency scaling may, however, lead to excessive temperature on the semiconductor and exceed the reliability limitation. This is why it is important to scale the operating frequency scaling of jobs. However, the reliability of soft errors and time performance are also unfavorable. To solve this problem, we offer a heuristic method that reduces the operating frequency scaling of jobs selectively and dynamically for a lifetime[10]. Taking it into account that

(1) If a high priority job fails, it is likely that slack is used for recovery and hence has an influence on the soft-error reliability of low priority activities and

(2) Maximum frequency scaling recovery would not have a major effect upon system reliability, because a task's failure likelihood is generally modest, the suggested heuristic method maintains high priority works and restoration frequency scaling while scaling low priority tasks operational frequency. Saving power efficiency is an energy-time ratio when the operation frequency scaling of a job is scaled between l and z . The effectiveness of the job μ_i is represented by scaling its operation frequency scaling from F_l to F_z

$$PE_i(F_l, F_z) = \frac{Pow_i(F_l) - Pow_i(F_z)}{e_i(F_z) - e_i(F_l)} \dots (4)$$

Here in which the energy consumption as well as completion time of operation i at frequencies (F_l, F_z) , correspondingly, is $Pow_i(F_l)$ and $e_i(F)$ along with $Pow_i(F)$ but in general mostly with $e_i(F)$.

```

1 for  $\tau_i \in T_{\text{Low}}$  do
2   |  $l_i = L$ ; //  $l_i$  is the frequency level of  $\tau_i$ 
3 end
4 while  $MTTF_{\text{sys}} < MTTF_{\text{thresh}}$  do
5   |  $PE_{\text{max}} = 0$ ,  $\tau_{\text{select}} = \tau_N$ ; //  $\tau_N$  is the task with the
   | lowest priority
6   | for  $\tau_i \in T_{\text{Low}}$  do
7     | if  $\bar{U} > e_i(F_{l_i-1}) - e_i(F_{l_i})$  &&
       |  $PE_i(F_{l_i}, F_{l_i-1}) > PE_{\text{max}}$  then
8       |   |  $PE_{\text{max}} = PE_i(F_{l_i}, F_{l_i-1})$ ;
9       |   |  $\tau_{\text{select}} = \tau_i$ ;
10      | end
11   | end
12   |  $f(\tau_{\text{select}}) = F_{l_i-1}$ ; //  $f(\tau_{\text{select}})$  is the operating
   | frequency of  $\tau_{\text{select}}$ 
13   |  $\bar{U} = \bar{U} - (e_i(F_{l_i-1}) - e_i(F_{l_i}))$ ;
14   | update  $MTTF_{\text{sys}}$ ;
15 end

```

Figure 3: Algorithm Explaining the Procedure of Scale the Frequency Scaling of Low-Priority Tasks

1.4 Simulation Setups:

Algorithm 3 sums together the overall flow of our heuristic frequency scaling. In view of the schedule of low-priority tasks in set T_{Low} , the algorithm initializes the operating frequency of tasks to the greatest level, and then iterates the operating frequency scaling of jobs to a lifespan limit. The algorithm evaluates each job's power-saving performance when its operational frequency is scaled and finds the task with the highest power-saving effectiveness and meets the slow limit (i.e., the real-time constraint). The slack and system must be updated as long as the specified task's operation frequency scaling is scaled. This paper formulates the workflow scheduling problem of maximizing soft-error reliability for Cyber-Physical Cloud Systems under system lifetime reliability, security, and real-time constraints. This paper proposes a hybrid approach that enhances the dependability of soft error by stating tasks and allocating retrieval dynamically. Security services maintain security systems and dependability for life is assured by the scaling of frequency scaling of low priority activities. To justify the effectiveness of our hybrid suggested strategy, this paper conducts a range of simulation tests. Our results are compared with those of one baseline and four competing techniques for the suggested algorithm. To solve the aforementioned problem, we propose a dependable workflow scheduling scheme. Specifically, this paper makes following contributions. Results of simulations showed that, compared to basic and competing techniques, proposal can produce better schedules with a less likely failure and more workability.

This research suggests a CPCS hybrid workflow strategy to enhance the reliability of the software under lifespan limitations, security and working flow deadlines. In our system, slack is used to recover failed jobs and therefore increase the dependability of soft error or to improve the safety of the system through use of security services. All workflow jobs share the slack available

in the system. The hybrid system first assesses the priority of the work and, using three important algorithms, allocates the maximum frequency scaling to all jobs and explains their periodical uses. Using the highest frequency scaling, recovery and security services might be slacked. The hybrid system then examines the dependability of the static workflow schedule. If not, the strategy scales the operation frequency scaling of low priority activities dynamically, thereby enhancing system dependability without breaking the deadline.

In order to recover the failed tasks the suggested algorithms employ slack and enable all jobs to share the slack in the available system. The method assesses the priority of tasks first to enhance soft-error reliability and allocates the maximum frequency scaling to every job and lastly dynamically assigns recoveries to tasks. Slack may also be utilized to leverage safety services to meet system security needs. Dynamically reducing the operation frequency scaling of low-priority tasks satisfies the lifetime reliability criterion. Extensive real-world benchmarking trials show that the approach presented decreases the likelihood of failure and improves scheduling. The corresponding soft-error reliability of these tasks are 0.90, 0.82, 0.74, and 0.67, respectively, in which the derived system soft-error reliability is 0.37. By assigning recovery to tasks, a higher.

2. DISCUSSION

Workflow Management System has become a new cloud computing application in the cloud environment. A number of system models and methodologies have been created for the use of the cloud workflow or Directed Acyclic Graph. A resource supply on demand with the use of the amazon elastic computing cloud for processes. Optimized cost supply for application processes using elastic resources. All of them implemented the supply of resources on the Amazon cloud platform. However, in some directed acyclic graph workflows, just a few study effort has been done to plan the problem. In this study we presented a multiple Reinforcement Learning-based directed acyclic graph cloud workflow scheduling method to resolve multiple directed acyclic graph workflow applications with varied priority submitted at various times in a cloud computing environment. The results of the experiments show that our work schedule is efficient.

Since the objective of this study is to enhance the dependability of the soft error system under lifetime, security and real-time limitations, we will also examine the feasibility of planning four kinds of workflow benchmarks using the suggested method. Of course, among all approaches employed, whatever benchmarks and failure rates are used, the suggested system may always achieve the highest timing feasibility. In comparison with others, the practicality of the suggested arrangement was improved. This improvement is due to our system's safety services and reliability-aware frequency scaling. Similar to Point of delivery observations, the planning of Rand is worse since the two approaches do not use countermeasures to prevent contraventions of restrictions. Moreover, if the rate of failure is larger than that of the lowest failed, feasibilities attained with offered schemes and comparative techniques will not be greater.

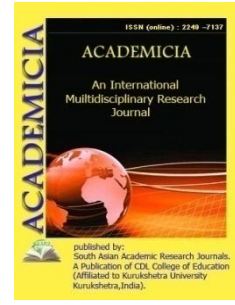
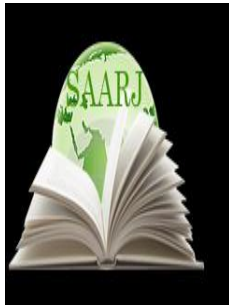
3. CONCLUSION

In this paper, we propose several directed acyclic graph scheduling programs for cloud computing based on enhancement learning. In view of the suggested system architecture, we examine the theoretical execution of cloud-based tasks and develop a new work plan using reinforcement learning to improve the time limit for certain cloud-based computing resources. This article assesses the suggested optimization of work schedules in comprehensive simulations.

Based on empirical observations, the proposed work plan may make the best use of cloud resources and load balance in order for the minimum span of time to be achieved with resource limitation. In the cloud computing business, specific tasks of the workflow planning sector should be handled by offering distinct pay-on-demand services and distribution systems structure performance criteria for cloud consumers. This article provides a novel paradigm based on cloud computing resources integration with local computing elements. The essential component of this system is the time algorithm that balances the performance and the cost of using cloud resources in the application schedule. Our proposed algorithms have demonstrated the possible benefits of the tests and the comparisons with other approaches.

REFERENCES

1. F. Wu, Q. Wu, and Y. Tan, "Workflow scheduling in cloud: a survey," *J. Supercomput.*, 2015, doi: 10.1007/s11227-015-1438-4.
2. Sandra V. B. Jardim*, "The Electronic Health Record and its Contribution to Healthcare Information Systems Interoperability," *Procedia Technol.*, 2013.
3. M. Tao, S. Dong, and L. Zhang, "A multi-strategy collaborative prediction model for the runtime of online tasks in computing cluster/grid," *Cluster Comput.*, 2011, doi: 10.1007/s10586-010-0145-4.
4. S. D. Verifier and A. H. Drive, "Simulink ® Verification and Validation TM Reference," *ReVision*, 2015.
5. S. Committee, *IEEE Standard for Software Verification and Validation IEEE Standard for Software Verification and Validation*. 1998.
6. M. Masdari, S. ValiKardan, Z. Shahi, and S. I. Azar, "Towards workflow scheduling in cloud computing: A comprehensive analysis," *Journal of Network and Computer Applications*. 2016, doi: 10.1016/j.jnca.2016.01.018.
7. E. K. Byun, Y. S. Kee, J. S. Kim, and S. Maeng, "Cost optimized provisioning of elastic resources for application workflows," *Futur. Gener. Comput. Syst.*, 2011, doi: 10.1016/j.future.2011.05.001.
8. M. Bobaru, M. Borges, M. d'Amorim, and C. S. Păsăreanu, *NASA formal methods : third international symposium, NFM 2011, Pasadena, CA, USA, April 18-20, 2011 : proceedings*. 2011.
9. Y. Zhang, "A foundation for the design and analysis of robotic systems and behaviors," 1994.
10. S. Smachat and K. Viriyapant, "Taxonomies of workflow scheduling problem and techniques in the cloud," *Futur. Gener. Comput. Syst.*, 2015, doi: 10.1016/j.future.2015.04.019.



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OVERVIEW OF IOT (INTERNET OF THINGS)

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ABSTRACT

The Internet of Things (IoT) is a ground-breaking communication paradigm that is critical in remote monitoring and control activities. This paper provides an overview of Internet of Things (IoT)-based remote monitoring and control systems that have the potential to address societal issues in the areas of healthcare, environment, home automation, transportation, military, agriculture, solid waste management, smart metering, surveillance, consumer asset tracking, smart grid, vehicular communication system, and pilgrim monitoring. The Internet of Things (IoT) is a hot subject with significant technological, social, and economic implications. Consumer items, durable goods, automobiles and trucks, industrial and utility components, sensors, and other common things are being coupled with Internet connection and sophisticated data analysis capabilities to change the way we work, live, and play. The effect of IoT on the Internet and economy has been estimated to be as high as 100 billion linked IoT devices and a worldwide economic impact of more than \$11 trillion by 2025, according to some estimates.

KEYWORDS: Agriculture, Internet of Things, Interaction, Sensor, Security.

1. INTRODUCTION

What would the world be without the Internet? It's impossible to conceive a situation like this that we've never seen before. The Internet is becoming more essential for everyone in both personal and professional life nowadays[1]. Smart phones, sensors, mobile computers, and a variety of other smart items are examples of things we interact with on a daily basis. These and other IoT-related technologies have a big impact on emerging ICT and business systems. It was first referred to as the "Internet of Computers," then as the "Internet of People," and, more recently, as the "Internet of Things," due to fast advancements in ICT. Different gadgets and smart things are integrated in the IoT in order to extend the Internet and make it more accessible and individually identifiable. The connection has been improved from "anytime, anywhere" for

"anyone" to "anytime, anyplace" for "anything"[2]. In terms of ICT breakthroughs and economic advances, a lot of attention has moved to IoT-related technologies, which are generally regarded as one of the most essential infrastructures for their promotion and one of the most promising future plans. The primary goal is to make it possible for the physical world and cyberspace to interact and integrate.

Internet of Things (IoT) is seen as a cornerstone of the future Internet, with gadgets, smart items, systems, and services being able to operate intelligently and communicate in sophisticated ways. Indeed, it is a new revolution in communication technology that will give a unique identity to everything from tires to hairbrushes so that they may be addressed, linked to other objects, and share information[3]. The Internet of Things has yet to be defined precisely or uniformly. Internet of Things (IoT) is a network that links ordinary physical things with identifiable addresses to offer intelligent services, based on conventional information carriers such as the Internet, telephone network, and so on. The author of proposed a semantically correct definition of IoT as "a global network of linked items uniquely accessible, based on standard communication protocols," since its origin phrase is made up of two words: "Internet" and "Things." The true value of IoT, on the other hand, lies in its ability to connect a diverse range of heterogeneous devices, such as everyday existing objects, embedded intelligent sensors, context-aware computations, traditional computing networks, and smart objects, all of which differ in terms of design, systems, protocols, intelligence, applications, vendors, and sizes[4]. Through applications and management systems located in data centers or network clouds, these organizations are able to interact and integrate with one another to gather, produce, process, and share data. This aids in the coordinated execution of complicated processes and intelligent activities, as well as the autonomous making of choices. The fundamental premise of the Internet of Things (IoT) is to link smart devices – or things – to the Internet in a transparent manner[5]. As a result, data is exchanged across all devices, and users' information is sent in a more secure manner.

According to Cisco Systems, the Internet of Things will have 50 billion connected devices by 2020, and many physical objects, such as computers and sensor actuators, will be distributed with unique addresses and the ability to securely transfer data ranging from common daily activities to restricted medical records. The Internet of Things (IoT) is a technology that "provides an integration method for all these physical items that include embedded technologies to be coherently linked and allows them to communicate, perceive, or interact with the physical environment, as well as among themselves"[6]. The Internet of Things (IoT) is a concept that encompasses "everyone, anything, anytime, anywhere, any service, and any network" [6]. Healthcare is one of the most appealing IoT application areas, as it allows for a variety of medical applications such as remote health monitoring, fitness programs, chronic illness management, and senior care. "A self-configured dynamic global network infrastructure with standards and interoperable communication protocols where physical and virtual "things" have identities, physical attributes, and virtual personalities, and are seamlessly integrated into the information infrastructure," according to another definition of IoT. Indeed, the Internet of Things (IoT) is the result of a global network interconnecting smart objects via extended Internet technologies, as well as the set of supporting technologies required to realize such a vision (such as RFIDs, sensor/actuators, machine-to-machine communication devices, and so on), as well as the suite of applications and services that leverage such technologies to open new business and market opportunities[4].

1.1 Advantages of IoT

- **Enhanced Customer Interaction** Current analytics include blind spots and severe accuracy problems, and engagement remains passive, as previously stated. This is totally transformed by the Internet of Things in order to create a deeper and more effective connection with audiences[7].
- **Technological Optimization** The same technologies and data that enhance the consumer experience also increase device usage and help to make more powerful technological advancements. The Internet of Things (IoT) opens up a world of vital functional and field data.
- **IoT reduces waste and identifies opportunities for development.** Current analytics offer just a surface level of insight, while IoT delivers real-time data that leads to more efficient resource management.
- **Improved Data Gathering** Modern data collection has limits and was designed to be used passively. IoT takes it out of those areas and puts it right where people want to go to study their surroundings. It provides a complete view of everything.
- **AI IoT basically turns everything into a "smart" object, enhancing every area of life via the use of data gathering, artificial intelligence algorithms, and networks.** This might be as easy as adding sensors to your refrigerator and cabinets to detect when milk and your favorite cereal are running short and placing an order with your chosen grocer.
- **New enabling technologies for networking, particularly IoT networking, imply that networks are no longer only dependent on large providers.** Networks may be built on a much smaller and less expensive scale and yet be functional. These tiny networks are created by IoT between its system devices.
- **Without sensors, the Internet of Things loses its uniqueness.** They function as defining instruments, transforming the Internet of Things from a passive network of devices to an active system capable of real-world integration.
- **Passive Engagement accounts for the majority of today's interaction with connected technology.** The Internet of Things (IoT) ushers in a new era of active content, product, and service interaction.
- **Small Devices have gotten smaller, cheaper, and more powerful throughout time, as anticipated.** To achieve accuracy, scalability, and flexibility, IoT relies on purpose-built tiny devices[8].

1.2 Disadvantages of IoT:

- **The Internet of Things (IoT) generates a networked ecosystem of continuously linked objects.** Despite any security precautions, the technology provides minimal control. As a result, users are vulnerable to a variety of threats.
- **Without the user's active involvement, the complexity of IoT offers significant personal data in extreme detail.** Given their usage of numerous technologies and a wide range of new

supporting technologies, some people perceive IoT systems to be difficult in terms of design, implementation, and maintenance[8].

- Many people worry about an IoT system's ability to seamlessly connect with other systems. They are concerned that they will be confronted with several systems that are either incompatible or locked.
- Regulations apply to IoT, just as they do to any other technology used in the corporate world. Because of its complexity, the problem of compliance seems to be very difficult, even if many people believe standard software compliance to be a struggle.

1.3 Application of IoT:

- **Houses with Smart Technology:** Smart homes are one of the finest and most practical IoT applications because they take both convenience and home security to the next level. Though IoT may be used at many levels for smart homes, the finest is the one that combines intelligent utility systems with entertainment. Your energy meter with an IoT device that gives you insights into your daily water use, your set-top box that enables you to record shows from a distance, Automatic Illumination Systems, Advanced Locking Systems, and Connected Surveillance Systems are all examples of smart homes. As the Internet of Things progresses, we can expect most gadgets to become smarter, allowing for improved home security.
- **City of the Future:** Smart cities are intended to be made up of not only internet connection for individuals in a city, but also access for the city's gadgets. And we can gladly announce that we're on our way to making this goal a reality. Efforts are being made to integrate linked technology into infrastructure needs as well as certain critical issues such as traffic management, waste management, water distribution, and electricity management, among others. All of these things help to alleviate some of the problems that individuals encounter on a daily basis while also adding convenience.
- **Autonomous Vehicles:** There has been a lot of talk about self-driving vehicles. Google experimented with it, as did Tesla, and Uber even developed a self-driving vehicle that was subsequently shelved. Because we're dealing with human lives on the roadways, we need to make sure that the technology has all it needs to improve passenger and road safety. The vehicles utilize a variety of sensors and embedded technologies that are linked to the Cloud and the internet to continuously generate data and transmit it to the Cloud for Machine Learning-based decision-making. Though it will take a few more years for technology to mature fully and nations to change their laws and regulations, we are now seeing one of the greatest IoT applications[9].
- **Internet of Things (IoT) Retail Stores:** You should see the video of Amazon Go - the eCommerce giant's concept shop – right now if you haven't already. Perhaps the greatest use of technology for bridging the gap between an online shop and a physical store is this. By deducting money from your Amazon wallet, the retail shop enables you to go cashless. When you choose goods from the shelves, it also adds them to your cart in real time. If you change your mind and choose another item, the old one is removed from your cart and replaced with the new one. The concept store's greatest feature is that there is no cashier to charge your purchases. You don't have to wait in line; just walk out after picking up your items from the

shelves. If this technology proves to be successful in attracting more customers, it will undoubtedly become the standard in the future years.

- Agriculture : One of the industries that will gain the most from the Internet of Things is agriculture. With so many advancements being made in agricultural equipment, the future seems bright. Drip irrigation, crop patterns, water distribution, drones for farm surveillance, and other tools are being developed. These will enable farmers to produce a higher-yielding crop and better address their concerns
- Wearable technology: Even now, wearables are a popular subject in the market. These gadgets are used for a variety of reasons, including medical, health, and exercise. Jawbone, a wearables company, is the most well-funded of all the IoT companies.
- Smart Grids are number seven: A smart grid, for example, is a comprehensive system that employs a wide variety of Information Technology resources to allow current and new gridlines to minimize energy waste and costs. Electricity efficiency, reliability, and economics will all benefit from a future smart grid.
- Internet for Industry: The Industrial Internet of Things is made up of networked sensors, instruments, and other devices that are linked to industrial computer applications such as production, energy management, and so on. While the industrial internet is currently unpopular in contrast to IoT wearables and other applications, market research firms such as Gartner, Cisco, and others think it has the greatest overall potential.
- Telemedicine: Telehealth, often known as telemedicine, is still in its infancy. Nonetheless, it has a bright future ahead of it. IoT Telemedicine includes digital medical imaging communication, remote medical diagnosis and evaluations, video consultations with specialists, and so on.
- Intelligent Supply-Chain Management: Supply-chains have been around for a long. Solutions for monitoring products while they're on the move are an excellent example. They are certain to remain on the market for a long time, thanks to IoT technology.

1.4 Industry take advantages from IoT

- Manufacturing: Manufacturers may obtain a competitive edge by utilizing production-line monitoring to allow proactive equipment repair when sensors indicate imminent breakdown. Sensors can detect when manufacturing output is being harmed. Manufacturers can rapidly inspect equipment for accuracy or remove it from production until it is fixed with the assistance of sensor warnings. Companies can save operational costs, increase uptime, and enhance asset performance management as a result of this[4].
- Automobile: The adoption of IoT applications has the potential to provide substantial benefits to the automotive sector. Sensors can identify imminent equipment failure in cars currently on the road and notify the driver with facts and suggestions, in addition to the advantages of using IoT on manufacturing lines. Automotive manufacturers and suppliers may learn more about how to keep vehicles operating and car owners informed thanks to aggregated data collected by IoT-based apps.

- **Logistics and Transportation:** A number of IoT applications assist transportation and logistics operations. Thanks to IoT sensor data, fleets of vehicles, trucks, ships, and trains carrying goods may be redirected depending on weather conditions, vehicle availability, and driver availability. Sensors for track-and-trace and temperature-control monitoring may be included within the inventory itself. Temperature-sensitive inventory is common in the food and beverage, floral, and pharmaceutical sectors, and IoT monitoring systems that provide warnings when temperatures increase or decrease to a level that threatens the product would be very beneficial[10].
- **Retail:** IoT apps help retailers manage inventory, enhance customer experience, increase supply chain efficiency, and save operating costs. Smart shelves with weight sensors, for example, may gather RFID-based data and transmit it to an IoT platform to automatically check inventory and provide warnings when goods are running short. Customers may get customized discounts and promotions through beacons, making for a more engaging experience.
- **The Government Sector:** In the public sector and other service-related settings, the advantages of IoT are equally extensive. Government-owned utilities, for example, may utilize IoT-based apps to inform their customers of large-scale outages as well as minor disruptions in water, electricity, or sewage service. IoT applications can gather data on the extent of an outage and deploy resources to assist utilities in recovering from outages more quickly.
- **Healthcare:** The healthcare sector benefits from IoT asset monitoring in a variety of ways. Doctors, nurses, and orderlies often need to know where patient-assistance items like wheelchairs are located. When wheelchairs at a hospital are fitted with IoT sensors, they can be monitored using an IoT asset-monitoring application, allowing anybody searching for one to easily locate the closest accessible wheelchair. Many hospital assets may be monitored in this manner to guarantee appropriate use and financial accounting for the physical assets in each department.

Across all industries, there is a need for general safety IoT may be utilized to enhance worker safety in addition to monitoring physical assets. Employees in hazardous settings, such as mines, oil and gas fields, chemical and power plants, need to be aware of the possibility of a hazardous incident affecting them. They may be informed of accidents or rescued as quickly as possible when they are linked to IoT sensor-based apps. Wearables that monitor human health and environmental factors also utilize IoT applications. These apps not only help individuals better understand their own health, but they also allow doctors to monitor patients remotely.

2. DISCUSSION

The Internet of Things (IoT) offers unparalleled possibilities for further innovations and investments in ICT as a fast-emerging, fast-growing technology. Open problems and difficulties, on the other hand, arise, emphasizing research trends and necessitating greater attention. Recent research articles, studies, and surveys cover a variety of topics related to the difficulties that IoT developers confront. Because the Internet of Things is still in its early stages, problems such as large data management, analytics & mining, architectural standardization, scalability, privacy & security, clock synchronization, energy management, protocols, visualization, and QoS exist.

Furthermore, as described in social IoT and nano-IoT are new developing aspects. Such problems are likely to be addressed in the near future, and greater collaboration is required. We emphasize the necessity of paying particular attention to the following two issues: (i) energy efficiency, which is a major consideration when developing IoT systems. As the number of connected devices grows, so does power consumption; as a result, energy-efficient methods are required for creating green IoT systems. (ii) Clock synchronization, which is becoming a key technology for distributed systems that are coherent. For data integrity, improved coordination, and job scheduling, scalable time synchronization is needed. Furthermore, an IoT device may time its sleep pattern using dynamic timing synchronization, allowing it to save more energy. We anticipate more involvement in order to mitigate the effect of such technological difficulties. As a result, creating a coherent and consistent IoT world in which a thing or a smart item is able to survive, interoperate, and adapt to any environment.

3. CONCLUSION

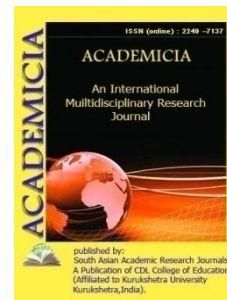
The Internet of Things (IoT) is a cyber-physical system that connects billions of disparate devices and smart things. Identification, embedded sensors, intelligent management, protocols, data storage/processing/analytics, and other technologies allow these things. In recent years, a broad variety of IoT applications have been accepted and implemented. This article presents an overview of the Internet of Things, including its vision, ideas, characteristics, and promising future. There are brief explanations of the major technologies, freshly created protocols, and the most popular IoT applications. For further efforts in the near future, the research directions/future problems are mentioned. We highlight the significance of power efficiency and temporal synchronization as future developments that, in our opinion, need greater attention and research. The most significant contribution of this article is that it pulls together the most important elements of the Internet of Things and their significance in a single document, presented in a simple and unverbose way.

REFERENCES

1. A. Al-Fuqaha, M. Guizani, M. Mohammadi, M. Aledhari, and M. Ayyash, "Internet of Things: A Survey on Enabling Technologies, Protocols, and Applications," *IEEE Commun. Surv. Tutorials*, 2015, doi: 10.1109/COMST.2015.2444095.
2. G. Carnaz and V. B. Nogueira, "An Overview of IoT and Healthcare," 2016.
3. R. Ratasuk, N. Mangalvedhe, Y. Zhang, M. Robert, and J. P. Koskinen, "Overview of narrowband IoT in LTE Rel-13," 2016, doi: 10.1109/CSCN.2016.7785170.
4. S. S. Pai, Vikhyath, Shivani, Sanket, and Shruti, "IoT Application in Education," *Int. J. Adv. Res. Dev.*, 2017.
5. H. Tahir, A. Kanwer, and M. Junaid, "Internet of Things (IoT): An Overview of Applications and Security Issues Regarding Implementation," *Int. J. Multidiscip. Sci. Eng.*, 2016.
6. M. U.Farooq, M. Waseem, S. Mazhar, A. Khairi, and T. Kamal, "A Review on Internet of Things (IoT)," *Int. J. Comput. Appl.*, 2015, doi: 10.5120/19787-1571.
7. M. Stočes, J. Vaněk, J. Masner, and J. Pavlík, "Internet of things (IoT) in agriculture - Selected aspects," *Agris On-line Pap. Econ. Informatics*, 2016, doi:

10.7160/aol.2016.080108.

8. C. Formisano *et al.*, “The Advantages of IoT and Cloud Applied to Smart Cities,” 2015, doi: 10.1109/ficloud.2015.85.
9. S. Chen, H. Xu, D. Liu, B. Hu, and H. Wang, “A vision of IoT: Applications, challenges, and opportunities with China Perspective,” *IEEE Internet of Things Journal*. 2014, doi: 10.1109/JIOT.2014.2337336.
10. D. Markovic, R. Koprivica, U. Pesovic, and S. Randic, “Application of IoT in monitoring and controlling agricultural production,” *Acta Agric. Serbica*, 2015, doi: 10.5937/aaser1540145m.



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SOME COMMENTS ON THE HISTORICAL BASIS OF MYTHOLOGICAL LEGENDS

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ABSTRACT

This article clarifies the role and importance of myths in the genesis of the mythological genre, as well as the impact of folk art on the history and stages of development. The method of storytelling within the art forms through words was the most convenient and common method for the popularization and transmission of certain information that reflected the mythological imagination from generation to generation. An important factor in the emergence of the genre of myth was the "desacralization" of myths, that is, the loss of their importance as a sacred text expressing a particular religious view, and increasingly gaining artistic and aesthetic significance.

KEYWORDS: *Imagination, Primitive, Belief, Myth, Syncretic, Ritual, Tradition, Archaic, Folklore, Evolution, Anthropomorph, Epic, Fairy Tale, Zoomorph, Myth, Dimiurg.*

INTRODUCTION

It is known that the ancient foundations of the art of speech go back to mythological notions and primitive beliefs. archaic folklore is also the primary source from which the first buds were formed. It is recognized by many folklorists that the most ancient layer of folklore of the peoples of the world is built on the basis of mythology, which in a sense has a syncretic nature. Commenting on the historical development and fate of Altai myths, folklorist SS Katash writes: Later myths were divided into anthropomorphic and zoomorphic myths during their evolutionary development. The move away from animism eventually led to the end of the myth-making tradition". ¹Doctors of Philology, Professors M. Juraev and Sh. Shomusarov write that "myth is one of the verbal manifestations of the beliefs, religious views and early creative researches of the ancient man. The myth was created by the need of the primitive man to express certain needs of the spiritual world, that is, his own worldview. The system of mythological notions formed in ancient times as the beginning of the tradition of artistic perception of reality

was the basis for the formation of the plot series and the composition of images of epic genres in folklore. epic heroes in folk epics played an important role in the formation of the image of heroes. In the mythical creativity and performance traditions of the last periods of the primitive community system, there was a certain basis for the origin of the mythical genre. This is especially true of a situation associated with the execution of a myth or the popularization of mythological imagery. It is known that information of an ancient mythological nature was conveyed to people by narrators, priests, tribal elders who knew the myth well, through dances performed by shamans in ceremonies and rituals, and in symbolic games and handicrafts. The main means of determining the mode of execution of the myth - the sign of popularity through the word - remains the main semantic feature that determines the way of life of the mythical genre. The method of storytelling within the art forms through words was the most convenient and common method for the popularization and transmission of certain information that reflected the mythological imagination from generation to generation. That is why the form of oral performance served as the main means of ensuring the popularization of myths. This ensured that at certain stages in the history of human thought, myth was absorbed into folk oral art, and that mythology was relatively more preserved in folklore than in other forms of art. As the ancient human worldview improved and a tradition of artistic perception was formed through certain images instead of interpreting the world through mythological beliefs, mythology was "denied" by members of society as a specific form of understanding of being. Because at this time in the history of human thought, which was characterized by these complex processes, the performance and creativity of myth could not meet the artistic needs of human thinking. As a result, the main part of the ancient myths was absorbed into the first manifestations of folk art thinking, which initially appeared in a mixed form, consisting of a unit of melody, word and action. The fact that many mythological images and ancient imaginations have survived to the present day in the composition of epics, fairy tales, legends, songs and other folklore genres also shows that mythology has served as a source for artistic thinking. At the same time, the features of the myth as an "archaic genre" have not completely disappeared. According to Professor M. Juraev, "when a myth is rejected as an expression of a simple understanding of the world, its content undergoes certain changes and moves to the genre of myth. These changes are the attitude to reality² (the transition from mythological to artistic perception of the world), the expansion of the function of myth (the reflection of moral and aesthetic views in stories created and narrated to explain reality), the renewal of myth, the transformation of mythological characters into artistic images it was based on the severing of its connection with rituals and the symbolic interpretation of the image of reality." There is another reason why the genetic basis of the myth genre is directly related to myth: ancient myths were close to the myth genre in terms of their popularity, i.e., mainly performed in a narrative way. Therefore, at the time of the collapse of the primitive social order, when mythology was unable to meet the emerging epic thinking and artistic and aesthetic needs of people, a new form of oral prose - the genre of myth - emerged, embracing the main plots and essence of ancient myths. In other words, the mythical genre is formed by denying the traditions of myth creation and performance, which at the same time embodied the plot structure, method of performance and vital functions of the myths, which were already known among the people and formed as a complete structure in the tradition of live performance. "The legend genre is not a direct repetition or copy of an old myth, but a product of a new epic creation. A new way of interpreting, explaining, and interpreting reality has emerged in a sense as a denial of the mythological worldview. Thus, the mythological plots did not

become a direct myth, that is, the myth absorbed its elements while completely rejecting the method of mythological imagination". Professor B. Sarimsakov said that one of the most important features of medieval myths is "always living and spreading in the form of a myth, that is, through an aesthetic code."³ During the development of the historical-folklore process, mythology proved its features as one of the forms of social consciousness through the epic form of the genre of myth. Folklorist M. Juraev The sources that gave rise to folk legends and the stages of their evolution show that they are in the form of "living reality -> myth -> myth".⁴

The genre of myth also derives its function as an example of the epic genre from the myth, that is, the genre is directly related to the myth. This functional feature also led to the decline of mythic creativity, which was replaced by the tradition of artistic and epic thinking, and the entire genre of myth. Legends are meant to convey information about a fact or information to the listener, as the narration of an event in life by both the narrator and the listener is accepted as true. Mythological legends about the creation of the universe, the struggle between chaos and space, the emergence of flora and fauna, the lights of the sky, the beginning of natural phenomena are examples of myths once created by primitive people preserved in folk art through the aesthetic code. Although there are many similarities and commonalities between myth and mythological myth, it would not be correct to identify these two phenomena. In our view, myth and mythological myths have much in common in terms of the following characteristics:

- 1) In myths and mythological myths, the goal is to clarify the essence of certain concepts, objects and phenomena related to the being, universe, nature, celestial bodies and human life that surround man;
- 2) Etiology predominates in the functional direction of ancient myths and mythological myths. For in both of them the aim is to explain the essence of certain things-phenomena in the universe and in nature;

Both in the myths of primitive man about the universe, and in the mythological legends of our people to explain the causes of certain phenomena in nature, reality is expressed through concrete objects. Therefore, O.M. had entered.⁵ For example, myths and mythological legends about the moon, sun, and stars speak of a specific celestial body;

Myth is represented in ancient ceremonies through various symbolic game actions and dances, as well as narrated through words like mythological legends. Ancient notions expressed in the form of myths are conveyed to the listener in a mostly fabulative form;

Just as mythology, which served as the leading ideology of primitive society, embodied religious beliefs associated with ancient forms of religion such as animism, totemism, fetishism, and magic, so in mythological myths there are motifs, plots, and images that carry animative, totemistic, fetishistic ideas.

Another aspect that shows the commonality of myth and mythological myth is that they both have a motive of 'evolution'. In both myths and mythological myths, the emergence of a certain part of being through the transformation of a person into a certain thing is described as a motive for "evolution."

- 5) The genre of legend is the closest to the myth among the works of folk epic art in terms of the history of its creation, the scope of the subject, the way of expressing reality and the system of images. At the same time, mythological legends are not an exact repetition of ancient myths, but

there are a number of differences between these two phenomena, which are characteristic of different stages of the history of human worldview and thought, and these distinctive features are:

- 1) The reality depicted in myths and legends also differs depending on when it occurred, that is, according to the chronological character of the epic text. In ancient myths, "the creation of the universe is explained as the beginning of time and space
2. The time described in mythological legends is characterized by the fact that the narrator and the listener are focused on the past, ie "retrospective" in its direction, without a clear expression of the time in which they live.
3. The reality narrated in myth and legend is perceived as the expression of the event by the narrator and the listener, i.e. as the truth.

An important factor in the emergence of the genre of myth was the "desacralization" of myths, that is, the loss of their importance as a sacred text expressing a particular religious view, and increasingly gaining artistic and aesthetic significance. It is therefore incorrect to regard myths and legends as one thing, they are examples of folklore that require one another and are the product of historically different periods in terms of their creation and popularity.

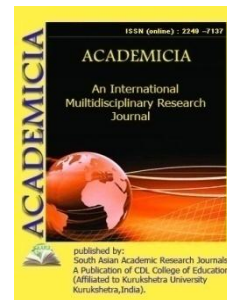
The expression of mythological ideas in the genre of myth took place in the form of a diffusion process consisting of "restoration of the socio-aesthetic code instead of the mythological code, acceptance of the mythological taboo as a social taboo, transformation of the mythological symbol into a poetic movement."The structural changes that took place in the method and forms of expression of the myth paved the way for the origin of the myth genre.

According to folklorist M. Juraev, "structural-semantic alternatives of ancient myth in Uzbek folklore are mythological legends.».⁶ In our opinion, the projects based on the mythological ideas of the ancients, that is, the re-perception of the original plots during the development of artistic thinking, reflect cosmogonic, totemistic, animistic, manistic views, that is, through the artistic perception of the tradition of mythological interpretation of the world. Oral prose works formed as a direct continuation of the performance and creativity of the myth, the successor of the myth, the popular manifestations of ancient myths in the epic form, are "mythological legends".

REFERENCES:

1. Katash S.S. Archaic genres of Altai folklore (genesis, typology, poetics).Diss. on sois.doct. filol. science. - Tashkent, 1984. - S.118-119.
2. 'Jo'raev M., Shomusarov Sh. Uzbek mythology and Arabic folklore. -Tashkent: Fan, 2001.- B.Yu-I.
3. Jo'raev M. Historical bases of Uzbek celestial legends: Philol. Ph.D. diss. avtoref. - Tashkent, 1996. - P.16.
4. Jo'raev M. Historical bases of Uzbek folk celestial legends. Filol.Ph.D. diss. - Tashkent, 1996. - P.53.
5. Sarimsoqov B. Diffusion of epic genres. –
6. B.142. Jo'raev M. Historical bases of Uzbek folk celestial legends. Filol.Ph.D. diss. - Tashkent, 1996. - P.53.

7. Freydenberg O.M. Myth and literature of antiquity. - M.: Nauka, 1978. - P.19.
8. Sarimsoqov B. Diffusion of epic genres // Epic genres of Uzbek folklore. - Tashkent: Fan, 1981. -B.97-140.
9. Jo'raev M. Historical bases of Uzbek celestial legends: Philol. Ph.D. diss. - Tashkent, 1996. - P.47.



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WORLDVIEW ASPECTS OF SYMMETRY AND CONSERVATION LAWS IN THERMODYNAMICS

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ABSTRACT

The article discusses the stages of development of the concept of symmetry, conservation laws, entropy and dissymmetry, its characteristic functions in the form of conservation laws and principles of symmetry imposed on certain processes under certain conditions. In connection with the ideological aspect, attention is drawn to the congruence inherent in synergetic constructions and constructions based on dissymmetry. The task of the theoretical substantiation of the conservation laws is determined not only to reveal from the connection with each other, with the structure of fields, with such universal principles as the principle of the non-creativity and indestructibility of matter and motion and the principle of the unity of the attributes of matter.

KEYWORDS: *Symmetry, Asymmetry, Dissymmetry, Thermodynamics, Energy, Momentum, Inertia, Matter, Motion, Conservation Laws, Entropy, Synergetics.*

INTRODUCTION

The development of natural science, and above all physics, provides new and new data confirming the inviolability of the universal idea of symmetry, the laws of conservation and transformation of energy, matter and motion, displayed with the help of particular laws of conservation and transformation, the number of which is constantly increasing in physics.

For the human mind, symmetry seems to have a very special attractive force. We like to look at the manifestation of symmetry in nature, at the perfectly symmetrical spheres of planets or the Sun, at symmetrical crystals, at snowflakes and other things that are almost symmetrical. "Symmetry is the idea through which man has been trying for centuries to comprehend and create order, beauty and perfection", said G. Weil [1, - p. 7]. Since ancient times, the symmetry

of the forms observed in nature has made a strong impression on a person. He saw in symmetry the order, harmony, perfection brought by the almighty creator into the primordial chaos.

The modern view of symmetry: the idea of conservation, the identification of commonalities in objects or phenomena, the limitation of the number of possible options, and therefore symmetry is associated with conservation. It identifies invariants, peculiar “reference points” in our changeable, dynamic world. Thus, the order is introduced. Parallel symmetry-general, connected with the parallel symmetry-conservation – both go to the conservation laws.

Among all the laws of nature, conservation laws play a special role, being one of the methods of cognition of the hidden forces of nature. One of the characteristic features of conservation laws is that they can manifest themselves in the form of restrictions or even categorical prohibitions imposed on certain processes under certain conditions. This is often the beginning of their knowledge. When a person is faced with the fundamental impossibility of any processes, he eventually comes to the discovery of a new conserved quantity. At the same time, an important feature of conservation laws is that they generally determine the possibility or impossibility of certain processes, regardless of their specific nature. The very process of discovery and cognition by the idea of symmetry and conservation laws has passed a number of historical stages.

The connection of symmetry with conservation laws

The idea of symmetry has often served as a guiding thread for scientists when considering the problems of the universe. Symmetry determines the necessity: it acts in the direction of reducing the number of possible options, in many cases suggests those options that are possible, i.e. allows you to make predictions. For example, in 1869, D. I. Mendeleev predicted the existence and properties of scandium, gallium, and Germanium. In 1931, V. Pauli predicted the existence of neutrinos.

Observing the chaotic scattering of stars in the night sky, we understand that the external chaos hides quite symmetrical spiral structures of galaxies, and in them – the symmetrical structures of planetary systems. The symmetry of the external shape of the crystal is a consequence of its internal symmetry – the ordered mutual arrangement of atoms (molecules) in space. It is the crystals that bring the charm of symmetry into the world of inanimate nature. Each snowflake is a small crystal of frozen water. The shape of snowflakes can be very diverse, but they all have a symmetry – a turning symmetry of the 6th order and, in addition, mirror symmetry. Although there is a lot of complexity in physics, there is also a lot of simplicity and grace in it, which is largely due to the symmetry of physical laws and physical systems. The concept of symmetry not only occupies an important place in physics, but also plays a powerful role in modern physical research. To investigate the physical consequences of the symmetry of the system, we obviously need to learn something about transformations and especially about the set (set) of transformations that leave some functions of the potential type unchanged.

Mathematics, art and architecture have been paying attention to the principles of symmetry since ancient times, but they entered natural science, especially physics, relatively recently, and they were subjected to a deep theoretical and philosophical understanding only in the XIX century when their close connection with the principles of conservation was realized. With complete and quite unambiguous certainty of the laws and uncertainty of the initial and boundary conditions, we get the entire diverse range of physical phenomena and processes. The terms “symmetry” and “invariance” are often used as synonyms, at least in the physical literature, where they denote

“the property of remaining unchanged with respect to one or several different operations” [2, - pp. 96-99]. The symmetry or invariance of objects always takes place with respect to certain, clearly fixed operations. The invariance of the laws of nature is a consequence of those essential symmetries, which, however, are not fully included in their content. Without the category of symmetry, it is impossible to give a complete description of the category of the law, since each law includes certain symmetry. Therefore, the most general principles are the principles of symmetry or invariance, which permeate all modern physical theories.

The principles of symmetry and invariance, according to the famous American physicist E. Wegner, are a kind of super principle that relates to the laws of nature in the same way as the laws of nature relate to phenomena. Physical laws have symmetry with respect to a given transformation (shift, rotation, mirror reflection, etc.). Conservation laws indicate that the state of the system will not change without its interaction with other systems. These laws can be obtained directly from the condition of a particular symmetry, and therefore the scope of their application is wider than the laws of motion of classical Newtonian dynamics, phenomenological in origin and valid only for macroscopic systems and moderate velocities of movement [3, - p. 56].

The symmetry of physical laws directly applies to the laws of conservation of substances (matter, energy, momentum, etc.). At the beginning of the twentieth century, Emmy Netr showed that for differential equations derived from the Lagrange variational principle, each conservation law is a consequence of the corresponding symmetry: from time invariance follows the law of conservation of energy, rotation-the law of conservation of angular momentum, shift in space - the law of conservation of momentum, etc. These laws follow from a symmetry called the Poincare group. The connection of conservation laws with symmetries determines their leading position among all the laws of nature [4, - p. 20].

Stages of development laws conservation

The law of conservation of mass is historically the first of the conservation laws known by man. Guesses about the existence of a certain universal principle of the conservation of matter as a synonym for matter go back to the philosophers of ancient India, China, from where they penetrated into the ancient world. Thus, Empedocles believed that nothing can come from nothing and nothing can be destroyed. According to Aristotle, matter does not come from nothing, is not subject to multiplication or reduction, is not created and does not disappear, but only changes. The ideas about the eternity of matter are presented by Lucretius Kara, Democritus, Epicurus, Gassendi, Lomonosov, Dalton.

This idea was not lost in the wilds of history from antiquity to the science of the early medieval (VII – XI centuries) Islamic culture of Central Asia and was already more specifically embodied in the idea of Beruniy about the force of attraction of the earth to the center, and Ibn Sina's theory of the driving force, introducing the concept of “aspiration” (impulse), his justification of “inertia” as a principle about preserving the amount of movement. From this understanding, the principle of inertia in the idea of R. Deckard arose, which assumes that if matter is at rest, it will not start moving by itself. There is also no reason to believe that if it begins to move, then this movement will stop by itself or weaken. To do this, it must meet something on its way that stops weakening it. This idea found expression in the works of G. Galileo, who defended the idea of preserving “natural motion”, in the understanding of which he, in a certain sense, followed the ideas of Aristotle, considering, for example, the “circular” movements of the planets as natural.

At the same time, he defended the position on the preservation of “rest” as natural, which later, after Newton's works, led to the development of such a concept of inertia, which is interpreted as a certain idea of conservation. After Newton introduced the concept of mass into physics as a measure of the amount of matter, the law of conservation of mass was implicitly introduced, that is, the idea that the amount of matter in the world should always remain the same due to the non-creativity and indestructibility of atoms.

The conservation of mass in chemical reactions was experimentally proved for the first time in history in 1755 by M.V. Lomonosov. But, for a long time, this law of conservation was not given much importance, it was considered self-evident, self-evident. In 1789, Lavoisier wrote: “Nothing happens either in artificial processes or in natural ones, and it can be argued that in every operation, the quality and quantity of the beginnings are the same, that only changes, changes have occurred” [5, -pp. 505-506]. M.V. Lomonosov in 1748 expressed in a very general form the idea of preserving matter and motion. In a letter to L. He wrote to Euler: “All the changes that occur in nature occur in such a way that as much as has been added to something, the same amount will be taken away from another... This law of nature is so universal that it also extends to the rules of motion: a body that excites another with a push to move loses as much of its movement as it gives away this movement to another body” [6, - p.160].

Quantitative analysis, as well as the atomistic hypothesis of Higgins, and then Dalton, are entirely based on the law of conservation of all matter, because the weight of Dalton atoms does not change during chemical reactions, as well as their number.

The effect of the second law of Newton's mechanics is based on the fact that force is associated with the inert properties inherent in any body, it is often interpreted as an example of the fact that mass is only a coefficient between force and acceleration, i.e. mass is a measure of inertia. Careful studies have shown that the inert and gravitational masses are numerically equal to each other and are, as it were, two manifestations of the same property of bodies. As is known, the identity of inertial and gravitational masses is the basis of Einstein's general theory of relativity, in which the geometric properties of space are related to the distribution of available masses. The theory of relativity created by Einstein at the beginning of the twentieth century showed that the dependence on speed has a mass of any origin. Mass is one of the decisive criteria for the stability of atomic nuclei: they are stable if the difference between the mass number and the charge of the nucleus does not exceed narrow boundaries. The stability of the nucleus is characterized by the binding energy of nucleons (protons and neutrons). In the physical and philosophical literature, we still meet with statements that mass is an adequate expression of matter, that mass is the amount of matter and energy, etc.

The law of conservation and transformation of energy is very important for theory and practice, for the scientific worldview. It is interesting to note that physicists themselves almost did not put their hands to the formulation of the law of conservation of energy. A significant contribution to the solution of this problem was made by: doctor Robert Mayer (1814-1878), technological engineer August Kolding (1815-1888), brewer James Joule (1818-1889), physiologist, physicist Hermann Helmholtz. Here we should also note the works of Russian academicians E. Lenz and G. Hess, which were a vivid expression of not only the conservation, but also the transformation of energy.

The law of conservation and transformation of energy was, as it were, the result of the development of mechanics. Thanks to practice, experimental and theoretical research, its deep content as a universal law of nature was revealed more and more. But the law of conservation and transformation of energy has played a particularly important role in the study of electric and magnetic phenomena. Thanks to the works of Clausius, Thomson, Maxwell, Boltzmann, Gibbs and others, since the 60s of the XVIII century, the law of conservation and transformation of energy has become a recognized tool of scientific research. There was a need for a more complete physical, as well as philosophical understanding of this fundamental law of nature. The physical analysis of it was brilliantly carried out by M. Planck in the book "The Principle of conservation of Energy " published in 1887. This allowed the rapid development of the theory of thermal processes, and led to the emergence of thermodynamics.

Conservation laws in thermodynamics.

All simple thermodynamic systems and complex objects initially contain single entities-microparticles (molecules, atoms, etc.), which eventually generate an enormous variety of structures and phenomena. Hence, we can expect the existence of few general laws that can comprehensively characterize the states of material systems. Indeed, thermodynamics is based on three fundamental laws (principles).

According to the first law of thermodynamics, when processes occur in closed systems, the total energy remains unchanged, which corresponds to the universal law of conservation and transformation of energy:

$$dU = \delta Q + \delta A \quad (1)$$

that is, the change in the internal energy of the system consists of increments with the corresponding signs of heat and work, which are not complete differentials. Only the internal energy U is a function of the state, and the heat and the work of the system are functions of the process. The work on overcoming the dissipative forces is converted into the bound energy $\delta Q = TdS$, and an equilibrium state is established in the system with a corresponding increase in the entropy S . Therefore, the law of conservation of energy can be formulated in the following form: "The energy of a material system in a certain state, taken in relation to another certain "zero" state, has an unambiguous value" [7, -p.96], i.e. it is independent of the method of transition. Thus, the first law of thermodynamics requires the energy balance of all interactions to be observed.

The formulated law is derived from the experimental fact that it is impossible to create work from nothing (perpetuum mobile) and destroy it-from the fact that "positive work can neither arise from nothing nor disappear into nothing" [7, - p. 138]. This makes it possible to interpret the energy contained in the system already "as a quantity that is independent of external actions in its meaning". The change in the internal energy of a closed thermodynamic system is equal to the sum of the thermal energy communicated to the system and the thermodynamic work applied to the system.

The second law of thermodynamics states (R.Clausius) that there is a quantity that, with all changes in a closed system, evolves in one direction – growth. This value, which is a function of the state, is entropy. The growth of entropy is an indicator of an increase in structural disorder, it establishes the existence of a fundamental asymmetry in thermodynamic systems – one direction

of spontaneous processes. And although the total amount of energy is preserved in a closed system, its distribution changes irreversibly: the inevitable loss of free energy means the loss of part of the value of energy; at the same time, the organization and structure tend to replace diversity with uniformity. From this we can say that this law plays a very special role in understanding the meaning of the arrow vector of time. The value of entropy:

$$dS = \delta Q / T \quad (2)$$

Here, a small change in the entropy (full differential) dS is equal to the ratio of the elementary heat δQ (δ is the sign of the incomplete differential), reported to the system or derived from it, to the temperature level T (on the Kelvin scale). In 1865, R. Clausius introduced this concept and explained the origin of the name of the new concept: “I propose to call the value S entropy from the Greek τροπή-transformation. I specifically chose the word entropy so that it would be consonant with the word energy, since these two quantities are so similar in their physical meaning that the consonance of their names seems useful to me” [8,- p.76].

Entropy is the most important function of a thermodynamic system that has the property of the thermal coordinate of the state, i.e. it is uniquely associated with the presence of an energy exchange in the form of heat.

Thus, the second law of thermodynamics indicates the direction of spontaneous state change – degradation (scattering, depreciation) of energy. It is valid only for a large collection of particles (the macrocosm) and does not make sense in the microcosm.

And, the ambiguity of the relationship between the concepts of chaos and entropy is also manifested in the fact that entropy, according to the second law of thermodynamics, is a “measure of the disorder of the system”. In the context of the synergetic theory, entropy is the “progenitor of order” (A. Toffler). In such an interpretation of chaos and entropy, the emphasis is not on the increase in disorder (with an increase in entropy and chaos), but on the creativity inherent in the state of disorder, which carries the possibility of order formation [9, -p.658]. The concept of chaos, and its synergetic understanding, is completely congruent to the concept of dissymmetry: both chaos and dissymmetry are represented as containing the creative potential to become either order and symmetry, or completely subject the system to elimination.

In connection with the worldview aspect, the congruence of another worldview conclusion, characteristic of synergetic constructions and constructions based on dissymmetry, attracts attention [10,- p.376]. Both points of view recognize the material unity of the world at its various structural levels. And if in synergetics, in this regard, the emphasis is placed on the idea of the Universe as a “complete system” (N. N. Moiseyov), then the view of this problem from the standpoint of dissymmetry was expressed by Louis Pasteur and for the first time introducing the concept of “dissymmetry” into scientific circulation, who considered the world as a “dissymmetric ensemble”, explaining this by the fact that “... the properties of certain figures are not combined by a simple overlay with their mirror image” [11, - p. 383]. Continuing the theory of L.Pasteur, P.Curie, in the logic of his scientific research on the influence of the environment on the bodies in it, determined that “...they retain mainly those elements of their own symmetry that coincide with the symmetry of the environment”. According to the principle of dialectical unity of symmetry and dissymmetry, every living object has one or another form of this unity [12, p. 74]. V. I. Vernadsky also noted that “there is a dissymmetry in the world, manifested in the existence of entropy in it...” [13, - p. 350]. It seems to us that dissymmetry should be understood

as a system-forming concept. This allows us to offer, as it seems to us, the most visual representation of the mechanism of self-organization. The phenomenon of self-organization should be represented as the desire of any particle to subordinate the oscillation phase of other particles to its oscillation phase, as a result of which a self-consistent interaction field, or response field, is formed around each particle. The phase correlation between the particle interaction field will lead to the formation of a self-consistent oscillating particle field. The use of a new physical invariant made it possible to discover an internal connection between all phenomena in Nature and to explain all phenomena from a unified point of view: from intra-nuclear to cosmic [14, - p.71]. From the standpoint of the dissymmetric concept of transformation, entropy is a measure of the degree of dissymmetrization of a system [15, -p.114], i.e., the growth of entropy in a system depends on the degree of its dissymmetrization. Energy is a property that allows a system to achieve specified states, or, figuratively speaking “energy creates an organization”. Then entropy determines the quality of energy, the measure of its ability to create, the “measure of creativity”, its final result.

The second principle of thermodynamics can be formulated in this form: the sum of changes in the entropy of the system and the external environment cannot decrease. Thus, the universe as a whole, i.e. as a kind of giant system, cannot return to its initial state and must (indefinitely?) strive for a state of thermodynamic equilibrium.

The entropy count starts from the absolute zero of temperature – this is the thermal theorem of V. Nernst, or the third law of thermodynamics. In this case, an absolute equilibrium of the system is achieved, i.e., the cessation of all movement of molecules in this basic energy state ($T=0$, $S=0$). Only one microstate corresponds to such a macrostate, so the thermodynamic probability of the latter is $W=1$. At $T=0$, a closed system left to itself is characterized by a tendency to thermodynamic equilibrium with the highest degree of disorder, i.e. the transition from less probable states to more probable ones. The stable equilibrium condition is $dS=0$ and $S= \max$. Entropy increases only in irreversible processes (processes with dissipation). “...In the redistribution of our geological and even cosmic time, the nature of the energy of the world always changes in the same direction – an increase in thermal energy that can no longer produce work in the world... It inevitably follows from the concept of entropy of the world that the center of symmetry cannot be in the space – time of a physicist”. In other words, it is in irreversible processes that the symmetry in time is broken [13, - p. 350]. However, idealized reversible processes do not depend on the direction of time: it is possible to calculate their states not only in the future, but also in the past. In such non-dissipative (conservative, Hamiltonian) systems, the direction of time can be any. It is believed that living beings have only a non-variant past and a multi-variant future, and the present is the interval where any processes can occur. This is the area of dissymmetry, or rather, its absence, the place of the alleged bifurcation, the place where Einstein’s postulate is not relevant. In places where there is no symmetry (in dissymmetry), the principle of cause and effect may even be violated. This is a kind of time tunnel.

Of great physical and philosophical interest is the question of the relationship of the law of increasing entropy with the direction of time. It is well known that the equations of classical mechanics are symmetric with respect to the replacement of time t by $-t$, and it is natural to assume that such symmetry should be preserved in statistics based on classical mechanics. L.D. Landau and E.M. Lifshits show that this is not the case. They come to the conclusion that “in quantum mechanics there is a physical nonequivalence of both directions of time, and, perhaps,

its “macroscopic” expression is the law of increasing entropy. However, until now it has not been possible to trace this connection in any convincing way and show that it really takes place” [16, - p. 48].

Thus, it is also impossible to deduce all aspects of the conservation laws related to dynamic symmetries from the symmetry data. In this case, even the invariance of the conserved quantities is obtained only approximately. While recognizing the great importance of this aspect in the analysis of the theoretical justification of conservation laws, it is still necessary to note its limitations.

CONCLUSION

The connection of conservation laws with the principles of symmetry is accepted by physicists as so fundamental that they classify the conservation laws of modern physics depending on the types of symmetry, and they identify the conservation principles themselves with the principle of symmetry in their physical contents and “do not distinguish between symmetry and conservation principles”.

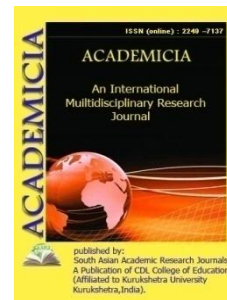
There is undoubtedly an essential connection between symmetry, asymmetry and conservation laws, but we think that it cannot be so exaggerated that the entire content of conservation laws can be reduced to forms of symmetry and asymmetry. The task of theoretical substantiation of conservation laws is not only to reveal their connections with each other, with the structure of fields, with such universal principles as the principle of the non-creativity and indestructibility of matter and motion and the principle of the unity of the attributes of matter.

Thus, the conservation laws are associated with the presence of a certain symmetry, the role of group-theoretic understanding of them becomes clear, because group theory studies the most general consequences arising from the existence of a particular symmetry.

REFERENCES

1. L.Tarasov.(1982). This surprisingly symmetrical world. M., Enlightenment, 176 p.
2. Bekpulatova U.R. (2017). Definition of the concept of symmetry, asymmetry and dissymmetry based on dialectical logic. Bulletin of the National University of Uzbekistan. №.1/3. p. 380.
3. Bekpulatov U. R. (2017). Symmetry in the past and modern science. Monograph. Saarbrücken, Deutschland. Germany, LAP LAMBERT Academic Publishing.108 p.
4. Korolkov B.P. (2011). Thermodynamic foundations of self-organization: monograph. - Irkutsk: IrGUPS,p.120
5. Menshutkin B.N. (1936).Lomonosov's works on physics and chemistry. M.-L. p. 460.
6. Lomonosov M.V. (1950). Selected philosophical works. M., p.264.
7. Planck M. (1957). The principle of energy conservation. M.,360 p.
8. Urusov V.S. (2009). Symmetry-dissymmetry in the evolution of the world. // Society, culture, science, education. Modern problems of science. Researcher / Researcher 1.
9. Mozheyka M.A. Synergetics. (2001). //The latest philosophical dictionary. 2nd ed. Mn.: Interpresservice. The Book House, pp.1038-1038.

- 10.** Bekpulatov, U.R., & Toshev, I.I. (2020). Principles of dissymmetry and entropy as the basis of modern scientific worldview. *ISJ Theoretical & Applied Science*, 11 (91), 400 p.
- 11.** Louis Pasteur. (1960). Selected works in 2 vols. Vol. I // Ed. by A. A. Imshenetsky. M.: Publishing House of the Academy of Sciences of the USSR, 1012 p.
- 12.** Bekpulatov U.R. (2017). Ontological and epistemological aspects of the category of symmetry // Context and reflection: philosophy about the world and man. Volume 6. №. 1A. p. p. 220.
- 13.** Vernadsky V.I. (1993). "The picture of the world has always changed in such times" // V. Vernadsky: Biography. Selected works. M.: Sovremennik, 489 p.
- 14.** Bekpulatov U.R. (2018). Symmetry and asymmetry in the modern stage of the development of sciences. // Collection of participants of the XI International Scientific and Practical Conference "Innovations in technologies and education", April 27-27, 2018; / / Branch of KuzSTU in Belovo. - Belovo: Russia; Publishing house of the University of St. Petersburg. Cyril and St. Methodius", Veliko Tarnova, Shumen, Bulgaria, - Part 4. p. 312.
- 15.** Golubeva N.A. (2014) Dissymmetric concept of transformation: ontological content // Dissertation for the degree of Doctor of Philosophy. Volgograd, 323 p. Electronic library of dissertations dslib.net
- 16.** Landau L.D., Lifshits E.M. (1964). Statistical Physics. M., Nauka.



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A BRIEF STUDY ON AZADIRACHTAINDICA (NEEM)

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ABSTRACT

Neem (Azadirachta indica) belongs to the Meliaceae family and is known for its health-promoting properties due to its high antioxidant content. It has long been utilized in Chinese, Ayurvedic, and Unani medicine, particularly in the Indian Subcontinent, to cure and prevent a variety of illnesses. An earlier discovery showed that neem and its components have a function in free radical scavenging and disease etiology prevention. According to animal research, neem and its main components have a key role in anticancer control by modulating a number of molecular pathways, including p53, pTEN, NF-B, PI3K/Akt, Bcl-2, and VEGF. It is regarded as a safe therapeutic herb that regulates a variety of biological processes without causing harm. I outline the function of Azadirachta indica in illness prevention and therapy through the control of different biochemical and physiological processes in this paper. This paper can be used for future work for further study on Neem.

KEYWORDS: *Azadirachta indica, Botanical Description, Effects, Healing, Neem.*

1. INTRODUCTION

Through the increase of antioxidant activity, suppression of bacterial growth, and regulation of genetic pathways, plant products or natural products play a significant role in disease prevention and therapy. Because of their low side effects and low cost, the medicinal function of a variety of plants in disease management is currently being vigorously studied. It is well acknowledged that allopathic medicines are costly and have a harmful impact on normal tissues and biological processes[1]. Many pharmacologically active medicines are produced from natural resources, including medicinal plants, as is widely recognized.

The Bible and the Quran, for example, both advocate the use of herbs in health treatment and prevention. The importance of herbs in illness management is also confirmed from an Islamic

viewpoint, with Prophet Mohammed (PBUH) recommending different plants and fruits for disease treatment. Many infectious, metabolic, and malignant illnesses are treated using neem components in Ayurveda, Unani, Homeopathy, and contemporary medicine. In many countries, several kinds of preparations based on plants or their components are extremely popular in illness treatment. Based on the fact that neem (*Azadirachta indica*), a member of the Meliaceae family widely found in India, Pakistan, Bangladesh, and Nepal, has therapeutic implications in disease treatment and formulation[2].

Azadirachta indica has a complex of components including as nimbin, nimbidin, nimbolide, and limonoids, which have a role in illness management by modulating different genetic pathways and other activities[3]. The first polyphenolic flavonoids, quercetin and β -sitosterol, were isolated from fresh neem leaves and were recognized to have antifungal and antibacterial properties. Biological and pharmacological properties such as antibacterial, antifungal, and anti-inflammatory have been documented[4]. Researchers have previously verified their anti-inflammatory, antiarthritic, antipyretic, hypoglycemic, antigastric ulcer, antifungal, antibacterial, and antitumor properties, and a review highlighted neem's numerous therapeutic roles. The function of neem and its active components in disease prevention and therapy through regulation of different biological pathways is summarized in this study.

1.1 Botanical account of Neem:

The Meliaceae family includes the neem tree, which is abundant in tropical and semitropical areas such as India, Bangladesh, Pakistan, and Nepal. It is a fast-growing tree that reaches a height of 20–23 meters and has a straight trunk with a diameter of 4-5 feet. The leaves are complex, imparipinnate, and have 5–15 leaflets apiece[5]. It has green drupes that mature to a golden yellow color between June and August. Table 1 shows the taxonomic classification of *Azadirachta indica* (neem).

**TABLE 1: ILLUSTRATES THE TAXONOMIC CLASSIFICATION OF
AZADIRACHTAINDICA (NEEM)**

Order	Rutales
Suborder	Rutinae
Family	Meliaceae
Subfamily	Melioideae
Tribe	Melieae
Genus	<i>Azadirachta</i>
Species	<i>Indica</i>

1.2 Active Compounds of *Azadirachta indica* L. (Neem):

Because of its abundant supply of different kinds of components, *Azadirachta indica* L. (neem) has a therapeutic function in health management. Azadirachtin is the most active component, followed by nimbolin, nimbin, nimbidin, nimbidol, sodium nimbin, gedunin, salannin, and quercetin. Nimbin, nimbanene, 6-desacetylnimbinene, nimbandiol, nimbolide, ascorbic acid, n-hexacosanol and amino acid, 7-desacetyl-7-benzoylgedunin, 17-hydroxy-azadiradione, and nimbiol are among the compounds found in the leaves. Quercetin and β -sitosterol, polyphenolic

flavonoids isolated from neem fresh leaves, have antibacterial and antifungal effects, while seeds include important components such as gedunin and azadirachtin.

1.3 Effect of Neem as Anti-Inflammatory:

Plants or isolated products of plants are used to treat or function as anti-inflammatory agents. In a cotton pellet granuloma test in rats, extract of *A. indica* leaves at a dosage of 200 mg/kg, p.o. exhibited substantial anti-inflammatory action, according to the results of a research. Other research found that neem leaf extract has a substantial anti-inflammatory impact, albeit it is less effective than dexamethasone, and that nimbidin inhibits macrophage and neutrophil activities that are related to inflammation. Earlier research revealed that bark and leaf extracts had immunomodulatory and anti-inflammatory properties, whereas oil seeds have antipyretic and anti-inflammatory properties. The analgesic efficacy of neem seed oil was tested on albino rats, and the findings indicated that neem seed oil had a substantial analgesic impact at doses of 1 and 2 mL/kg, and that the oil had dose-dependent analgesic action[6].

Another research looked at the anti-inflammatory effects of neem seed oil (NSO) on albino rats with carrageenan-induced hind paw edema, and the findings indicated that NSO exhibited increasing suppression of paw edema when the dosage was raised from 0.25 mL to 2 mL/kg body weight. During the dosage of 2 mL/kg body weight, NSO inhibited edema to the greatest extent (53.14 percent) at the 4th hour after carrageenan injection. The research found that rats given a 100 mg/kg dosage of Azadirachtaindica fruit skin carbon tetrachloride extract (CTCE) and the isolated component azadiradione had substantial antinociceptive and anti-inflammatory effects.

1.4 Wound Healing Effect:

The wound healing effect is influenced by a variety of plants and their components. Excision and incision wound models in Sprague Dawley rats were used to evaluate the wound healing activity of extracts of leaves of *A. indica* and *T. cordifolia*, and the results revealed that extracts of both plants significantly promoted wound healing activity in both excision and incision wound models. Furthermore, the tensile strength of the healing tissue of both plants treated groups was shown to be substantially greater than the control group in incision wounds. Other findings revealed that Azadirachtaindica leaf extracts enhance wound healing activities by increasing inflammatory response and neovascularization[7].

1.5 Hepatoprotective Effect:

Medicinal herbs and their constituents serve an important function in hepatoprotection without causing any side effects. The hepatoprotective effect of azadirachtin-A in carbon tetrachloride (CCl₄) caused hepatotoxicity in rats was investigated, and histology and ultrastructure findings showed that pretreatment with azadirachtin-A decreased hepatocellular necrosis dose-dependently. Furthermore, the study's findings indicate that pretreatment with azadirachtin-A at higher dosage levels returns the rat liver to a modest degree of normalcy.

1.6 Antidiabetic Activity:

A research was conducted to assess the 70 percent alcoholic neem root bark extract (NRE) in diabetes, and the findings revealed that the neem root bark extract exhibited statistically significant outcomes in the 800 mg/kg dosage. Another experiment was carried out to investigate

the pharmacological hypoglycemic action of *Azadirachta indica* in diabetic rats, and the results revealed that in a glucose tolerance test with neem extract 250 mg/kg, glucose levels were significantly lower than in the control group, and *Azadirachta indica* significantly reduced glucose levels at the 15th day in diabetic rats.

1.7 *Role of Neem in Dentistry:*

A research was conducted to determine the effectiveness of neem mouth rinse in terms of its anti-gingivitis impact, and the results revealed that *A. indica* mouth rinse is just as efficient as chlorhexidine in lowering periodontal indices. Another research looked at the antibacterial capabilities of organic neem extracts against three bacterial strains that cause dental caries, with the findings revealing that petroleum ether and chloroform extracts had significant antimicrobial activity against *S. mutans*. *Streptococcus salivarius* was extremely sensitive to chloroform extract, while *Fusobacterium nucleatum* was highly sensitive to both ethanol and water extract. In comparison to *S. salivarius*, *S. mitis*, and *S. sanguis*, dried chewing sticks of neem exhibited the highest antibacterial activity against *S. mutans*.

1.8 *Antinephrotoxicity Effect:*

The effects of a methanolic leaves extract of *Azadirachta indica* (MLEN) on cisplatin-(CP-) caused nephrotoxicity and oxidative stress in rats were investigated, and the findings showed that the extract efficiently protects the kidney from CP-mediated oxidative damage. PCR findings for caspase-3, caspase-9, and Bax genes also revealed downregulation in the MLEN-treated groups.

1.9 *Neuroprotective Effects:*

The neuroprotective properties of *Azadirachta indica* leaves against cisplatin-induced neurotoxicity were investigated in a research, and the results revealed that morphological findings of neem before and after CP injection indicated well-preserved brain tissue. There were no changes in biochemical indicators in the neem-treated groups.

1.10 *Antimicrobial Effect:*

Neem and its constituents prevent the development of a variety of microorganisms, including viruses, bacteria, and dangerous fungus. Individually, the function of neem in preventing microbial development is explained as follows.

1.10.1 *Antibacterial Activity:*

The antibacterial effectiveness of herbal alternatives as endodontic irrigants was evaluated and compared to the conventional irrigant sodium hypochlorite, with the findings confirming that leaf extracts and grape seed extracts exhibited zones of inhibition, indicating that they possessed antimicrobial characteristics. Leaf extracts also revealed considerably more inhibitory zones than 3 percent sodium hypochlorite.

1.10.2 *Antifungal Activity:*

The effectiveness of different neem leaf extracts on seed-borne fungus *Aspergillus* and *Rhizopus* was tested, and the findings showed that both alcoholic and water extracts substantially inhibited and regulated the growth of both fungal species. Furthermore, as compared to aqueous extract, the alcoholic extract of neem leaf was most effective in inhibiting the development of both fungal species. Another finding revealed that aqueous extracts of neem cake inhibited spore

germination against three sporulating fungi, including *C. lunata*, *H. penniseti*, and *C. gloeosporioides* f. sp. *mangiferae*, and that methanol and ethanol extracts of *Azadirachta indica* inhibited growth against *Aspergillus flavus*, *Alternaria solani*.

2. LITERATURE REVIEW

Rajkumar Paul et al. discussed a review on anticancer biology on Neem[8]. A member of the Meliaceae family, neem (*Azadirachta indica*) is a fast-growing tropical evergreen tree with a strong, robust stem. Neem has been dubbed "the wonder tree" and "nature's medicine store" because of its enormous therapeutic, domestic, agricultural, and ethnomedicinal value, as well as its closeness to human culture and civilization. All components of this tree, including the leaves, bark, seed oil, and refined products, are extensively utilized in cancer therapy. This plant has purified about 60 distinct kinds of biochemicals, including terpenoids and steroids. The anticancer activities of the crude and purified compounds from this plant have been fine-tuned through pre-clinical research work done over the past decade. The plant's anticancer qualities have mostly been investigated in terms of its preventative, protective, tumor-suppressive, immunomodulatory, and apoptotic actions against different cancers and their molecular processes. The goal of this study is to comb through the dispersed material on "the anticancer biology of *A. indica*," as well as associated toxicity issues and future prospects. The compelling evidence on the anticancer biology of *A. indica* compounds demands multi-institutional clinical studies as soon as feasible. The chances for comparatively inexpensive cancer medicines may potentially be better, especially for the world's poorest cancer sufferers.

Alok Maithani et al. discussed a review on Neem[9]. Traditional medicine and medicinal plants are extensively used as a normative foundation for the preservation of good health in most underdeveloped nations. Based on knowledge acquired from traditional healers, about 121 medicinal items were developed in the past century. Natural chemical principles have grown simpler, which has aided in the creation of novel medicines derived from medicinal plants. And as a result of these facts, the global market for plant-derived chemicals – medicines, perfumes, flavors, and colorants – is worth several billion dollars each year. Because of numerous phytoconstituents found in it, as well as a variety of pharmacological properties connected with it, *Azadirachta indica* is one of the most revenue-generating plants cultivated in India. The current study focuses on the literature on *Azadirachta indica* leaves from a taxonomic, botanical, phytoconstituents, and pharmacological standpoint. Jose Francisco Islas et al. discussed a review on Neem and its impact on health[10]. For a better knowledge of the metabolic process and its consequences in the human body, global health and medical practice strive to combine traditional medicine with evidence-based medicine. Complementary medicine, such as phytotherapy, is one example. Because of its many health benefits, *Azadirachta indica* (Neem), a tree native to India and Myanmar, has been dubbed "The Village Pharmacy" or "Divine Tree" by many. Neem-derived extracts have recently been proven to be effective in a variety of applications, including insect repellent, anti-inflammatory supplements, diabetic management, and even cancer prevention. We describe the health benefits of various compounds and extracts derived from Neem, as well as the mechanisms and pathways by which Neem compounds produce their effects. We also warn that extracts produced under unsanitary and unstandardized conditions can cause health problems, with certain compounds having potentially harmful effects on the liver and kidneys.

3. DISCUSSION

Natural products or their derivatives are becoming more popular in the treatment and prevention of illnesses owing to their lack of adverse effects. Neem and its constituents have medicinal properties and have been utilized in traditional medicine throughout the globe, particularly in the Indian Subcontinent, since ancient times. Clinical investigations have shown that neem is effective in preventing a variety of illnesses. Active components have been shown to have a chemo preventive impact in a variety of tumors by modulating several cell signaling pathways. To understand the precise mechanism of action in illness management, a thorough research based on animals should be conducted for future work.

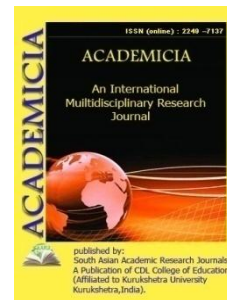
4. CONCLUSION

Neem (*Azadirachta indica*) has long been used as a herbal remedy for a range of human ailments. Researchers have been attempting to isolate the active compounds in this plant in order to determine its mechanistic, pharmacological, and clinical features using trustworthy methods. The refined version of neem is accessible in over 60 different formulations. These compounds are being evaluated on appropriate in vitro and in vivo systems to determine their anticancer and immunomodulation effects in comparison to crude neem extracts. There is strong experimental evidence that neem compounds, such as Azadirachtin A, Nimbolide, Nimbodin, and others, have anticancer effects. Their action has been studied at the molecular level. For these reasons, it is critical to perform appropriate clinical studies in order to pave the way for these medicines to be approved as anticancer medications on the market. The scientific evidence suggests that the use of appropriate medication combinations in conjunction with radiation and bioimmunotherapy may hold tremendous promise in finding a cure for cancer patients. Neem products may have certain unpleasant side effects, especially when used in large amounts. As a result, these items should only be used under the guidance and prescription of experienced medical practitioners and doctors.

REFERENCES

1. J. Jerobin, P. Makwana, R. S. Suresh Kumar, R. Sundaramoorthy, A. Mukherjee, and N. Chandrasekaran, "Antibacterial activity of neem nanoemulsion and its toxicity assessment on human lymphocytes in vitro," *Int. J. Nanomedicine*, 2015, doi: 10.2147/IJN.S79983.
2. R. Subapriya and S. Nagini, "Medicinal properties of neem leaves: A review," *Current Medicinal Chemistry - Anti-Cancer Agents*. 2005, doi: 10.2174/1568011053174828.
3. M. A. Alzohairy, "Therapeutics role of azadirachta indica (Neem) and their active constituents in diseases prevention and treatment," *Evidence-based Complementary and Alternative Medicine*. 2016, doi: 10.1155/2016/7382506.
4. P. V. Quelemes *et al.*, "Effect of neem (*Azadirachta indica* A. Juss) leaf extract on resistant *Staphylococcus aureus* biofilm formation and *Schistosoma mansoni* worms," *J. Ethnopharmacol.*, 2015, doi: 10.1016/j.jep.2015.09.026.
5. S. S. Bhat, "Neem – A Green Treasure," *Electron. J. Biol.*, 2008.
6. H. K. Shannag, J. L. Capinera, and N. M. Freihat, "Effects of neem-based insecticides on consumption and utilization of food in larvae of *spodoptera eridania* (lepidoptera: Noctuidae)," *J. Insect Sci.*, 2015, doi: 10.1093/jisesa/iev134.

7. G. Benelli *et al.*, “Neem (*Azadirachta indica*): towards the ideal insecticide?,” *Natural Product Research*. 2017, doi: 10.1080/14786419.2016.1214834.
8. R. Paul, M. Prasad, and N. K. Sah, “Anticancer biology of *Azadirachta indica* L (neem): A mini review,” *Cancer Biol. Ther.*, vol. 12, no. 6, pp. 467–476, 2011, doi: 10.4161/cbt.12.6.16850.
9. A. Maithani, V. Parcha, G. Pant, I. Dhulia, and D. Kumar, “*Azadirachta indica* (neem) leaf: A review,” *J. Pharm. Res.*, vol. 4, no. 6, pp. 1824–1827, 2011.
10. J. F. Islas *et al.*, “An overview of Neem (*Azadirachta indica*) and its potential impact on health,” *J. Funct. Foods*, vol. 74, no. April, p. 104171, 2016.



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A REVIEW ON RAIN WATER HARVESTING TECHNIQUES

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ABSTRACT

Our most valuable natural resource is water, which most of us take for granted. We are more conscious of the significance of water to our existence, as well as its scarcity. Humans need water for a variety of reasons. Water covers the majority of the earth's surface (about 71 percent). Only 1% of the total volume of water accessible on the earth's surface is fresh but also drinkable water, with 97 percent being salty water, 2% being ice & glaciers, as well as 1% being fresh and potable water. In terms of average annual rainfall, India is one of the world's wealthiest countries. It's hard to believe, but Cherapunji, which receives 11000 mm of yearly rainfall, nevertheless has a severe drinking water deficit. Though India's average annual rainfall is 1170 mm, it may be as low as 100 mm in the deserts of western India. As a result, rainwater collecting techniques must be used to meet the water demand.

KEYWORDS: Rain Water Harvesting, Filter, Rainfall.

INTRODUCTION

India is classified as a developing country. Water demand is rising day by day as a result of quicker industrialization or urbanization, as well as a rise in population. India's rainfall is erratic at best. The majority of it is concentrated over a few month of the year, and the majority of it flows away, resulting in inadequate ground water recharge. There is a substantial geographical mismatch in the available water resources and the demand for water. As a result, it is becoming essential to transport water from farther away, increasing the expense of transportation. It's also a frequent observation that the subterranean water table is dwindling as a result of unregulated water extraction. Maharashtra is a state in India that spans 307,713 square kilometers and has a population of 82 million people. Over half of the population lives in rural areas where water scarcity is a concern. Due to decreasing water tables, poor water quality, and expensive operating and maintenance costs, traditional sources such as open wells, bore wells, and piped water

supplies have failed. Every year, a large quantity of water that falls on terraces is lost, and it all ends up in storm water drains. Rainwater collecting has the potential to help solve water shortages[1]

Why Collect Rainwater?

1. Rainwater harvesting is the process of collecting rainwater directly from the sky and recharging it in the ground to prevent groundwater levels from falling, or storing it in a surface or subterranean water tank. Because of the following reasons, it is best suited in today's setting. This is the most scientific and cost-effective method for replenishing groundwater and rejuvenating the water table.
2. It improves the quality of water for irrigation and household usage.
3. It produces water that is naturally soft and free of dissolved minerals, salts, arsenic, and other heavy metals.
4. It may be done at both an individual and a communal level. This manner, we may be self-sufficient in terms of household water needs, rather than relying on government or other local bodies to take action.
5. Collecting rainfall as it falls out of the sky seems to be a brilliant idea in places where drinkable water is in short supply. Rainwater has relatively few contaminants, making it one of the cleanest sources of water accessible. Where traditional water delivery systems have failed to satisfy people's requirements, rain water collecting technologies may be used.

Rainwater harvesting is the collection as well as storage of rainwater for reuse on site while preventing runoff. We may collect it in a variety of locations, such as a river or a roof, and divert it to a well, bore well, shaft, reservoir using percolation, aquifer, and so on. Shown in figure 1. We utilize it for garden watering, animal drinking, irrigation, and residential usage after appropriate treatment. It is one of the earliest and most basic ways of home water self-supply[2].



Figure 1: Illustrate Diagram Showing The How We Utilize The Rain Water[3].

Rainwater Harvesting Structure Components:

There will be three fundamental components to all rainwater collecting structures:

1. The catchment area, or the surface area used to collect rainfall.
2. A collection device for collecting or retaining water, such as tanks, cisterns, or percolation pits.
3. Conveyance system, which is a network of pipelines or percolation pits that transports water from a catchment region to a collecting device.

Rainwater Harvesting Methods:

Rainwater harvesting may be accomplished in a variety of ways. In the following paragraphs, some of the most significant techniques will be described one by one.

1. Rainwater harvesting for the Dewas Roof Water Filter:

The city of Dewas is situated in the state of Madhya Pradesh. This roof water filter was originally used in Dewas, which is why it is known as the Dewas roof water filter. Figure 1 depicts the Dewar roof water filter in detail. Sand pebbles of various sizes may be used to make it. T1 and T2 are the two caps included in this set. Always keep caps T1 and T2 closed. T2 is for backwashing the filter on a regular basis, while T1 is for backwash drainage. Rainwater enters via little stones about 6 mm in size. Cap T2 is used to provide medication for water purification. For the first two days of the rainy season, do not recharge rainwater. Maintain a clean roof at all times, particularly during the rainy season, to ensure that the quality of rainwater dropping on the roof does not degrade. This roof filter costs about Rs 800 without the connecting pipe. This filter can percolate approximately 50 m³ of water from a 100 square meter roof area in Maharashtra under normal conditions[4].

2. Rainwater harvesting for recharging:

Pit Total rainwater falling on the open plot may be recharged by digging a recharge pit if there is no well or bore well in the home. This hole may be used to collect water that runs off the plot. This pit may be filled 10 to 15 times in a single monsoon, recharging up to 200 m³ of water. This technique works well in areas where the soil permeability is high. The pit's capacity may be increased to 10 m³. Water percolation on the order of 200 m³ per year is feasible via this hole. The price of this construction is estimated to be about Rs. 7000.

Rainwater is directed to a 6 m × 6 m x 1.5 m water collecting tank near the well, and a tiny filter pit of 1.5 m x 1.5 m x 0.6 m is dug at the bottom of the main pit. Otherwise, depending on the availability of space around the well, an appropriate pit may be dug. the intricacies of agricultural runoff recharging an open well. The filter pit is filled in three equal layers with sand, pebbles bigger than 20 mm, and pebbles/boulders larger than 75 mm pebbles, and is linked to the well via a 150 mm diameter PVC pipe that extends 0.5 to 1.0 m into the well. The water tank's volume is estimated to be about 50 m³. This structure allows for the percolation of 400 to 1000 m³ of water per year[5].

Bore well recharging with rainwater:

Around the bore well casing pipe, a six-meter-diameter collection pit with a 1.5-meter depth is dug. At the bottom of the big pit, a small hole of 1.5 m × 1.5 m x 0.6 m depth is dug and filled

with filter material. After the initial layer of 75 mm stones, a 75 mm diameter PVC pipe is attached to the bore well casing pipe. The pipe is linked to an inverted elbow[6].

Recharging Trench with Roof Water

The collected roof water may be replenished using a recharge trench. Throughout the year, water may be replenished by utilizing spent water or rainfall. This recharge trench may be filled many times depending on the amount of utilized or rain water available. This technique works well in areas where the soil permeability is high. The trench's capacity may be increased to 20 m³. Water percolation on the order of 100 to 200 m³ per year is feasible via this hole. The cost of this construction may be in the region of Rs. 5000.

Recharging Tube Wells with Surface Rainwater

Depleted aquifers are immediately replenished with surface rainfall through a recharge tube well, resulting in rapid recharge and minimal evaporation and transit losses. The following is a diagram of a typical recharge tube well:

- A 50 cm diameter borehole is bored to the required depth.
- A 20 cm diameter casing, i.e. the bore well's outer pipe, is constructed with slotted perforated portions to protect against aquifers.
- The recharge tube well should be about 30 meters below the water table in the region.
- A compressor is used to fill the annular area between the borehole and the pipe with excellent gravel and develop it until it produces clear water. A filter mechanism is supplied at the top to prevent suspended particles from entering the recharge tube well.
- Small spherical boulders, stone chips, and sand are layered in this pit, with boulders at the bottom & sand at the top.
- In this hole, the top one meter of the casing component is filled with sand. To prevent suspended debris from entering the well, the top of the casing pipe is fitted with a cover that is approximately 600 mm below the sand bed.
- The air vent is supplied via a 75 mm diameter pipe linked to the recharge tube well inside the top 600 mm using a reducer tee of dimensions 200 mm x 75 mm in order to escape the air present in the casing component during the percolation process of floodwater. After that, the air releasing pipe is extended to one of the banks, where the vent is built.

The majority of suspended contaminants are filtered out of flood water when it passes through the sand. The second sand filter, which surrounds the well's slotted portion at the top, keeps any residual suspended material out. Before water enters the well, a coir covering serves as a last protective filter. Due to the placement of a slit at the top, the rate progressively drops. After the wet season, approximately one meter of sandy in the filter bed must be changed every year. Because the level of water is shallow soon after the monsoon as well as development is effective, the well is developed with a compressors once a year, right after the properly stored become empty. When the water is clear during pumping, it may be let on the filtered bed to remove the slit that has collected in the filter bed and into the well that is being built. During the infiltration process, the whole filter bed is cleaned of silt using this technique.

Using Roof Water to collect and Store Water: Tanks Rainwater from the roof surface is drained into storage tanks through gutters. There is a hand moveable gutter connector that may be manually moved to redirect the water out to avoid pollution and dust from flowing into the storage tanks. The rooftop is utilized to gather the trash. Rainwater is transported from the roof top to the storage tanks through guttering, which is often constructed of PVC.

Rain Water Harvesting For Building In Urban and Village Area: A Case Study

For research purposes, a rainwater harvesting system for the annexure building of the Govt. Engineering College, Aurangabad is being explored.

The Government Engineering College is situated in Maharashtra's area. Aurangabad receives about 700 mm of rain each year on average. The city has a population of more than ten lakh people. The town is now supplied with water by the Municipal Corporation of Aurangabad. Water is delivered to the town on alternate days due to the capacity of the water treatment facility. The institution requires approximately 350 m³ of water each day. The town's ground water level has been reduced in recent years. Rainwater must be conserved not only in the city but also in the outlying regions of Aurangabad. The significance of rainwater collecting cannot be overstated. It is recommended that each community collect roof water from at least 10 hoses. It is also planned to collect rainwater from the roof of this institute's Annex building. All civil engineering students from this institution would have a role model if this roof top rain water collecting system is built. These students will witness the system and be inspired to build roof water collecting systems elsewhere in the future. The following is a preliminary estimate[7].

LITURATURE REVIEW

Water shortage is a significant issue in many developing nations, according to B. Helmreich et al. Rainwater may be used as a source of drinking water depending on the amount of precipitation. Furthermore, effective management may help alleviate water and food shortages in some of these areas. Rainwater harvesting (RWH) is a technique for efficiently collecting surface runoff during rainy seasons. RWH systems should be based on local skills, materials, and equipment to support such technologies. Rainwater harvesting may then be utilized for rain fed agriculture or domestic water supply. Rainwater, however, may be contaminated with germs and dangerous substances, necessitating treatment before to use. Pollution may be reduced using slow sand filtering and solar technologies. Membrane technology may potentially be used to disinfect drinking water to make it safe to drink[8].

Olanike Olowoia Aladenola and colleagues investigated Rainwater collecting is one of the most promising methods for augmenting limited surface and subsurface water resources in places where the current water delivery infrastructure is insufficient to satisfy demand. Rainwater collecting is one of the measures that may be taken to mitigate the effects of climate change on water supply. Rainwater collection is excellent in Abeokuta due to the city's average annual rainfall of 1,156 mm. The intra-annual range was 0.7 to 1.0, whereas the inter-annual variability was 0.2. Each home may collect 74.0 m³ of rainwater each year. Annual water consumption for flushing, washing, and flushing was estimated to be 21.6, 29.4, and 21.6 m³ correspondingly. Except in November, December, January, and February, harvested rainwater in Abeokuta can meet family monthly water needs for WC flushing and washing. If there is enough storage, the extra rainfall saved in September and October will enough to replace the short fall in the dry

months. The opportunity for water conservation is greatest between June and September, which are the two rainiest months in Southwest Nigeria[9].

F.A. Memon and colleagues investigated the Rainwater collection is becoming a more important component of the toolbox for sustainable water management. Despite a slew of research examining the viability of deploying rainwater harvesting (RWH) systems in specific situations, there is still a substantial vacuum in information in terms of comprehensive empirical performance evaluations. Domestic networks have been studied in the literature to a limited extent, notably in the United Kingdom, but there are few contemporary longitudinal studies of larger non-domestic systems. There are very few research that compare estimated and actual performance. The findings of a longitudinal empirical performance evaluation of a nondomestic RWH system in a UK office building are presented in this article. It also compares actual performance to predicted performance using two British Standards Institute-recommended methods: The Intermediate (basic calculations) and Detailed (simulation-based) Approaches. The real over-sized tank and the smaller optimized tank had capital payback times of 11 and 6 years, respectively, based on estimated cost reductions. To conduct whole-life cost assessments, however, additional comprehensive cost data on maintenance and operation is needed. These results suggest that office-scale RWH systems may save significant amounts of water and money. They also stress the significance of data monitoring and the need for a shift to Detailed Approaches (especially in the UK) to (a) reduce storage tank oversizing and (b) increase confidence in RWH system performance[10].

DISCUSSION

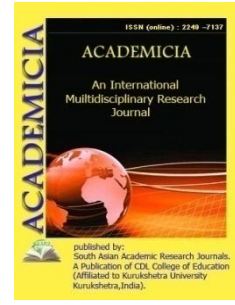
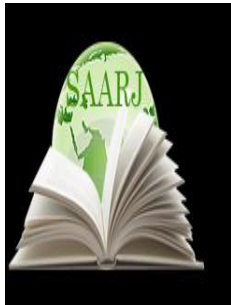
Our most valuable natural resource is water, which most of us take for granted. We are more conscious of the significance of water to our existence, as well as its scarcity. Humans need water for a variety of reasons. Water covers the majority of the earth's crust (about 71 percent). Only 1% of the total amount of water accessible on the earth's surface is fresh and drinkable water, with 97 percent being salty water, 2% being ice and glaciers, and 1% being fresh and potable water. It is the duty of both government and individuals to collect every drop of water that falls on the earth's surface. To do so, each individual must collect raindrops that fall on his roof, plot, or farm as well as recharge them underground. In this research, two examples of roof top water collecting for urban and rural areas were examined. Rainwater harvesting on the roofs of other buildings may be done in the same way. In reality, rainwater collecting methods can satisfy the basic drinking and cooking requirements of every village or hamlet in India.

CONCLUSION

Water is a necessary component of life. Everyone understands that if we do not harness existing water sources and utilize them wisely and with care, water scarcity will become a major issue. Regardless of rapid advancements in all areas of science, there is no replacement for water. As a result, different water collection methods are required. It is the duty of both government and individuals to collect every drop of water that falls on the earth's surface. To do so, each individual must collect raindrops that fall on his roof, plot, or farm and recharge them underground. In this research, two examples of roof top water collecting for urban and rural areas were examined. Rainwater harvesting on the roofs of other buildings may be done in the same way. In reality, rainwater collecting methods can satisfy the basic drinking and cooking requirements of every village or hamlet in India.

REFERENCES

1. T. M. Boers and J. Ben-Asher, "A review of rainwater harvesting," *Agricultural Water Management*, vol. 5, no. 2, pp. 145–158, 1982, doi: 10.1016/0378-3774(82)90003-8.
2. L. Handia, J. M. Tembo, and C. Mwiindwa, "Potential of rainwater harvesting in urban Zambia," *Physics and Chemistry of the Earth*, vol. 28, no. 20–27, pp. 893–896, 2003, doi: 10.1016/j.pce.2003.08.016.
3. "Rainwater Harvesting: Methods, Importance, Conclusion," [Online]. Available: <https://readingjunction.com/rainwater-harvesting-methods/>.
4. D. A. King, "Religion and Science in Islam I: Technical and Practical Aspects," *Encyclopaedia of the History of Science, Technology, and Medicine in Non-Western Cultures*, no. December 1887, pp. 3721–3727, 2016, doi: 10.1007/978-94-007-7747-7_9287.
5. E. Sazakli, A. Alexopoulos, and M. Leotsinidis, "Rainwater harvesting, quality assessment and utilization in Kefalonia Island, Greece," *Water Research*, vol. 41, no. 9, pp. 2039–2047, 2007, doi: 10.1016/j.watres.2007.01.037.
6. R. K. Sivanappan, "Rainwater harvesting techniques," *Rainwater harvesting and water management*, no. 14, pp. 10–15, 2006.
7. S. Ward, F. A. Memon, and D. Butler, "Rainwater harvesting: Model-based design evaluation," *Water Science and Technology*, vol. 61, no. 1, pp. 85–96, 2010, doi: 10.2166/wst.2010.783.
8. B. Helmreich and H. Horn, "Opportunities in rainwater harvesting," *Desalination*, vol. 248, no. 1–3, pp. 118–124, 2009, doi: 10.1016/j.desal.2008.05.046.
9. O. O. Aladenola and O. B. Adeboye, "Assessing the potential for rainwater harvesting," *Water Resources Management*, vol. 24, no. 10, pp. 2129–2137, 2010, doi: 10.1007/s11269-009-9542-y.
10. S. Ward, F. A. Memon, and D. Butler, "Performance of a large building rainwater harvesting system," *Water Research*, vol. 46, no. 16, pp. 5127–5134, 2012, doi: 10.1016/j.watres.2012.06.043.



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SELECTION OF METHODS OF ACCEPTANCE INSPECTION IN PRODUCTION

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ABSTRACT

Product quality control in production is carried out by various methods. But the most effective method is based on actual observations or calculations. This article provides an acceptance method for product quality control in production lines by various types of control. A decision is given on how to organize or draw up a product control plan, registration of control data, analysis of these results and conclusions for their improvement.

KEYWORDS: *Single-Stage, Multi-Stage, Sequential, Classification Of Methods, Operational Characteristics, Test Results, Samples, Value Of The Rejection Level, Efficiency Assessment.*

1. INTRODUCTION

Consider control plans, which are based on the principle of inadmissibility of consignments entering the goods, the quality level of which is lower than the acceptable in operation. In practice, three types of acceptance control plans are most common:

- One-stage - the decision to accept or rejected lot is made on the basis of checking a single sample from it;
- Multistage - the decision to accept or rejected a lot is made on the basis of tests ($k \geq 2$) samples, and the maximum number of samples is limited and predetermined. In practice, two-stage control is most often used, in which the number of samples does not exceed two;

- Sequential - the decision on batch acceptance, rejection or continuation of testing is made after evaluating each sequentially inspected product, and the number of products subject to inspection is not limited in advance.

Each of these plans has a number of advantages and disadvantages. One-step inspection plans are much simpler from an organizational point of view, as they provide for a basic inspection procedure in which the sample size is constant and known in advance. In other plans, the control procedures are much more complicated; their application in production requires qualified personnel. At the same time, with multi-stage and sequential control with the same average sample size equal to the sample size of one-stage control, greater reliability of decisions is achieved.

Further classification of acceptance control methods is related to the principle of classification of test results.

The fact is that the degree of suitability of products for further use can be determined in various ways. For example, you can register the exact numerical values of the parameters, or you can make one of two decisions: is the product suitable for further use or not, that is, divide products into good and defective. In the first case, they talk about the so-called quantitative quality attribute, in the second - about the alternative.

Accordingly, two main statistical control methods are distinguished: by alternative and quantitative criteria. There is also quality control (a special case of which is control by an alternative indicator), but for this method no standardized control plans have been developed and therefore it is practically not used.

Alternative trait control has several advantages over quantitative trait control. First, it is simpler both in terms of the amount of computation and its organization in production. Secondly, the control technique does not depend on the type of distribution of the measured parameters and therefore is more universal (when controlling by quantitative criteria, in most cases it is assumed that the measured parameters have a normal distribution).

However, when testing on an alternative basis, only a small part of the information contained in the observations is used, which leads to the need for a large number of measurements.

In accordance with the decision on the further use of the batch, inspection plans are divided into two types:

D1 - when the conclusion of the rejection of the batch leads to a decision to reject the batch as unfit;

D2 - when the conclusion of the rejection of the lot leads to a decision on its sorting and removal of defective products (with or without replacement of defective products with good ones).

If control is destructive, then only plans of the first type can be used; in all other cases, the choice of the type of plan is determined by purely economic considerations and specific production conditions.

Main characteristics of statistical acceptance control plans. Since, during statistical acceptance control, a judgment on the quality of a lot is made on the basis of testing only a part of the products from a lot (sample), errors associated with the rejection of good and acceptance of bad

lots are inevitable. With a random selection of products, it is possible, with a small total of defective products in the lot, to select a significant number of defective products for inspection, which will lead to a false decision about rejecting a good lot (error of the first kind). On the other hand, if the lot is littered with defective products, there may be a relatively small number of defective products in the sample, and a bad lot will be accepted (type II error).

The challenge is to ensure that such erroneous conclusions are made extremely rarely under sampling conditions, and the degree of their possibility is predetermined. Errors of the first and second kind should be taken into account when planning acceptance inspection, as well as proof tests.

To assess the effectiveness of a sampling plan, a so-called operational characteristic, or, as it is otherwise called, performance characteristic, is used. The operational characteristic of a control plan is understood as a function $P(q)$ equal to the probability of accepting a batch with a quality level q .

2. RESULTS

Let's consider the operational characteristics of the plan of continuous control.

During the inspection of each sample in the lot, the exact number of defective samples in the lot is known. If this quantity is greater than a certain critical value $M_{cr} = N_{q_{cr}}$ (N is the volume of the batch), then such a batch will necessarily (with a probability equal to one) be rejected as not meeting the requirements of the consumer. If the number of defective samples in the sample is less than M_{cr} , then the lot will be accepted with a probability of one. At the same time, it is considered that errors associated with determining the degree of suitability of the sample are excluded. The operational characteristics of the complete control plan are shown in Figure 1.1, a. This operational characteristic will be called ideal. However, it is impossible to build a sample plan with such a performance characteristic. In these cases, the supplier and the consumer agree on two quality levels q_0 and q_m : lots with a quality level $q \geq q_0$ are considered to be known to be good, and lots with a quality level $q \geq q_m$, with $q > q_0$, are considered bad.

The interval $q_0 \leq q \leq q_m$ is considered a zone of uncertainty. Lots of this quality level are still considered acceptable. The q_0 value is called the acceptance quality level, the q_m value is called the rejection quality level.

Thus, all products are divided into three categories:

- products of the first category, the quality level of which is $q \leq q_0$;
- products of the second category, the quality level of which is $q \leq q_m$;
- products of the third category, the quality level of which satisfies the ratio $q_0 \leq q \leq q_m$.

Requirements are imposed on the control plan, which are that the parties of the first category should, if possible, be accepted, the second, if possible, rejected. In quantitative terms, these requirements are expressed in the fact that the probability of accepting a batch with a quality level $q \leq q_0$ should be less than $1 - \alpha$, and the probability of accepting batches for which $q \leq q_m$ should not exceed β .

The values α and β are referred to as the supplier's risk and the consumer's risk, respectively, and represent the probabilities of errors of the first and second kind. Supplier's risk α is the

probability of making a false decision about rejecting a good lot (the supplier risks incurring unjustified losses). The consumer's risk β is the probability of making a false decision to accept a bad batch (the consumer is at risk of incurring losses).

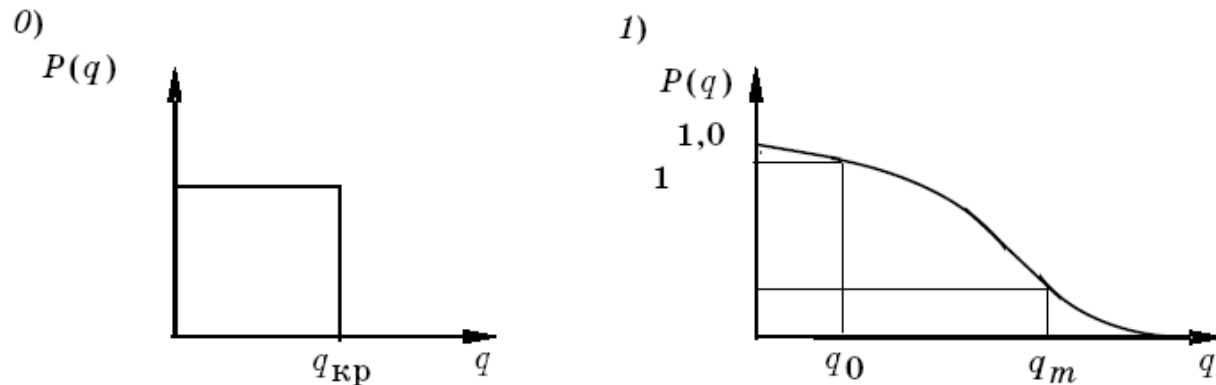


Figure 1.1. Operational characteristics of the control plan: a - continuous; b - statistical

The assignment of risks α and β provides guarantees for the supplier and the consumer regarding the rejection of good and acceptance of bad lots. In practice, the values of α and β are chosen equal to 0.1; 0.01; 0.05. Their appointment is not a statistical task, but is completely determined by the consequences of incorrect decisions (errors of the first and second kind).

Thus, if the requirements of the supplier and the consumer are formulated in the form of four numbers, for example: $q_0 = 0.01$; $q_m = 0.05$; $\alpha = \beta = 0.1$ - this means that, on average, no more than five lots will be rejected out of every hundred lots with a defectiveness level of no more than 1%, and no more than 100 lots containing 5 or more defective products will be accepted.

Thus, for any acceptance control plan, the equations

$$P(q_0) \geq 1 - \alpha \quad (1.1)$$

$$P(q_m) \leq \beta \quad (1.2)$$

Considering also that $P(0) = 1$, $P(1) = 0$, it is easy to imagine the type of operational characteristics of the statistical control plan (Figure 1.1, b).

Equations (1.1), (1.2) are the basis for setting an acceptance control plan, i.e., assigning the sample size and standards with which the control results are compared, and calculating the operational characteristic $P(q)$.

Consider how requirements are assigned.

The value of the rejection quality level (q_m) is selected based on the requirements of the consumer who needs products with a quality level of at least q_m . The value of the acceptance level of quality (q_0) is set taking into account the capabilities of production, which must ensure the release of products with a quality level of $q_H \leq q_0$, where q_H is the average level of contamination of batches during the normal course of production. Only in this case, the supplier guarantees itself against a vain rejection of good lots produced in compliance with the basic requirements of the technology. As a rule, the value of q_0 is slightly larger than q_H . Otherwise,

the effectiveness of the control plan is reduced. Indeed, if the acceptance level of quality is much less than q_H , the probability of accepting lots, as can be seen from Figure 1.2, drops sharply, and the actual risk of the supplier, α_d , increases.

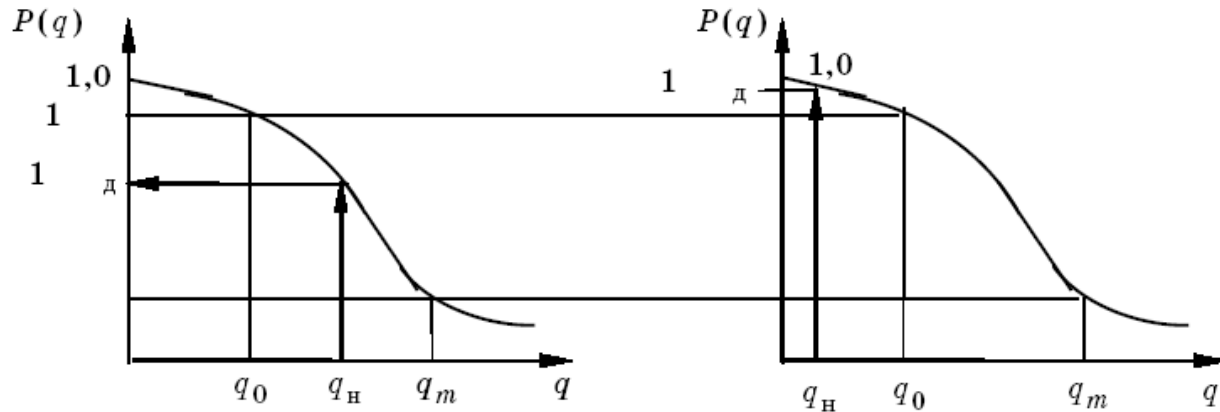


Figure 1.2. The actual risk of the supplier in case of unreasonable setting of the acceptance level of quality

If q_0 is chosen significantly greater than q_H , the actual risk of the supplier is less than α , but such a control plan will, as will be seen from what follows, actually ineffective, since it will require large sample sizes.

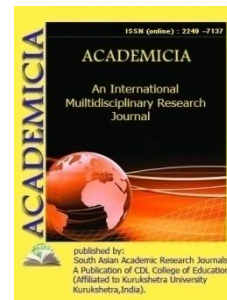
3. CONCLUSIONS

Thus, knowledge of: 1) consumer requirements for product quality, 2) the level achieved by the manufacturer, 3) the consequences of making false decisions on acceptance and rejection of lots - turns out to be necessary and sufficient for planning control tests on the principle of an unacceptable level in operation quality. A preliminary assessment of the effectiveness of the control plan is made using an operational characteristic, the nature of the right side of which must satisfy the requirements of the consumer, the left side - the requirements of the supplier, and the middle - one or the other, depending on the degree of responsibility of the controlled products. A more complete assessment of the effectiveness can be carried out taking into account the statistical assessment of the quality level of the accepted products. Such assessments in the statistical acceptance inspection are called follow-up.

REFERENCES

1. Sudarikova E.V. Nondestructive control in production: textbook. Part 1; GUAP. - SPb., 2007 .-- 137 p .: ill.
2. Sudarikova E.V. Nondestructive control in production: textbook. Part 2; GUAP. - SPb., 2007 .-- 112 p .: ill.
3. Shishkin I.F., Sergushev G.F. Tests and test equipment: textbook. - SPb .; SZTU, 1991 .-- 37 p.
4. Umaraliev, N., Matbabaev, M.M., & Ergashev, K.M. (2020). Installation For Studying Optoelectronic Air Humidity Sensor. Proceedings of higher educational institutions. Instrument Engineering, 63 (3).

5. Ergashov, K. M., and U. A. Madmarova. "Technics of the infra-red drying of farm products." *ACADEMICIA: An International Multidisciplinary Research Journal* 10.11 (2020): 1351-1355.
6. Ergashev, K.M., & Ibrokhimov, J.M. *EURASIAN UNION (ESU)*, 59.
7. Ergashov, K. M., and U. A. Madmarova. "Research of metrological characteristics optoelectronic of devices for control of humidity of installations." *ACADEMICIA: An International Multidisciplinary Research Journal* 10.11 (2020): 1337-1341.
8. Kuldashov, O. H., N. Umaraliev, and K. M. Ergashev. "Stabilization Of The Parameters Of A Two-Wave Optoelectronic Device." *Scientific-technical journal* 4.2 (2021): 51-61.
9. Xabibulloqli, Erkaboyev Abrorjon, and Madmarova Umida Abdugarimovna. "Assesment of metrological reliability of measurements using the method of producing functions." *ACADEMICIA: An International Multidisciplinary Research Journal* 11.8 (2021): 520-528.



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QUALITY ANALYSIS OF ALKALOIDS OF SOME PLANTS GROWING IN THE REPUBLIC OF GUINEA

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ABSTRACT

The qualitative analysis of the alkaloid content of 51 samples of plant species belonging to 23 botanical families, collected in the Republic of Guinea was carried out. Among them, 5 families contain an abundance of alkaloids: they are Annonaceae, Lauraceae, Menispermaceae, Rhamnaceae and Rutaceae.

KEYWORDS: *Analyse qualitative, Alkaloids, Botanical families, Phytochemical interest, Republic of Guinea, University of Kindia.*

1. INTRODUCTION

The object of our work is the qualitative research of the alkaloid content of plants in the form of trees, shrubs and climbing plants of Guinea [1-4]. The plant samples studied (leaves, bark, stems, etc.) were collected at the Botanical Garden of Conakry and at the edge of the forest near the University of Kindia.

Alkaloid, a natural substance isolated from plants, of a basic nature, endowed with physiological activity and whose molecule generally contains one or more nitrogenous heterocycles.

Nearly 15000 alkaloids have been identified [7]. Many known alkaloids are used in medicine. For example, atropine from belladonna causes dilation of the pupil; poppy morphine suppresses pain; quinine is a remedy for malaria. Finally, it should be noted that nicotine is a powerful insecticide [2-4].

2. RESEARCH METHODOLOGY

We have qualitatively analyzed the alkaloid content of nearly 51 plant species belonging to 23 botanical families very widespread in the Kindia region [1]. Among them, 5 families contain an abundance of alkaloids: they are *Annonaceae*, *Lauraceae*, *Menispermaceae*, *Rhamnaceae* and *Rutaceae* (Table 1).

The alkaloid composition was determined in the conventional way [5-6].

2-3 g of study plant (pulverized and dried leaves) were placed in a flask (50 ml capacity) and 10-15 ml of 5% sulfuric acid solution (H_2SO_4) was poured into it. The contents were left for 4-5 hours at room temperature. After filtration, a few drops of silicon-wolframic acid solution (H_2SiWO_6) were added to the filtrate. The formation of an abundant precipitate indicates the presence of a considerable quantity of alkaloids in the plant studied.

3. RESULTS

TABLE 1 : QUALITATIVE DETERMINATION OF ALKALOIDS IN PROPOSED PLANTS

No Order	Family, genus and species	Plant organ	Content of alkaloids *
1. <i>Annonaceae</i> family			
1.	<i>Annona muricata</i> L.	Leaf Bark	+++ +++
2.	<i>Annona senegalensis</i> Pers.	Leaf Bark	+++ +++
3.	<i>Cananga odorata</i> (Lam.) Hook. F & Thoms.	Leaf Bark	+++ +++
4.	<i>Xylopia aethiopica</i> A. Rich.	Leaf Bark	+++ +++
5.	<i>Uvaria chamae</i> P. Beauv.	Leaf	+++
6.	<i>Cleistopholis patens</i> Benth.	Leaf	+++
2. <i>Anacardiaceae</i> family			
7.	<i>Mangifera indica</i> L.	Leaf	+
8.	<i>Anacardium occidentale</i> L.	Leaf	+
9.	<i>Spondias monbina</i> L.	Leaf	+
3. Family of <i>Apocynaceae</i>			
10.	<i>Thevetia neriifolia</i> Juss	Leaf	++
11.	<i>Tabernanthe iboga</i> H. Br..	Leaf	++
12.	<i>Landolphia incerta</i> (K. Shum.) Pichon.	Leaf	+++
13.	<i>Landolphia dulcis</i> (Sabine.) Pichon.	Leaf	++
14.	<i>Landolphia senegalensis</i> Korschy.	Leaf	++
15.	<i>Voacanga africana</i> Stapf.	Leaf	+++
16.	<i>Rauvolfia vomitoria</i> Afz.	Leaf	+++
4. <i>Bromeliad</i> family			
17.	<i>Anonas comosus</i> L.	Leaf	+
5. <i>Caesalpinaceae</i> family			
18.	<i>Dialium guineense</i> Willd.	Leaf	-

19.	Guibourtia copallifera J. J. Benn.	Leaf	-
6. Clusiaceae family			
20.	Carcinia mangostana L.	Leaf	+
7. Family of Combretaceae			
21.	Combretum micrantum Shumach & Thonn.	Leaf	-
22.	Terminalia ivorensis A. Chev.	Leaf	-
8. Euphorbiaceae family			
23.	Hevea brasiliensis (Kunth) Mill. Arg.	Leaf	++
9. Caricaceae family			
24.	Carica papaya L.	Leaf	+++
10. Lauraceae family			
25.	Persea americana Mill.	Leaf	++
26.	Beibchmiea diamanvi L.	Leaf	+++
27.	Cinnamomum zeylanicum Ness.	Leaf	++
11. Meliaceae family			
28.	Entandrophragma angolense (Welw.) DC.	Leaf	-
29.	Carapa procera DC.	Leaf	-
12. Menispermaceae family			
30.	Dioscoreophyllum cumminsii (Stapf.) Diels.	Leaf	+++
30.	Dioscoreophyllum cumminsii (Stapf.) Diels.	Leaf	+++
31.	Cocculis pendulus Diels.	Leaf	+++
32.	Triclisia patens Oliv.	Leaf	+++
13. Mimosaceae family			
33.	Acacia mangium Willd.	Leaf	++
14. Moraceae family			
34.	Ficus ingens Miq.	Leaf	++
35.	Ficus congensis Thunb.	Leaf	++
15. Moringaceae family			
36.	Moringa oleifera Lam.	Leaf	-
16. Family Oxalidaceae			
37.	Averrhoa carambola L.	Leaf	-
38.	Averrhoa bilimbi Willd.	Leaf	-
17. Rhamnaceae family			
39.	Ziziphus mauritiana Lam.	Leaf	+++
40.	Gouania longipetala Hemsl.	Leaf	++
41.	Ventilago africana Exell.	Leaf	++
18. Rhizophoraceae family			
42.	Anisophyllea laurina R. Br. Ex Sabine	Leaf	-
19. Rutaceae family			
43.	Zanthoxylum gillettii (De Wild.) Waterman	Leaf	+++
44.	Zanthoxylum leprieurii Guill.	Leaf	+++
45.	Zanthoxylum viride (A.Chev.) Waterman	Leaf	++

46.	Fagara zanthoxyloides Lam.	Leaf Bark	+++ +++
20. Sterculiaceae family			
47.	Cola cordifolia (Cav.) R. Br.	Leaf	-
48.	Cola reticulata A. Chev.	Leaf	-
21. Sapotaceae family			
49	Achras sapota L.	Leaf	-
22. Solanaceae family			
50	Solanum stramonium L.	Leaf	-
23. Verbenaceae family			
51.	Gmelina arborea L.	Leaf	-

* Content of alkaloids: + + + - in abundant quantity; + + - in small quantity;
+ - in insignificant quantity; (-) - absence of alkaloids



A



B



C

Photos of the few plants analyzed: A) Annona muricata L ; B) Xylopia aethiopica A. Rich; C) Carica papaya L.

4. CONCLUSION

In total, 51 species of plants belonging to 23 botanical families were qualitatively examined for the first time by us. Among them, 5 families contain an abundance of alkaloids. These are *Annonaceae*, *Menispermaceae*, *Lauraceae*, *Rutaceae* and *Rhamnaceae*.

It should be noted that in the future the study of the alkaloid content of the following species: *Annona muricata* L., *Annona senegalensis* Pers., *Cananga odorata* (Lam.) Hook. F., *Xylopia aethiopica* A. Rich., *Persea americana* Mil., *Dioscoreophyllum cumminsii* (Stapt.) Diels., *Cocculis pendulus* Diels. *Ziziphus mauritiana* Lam., *Fagara zanthoxyloides* Lam., *Solanum stramonium* L. would be of phytochemical interest, because these plant resources contain a considerable quantity of alkaloids belonging to several chemical structural types.

To mention gratefulness

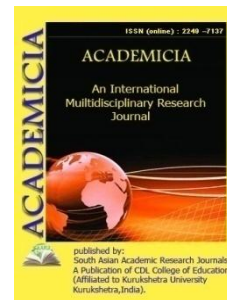
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5. BIBLIOGRAPHY

1. Lisowski S., *Flore (Angiospermes) de la République de Guinée, Première partie (texte)*, Jardin Botanique National de Belgique, 2009, 517 pp. (Scripta Botanica Belgica, vol. 41).
2. Poussset J. L. *Plantes Médicinales d'Afrique*. Comment les reconnaître et les utiliser ?. Secum/Edisud, Paris. 2004, p.515
3. Boullard B. *Plantes médicinales du monde*. Croyances et Réalités. Estem Ed., Paris. 2001, p.42.
4. Sofowora A. *Plantes Médicinales et Médecine traditionnelle d'Afrique*. 1996, 1 Vol., 378p., Acad. Suisse des Sc. Nat. Et Ed. Karthala, co-édit., Berne/Paris., 1996, vol.1., 378p.
5. Ziyaev R., Ikramov K., Shumaeva L. M., Abdusamatov A., *Introduction alkaloid plants*, Biological review of Uzbekistan, 1993, № 1, pp. 38-41.
6. Orekhov A. P., *Chemistry of plant alkaloids from the USSR*. , 1984, pp. 230-241, Ed. "Naouka", Moscow.
7. Yunusov S. Yu. *Alcaloids* 1994, 259p, Ed. "FAN", Tashkent

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A RESEARCH PAPER ON SOLAR TRACKING

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ABSTRACT

Solar energy is a very effective method to increase the supply of renewable energy. The design and development of a microcontroller-based Solar Panel Tracking System is discussed in this article. Sunlight is a non-conventional energy source, since the author has erected solar panels to meet our electrical needs. The solar source, i.e. the sun, does not constantly face the plate due to the earth's rotation, resulting in less power being generated. The energy panel will face the SUN until the SUN appears, which should happen within a day. The block diagram below shows the device design, which contains an LDR sensor that provides maximum solar power to the microcontroller through an ADC that digitizes the LDR's performance. The controller then makes a decision based on the algorithm and tilts the panel in the direction of the LDR's greatest energy with the aid of a DC Motor. As a DC geared motor driver, the system is controlled by two relays, while the main processor is a microcontroller. A single axis protects this project, which is designed for low-power and home applications. The system can monitor and follow the Sunlight intensity from the hardware test regardless of motor speed to get maximum solar power at the output. This solar tracker system may be updated in the future using new technologies such as the Internet of Things (IOT) and utilized at home.

KEYWORDS: LDR, Microcontroller, Motor Driver, Photovoltaic Cell, Solar Panel.

1. INTRODUCTION

Energy is the most important component in a country's development. Every day, a tremendous amount of energy is generated, transferred, transformed, and consumed in the worldwide civilization. 85 % of energy is produced from fossil fuels. Fossil fuel supplies are finite, and their usage contributes to global warming by releasing greenhouse gases into the atmosphere. To ensure a sustainable power supply and a healthy environment for future generations, there is a

rising need for energy from renewable sources such as solar, wind, geothermal, and ocean tidal waves[1]. The sun is the major source of power and the fuel for most renewable energy systems, whether directly or indirectly. The photovoltaic system is one of the many renewable energy technologies that have the potential to replace traditional energy sources. A solar panel converts sun energy into electricity directly. Solar panels are mostly composed of semiconductor-based materials. Si is the primary component of solar panels, with a maximum efficiency of 24.5 %. The only method to boost a solar panel's output if high-efficiency solar panels are created is to increase the light intensity falling on it. Solar trackers are the most effective and well-tested technique for improving solar panel performance by keeping them aligned with the sun's position[2]. Solar trackers have recently gained popularity across the world as a more effective way to collect solar energy. This is a far more cost-effective alternative than purchasing extra solar panels.

The practice of designing a specific manual and/or automatic system that meets the demands of the client is known as Mechatronics system design. A designer considers and evaluates numerous elements and product designs for specific requirements that may differ from those currently in use. Certain criteria, such as size, shape, material, load, and application type, are required for every electronic/mechanical component[3]. Sensor type, rotation technique, motor weight, kind of photovoltaic panel, type of microcontroller utilized, component selection, and other aspects all impact the design of a solar tracking system.

India is a developing country that gets its energy from a range of commercial and non-commercial sources. In recent years, it has been highlighted that fossil fuel supplies are fast decreasing and that the era of fossil fuels, particularly oil and natural gas, is gradually coming to an end. The most severe issue with traditional energy sources is their negative environmental impact[4]. It is also the primary contributor to the global warming problem, which is becoming a major worry. According to the latest assessment from the Intergovernmental Panel on Climate Change (IPCC), increasing methane and nitrous oxide concentrations have caused global surface temperatures to rise. Solar energy, which is renewable in nature, is being employed increasingly frequently to address these concerns.

Solar energy is a clean, sustainable form of energy that is abundant in nature[5]. The sun is a huge sphere of very hot gases heated by fusion reactions of many kinds. The sun has a diameter of 1.39 10⁶ kilometers. When the sun is high, it subtends the earth's surface at an angle of 32 minutes (0.53°C) due to its expanded reach. Therefore, the earth's sun's beam radiation is almost identical. The brightness of the sun changes from top to bottom. The amount of energy that the earth receives from the Sun is hundreds of times more than the entire amount of commercial energy produced on Earth today. Therefore, solar energy, rather than conventional sources of energy such as fossil fuels, may be used for thousands of years. Each year, India receives 4000-5000 hours of sunshine, enough to generate hundreds of times the country's current power consumption. Photovoltaic panels must be maintained perpendicular to the direction of sun motion throughout the day for optimal energy extraction/generation from solar energy.

The goal of this article is to create an automated solar tracking system that can capture all of the available solar energy and convert it to electrical energy[6]. Natural processes in the earth's crust that take millions of years to complete create nonrenewable sources. Once they have been burnt to generate electricity, they are gone for good. Burning fossil fuels releases unwanted by-products that pollute our environment, change the planet's temperature, and put ecosystems in

jeopardy. Solar power, on the other hand, is unlimited and free of harmful toxins. The problem statement for this thesis is to monitor the movement of photovoltaic (PV) panels in response to sunlight using Light-Based Resistors, microcontrollers, and DC motors in order to collect the most amount of solar energy and convert it into electrical energy. The main goal of this project is to develop the idea of a sun-tracking solar system, which is a device that tracks the movement of the Sun regardless of motor speed. Furthermore, the goal is to increase total power production while also offering residential architecture utilizing a single-axis sun tracking system. Because the LDR, or light-based resistor, is extensively used in sun-tracking systems, it was selected as the sensor.

Because LDR is light-sensitive, this is the case. The resistance of LDR will decrease as the light intensity of events increases[7]. The AT89S52 was chosen as the controller. ATMEL's programming will provide the driver the signal to turn on the motor. With the relay to the driver, bidirectional DC motor control was employed. The motor controller was chosen because it allows the engine to revolve in both clockwise and counterclockwise directions with ease. The DC geared motor, which has a holding torque of upto 24 kg.cm and a low rpm, is another option. Last but not least, the LM7805 is utilized to convert the input voltage from the source to the 5 V output required by the integrated circuit.

1. Benefits:

A method for solar tracking is a technique for permanently guiding photovoltaic panels towards the sun, allowing you to get the most out of your PV system investment. They are helpful since the position of the sun in the sky may vary throughout the day and year as the seasons change. They are most effective in places with low horizons and no shadow from sunrise to dusk each day. The tracking array will be able to take use of the open access to the sun all year to capture every available electron. Therefore, energy production is at an all-time high, but energy consumption increases all year.

Solar panels that stand alone are a cost-effective and low-maintenance method to produce electricity. Photovoltaic panels may be constantly oriented toward the sun using solar tracking devices, which will help you get the most out of them. This is essential since the sun's position in the sky can vary slowly over the course of a day and through the seasons over the course of a year. The effectiveness of a tracking device will be determined mainly by how well it is positioned to analyze how well the panels can improve their performance. As a rule, they work best in places with low horizons and areas where there is no shade from sunrise to sunset. The tracking array will be able to take use of the open access to the sun all year to capture every available electron. Therefore, energy production is at an all-time high, but energy consumption increases all year. This is particularly true during the summer, when there are so many long bright days to enjoy.

2. Applications:

It controls movement in both the azimuthal and zenithal directions, regardless of whether a photovoltaic (PV) or concentrated solar power (CSP) plant is needed. Regardless of the sun's location, the components or mirrors are precisely aligned with the angle of the sun's rays to maximize solar energy. Solar tracking systems produce up to a third more energy than stationary PV systems, and the closer and installation is to the equator, the more effectively the PV tracking systems work, depending on the intensity of the sunlight at the installation site. Solar units must

be precisely tracked in order to focus sunlight on the target medium in concentrated photovoltaics and concentrated solar power applications. Solar trackers are used to align photovoltaic panels, lenses, reflectors, and other optical equipment to the sun. Because the position of the sun in the sky varies with the seasons and time of day, trackers are used to coordinate the collecting system in order to maximize energy production. When deciding whether to use trackers, many considerations must be taken into account. Solar panels are often installed in direct sunlight in the middle of the day, either south in the Northern Hemisphere or north in the Southern Hemisphere. Therefore, the panels are struck at an extreme angle in the morning and evening, limiting the total amount of electricity that may be generated each day. A solar tracker is a system with solar panels that follow the sun's movement across the sky during the day, ensuring that the most amount of sunlight hits the panels. In comparison to the cost of PV solar panels, the cost of a solar tracker is quite cheap. They are patented solar tracking devices with single and double axes that are very efficient[8].

2. LITERATURE REVIEW

Suneetha Racharla et al. discussed a review on Solar tracking system[8]. The greatest problem for the next half-century will be generating power from the decrease of fossil fuels. When compared to other renewable energy sources, the notion of turning solar energy into electrical energy using photovoltaic panels is at the top of the list. The watts provided by solar panels are reduced by the constant shift in the relative angle of the sun with respect to the earth. In this case, the greatest option for increasing the efficiency of the photovoltaic panel is to use a solar tracking system. Throughout the day, solar trackers bring the payload closer to the sun. The advantages and disadvantages of various types of tracking systems are discussed in detail in this paper. In comparison to other tracking systems, the azimuth and altitude dual axis tracking system is more efficient, according to the results presented in this review. However, from the standpoint of cost and versatility, a single axis tracking system is more practical than a dual axis tracking system.

Prof. Vaibhav J. Babrekar et al. discussed a review on automatic system of solar radiation tracking[9]. Because fossil fuels are a rather short-term energy supply, an alternate energy resource is required. Solar energy is being increasingly widely used as a renewable energy source. Solar modules are commonly used to convert solar energy into electricity, although the solar energy is not entirely utilized. The efficiency of solar array systems must be increased to make solar energy more usable. Solar radiation tracking is a viable method for increasing the efficiency of solar array systems. A system that regulates the movement of a solar array so that it is always aligned with the direction of the sun is known as an automatic solar radiation tracker. For the implementation of such systems, several technologies are utilized across the world. Some of these technologies are discussed in this publication.

Mahipal Soni et al. discussed an analysis of solar tracker system[10]. This report offers a research analysis of a solar tracker system for increasing solar panel efficiency. The act or practice of following something or someone is referred to as tracking. So, an automated solar tracker system is a device that follows the sun's light to extract the most amount of energy from it. Solar panels are always in perpendicular profile with regard to the sun light to maximize efficiency or obtain maximum energy. Solar tracking with mirror booster and automatic cleaning system are two technologies being investigated to improve the efficiency of solar panels. Microcontroller, LDRs, stepper motor, solar panel, mirror booster, and automatic cleaning machine comprise the solar tracker system. With the aid of a stepper motor, the LDR sensor detects the sun light falling on

the solar panel and spins the solar panel according to the intensity of the light. To increase efficiency, a mirror is utilized as a booster. The system is controlled by a programmed microcontroller that communicates with a sensor and a motor driver dependent on the movement of the sun.

Research Questions:

- How this system of solar tracking is better than the existing systems?
- Explain the components used in this solar tracking system?

3. METHODOLOGY

3.1 Design:

This electrical device's main component is a microcontroller. This is where all of the operations are managed. With the help of a microcontroller, you may position the solar panel according to the strength of the sunshine. The rechargeable battery, which is utilized to store energy by the panel, is another component. The charging control's purpose is to regulate battery charging. The battery state is received by the microcontroller unit via the control panel for charge. It features two LDR sensors, one on each side. On the unit, four LDRs form and are located in the four corners of the panel. The controller receives the output from the LDR, which detects the intensity of sunlight. The Control unit determines which way the panel should be turned to obtain the most sunlight. LDRs are also utilized in another section of the sensor, which is employed to adjust the lighting load. The server motor can rotate the panel in the desired direction. In this study, the author employed a solar panel to convert light energy into electrical energy. The Sun varies its position during the day, so the author couldn't use all of the light energy, so they created a monitoring mechanism that rotates the solar panel when the sun alters its position.

An embedded system consists of a combination of computer hardware and software, as well as perhaps external mechanical or other elements, all of which are designed to serve a specific function. Embedded systems are frequently a component of a larger, more sophisticated system. Dedicated applications are developed and embedded in systems that are intended to carry out specialized tasks. These embedded programmers must communicate with the rest of the enclosed system's components. The application's embedded components often connect with the outside non-human environment. They utilized four LDR sensors to detect light, and if the sun's position changes, the sensor changes as well. Each LDR sensor's voltage readings are sent to the microcontroller and compared to the LM324. The microcontroller compares each LDR output to each LDR output after receiving the voltage signal from any I/O pin on the controller. The motor is told to spin the solar panel on a single axis in the direction of the LDR sensor that provides the greatest voltage output when the controller discovers the highest voltage level of any LDR sensor. Figure 1 illustrates the block diagram of the solar tracking system.

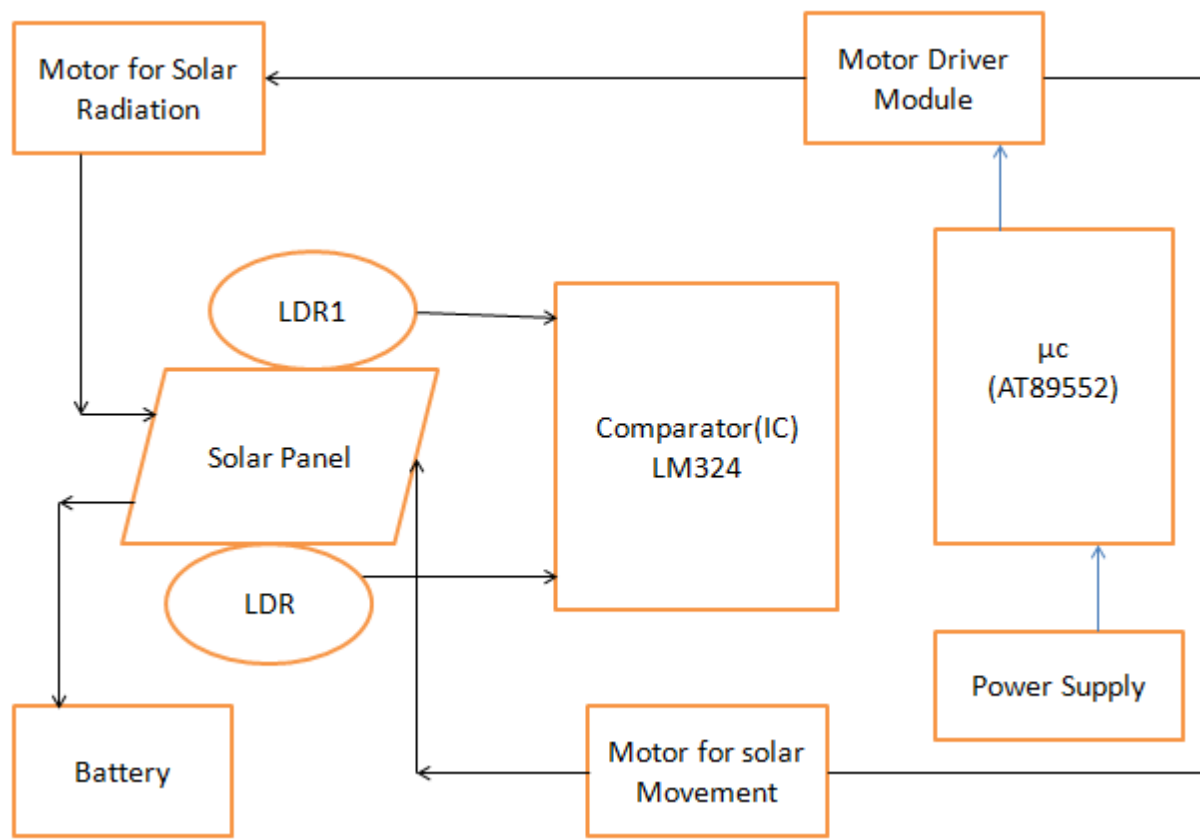


Figure 1: Illustrate the Block Diagram of solar trackingsystem

As a result, the battery may be recharged properly using the Solar Panel, and the author can use certain electrical equipment to rotate the 12 V DC fan on a regular basis. Using two external motors and connecting them in tandem, the author can move the solar panel in any direction. By orienting the solar panel towards the direction of the sun, the whole energy of the sun is harnessed. The LDR sensor detects light and creates the highest voltage signal, which is sent to the comparator IC, as well as other sensors, to determine the voltage level generated by the comparator IC.

3.2 Instruments:

3.2.1 Micro-controller:

In an embedded system, a microcontroller is a small integrated circuit that governs a certain operation. On a single chip, a microcontroller has a CPU, memory, and input/output (I/O) peripherals. It can be used in many machines like keywords, ovens, dryers, security systems and electrical machines.

3.2.2 Solar Panel:

A solar panel, also known as a photovoltaic (PV) module, is an installation of photovoltaic cells set in a framework. Solar panels create direct current electricity using sunlight as a source of energy.

3.2.3 LDR Sensor:

A photo resistor or a cadmium sulphide (CdS) cell is another name for a Light Dependent Resistor (LDR). A photoconductor is another name for it. LDRs are used to detect light levels in automated security lighting, for example. Their resistance reduces as the light intensity increases: an LDR's resistance is high in the dark and at low light levels, and only a small amount of current may flow through it.

4. RESULT AND DISCUSSION

The machine centers on designing the controller. The designed system was checked and some data from measuring hardware were collected and discussed. The typical solar panel was used and the intention was only to show that the built system is capable of working accordingly. For example, weather conditions are not seriously considered during hardware testing therefore the surrounding effects. In this research, researcher proposed the design and development of a microcontroller-based Solar Panel Tracking System. The device design is depicted in the block diagram, which includes an LDR sensor that supplies maximum solar power to the microcontroller through an ADC that digitizes the LDR's performance. The controller then makes a choice based on the algorithm and tilts the panel with the help of a DC Motor in the direction of the LDR's highest energy. Two relays manage the system as a DC geared motor driver, and a microcontroller controls the system as the primary processor. The future of this solar tracking system is bright as it can be used for home purposes and further, it will be modified by adapting new technologies.

5. CONCLUSION

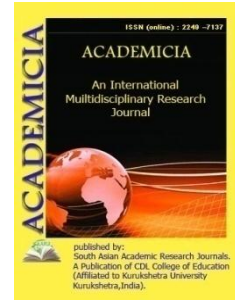
The Axis Solar Tracking System has a single prototype model that has been successfully developed. The designed system focuses on the controller part, with the primary concern being to design appropriate circuits that can control the direction of rotation of the DC-gear motor without taking the motor's speed into account. Regardless of the motor speed, the machine is capable of monitoring and following Sunlight intensity in order to obtain full solar power. The motor speed is not a significant issue as distinctive of the proposed system because the DC-gear motor has a low output rated speed and a high output rated torque. As a result, any DC-gear motor can be used in this system, regardless of the motor speed control unit, as long as the motor's speed and torque meet the specifications. In the future, the built system concept may be used to develop alternative energy sources in the home, especially for non-critical and low-power appliances.

REFERENCES

1. R. S. Zulkafli, A. S. Bawazir, N. A. M. Amin, M. S. M. Hashim, M. S. A. Majid, and N. F. M. Nasir, "Dual axis solar tracking system in Perlis, Malaysia," *J. Telecommun. Electron. Comput. Eng.*, 2018.
2. H. Fathabadi, "Novel high accurate sensorless dual-axis solar tracking system controlled by maximum power point tracking unit of photovoltaic systems," *Appl. Energy*, 2016, doi: 10.1016/j.apenergy.2016.03.109.
3. S. Obara, K. Matsumura, S. Aizawa, H. Kobayashi, Y. Hamada, and T. Suda, "Development of a solar tracking system of a nonelectric power source by using a metal hydride actuator," *Sol. Energy*, 2017, doi: 10.1016/j.solener.2017.08.056.
4. A. Singh and N. Aphiratsakun, "AU solar tracking system," in *ECTI-CON 2015 - 2015 12th*

International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology, 2015, doi: 10.1109/ECTIcon.2015.7206970.

5. E. Kabir, P. Kumar, S. Kumar, A. A. Adelodun, and K. H. Kim, "Solar energy: Potential and future prospects," *Renewable and Sustainable Energy Reviews*. 2018, doi: 10.1016/j.rser.2017.09.094.
6. F. Abdel-Hady, "DESIGN OF SOLAR TRACKING SYSTEM," *Int. J. Eng. Technol.*, 2018, doi: 10.21817/ijet/2018/v10i2/181002023.
7. A. Makwana and D. Lad, "Dual Axis Solar Tracking System using 5-LDR sensor," *Int. Res. J. Eng. Technol.*, 2017.
8. S. Racharla and K. Rajan, "Solar tracking system—a review," *Int. J. Sustain. Eng.*, vol. 10, no. 2, pp. 72–81, 2017, doi: 10.1080/19397038.2016.1267816.
9. P. V. J. Babrekar, M. S. Kurhekar, K. K. Mulmule, and D. B. Mohade, "Review On Automatic Solar Radiation Tracking System," vol. 7, no. 2, pp. 625–628, 2016.
10. D. D. C. Soni, Mahipal, "Analysis of Solar Tracker System to Increase the Efficiency of Solar Panel : A Study," vol. 1, no. 9, pp. 6–9, 2018.



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NLP BASED SIGN GESTURES RECOGNITION SYSTEM

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ABSTRACT

There are many methods for identifying signs, each of which generates a word for each one. It focuses on converting sign language into an appropriate English sentence. NLP techniques are also used in addition to sign recognition. The input is a framed and split video of sign language. This booklet teaches deaf and mute people sign language. It's tough for non-blind persons to engage with blind people due to communication difficulties. To address this issue, the article suggests and describes an effective method. Language technology methods such as POS tagging and the LALR parser are used to convert identified sign words into English phrases. A number of applications are available on the market that allows blind people to interact with the world. Combining technology will not be able to address the problem of mobile sign language translation in daily activities. A video interpreter can assist deaf or hearing-impaired people in a variety of situations. People with hearing impairments will be able to learn sign language and have films translated into sign language as a consequence of this research. The present work may be used as a communication interface for both speech-impaired and non-speech-impaired individuals. It will assist bridge the communication gap between speech-impaired people and the rest of the population by capturing and analyzing signals, as well as recognizing and displaying output in the form of comprehensible phrases.

KEYWORDS: *Communication, Hearing and speech, NLP, Parsing, Sign Language.*

1. INTRODUCTION

Deaf or dumb people have a variety of difficulties when it comes to interacting with others in their everyday lives due to their hearing and speech disability. Many people with hearing and speech impairments are unable to express or utilize their skills in the outside world due to a linguistic barrier. The aim is to develop a system that will help these individuals bridge the gap

between themselves and the rest of society[1]. According to a research, India is home to 20% of the world's population with hearing and speech impairment. While hearing and speech impaired people in India communicate using Indian Sign Language, which is not widely recognized or understood by the general public, the general public uses natural language. This will need the use of an interpreter. Human interpreters are often used, although they are costly and not available to everyone.

Hearing and speech impaired people's interactions are influenced by hand movements. Tactile sign language, which comprises of hand motions and symbols, is an efficient way for them to communicate. Even if this is true, hearing-impaired individuals have communication difficulties in a society that is mainly deafeningly[2]. The interaction between sign language users is the subject of this research. Human language may be deciphered using natural language principles. It is a strong tool that combines language technology with artificial intelligence. NLP includes both syntax and semantics. Syntax is in charge of the ordering and grouping of words. Semantics includes word and phrase meanings, as well as compositional meanings. Lexical semantics determines the meanings of component words, whereas compositional semantics, which combines these components, determines the wider meaning. In Natural Language Processing, POS labeling is a critical step (NLP). This is where the recovery of information starts. Parsing, which deals with grammar, is another important method[3].

Normal people interact with one another using normal language, while hearing and speech challenged people communicate through tactile sign language. In every field, intense competition makes it more difficult for people with disabilities to participate[4]. Individuals with hearing and speech impairments will benefit from the development of an application that allows them to converse successfully with a normal person. According to surveys, India has about 2.4 million people with hearing and speech impairment, accounting for around 20% of the global total. To assist communication between a normal individual and someone who has a hearing or speech disability, an interpreter is needed[5].

The interplay of hearing and speech disability is influenced by hand movements[6]. Tactile sign language, which comprises of hand motions and symbols, is an efficient way for them to communicate. It is true that the hearing-impaired must overcome social barriers in a society that is mainly deafeningly. This research focuses on sentencing for hearing impairment interactions. Human language can be deciphered by someone who is fluent in natural language. Artificial Intelligence and linguistics are both engaged. NLP refers to a system that can convert text (words) into human language (Natural Language Processing) [7]. The POS tagging method was presented for the first time in 1960, according to NLP. It is a necessary instrument in the area of language processing. In many NLP applications, it is the simplest and most stable step. In machine translation, information retrieval, and other applications, it is the initial step[8].

2.LITERATURE REVIEW

Syed Atif Mehdi et.al discussed a review on Sensing gloves for Sign Language Recognition using artificial neural networks[9]. After that, the sensor data is classified using 24 English alphabets and two punctuation marks. The subject of dynamic gestures is investigated in this research. Because sensor gloves may be unable to detect dynamic movements, an arm gesture may be employed to compensate. The main goal of the paper's approach was to see whether a sensor glove could be used to recognize various sign languages. Because sensor gloves can only

recognize a portion of sign language, as shown in the article, additional sensors are needed to detect the full form of sign language.

Chung-Hsein Wu et al. discuss a method for forming Chinese phrases from Taiwanese Sign Language for persons with hearing problems[3]. The proposed method is intended to assist people with language disabilities in constructing sentences and correcting grammatical errors. Enhanced attribute grammar is used to translate text across languages. On the basis of context-free grammar, attribute grammar formalizes the semantics of a language. This article offers efficient methods for implementing the famous Viola Jones algorithm in a real-time environment utilizing Local Binary Pattern features for hand motion recognition.

ChandhanaSurabhi M discussed about the development of natural language interfaces to interact with robots[10]. The user will be able to access apps more easily with this approach. A technique for comparing fundamental grammar phrases to a collection of simple pictures was shown. In the method presented here, attribute grammar is utilized to show semantic analysis of natural language text. Real-time data was used to build and test an Android application with an improved algorithm. This algorithm implementation has not been used to create a robust and real-time algorithm. A significant lot of research has been done to automate the process of sign language interpretation using image processing and pattern recognition technologies.

Research Question:

- What is the importance of sign language as an interpretation language?
- What are the methods/techniques available for Sentence creation utilizing Natural Language processing Engine?

3. METHODOLOGY

3.1.Design:

Hearing and speech impaired users will perform hand gestures based on ISL using body position snippets in the initial stage of the application. A sensor glove is made by the 5DT Company. A little sensor is placed on each finger and thumb. Two additional buttons must be pressed to rotate and tilt the hand. The bend of each sensor is calculated using a value between 0 and 4095. 0 indicates that the sensor is completely stretched, while 4095 indicates that it is entirely bent. These characteristics are compared to the database for each gesture to identify the one-of-a-kind word that corresponds to it. The NLP engine takes those words and gives a sign attribute to each one based on components of speech. These characteristics are then used to construct a meaningful sentence based on the syntax of sentences in English grammar. A grammar must be developed in order to construct sentences.

It involves the following steps:

- A person who is hearing impaired signs.
- As a result of software, signs are translated into text (and video)
- The one who is hearing it reads it (and view it)
- It is important that both hearing and speech impaired talk into a microphone
- Text-to-voice software (and ASL video)

3.2. Instruments:

The movies are captured using a 2D camera. For frame extraction, the largest curvature point is utilized. The photographs with the most distinguishable coefficients are chosen for P2-DHMM training once the DCT coefficients of the images are determined. As a consequence, the data set collected may be used to extract the most important information from the subject's photographs. Using the equation for all the pictures, calculate the distance between each image and chosen training photographs.

$$D_{i,j}^2 = \sum_{n=1}^N (d_i(n) - d_j(n))^2$$

Training regarding next image Index = $\text{argmax}_i (\min (D_{i,j}))$ where 'N' is the length of image vector (No. of rows \times No. of columns).

3.3. Data Collection:

Step 1: Take video as an input. Specifications of video is as follows: Type of file: .avi, Size: 7.49mb, Length: 5 sec, Frame width: 900, Frame height: 508, Frame rate: 12 Fps as shown in figure 2.



Figure 2: Sample Frames of the Number of the Frames = Frame Time*FPS

Step 2: The following formula may be used to divide the video into frames: Framing time = number of frames*FPS as shown in figure 2.

Step 3: For Grayscale conversion, binaries the frames before converting them to black and white as shown in figure 3.

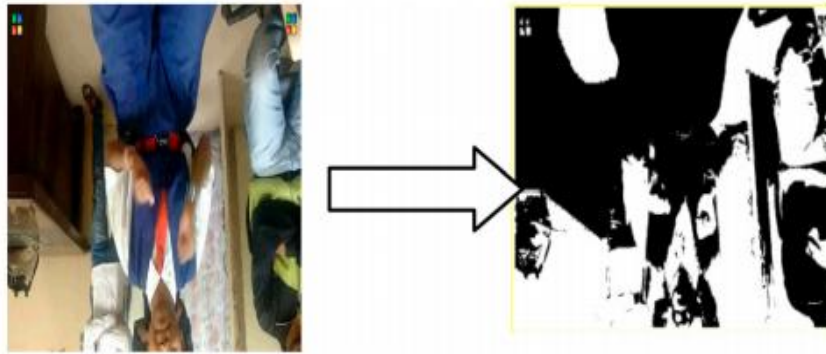


Figure 3: A Single Sample Frame from the Camshift of the Frame into Grayscale i.e. Binary Format

Step 4: Using HSV and CAMSHIFT, segmentation and tracking are conducted as shown in figure 4.

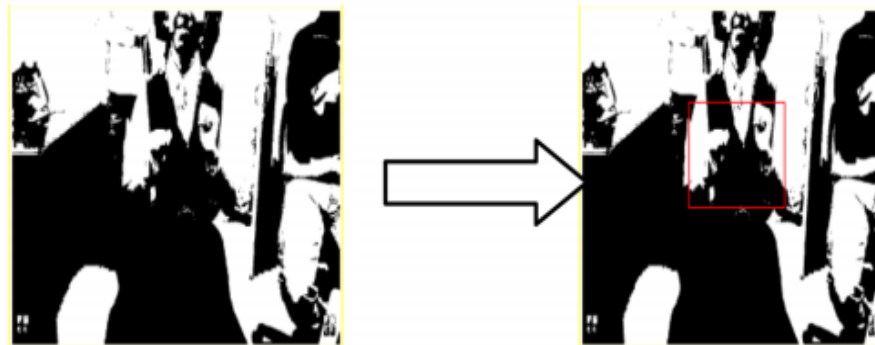


Figure 4: A Single Sample Frame from Grayscale to More Subjected Tracking to the Gesture.

Step 5: The P2DHMM method is used to extract features from the frame as shown in figure 5.

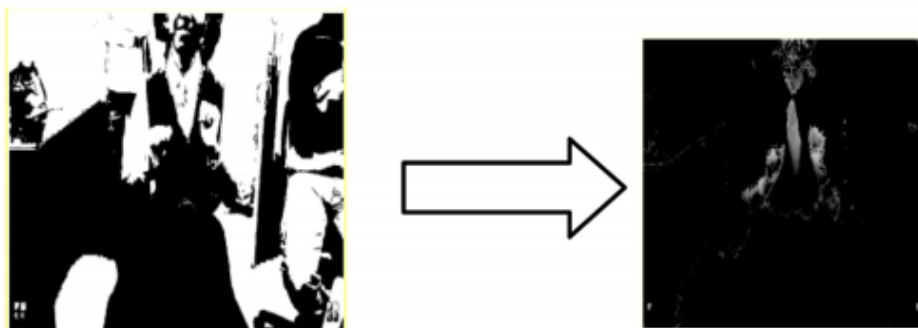


Figure 5: A Single Sample Frame from Grayscale to More Subjected Tracking for Extract Features from the Frame.

Step 6: With the help of the Haar Classifier, which identifies the model feature using 33 samples of expression, the hand movement is classified and recognized.

Step 7: Next, the NLP engine, which consists of POS tagger and LALR parser, receives the output words from the NLP engine. As the words are tagged by the POS tagger, they are then parsed by the Parser to produce sentences. The following is the POS tagging and parsing of the words above: I (N), Active (Adj).

3.4. Data Analysis:

Analysis: To provide a sense of the various gesture examples, the samples in the data gathered below were taken from snippets of several movies featuring hand asserted motions. Each of these movies is different in duration. A total of 60 videos were made with various backdrops and lighting conditions. While the number of frames in a video varies with its size, the database sample and video resolution influence the accuracy of a sign language translation system.

TABLE 1: SAMPLE VIDEOS REFERRED TO THE RECORDING AND THE SUCCESS RATE FRAME VISE

Name Of Video File	Sentence In The Video File	Duration of Video	Total Frames	Successfully Recognized Frames From Total Frames
Vid4.avi	Take your glasses off	4 seconds	60	54
Vid3.avi	Think about my idea	5 seconds	56	51
Vid2.avi	Tell me the time	4 seconds	25	19
Vid1.avi	Give me a pen	4 seconds	48	40

TABLE 2: SHORT SYSTEM AND SHORTENED MANUAL GENERATED OUTPUTS SENTENCES/PHRASES.

System Generated Output	Manually Generated Outputs
Take your glasses off	Take glasses off
Think about my idea	Think my idea
Tell me the time	Tell time
Give me a pen	Give pen

Context isn't a factor in any of the grammars we've looked at so far. The initial version of the application's grammar utilized Non-Deterministic Finite Automata. The conversion to Deterministic Finite Automata (DFA) is done in order to enhance the accuracy and results. Superior results were achieved because DFA considers each state as a distinct entity. As a result, the DFA that was generated is clear and simple. It also resulted in the grammar's ambiguity being removed, as well as a substantial increase of the grammar's area of applicability. All kinds of words and tenses are very difficult to comprehend. The software did not accept the tense as an input parameter. As a result, 33.33 percent of the phrases generated from table 2 were correct. This may be illustrated using the following example. The software only works with basic and continuous tenses of speech when it comes to simple and complex sentences. You'll only receive sentences that meet the grammatical rules if you utilize the grammar you've constructed. As a

result, it's conceivable that in certain circumstances, a meaningful sentence will be impossible to come up with.

4. RESULTS AND DISCUSSION

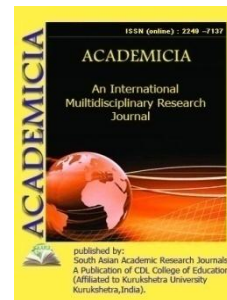
For analytical reasons, the hearing and speech impairment expert analyzed the sentence obtained from the videos. Special school instructors for hearing and speech impairments manually evaluated five films that were translated to sign language using the system's output, yielding five phrases. As a consequence, the output of this system and the manual interpretation are quite similar in terms of outcomes. As a result, it's accurate to within approximately 90% of the time. Hearing and speech challenged individuals may communicate with anybody, anyplace, with this software. This effort also supports speech-to-sign translation. Two of the most essential software components are Video Relay Service and outfit-7 (VRS). It is feasible to create a system that incorporates all of these elements. Nothing has been incorporated in our study as a crucial method of communication among speech disabled individuals except American Sign Language (ASL) (American Sign Language). All letters are signed with just the right hand, with the palm towards the spectator. In terms of manual nature and organization, SE (Sign English) is a good equal to English. People who are deaf or hard of hearing will learn English more rapidly if they are exposed to SE and other parallel signing systems. Sign words and sign markers are the two kinds of gestures used by a sign language interpreter (SE). Each Sign word corresponds to a distinct item in a dictionary of Standard English. As part of our study, we're putting the Sign Word concept into practice, which is useful for translating Sign Language into words, as well as creating Natural Language Processing (NLP) algorithms that can handle longer sentences. With the exception of one, they are signed in the same order as the words in an English sentence. In SE, ASL is the main source of signs. To prevent misunderstanding, these signals are now used in the same sequence and with the same meaning as English terms. Hearing-impaired individuals may also use this software for mobile sign translation (VSR) and UTF-7, which enables them to communicate without calling numbers in everyday activities.

5. CONCLUSION

The main aim of this paper is to illustrate the significance of sign language interpretation and to show how sign language may be translated into words to assist people with hearing and speech impairments in their everyday activities. In this research, just a few words were utilized, and only brief sentences were used to assess the findings. We want to expand our work in the future by creating a large database with the most conceivable words and developing NLP algorithms that can handle longer phrases. As with other languages, converting ISL to English is not a straightforward word-for-word translation. When it comes to recognizing pronouns, prepositions, and other grammatical elements, language learners face a number of difficulties. Prior work on NLP and gesture recognition would be very useful in creating the app. The desire for new software and novel ways to create valuable things will never go away. As a result, an algorithm must be developed in order to build the application. In the future, face emotion detection may be incorporated to the sign recognition software, which would help us punctuate words correctly. This allows us to get a deeper understanding of how someone is experiencing. If we follow specific linguistic principles, we may really contribute to the development of a sign language interpretation system with the help of sign language trainers and hearing and speech challenged people. Assistive devices for hearing impaired people are required to overcome the communication gap between hearing impaired and normal people.

REFERENCES

1. S. Basar, A. Adnan, N. H. Khan, and S. Haider, "Color Image Segmentation Using K-Means Classification On RGB Histogram," *Recent Adv. Telecommun. Informatics Educ. Technol.*, 2014.
2. M. Mohandes, J. Liu, and M. Deriche, "A survey of image-based Arabic sign language recognition," 2014, doi: 10.1109/SSD.2014.6808906.
3. C. H. Wu, Y. H. Chiu, and C. S. Guo, "Text generation from Taiwanese sign language using a PST-based language model for augmentative communication," *IEEE Trans. Neural Syst. Rehabil. Eng.*, 2004, doi: 10.1109/TNSRE.2003.819930.
4. P. S. Rajam and G. Balakrishnan, "Real time Indian Sign Language Recognition System to aid deaf-dumb people," 2011, doi: 10.1109/ICCT.2011.6157974.
5. M. Zimmermann, J. C. Chappelier, and H. Bunke, "Offline grammar-based recognition of handwritten sentences," *IEEE Trans. Pattern Anal. Mach. Intell.*, 2006, doi: 10.1109/TPAMI.2006.103.
6. A. D. Wilson and A. F. Bobick, "Parametric hidden Markov models for gesture recognition," *IEEE Trans. Pattern Anal. Mach. Intell.*, 1999, doi: 10.1109/34.790429.
7. K. Dabre and S. Dholay, "Machine learning model for sign language interpretation using webcam images," 2014, doi: 10.1109/CSCITA.2014.6839279.
8. C. Jung, C. Kim, S. W. Chae, and S. Oh, "Unsupervised segmentation of overlapped nuclei using bayesian classification," *IEEE Trans. Biomed. Eng.*, 2010, doi: 10.1109/TBME.2010.2060486.
9. S. A. Mehdi and Y. N. Khan, "Sign language recognition using sensor gloves," 2002, doi: 10.1109/ICONIP.2002.1201884.
10. M. C. Surabhi, "Natural language processing future," 2013, doi: 10.1109/ICOISS.2013.6678407.



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THE FORMATION OF DERIVATIVE WORDS FROM THE BASES OF BORROWED LEXICAL UNITS IN THE GERMAN LANGUAGE OF THE MODERN PERIOD

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ABSTRACT

The article examines the features of the formation of new derivatives of words from the foundations of borrowed lexical units in the German language of the latest period, establishes the most productive word-formation models for various parts of speech, reveals the specificity of producing bases of foreign language origin, reveals the indirect influence of borrowings on the word educational system of the German language.

KEYWORDS: *Word Formation, Borrowing, Neologism, Derivative Word, Borrowed Stem.*

INTRODUCTION

Modern German is strongly influenced by the English language, as evidenced by the continuously growing number of lexical borrowings. The main reason for the intensification of borrowing processes is most likely, globalization - the process of world economic, political and cultural integration and unification. Factors such as: the leading role of the United States in politics, economics, science and the entertainment industry; dominance of the English language in various social spheres; the ubiquitous spread of computer technologies and the associated tremendous acceleration of the dissemination of information; improving the knowledge of the English language among the German-speaking population; passive-wait-and-see position of the German linguocultural community in relation to English-speaking borrowings, inactivity of language policy, etc.

The active use of borrowed words in various spheres of communication contributes to the development of their derivational potential, the emergence on their basis of new lexical units of various structural and semantic types. The interaction of word formation and borrowing

processes in the modern German language is manifested, first of all, in an increase in the productivity of the primordially German word-formation models. Derived verbs and verbal units, derivative nouns and adjectives are formed from the stems of borrowed words according to traditional derivational models, which are also actively used for word production from the stems of proper German words. The bases of borrowed verbs and nouns, less often the bases of adjectives and adverbs, are most often producing ones.

The subject of research in this article is the new derivative lexemes of the German language, formed from the bases of borrowed lexical units. The linguistic material is taken mostly from the dictionary of neologisms of the German language [12; 13], and was also revealed through our own observations of neological material and corpus analysis [5].

Formation of verbs and verb units

The array of verbs and verbal units is very indicative in terms of the interaction of word formation and borrowing processes. By borrowing new non-derivative verbs such as *bladen*, *carven*, *chatten*, *dissen*, *hopen*, *mailen*, *mobben*, *outen*, *piercen*, *raften*, *scrollen*, *taggen*, *walken*, *zappen*, etc. [12; 13], a large number of non-derivative verb stems enter the German language, which can later be used to form derivative verbs and verb units with prepositional and pronoun-adverbial particles. In this case, from the side of the source language (i.e., English), we can talk about both simple and phrasal verbs. As the analysis of neological material shows, it is verbs with non-derivative borrowed stems that show high activity in German verbal word formation. At the same time, we note that non-derivative verbs with English stems can appear not only by direct borrowing, but also by converting from the stems of the corresponding nouns in German.

The bases of non-derivative verbs of English-speaking origin are actively involved in the formation of derivative verbs by prefixing (*dealen* → *verdealen*) and in the formation of verbal units with prepositional and pronominal-adverbial particles (*dissen* → *zurückdissen*). Combinatorial restrictions associated with the status of Anglicism are not observed [15, 77]. In many cases, word formation serves from a semantic point of view to indicate an intensification or to clarify the indicated action. At the same time, word-formation models with the participation of prepositional and pronoun-adverbial particles are used much more often than prefixing. We:

carven - *heruntercarven*, *hinuntercarven*, *loscarven*, *runtercarven*;

checken – *abchecken*, *auschecken*, *einchecken*;

chillen – *abchillen*, *auschillen*, *durchchillen*, *nachchillen*, *verchillen*;

dissen – *wegdissen*, *zurückdissen*;

Borrowing of English phrasal verbs is often accompanied by a partial substitution of components with native German prepositional and pronoun-adverbial particles: *to space out* → *abspacen*, *to flip out* → *ausflippen*, *to pop up* → *aufpoppen*. Also here, not in every case it is possible to be sure whether the verb in German really arose by borrowing and partial substitution, whether polygenesis takes place, or whether a synonymous verb in German caused the emergence of a new formation by analogy, as, perhaps, it has place in pairs *abspacen* - *abheben*, *besprachen* - *besprühen*.

We believe it is necessary to use the example of the verb *mailen* (the neologism of the 1990s of the last century) to show the principles by which the formation of new derivative prefixed verbs

and verb units with borrowed stems in modern German is carried out. At the same time, two factors are decisive: the meaning of the verbal stem, on the one hand and the array of verbs and verbal units already in use in the German language, on the other. Based on the corpus analysis, a number of derived verbs with the stem under consideration (bemailen, ermailen, vermailen, zemailen), as well as verbal units (abmailen, anmailen, ausmailen, durchmailen, einmailen, hintermailen, mitmailen, nachmailen, übermailen, übermailen vormailen, zumailen, herummailen, wei termailen, zurückmailen).

The verb mailen has the meaning, to send a message via e-mail. The central conceptual features of this modern way of exchanging information are, writing to someone, entering a message into a computer, expecting an instant response based on a high transmission rate, exchanging several messages in a short time, performing actions similar to telephone communication. As the analysis of the linguistic material shows, verbs and verbal units formed from the stem mailen focus attention on one or another feature of the concept under consideration or supplement it with other features.

In doing so, they rely on semantically correlative German verbs that provide comparable concepts, for example, jemandem schreiben or etwas senden, etwas mitteilen, and also mit jemandem kommunizieren, sich unterhalten. Let us illustrate this idea by comparing the following verb pairs:

- jemanden ermailen – jemanden erreichen;
- etwas vermailen – etwas verschicken/ versenden;
- etwas zemailen – etwas zerreden;
- etwas zumailen – etwas zuschicken.

The data of language analysis confirm the observation of L. Eichinger [7, 26] on the dominant role of derivative prefix verbs and verb units in the process of linguistic coding of conceptual schemes. Obviously, the "xenogeneity" of the verbal stem does not in any way establish restrictions on the functioning of verbal neoplasms.

On the other hand, the stem of the verb emailen, which also functions in German, is practically not used in the formation of verbs and verb units. Here, apparently, phonetic (prosodic) reasons play a role.

Borrowed verbs with complex stems in the source language, such as downloaden, updaten, outsourcen, as a rule, do not participate in the formation of new verbs and verb units in German. We have registered only isolated cases of using the stems of these verbs in word formation: mitdownloaden, mitupdaten, nachdownloaden.

Suffixal derivation from verb stems is known to be much less pronounced in German. In neoplasms, suffixes -ier (en) are predominantly used with the options -isier (en), -ifizier (en). English verbs get these suffixes in German if their stems are of Greek-Latin origin, and in English they end in -ate, -ify, -ize / ise, for example: to computerize - computerisieren, to globalize - globalisieren (moreover, in these cases, one cannot be completely sure of the course of borrowing through English). In some cases, these suffixes are also given to simple English verbs with foundations of Romance origin (limitieren, trainieren).

Along with the prefixation, suffixation and formation of verbal units with prepositional and pronominal-adverbial particles in the German language, a derivational method such as regressive derivation or reverse word formation is spreading under the influence of the English language. Compound nouns in -ing, borrowed from the English language, in many cases determine the formation of the verb by means of regressive derivation. For example: Powerwalking → po werwalken, Nordicwalking → nordicwalken, Mountainbiking → mountainbiken, Windsurfing → windsurfen), cf. indigenous formations Kopfrechnen → kopfrechnen, Lehnbildung → lehnbuilden, Schleichwerbung → schleichwerben.

Hybrid nouns with autochthonous and borrowed components can also undergo regressive derivation; cf. Blutdoping → blutdopen, Inselhopping → inselhoppfen. This way of word formation is also productive in English. H. Schmid [14, 217] gives examples such as sun bathing → to sunbathe, sightseeing → to sightsee. Therefore, it should be noted that verbal neoplasms that arose through regressive derivation could have been formed already in English and only then borrowed into German.

In general, in the German language at the present stage of its development, as observations on the linguistic material show, nouns in -ing predominate significantly in comparison with verbs with the same stems. So, S. Loskant [11] gives about 70 nouns and only 7 verbs: Bombing - bomben, Briefing - briefen, Carving - carven, Debugging - debuggen, Outsourcing - outsourcen, Sampling - sampfen, Scratching - scratchen. This discrepancy in numbers suggests that the formation of new verbs is carried out directly in the German language itself.

Another way of the emergence of new verbs with borrowed stems is derivational conversion. Converted verbs are formed in German from substantive and adjective stems, both simple (fischen, kürzen) and complex (schauspielfern), and more recently from compound stem (TÜV → tüfen). Also, Anglicism's can be converted without limitation. Nouns with simple, complex and even compound abbreviated stems act as starting bases for the formation of new verbs (Flashmob → flash mobben, Kickboard → kickboarden, Podcast → podcasten, Snowboard → snowboarden, SMS → simsen, MMS → mimsen, WAP → wappen).

Prefixal derivation and the formation of verbal units from substantive stems is expressed to a much lesser extent, cf. verslumen, versnoben, aufgaben, aufpeppen.

The large number of simple verb stems of English-language origin that have come to German over the past few years, apparently, explains another phenomenon of German word formation that has become widespread in recent times, namely, the reduction of complex stems of English-speaking origin to simple verb stems by truncating one of the original components, for example: downloaden → downen, inlineskaten → inlinen, kitesurfen → kiten, uploaden → uppen. In most cases, such truncated verbs serve as informal communication in the private sphere, and their formation is explained, apparently, by the principles of linguistic economy. Some of them, however, become stable vocabulary units, for example, inlinen, kiten [12; 13]. The formation of new verbs by truncating an element of the original complex or derived stem can be explained by the desire to assimilate verbs with simple stems that are massively entering the German language of the modern period. J. Erben calls the possibility of joining the class of verbs with simple stems "a stimulating factor for the appearance of abbreviated forms" [8, 93]. The productivity of this derivational type is confirmed by the abbreviated forms from the stems of proper German verbs found in the texts of German chats: fotografieren → foten, funktionieren → funzen, installieren

→ insten, programmie ren → proggen, registrieren → reggen, cf. Russian colloquial xery ← a photocopy.

Formation of derivative nouns and adjectives

In the field of the formation of derivatives of nouns from the bases of borrowed lexical units, several groups can be distinguished. The most numerous of them are verbal nouns, primarily nomina agentis and nomina instrumenti, formed from the stems of borrowed verbs using the suffix -er. For example: bladen → Blader, bloggen → Blogger, carven → Carver, casten → Caster, chat ten → Chatter, downloaden → Downloader, emailen → Emailer, inlineskaten → Inlineskater, mobben → Mobber, nordicwalken → Nordicwalker, outsourcen → Outsourcer, piercen → Piercer, raften → Rafter, raven → Raver, roamen → Roamer, rollenbladen → Roller blader, scratchen → Scratcher, skypen → Skyper, slacken → Slacker, spammen → Spam mer, taggen → Tagger, voipen → Voiper, wakeboarden → Wakeboarder, walken → Wal ker, zappen → Zapper, etc.

In many cases, however, it is very difficult to determine which linguistic process underlies a new derivative word - the process of word formation or the process of borrowing. The assignment of such nomina agentis and nomina instrumenti to the category of word formation or borrowing is complicated by the fact that the source language (English) also contains a word - the name of the agent or the name of the instrument of action, which formally and meaningfully coincides with the German word-formation product.

In this matter, the appropriate dictionaries are not always reliable helpers. On the one hand, it is impossible to include all neoplasms in the vocabularies of dictionaries; on the other hand, different dictionaries evaluate such controversial innovations unequally, as can be seen on the example of the lexemes Test, testen and Tester. According to the dictionary of Anglicism's [2, 1515] all three words are borrowings from the English language. In the dictionary of foreign words [6, p. 196] testen is regarded as a derivative verb formed in German from a previously borrowed noun Test, and the noun Tester is a German derivative that arose under the influence of the equivalent English noun tester. The reason for the different interpretation is, as in the case of word composition, that both languages have derivational models of conversion, noun → verb (Test → testen) and derivation with the meaning nomina agentis, verb + suffix -er' (testen → Tester), and analysis of usage examples allows for both interpretations. In the dictionary of the new vocabulary of the German language of the 90s of XX century a double interpretation of the emergence of a new word is allowed. So, the noun Chatter is interpreted as a derivative of the previously borrowed verb chatten, however, with the mark: "Chatter kann auch als Lehnwort interpretiert werden (Engl. Chatter)" [13, 60].

Synchronously, it is impossible to classify such new words with certainty either as borrowings or as products of word formation, since the recognition of a word by borrowing from the English language has as many reasons as there is to classify it as a word-building product in the space of the German language. According to L.P. Krysin, who investigated such cases in the vocabulary of the Russian language, "many of these alternatives do not have an unambiguous solution" [1, 197]. In such cases, we can talk either about lexical polygenesis (parallel independent emergence of new words in both languages) [3, 40], so that in order to update the vocabulary, lexical material is used that is already available in the German language, or about the possible direct borrowing from the English language, or about the strengthening of the tendency of lexical

development already existing in the German language under the influence of the English language [4, 94].

Nomina agentis are formed in modern German not only from the stems of borrowed verbs, but also from substantive and adjective stems of foreign language origin, most often with the -er suffix, for example: Beachvolleyball → Beach vollerballer, Handyparken → Handyparker, Junkmail → Junkmailer, Streetball → Street baller, all-inclusive → All-inclusivler, online → Onliner, as well as with international suffixes of Latin origin, for example, Streetart → Streetartist.

From the stems of the borrowed nomina agentis, grammatically marked by the masculine gender, the names of the females are formed. The way of word formation, specializing the sex feature, is moving [9, p. 182] by means of the -in suffix. At the same time, the markedness of the names of a masculine person on the basis of sex is manifested only in comparison with the names of a feminine person, in other cases, male names, on the contrary, is unmarked and can be used in the nomination of persons of both genders. For example: Carsharer → Carsharerin, Ca- semanager → Casemanagerin, Fundraiser → Fundraiserin, Handbiker → Handbikerin, Infotainer → Infortainerin, Loser → Loserin, Powerseller → Powersellerin, Shareholder → Shareholderin, Smartshopper → Smartshopperin, Stalker → Stalkerin, Television → Traceurin, Webmaster → Webmasterin, etc.

In the German language of the latest period, the formation of names of processes or actions in the subject plan in -isierung is also actively taking place, mainly from the bases of words of foreign language origin. In the most general terms, the data nomina actionis in -isierung denote the processes of mass distribution in modern society of what is called the nominal part of the producing basis, or the processes of endowing with a certain property named in the nominal part of the producing basis. Observations on the linguistic material show that the newly formed abstract nouns in the modern German language, as a rule, name socially significant processes. We are talking about changes that cause a mostly skeptical attitude in society. This series of abstract nouns in -isierung has an open character. In most cases, we are talking about occasional lexical innovations that realize a certain stylistic goal and are marked by the dominance of a certain pragmatic function. In the lexical meaning of such neoplasms, in most cases there is a pragmatic aspect, which conveys the predominantly skeptical attitude of the speakers to the designated process. Thus, the new formation of McDonaldisierung denotes the current trend towards rationalization and low-level unification of processes in many public spheres, by analogy with the worldwide fast food chain McDonald's. By using the designation McDonaldisierung, the speaker expresses his critical attitude towards the progressive drive for rationalization and efficiency in many areas of life in connection with the process of globalization, which is seen as universal alignment and the elimination of diversity and individuality. Compare, for example: "Die Globalization regt zu einer stärkeren Besinnung auf die eigene Identi tät an. Die McDonaldisierung führt zu einer Gleichmacherei, in der alle Konturen und Spezifika verlorengehen "(Nürnberger Nachrichten, 17.09.2008).

The word-formation model, according to which these lexical units are formed, has a great derivational potential. The analysis of the linguistic material reveals a very indicative trend in the period under study: the formation of lexical innovations of the type under consideration is characterized by the existence of missing links in the word-formation chain. Verbs can be derived from such nominal stems by explicit derivation with the suffix -isieren. But the real

prevalence of these formations is different. Abstract nouns ending in -isierung are most commonly used, and verbs ending in -isieren with these abstract nouns are often less common (for example, Eventisierung, eventisieren) or absent altogether (for example, McDonaldisierung in the absence of the verb * mcDonaldisieren).

Such neoplasms are identified through a productive name. The producing base of the name plays the role of a symbol, a conditional prototype, with which certain ideas and associations are associated in society. In the process of nomination, the knowledge that has developed under the influence of social conditions and previous experience is restored and its most essential elements are extracted to form the name of a new concept. For example: Boulevardisierung - the orientation of the media towards the entertainment of the general public, mainly through a simplified and superficial depiction of processes, events (die Boulevardisierung des Fernsehens / der Medien); Eventisierung - the transformation of an event in the field of art, science, sports or daily activities into a major entertainment and advertising event (die Eventisierung der Wissenschaften / des Alltags / Fußballs / Museumsbetriebes); Yuppisierung is the process of transforming city blocks or entire cities into elite ones intended for prosperous and wealthy young people (Yuppisierung ganzer Stadtteile / Hamburgs).

For the sake of completeness, examples of derivative nouns formed according to other derivational models that are productive in the modern German language from the stems of verbs, adjectives and nouns should be given. For example: twittern → Getwitter, Twittererei; podcasten → Podcasterei; Cybernaut → Cy bernautik; Sequel → Sequelitis.

In substantive word formation, one can also trace the indirect influence of the English language. A large number of borrowed nouns with non-derivative stems, such as Job, Boom, Shop, Bluff, Talk, from a derivational morphological point of view, correlate with endogenous (proper German) verbal nouns formed by conversion (cf. Schlaf, Ruf, Ritt). This stimulates conversion as a way of word formation in the German language, which is expressed in the emergence of new converted nouns. We believe that nomina actionis, relatively recently arising from the stems of German weak verbs, such as Dreh, Schwenk, Stau, Treff, Kick, are formed by analogy with English borrowings with non-derivative stems.

The increasing productivity of derivation with the -i suffix, which serves mainly for the formation of informal names of persons in the German language (Schlucki, Knacki, Knasti, Studi, Ersti, Grufti, Blondi, Hirni) can also be stimulated by a relatively large number of Englishisms with the -y / ie [10, 69.]. From the English language, for example, Groupie, Hippie, Junkie, Speedy, Teenie / Teeny, Yuppie, Zombie, etc. were borrowed. Both Anglicism's and German neoplasms proper show mostly hypocoristic (informally diminutive), ironic or even pejorative nuances of meaning. In both German and English, the explicit derivation can be preceded by a truncation of the original stem: cabdriver → cabby, Student → Studi. With the help of the suffix - i, new words can be formed not only from the stems of nouns, but also from the stems of adjectives, for example: schaff → Schlaffi, schwul → Schwuli, blöd → Blödi.

Adjectives are also formed from the bases of borrowed lexical units, for example: chillen → chillig, Cybernaut → cybernautisch. Relatively widespread are adjectives with the -bar suffix, formed from the stems of borrowed verbs, for example: downloaden → downloadbar, googeln → googelbar, han deln → handelbar, outsourcen → outsourcebar, scrollen → scrollbar, as well

as adjectives with the *-mäßig* suffix, formed from the stems of English *-nouns*, for example: *Flatrate* → *flatratemäßig*, *Skype* → *skypemäßig*, *Spam* → *spammäßig*, etc.

As the analysis of neological material shows, the English language is now strongly influencing both the vocabulary of the German language in general and the functioning of its word-formation system in particular. The bases of borrowed lexical units are actively involved in the formation of new words according to the traditional word-formation models of the German language. The class of verbs and verb units is being replenished especially intensively. The foundations of simple verbs of English origin are actively involved in the formation of German derivative verbs by prefixing, as well as in the formation of verbal units with prepositions and pronoun-adverbial particles. Borrowing of English phrasal verbs can be accompanied by the replacement of adverbial components with native German prepositional or pronominal adverbial particles. Suffix derivation from verb stems is less popular in modern German. Under the influence of the English language, such a derivational method as regressive derivation from the stems of complex nouns in *-ing* is gaining popularity. New verbs arise from the stems of borrowed lexical units also by converting and reducing complex verb stems of English-language origin to simple verb stems by truncating one of the original components.

In the field of the formation of derivatives of nouns from the stems of borrowed lexical units, the most numerous group is represented by verbal nouns of the type *nomina agentis* and *nomina instrumenti*, formed from the stems of borrowed verbs using the suffix *-er*. In many cases, however, it is very difficult to determine which linguistic process underlies a new derivative word - the process of word formation or the process of borrowing. The names of the doer are formed in modern German not only from the stems of borrowed verbs, but also from the substantive and adjective stems of Anglophone origin. From the stems of the borrowed *nomina agentis*, which are grammatically masculine, the names of females are formed by moving with the suffix *-in*. In the German language of the latest period, the formation of names of processes or actions in the subject plan in *-isierung* is also actively taking place, mainly from the bases of words of foreign language origin. Among the attribute names, adjectives with the *-bar* suffix, formed from the stems of borrowed verbs, are relatively widespread.

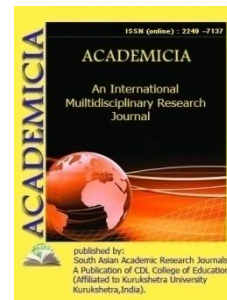
Anglicism's affect the word-formation system of the German language and indirectly: being present in the vocabulary of the German language, they play the role of structural and semantic samples for the development of productive word-formation models. A large number of borrowed nouns with non-derivative stems stimulate the formation of proper German words by conversion from verb stems. The increasing productivity of derivation with the *-i* suffix, which serves mainly for the formation of informal names of persons in the German language, can also be explained by the relatively large number of Englishisms with the *-y / ie* suffixes.

The formation of numerous derivatives of words from the bases of borrowed lexical units is a vivid evidence of their mastery in modern German. The use of lexical units of foreign language origin in order to further develop the vocabulary of the receiving language speaks of its viability, high creative potential.

THE LIST OF USED LITERATURE

1. Krysin L.P. Slovoobrazovanie ili zaimstvovanie / L.P. Krysin // Liki yazyka: K 45-letiyu nauchnoj deyatel'nosti E.A. Zemskoj: sb. nauch. st. - M.: Nasledie, 1998. - S. 196 – 201.

2. Anglizismen-Wörterbuch. Der Einfluß des Englischen auf den deutschen Wortschatz nach 1945: slovar' / Begründet von Broder Carstensen, fortgeführt von Ulrich Busse. – 3 Bde. – Berlin [u.a.]: de Gruyter, 1993 – 1996. – 193, 1752, – 42 S.
3. Barz I. Englisch in der deutschen Wortbildung / I. Barz // Eichinger L., Meike M., Domínguez Vázquez M. J. (Hg.). Wortbildung heute. Tendenzen und Kontraste in der deutschen Gegenwartssprache. – Tübingen: Gunter Narr, 2008. – S. 39 – 60.
4. Carstensen B. Evidente und latente Einflüsse des Englischen auf das Deutsche [Tekst] / B.Carstensen // Fremdwortdiskussion. – München: Fink, 1979. – S. 90 – 94.
5. COSMAS II – Cosmas Management and Analysis System: korpus. – URL: [https://cosmas2.ids-mannheim.de/cosmas2-web/].
6. Deutsches Fremdwörterbuch: slovar' / Begonnen von Hans Schulz, fortgeführt von Otto Basler, weitergeführt im Institut für deutsche Sprache, bearbeitet von Alan Kirkness, Elisabeth Link, Isolde Nortmeyer, Gerhard Strauß unter Mitwirkung von Paul Grebe. – Band 5: T. – Berlin [u. a.], 1981. – VI, – 580 S.
7. Eichinger L.M. Weltansicht in Wörtern. Vom Zweck und Nutzen verbaler Wortbildung / L. Eichinger // Šimečková A., Vachková M. (Hg.). Wortbildung, Theorie und Anwendung. – Praha: Karolinum, 1997. – S. 24 – 41.
8. Erben J. Einführung in die deutsche Wortbildungslehre / J. Erben. – 5., durchges. und erg. Aufl. – Berlin: Schmidt, 2006. – 205 S.
9. Fleischer W., Barz I. Wortbildung der deutschen Gegenwartssprache / W. Fleischer, I. Barz. – Tübingen: Niemeyer, 2007. – 382 S.
10. Glück H., Sauer W.W. Gegenwartsdeutsch / H. Glück, W.W. Sauer. – Stuttgart, Wien: Verlag J.B. Metzler, 1997. – 190 S.
11. Loskant S. Das Lexikon der Trendwörter: von Abzocke bis Zuwendungsempfänger: slovar' / S. Loskant. – Gütersloh: Wissen Media Verlag, 2006. – 192 S.
12. Neologismen der 90er Jahre: slovar'. – URL: <http://www.owid.de/Neologismen>.
13. Neuer Wortschatz: Neologismen der 90er Jahre im Deutschen: slovar' / Von Dieter Herberg; Michael Kinne; Doris Steffens. – Berlin [u. a.]: de Gruyter, 2004. – XXXVII, – 393 S.
14. Schmid H.-J. Englische Morphologie und Wortbildung. Eine Einführung / H.-J. Schmid. – Berlin: Schmidt, 2005. – 247 S.
15. Ziffonun G. Grammatische Integration jugendsprachlicher Anglizismen / G. Ziffonun // Deutschunterricht. – 2000. – Heft 4. – S. 69 – 84.



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"COMPARATIVE AND FUNCTIONAL STUDY OF ADVERBIAL CLAUSES OF TIME IN ENGLISH AND UZBEK"

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ABSTRACT

The world up to the present stage of development of linguistics in linguistics, including Uzbek linguistics significant research work on the study of its theoretical foundations was carried out. Interact with different tools in terms of content and grammar two that represent a coherent whole that has the integrity of a cohesive tone and sentences made up of more simple sentences are called compound sentences. The grammatical basis of compound sentences is two or more sentences, a whole that is interconnected according to the content of its constituent parts forms.

KEYWORDS: *Punctuation, Simple Sentences, Morphological, Subject, Conjunction, Complex Sentences, Linguistics.*

INTRODUCTION

In English, compound sentences are divided into two types: connected compound sentences (compound sentences) and compound sentences (complex sentences). Linked sentences are simple, with equal rights and not subject to each other consists of sentences. Simple sentences that are part of a connected compound sentence **and, but, or**.

He speaks English but his sister speaks German.

Even if two or more sentences are connected without a conjunction, they are Uzbekas in the language, can form a connected compound sentence. In this case it will be possible to put an oath in the middle of simple sentences. Without a binder a semicolon between simple sentences in a compound sentence put:

The signal was given; the steamer moved slowly.

Subordinate clauses are two or more that do not have equal rights consists of excess sentences. In this case, one sentence is subordinate to the other. Other the sentence that explains the sentence is called the Subordinate Close. The sentence being interpreted is called the Principal Clause. Follow compound sentence components are words in the function of connectors or connectors links to:

He thought that the train arrived at 6.15.

Follow-up questions are questions that are essentially simple pieces of speech is placed. Only the following sentence is a common form of a part of speech. So the more pieces of speech there are, the more types of sentences to follow.

Punctuation in adverbs in English and Uzbek noting that the use of symbols is also unique, the most commonly used punctuation is the different use of commas Here are some examples of cases:

The heavy rain rose and kept no one out of the house.**The man touched it and rebuilt the abandoned land.**

However, simple sentences in a compound sentence connected in English if it is connected without any connectors, a semicolon is used.

The moon is full; the stars are out.**Call me tomorrow; I will give you my answer then.**

At the same time, it should be noted that in compound sentences it is specific to the text the presence of characters is natural. This is a reciprocal of several statements observation in the presentation of a completed opinion as a result of the approach possible. However, with this we have to apply the concept of joint speech we do not want to object. The point is, it's both a simple sentence and a compound sentence when it comes to text status (e.g., paragraph status), from the term 'speech' and using the rules applied in its syntactic analysis will not happen. When we interpret them without the concept of text, of course, using traditional terms and the concept of parts of speech we can. But AM Peshkovsky commented on the term "joint speech." it is different in that several sentences are called a single sentence mentioned in the Hamoz period that it causes misunderstandings was. In our view, Peshkovsky's comment is at the level of a joint statement is inextricably linked with the presence of a text hall.

It is from this that the linguistics of the text of compound sentences complex syntactic devices in a microtext template in terms of the study of the style seems expedient. But that's also to say it is only when we take the compound sentences independently we can talk about the status of the microtext, and they are in the composition of the macrotext is active as a component of this text.

In terms of content and grammar of three or more simple sentences a compound sentence made up of compounds is called a compound sentence. This is a joint the difference between a sentence and a simple compound sentence is that if it is a simple compound sentence consists of two simple sentences, three and more simple sentences are intertwined.

In English, too, follow the preposition in compound sentences a comma is used to separate the sentence. But one smaller than the Uzbek language The difference is that in English, the

dominant sentence comes before the subordinate clause there is no comma between them; only if the subject comes before the governor's sentence comma is used.

Because Henry and Pascal arrived at the bus stop before 10 o'clock, Jeff did not see them at the station. While he waited at the train station, Jeff realized that the train was late.

Like any language unit, a sentence, especially a compound sentence, is two is a one-sided unit, i.e. it has an expression side and a content side. Long mainly the expression and partial content of the compound sentence over time aspects were studied.

A number of scientific papers devoted to the study of compound sentences to study their linguistic-theoretical issues despite their existence is still relevant. However, the conjunctions are complex although constructive microtexts are very common in communicative contexts actively applied. As it demonstrates the incomparable potential of language any research speech act while performing the task of making speech must be carried out taking into account the circumstances.

In grammar, an adverbial is a word or a group of words adverbial that modifies or more closely defines the sentence or the verb. (The word adverbial itself is also used as an adjective, meaning "having the same function as an adverb".) Look at the examples below:

Danny speaks fluently. (telling more about the verb)

Lorna ate breakfast yesterday morning. (telling when the verb's action occurred)

An adverbial clause is a dependent clause that functions as an adverb. That is, the entire clause modifies a verb, an adjective, or another adverb[citation needed]. As with all clauses, it contains a subject and predicate, though the subject as well as the (predicate) verb may sometimes be omitted and implied.

An adverbial clause begins with a subordinating conjunction—sometimes called a trigger word. (In the examples below the adverbial clause is italicized and the subordinating conjunction is bolded.)

- Mary, the aspiring actress, became upset as soon as she saw the casting list.

(subject: she; predicate: saw the casting list; the clause modifies the verb became)

- Peter Paul, the drama teacher, met with Mary after she came to the next class."

(explicit subject: she; predicate: came to the next class.; predicate (verb): came; the clause modifies the verb met)

- He talked carefully in order to appear fair.

- He talked carefully in order .. [that 'he'] appear fair.

(Implied subject, he, is omitted; predicate (verb): appear; the clause modifies the adverb carefully)

- The little boy preferred fierce dinosaurs, as [was] T rex.

(Subject of the clause: T rex; predicate of the clause: [was], implied; the clause modifies the adjective fierce.)

According to Sidney Greenbaum and Randolph Quirk, adverbial clauses function mainly as adjuncts or disjuncts, which parts also perform in a sentence as adverbial phrases or as adverbial prepositional phrases (Greenbaum and Quirk, 1990). Unlike clauses, phrases do not contain a subject and predicate; they are contrasted here:

- We left the convention the day before.

(Adverbial phrase; contains no subject or predicate)

- We left before the speeches.

(Adverbial prepositional phrase; contains no subject or predicate—and no verb (action) is implied)

- We left after the speeches ended.

(Adverbial clause; contains subject and predicate)

- We left after the speeches.

or, (".. After the speeches [ended]")

(adverbial clause; contains subject and predicate, but the verb 'ended' is omitted and implied).

CONCLUSION

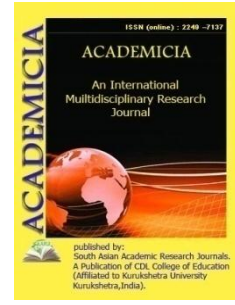
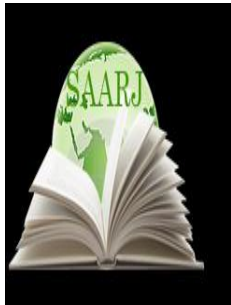
In short, English and Uzbek are different systematic languages and are more specific than general can be seen that the sides are more. These languages are only genetic but also morphologically (typologically) distant from each other is calculated. Therefore, word formation in both languages creates a word form pronunciation, sentence construction and other grammatical features differ from each other does. The same can be said of compound sentences.

As we can see, a compound sentence in English is a compound sentence the relationship between the components, the punctuation used between them the signs are obvious when compared with the Uzbek language is a series of scientific works devoted to the study of compound sentences their linguistic-theoretical issues, despite the existence of works the study is still relevant.

However, the conjunctions are complex although constructive microtexts are very common in communicative contexts actively applied. As it demonstrates the incomparable potential of language any research speech act while performing the task of making speech must be carried out taking into account the circumstances.

REFERENCE:

1. Boronov J. English and Uzbek dialects. T.: Teacher, 1973.
2. Abduazimov A. A. Elementy obshchey i sravnitelno-tipologicheskoy fonologii. T.: Fan, Fan, 1981.
3. Arakin V.D. Sravnitelnaya typologiya angliyskogo yazyka. M.: Prosveshchenie, 1990.
4. Fillmore Charles J. Remarks on Contrastive Pragmatics. In - J. Fisiak (ed.), contrastive linguistics-Prospect and Problems. Padstow 1984.
5. Roget Thesaurus www.thesaurus.com.



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SMART HEALTH CARE SYSTEM USING INTERNET OF THINGS

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ABSTRACT

Health is a fundamental need. It is also a human right to have access to high-quality health care. Due to a lack of resources, India is now dealing with a slew of health problems. This review article discusses the concept of utilizing cutting-edge technology, such as the Internet of Things, to solve health problems. It provides an architectural assessment of a smart health care system based on the Internet of Things that aims to serve everyone with high-quality health care. Patients' bodily parameters may be measured in real time using this system design. Sensors gather patient body characteristics and send them to an Arduino Uno, which then sends the data to the cloud via a Wifi module. This information is saved in a MySql database server, which handles information and makes it accessible. The Android App may be used to see this information. Which may be installed on a smartphone, tablet, or computer. Authentication, privacy, security, and data management are all handled via cloud computing. If the data is abnormal, the patient and caretakers will be notified through email. Different decision-making algorithms may be used to make choices, and individuals can access the database based on them. The patient has access to their medical records. As a result, this system offers everyone with high-quality health care as well as error-free and seamless contact with patients.

KEYWORDS: *Internet of Things, Cloud server, Patient, Monitoring, Smart Health.*

1. INTRODUCTION

In today's society, health monitoring is a significant issue. Patients suffer from severe health problems as a result of a lack of appropriate health monitoring. There are several IoT devices available these days to monitor a patient's health via the internet. Health professionals are also using these smart gadgets to keep tabs on their patients[1]. IoT is quickly changing the health care sector, thanks to a slew of new healthcare technology start-ups. In this project, we'll create

an IoT-based health monitoring system that monitors the patient's heart rate and body temperature and sends an email/SMS warning when those readings exceed crucial thresholds. Thing view records pulse rate and body temperature data so that patient health may be tracked from anywhere in the world through the internet[2]. A buzzer is connected to the kit near the patient so that the patient's family are aware of the patient's severe state. The suggested system is primarily designed for situations in which physicians and patients are separated by a significant distance, and it is critical to provide the doctor with complete information on the patient's heart rate and temperature.

In terms of obtaining medical data, IoT technology offers both possibilities and difficulties. Because the data utilized is massive (Big Data), computer resources are a problem. As a result, the data must be dispersed. Furthermore, since the data is diverse in nature and is dispersed, the software method to dealing with it is via the cloud computing platform. These are made to work along with the hybrid data. To cope with the heterogeneous data, a cloud platform has been created. For industrial applications, an IoT for health care data is utilized. Sensors are used to gather information. Data is gathered using a hard wired in evaluating operational performance, and the data is linked with the technician's measurements, allowing the performance to be reviewed and determined on the basis of data[1].

The Internet of Things (IoT) is a system of interconnected computing devices, mechanical and digital machines, livestock, or people with unique identifiers that connects any object to the Internet, performs information and correspondence exchange, and realizes object intellectualized recognition, localization, tracking, monitoring, and management. It provides services based on the integration of Information Technology (IT), which is the use of computers to store, retrieve, transfer, and modify data without the need for human-to-human or human-to-computer interaction. IoT is described as "a dynamic global network architecture with self-configuring capabilities based on standard and interoperable communication protocols where physical and virtual objects have identities, physical characteristics, and virtual personalities" in this context. The IoT idea may be brought to life in the real world by combining a number of promising technologies. IoT may include identification, sensing, and communication technologies. RFID tags that interact with IoT may be identified by a unique identifier and applied to items in terms of identification technology. RFID devices may be used to track things in real time, making RFID a viable option for a sophisticated healthcare system. In terms of sensing and communication technologies, wireless sensor networks combined with IoT may provide peer-to-peer communication, while other computing and communication options in a passive system are asymmetric. It is obvious that the Internet of Things may be used to detect and communicate for a better healthcare system[3].

As a result, our study uses the Internet of Things (IoT) to gather data using sensing technologies and to communicate in order to create a smart healthcare system. Rather of applying IoT to a specific job with a limited scope, IoT may be approached with a broad scope. The Service Oriented Architecture (SOA) often necessitates the use of middleware to bridge the gap between the technical and application levels. IoT may be linked to the development of a particular application in middleware architecture[3].

Despite the fact that many academics are working on IoT middleware, there is no general middleware that can be used across all conceivable smart devices, such as smart homes, smart vehicles, smart hospitals, smart cities, and so on. Nonetheless, by expanding the scope of IoT, we

want to offer a notion of a smart hospital in this research. The power of many kinds of systems. As a result, RFID sensor networks can support sensing, and this study uses machine learning to analyze big data stored in cloud computing, which is a model for providing a simple, ubiquitous, on-demand network approach to a shared pool of configurable computing environments with minimal management effort[3]. IoT sensing devices must gather data, connect networks to store data, and evaluate data as experts to support a truly smart healthcare system. Machine learning is required to transform data into knowledge. The use of machine learning models in the area of healthcare for human illness diagnosis aids medical personnel in identifying diseases based on characteristics that are visible to the patient. In the medical sector, machine learning may be used to convert human expertise knowledge and abilities acquired via clinical experience into application software. By using machine learning, software can make correct diagnostic and treatment choices, reducing the number of needless tasks for medical personnel. As a backdrop, we examine our past research in healthcare systems focuses on contemporary technology that may be used to improve the healthcare system in two ways: research and industry[4]. We provide the blueprints for our smart healthcare system concept. The logical architecture of IoT healthcare. For improved healthcare systems, technology and data processing technology may be key high technologies[5]. The Internet of Things (IoT) aims to connect a range of activities and items in the environment so that they may interact and conduct business “anytime, anywhere, with anything and anybody, preferably utilizing any route, network, or service.” By incorporating IoT into a healthcare system, it is possible to expand healthcare systems. The Internet of Things (IoT) is a system that combines ubiquitous communication, connection, and computation with ambient intelligence[6]. It is a cyber-physical paradigm in which all real-world components may remain linked. The Internet of Things (IoT) allows people to organize their daily activities by integrating real-world components such as electronic gadgets, smart phones, and tablets that can interact both physically and wirelessly. The Internet of Things aids in the management of practically any number of devices. It seeks to bring the advantages of the internet, such as remote access, data sharing, and connection, to a variety of different application areas, including healthcare, transportation, parking, agriculture, and surveillance.

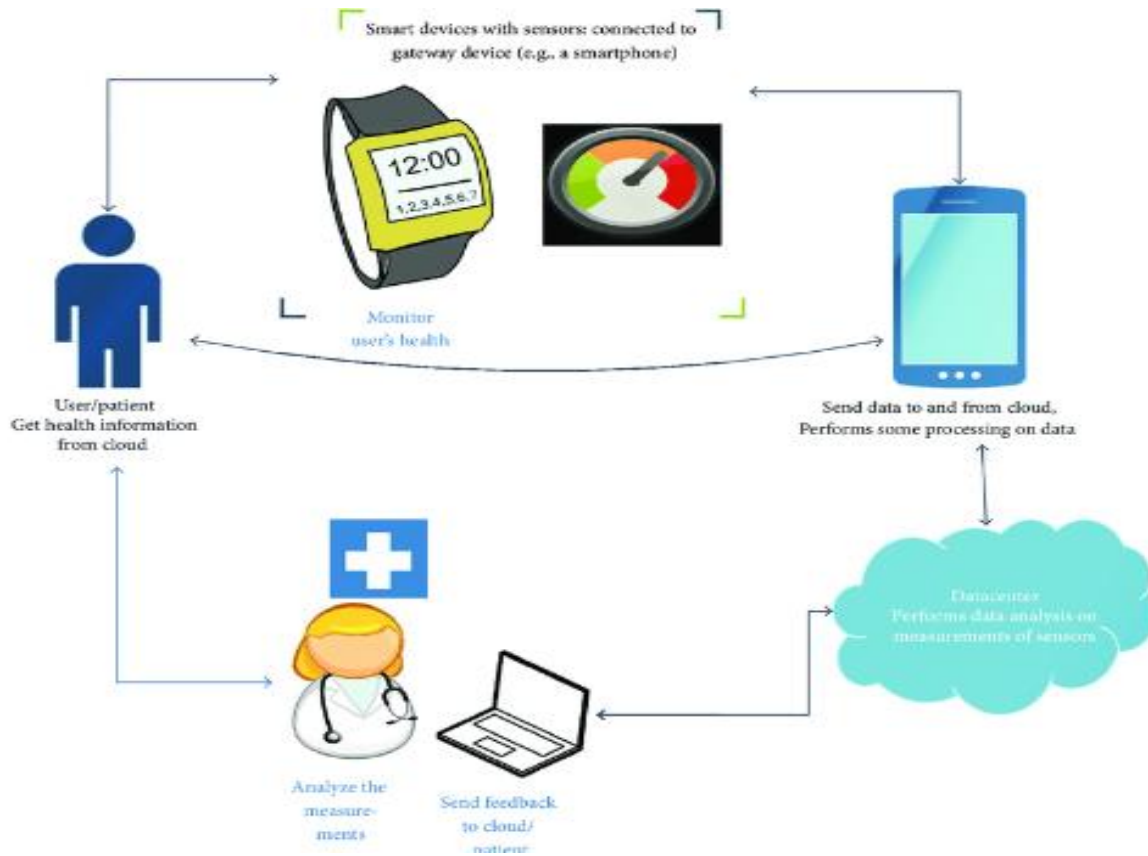


Figure 1: Diagrammatic Representation Of Smart Health Care System [RESEARCHGATE]

Using sensors, smart health monitoring devices assess the health status, such as pulse rate, body temperature, respiration rate, blood glucose rate, body posture, ECG and other factors. Various microcontroller-based systems, such as Arduino, Raspberry Pi, and others, are used to connect and operate the sensors. Sensors are used by the microcontroller to gather data. Typically, biological data is gathered and kept on servers. The gadget can determine if the patient's state is normal or abnormal based on the recorded data. This gadget gives physicians and medical assistants with real-time health care observation that they may access at any moment [7]. The device's primary benefit is its low power consumption, improved performance, great sensitivity, and ease of setup. By 2020, there are expected to be between 26 and 50 billion network-connected devices, with 100 billion by 2030. The Raspberry Pi is the most popular IoT platform. It's a low-cost Linux-based gadget. Raspberry Pi and the Internet of Things have ushered in a new age in healthcare systems. A Raspberry Pi may be turned into a mini-clinic using a combination of sensors such as a pulse rate sensor, temperature sensor, accelerometer, and respiration sensor. In many areas of the globe, these systems are in use. The primary controller of the systems is a microcontroller unit (MCU), however it does not allow parallel data processing.

The IoT is an important component of smart healthcare, since it provides significant advantages and characteristics such as identity, location, sensing, and connection. The Internet of Things (IoT) may be used to create a smart healthcare system in a variety of ways, from calibrating

medical equipment to creating a customized monitoring system. The Internet of Things (IoT) plays a major role in healthcare applications, ranging from controlling chronic illnesses on one end of the spectrum to tracking daily physical activity that may aid in achieving fitness objectives on the other[1]. The Internet of Things may be used to track medical equipment deliveries and oversee the manufacturing process. Medical data may be collected from users via IoT-based systems. The Internet of Things serves as a link between the doctor and the patient by allowing remote access, which allows the doctor to keep an eye on the patient and provide remote consultations. The Internet of Things (IoT) combines sensors, actuators, microcontrollers, CPUs, and cloud computing to provide precise findings and make healthcare accessible to everyone. The use of the Internet of Things in healthcare has prompted researchers all around the globe to develop potential frameworks and technologies that may offer everyone with convenient medical help. In addition to improving the user experience, the Internet of Things pushes the industry to automate, allowing for more research to be conducted across many platforms. A sensor/actuator, a local area network (or, in some cases, a body area network), the internet, and the cloud are all essential components of the IoT in smart healthcare. The specifications of each of these four essential components may vary greatly depending on the application and needs of the particular healthcare system. The term "smart health" refers to the use of various biometric sensors to collect human bodily data. And that sensor data may be utilized to offer smart health in a variety of ways.

- Smart health is a result of the internet of things, and the emphasis is on increasing operational efficiency and creating a cost-effective system while preserving quality, providing health records, and protecting data privacy. As a consequence, consumers get high-quality health care[8].
- One may access his or her medical data and get understanding of their physical fitness by using smart. In this area, several mobile apps and notifications are also utilized to provide alerts when data is aberrant[9].
- The pathway for smart health care is shown in the diagram below. The cloud is utilized to send data from the sensor to the patient, health care practitioner, or caretaker, who can then access the data and check on the patient's health condition[10]. Smart health care enables two-way communication between the patient and the caregiver or provider of health care.



Figure 2: Diagrammatic Representation of Pathway of Smart Health Care System [RESEARCHGATE]

1.1 Component of smart health care system:

- Intelligent Network:** IoT-driven sensors gather real-time monitoring data from smart sensors as part of the data collecting function. Sensor technology advances in the handling of data in bio optic sensors. EEG biotelemetry, ECG sensor, cardiac bit rate sensor, blood pressure monitoring, glucose monitoring, virus monitoring, and a healthcare watch are just a few of the features available. The Wireless Sensor Network (WSN) is a critical component of the IoT HEALTHCARE intelligent network. WSN technologies based on IP may be a viable option for common items. Any item, such as sensors, computers, RFID tags, or smart phones, will be able to dynamically join to the network, communicate, and cooperate effectively to accomplish various tasks when given a unique address. To be effectively controlled and maintained, the data gathered from the sensors should be accessible in cloud computing systems. As a result, data from sensors that are remotely dispersed is manipulated by a single point of software. Furthermore, industrial operations need the use of wireless communication systems to send signals obtained by distant sensors monitoring the control loop (due to the hostile environment and difficult access to the locations). This is why the study, design, and development of a remote wireless system for an industrial process have already been completed²⁸. The communication of information technology devices within the range of a personal space, usually within a range of about 10 meters, is known as a personal area network (PAN). PAN is a helpful tool for tracking the movements of elderly individuals. To create an intelligent network for IOT HEALTHCARE, WSN, PAN, and a generic network are sufficient.
- Cloud Computing:** Cloud computing, often known as on-demand computing, is a kind of Internet-based computing environment that allows computers and other computing resources to access shared processing devices and data on-demand. Through virtualization, dynamic data integration, and integrating data from many, the cloud computing paradigm offers flexible, dependable, and powerful storage and computing resources that enable high scale

computation. Cloud computing's main aim is to provide scalable and easy-to-use computer resources and IT services. It is difficult to exchange patient data in a specific hospital since the data format is incompatible with others. Exams must be repeated if a patient has to be transferred to another hospital. It's a waste of time and money. As a result, hospitals must exchange patient information in a secure manner. Furthermore, each hospital is not required to retain all raw data gathered in order to evaluate a patient's condition. As a result, cloud computing is the best solution for a storage system in IOT HEALTHCARE.

- *Data Analysis:* Machine learning is used by the data analysis module. The science of teaching computers to behave without being explicitly programmed is known as machine learning. Machine learning has given us clever cars, practical speech recognition, efficient online search, and a far better knowledge of how to maximize a performance criteria using example data or previous experience. Machine learning must be used to summarize relevant results from stored data; otherwise, computers would spend processing time dealing with insignificant data. Machine learning is accelerated by improved data collecting, networking, and faster computers, while human specialists struggle to extract information from vast amounts of data. The degree of dependability in the analysis results is improved by using an algorithm approach. Figure 5 depicts the algorithm's approach. Because the definition of "enough data" is unclear, it is considered a condition of enough data if it has been recognized as a successful practice for more than three times. The study's findings help the system offer real-time advice and warnings to medical personnel and assistants about changes in vital signs or patient transitions, as well as significant changes in environmental factors, so that preventive treatment may be provided.

DISCUSSION

A smart health monitoring system based on the Internet of Things (IoT) is a patient monitoring system that can monitor a patient 24 hours a day, seven days a week. In today's world, the Internet of Things (IoT) is transforming the technological infrastructure. IoT has allowed us to implement many complicated systems such as smart home appliances, smart traffic control systems, smart office systems, smart environment, smart cars, and smart climate control systems in very little area by enabling easy interaction among different modules. One of the most well-known IoT applications is health monitoring. Many different designs and patterns have previously been developed to use IoT to monitor a patient's health. A review of IoT-based smart health monitoring systems is given in this article. The newest novel technologies created for IoT-based smart health monitoring systems have been addressed, along with their benefits and drawbacks. The goal of this study is to identify common design and implementation trends for intelligent IoT-based smart health monitoring devices for patients.

CONCLUSION

It has been outlined how IoT is being used in health monitoring systems. Despite the fact that IoT is being utilized in all areas of medical science, there is always space for development and study. Early detection of any health issue may assist the patient in taking the required emergency steps, which may save his or her life. In this case, the Internet of Things (IoT) may assist. Patients may be monitored in real-time by IoT-based health monitoring devices, which can alert them to any anomalies. However, the IoT architecture must include features that guarantee sensitive data is kept secure. In addition, the sensors utilized must be small enough to be readily

integrated into a variety of systems. Finally, the application of different machine learning and deep learning methods may improve the accuracy and robustness of the systems. The concept of a smart health monitoring system based on IoT architectures is a new addition to medical research that will help to decrease health problems and prevent unnecessary deaths.

REFERENCES

1. J. Kharel, H. T. Reda, and S. Y. Shin, "An architecture for smart health monitoring system based on fog computing," *J. Commun.*, 2017, doi: 10.12720/jcm.12.4.228-233.
2. V. Vippalapalli and S. Ananthula, "Internet of things (IoT) based smart health care system," 2017, doi: 10.1109/SCOPES.2016.7955637.
3. M. Bansal and B. Gandhi, "IoT based smart health care system using CNT electrodes (for continuous ECG monitoring)," 2017, doi: 10.1109/CCAA.2017.8230002.
4. A. Santos, J. Macedo, A. Costa, and M. J. Nicolau, "Internet of Things and Smart Objects for M-health Monitoring and Control," *Procedia Technol.*, 2014, doi: 10.1016/j.protcy.2014.10.152.
5. M. S. Hossain and G. Muhammad, "Cloud-assisted Industrial Internet of Things (IIoT) - Enabled framework for health monitoring," *Comput. Networks*, 2016, doi: 10.1016/j.comnet.2016.01.009.
6. M. N. Kamel Boulos, A. D. Tsouros, and A. Holopainen, "'Social, innovative and smart cities are happy and resilient': Insights from the WHO EURO 2014 International healthy cities conference," *International Journal of Health Geographics*. 2015, doi: 10.1186/1476-072X-14-3.
7. F. Nasri and A. Mtibaa, "Smart Mobile Healthcare System based on WBSN and 5G," *Int. J. Adv. Comput. Sci. Appl.*, 2017, doi: 10.14569/ijacsa.2017.081020.
8. M. Thangaraj, P. P. Ponmalar, and S. Anuradha, "Internet of Things (IoT) enabled smart autonomous hospital management system - A real world health care use case with the technology drivers," 2016, doi: 10.1109/ICCIC.2015.7435678.
9. R. Gravina, P. Alinia, H. Ghasemzadeh, and G. Fortino, "Multi-sensor fusion in body sensor networks: State-of-the-art and research challenges," *Inf. Fusion*, 2017, doi: 10.1016/j.inffus.2016.09.005.
10. A. L. Kor, M. Yanovsky, C. Pattinson, and V. Kharchenko, "SMART-ITEM: IoT-enabled smart living," 2017, doi: 10.1109/FTC.2016.7821687.



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AN EVALUATION OF BIOMASS GASIFICATION MODELLING

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ABSTRACT

Corn fermentation competes with the world food supply, while sugarcane fermentation contributes to deforestation. As a result, even if it is economically possible, the renewable and sustainable development of these two bio-based energy sources may not be desired. Biomass gasification, on the other hand, is far more versatile in terms of the bio-feedstock or waste that may be used to create biofuels or co-generate power and heat on demand. Downdraft gasifiers are well-suited for small-scale heat and power co-generation, whereas fluidized bed and entrained flow gasifiers currently reach promising economies of scale for fuel production. The frequency of different modeling options used, as well as the patterns shown by this data, are presented. This article offers a concise guide to the modeling decisions that must be made early in a modeling study or project for novice researchers. A comprehensive technique characterization is presented, which includes important modeling decisions that have not been clearly addressed in previous assessments. This survey gives seasoned researchers their first statistical snapshot of what their peers are working on.

KEYWORDS: *Biomass Gasification Equilibrium model Stoichiometric model Kinetic model Tar.*

INTRODUCTION

The main three fossil fuels now provide approximately 80 percent of the world's primary energy needs. Biomass and trash make up the second largest contribution, accounting for around 9%. Nuclear, hydropower, and the trio of fast increasing renewables geothermal, solar, and wind provide the rest of the world's energy requirements. The use of fossil fuels to generate energy has severe social, political, and environmental consequences, as fossil fuel combustion has raised global concentrations and accelerated climate change. These ramifications are powerful

motivators for the development of renewable and locally accessible energy sources. Biochemical and/or thermo chemical procedures are required to recover energy from biomass or organic solid waste. Biomass is transformed to biofuels via the digestive activity of living organisms during biochemical processes like fermentation[1]. Thermo chemical processes, on the other hand, use heat and/or pressure to transform biomass into biofuels, gases, and chemicals. Gasification, which is also often used to gasify coal and natural gas, is the most well-known thermochemical biomass-to-energy and waste-to-energy conversion process, and it is attracting increasing scientific and commercial attention. Gasification, in comparison to more traditional methods such as incineration, produces syngas from biomass for future biofuel synthesis and generally achieves higher power generation efficiency[2]. When compared to alternatives such as incineration or biogas from digesters, gasification recovers more power per kilogram of biomass or per kilogram of municipal garbage. With current or little changed infrastructure, energy may be produced from syngas using gas engines, gas turbines, or fuel cells.

There is currently a large body of work that uses models of several kinds of gasifiers with varying degrees of sophistication. However, there are few reviews of these modeling and simulation research. Our search yielded seven more evaluations, which would seem to be adequate if not for the fact that many of them are very similar[3]. There is a specific need for reviews that evaluate modeling methods and address key questions about what is known about the relative advantages of various modeling approaches, rather than just listing kinds of models and previous research. For example, the present study is the first to look at whether stoichiometric and nonstoichiometric models provide the same results. The current study is also the first to address one of the most important decisions a modeler must make: whether to adopt a complete equilibrium or semi-equilibrium method[4]. The inclusion of sample data showing the frequency of usage of the different competing modeling options in the literature to date is another aspect of the current research that sets it apart from previous studies.

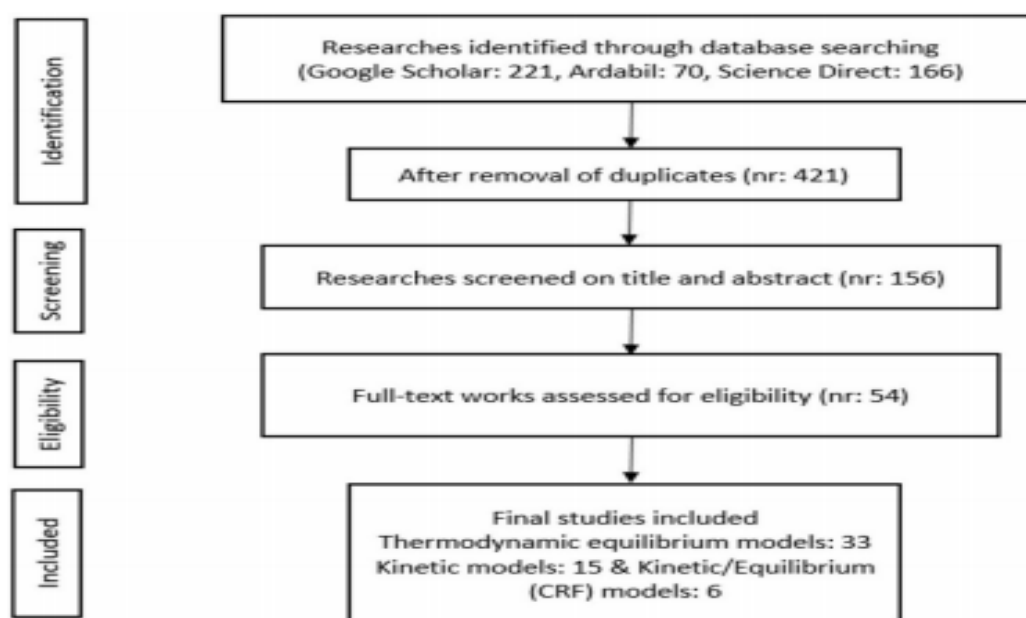
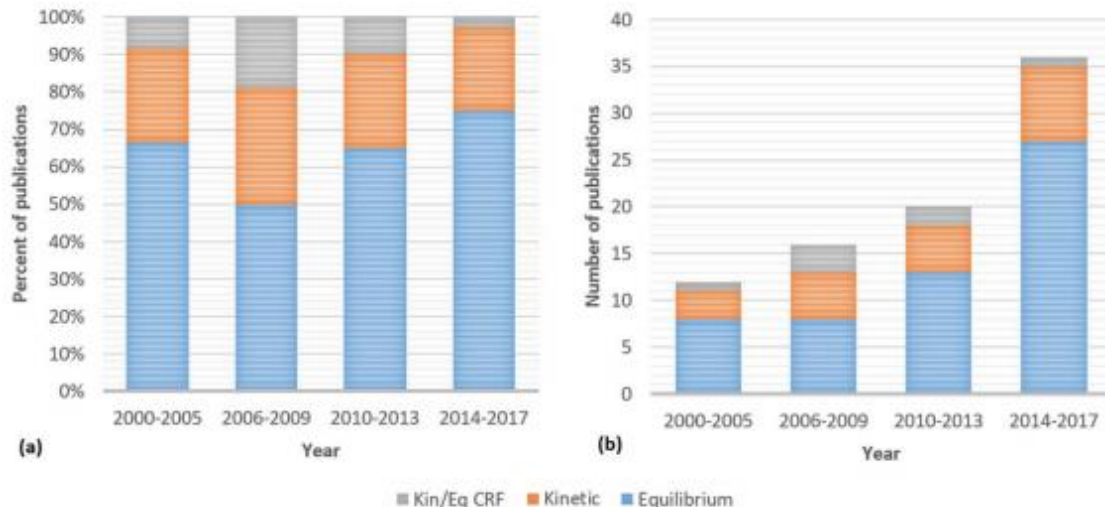


Figure 1:Flow diagram depicting the details of the literature search.

This section explains how the systematic search approach (shown in Fig. 1) was used to select articles for inclusion in the review's statistics and comments. To begin, keywords gasification and modeling or modeling were searched in three databases: Google Scholar, Ardabil Science, and Science Direct. Further evaluation of eligibility based on full-text publications resulted in the selection of 54 research, including 33 thermodynamic equilibrium models, 15 kinetic models, and 6 kinetic/equilibrium (CRF) models. One goal of the present study was to get a better grasp of how common these methods are.

**Figure 2:Overview of gasification models since 2000, (a) as percent, (b) absolute number of studies**

Gasification process and technologies

Gasification process overview

The combustion of solid or liquid fuel into syngas is known as gasification. Syngas may be used as a chemical feedstock or directly as a fuel to produce heat, power, or both. The phases of the gasification process are: drying, pyrolysis, oxidation, reduction, and cracking (Fig. 3). The moisture content of biomass feed typically varies from 5 to 35 percent, but it is decreased to less than 5 percent throughout the drying process. The biomass is heated from 200 to 700 °C in the pyrolysis phase with little oxygen or air. The volatile components of the biomass are evaporated under these circumstances. Furthermore, the hydrogen in the biomass may be oxidized, resulting in the production of water[5]. The reduction processes that take place within the gasifier are endothermic, and the energy needed for them comes from the burning of char and volatiles. Through a series of processes, biomass reduction produces combustible gases such as hydrogen, carbon monoxide, and methane; the major reactions in this subcategory are as chooses to follow:

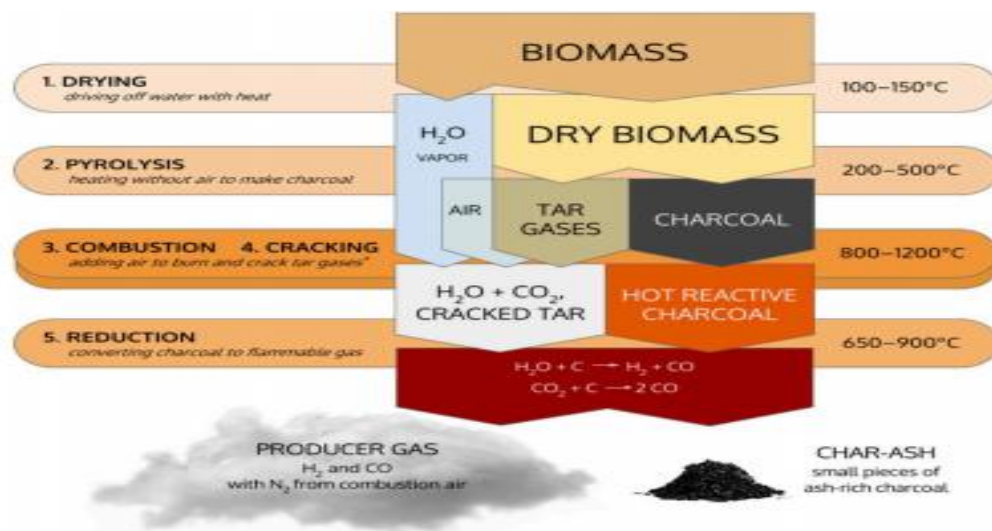


Figure 3: Gasification process steps

Biomass gasification technologies Fixed beds and fluidized beds are the two most common kinds of gasifiers.

- **Fixed-bed:** Gasifiers having a bed filled containing solid fuel particles and the gasifying medium and gas ascending, descending, or migrating horizontally through the reactor are classified as fixed-bed gasifiers. Air, steam, oxygen, or a combination of these may be used as the gasifying medium. When compared to fluidized bed alternatives, fixed-bed gasifiers have two major practical advantages: they are substantially more cost-effective for small-scale applications and they generate a clean product gas with minimal dust and tar content.
- **The fluidized bed:** A fluidized bed is a cylindrical column that holds particles and flows fluid across it. The fluid's velocity is high enough to suspend the particles inside the column, resulting in a wide surface area for the fluid to touch, which is the main benefit of fluidized beds. Fluidized beds' primary potential benefits are better heat and material transmission between the gas and solid phases.

Fluidized bed generators and entrained flow digester seem to be the most viable options for biofuel production facilities among these gasifier types[6]. Downdraft gasifiers have emerged as the most appropriate choice among gasifier types for small-scale distributed power generation.

Models for biomass gasification

Equilibrium and kinetic models are the two major types of gasification models. According to this study of gasification modeling options, about 60% of biomass gasification simulations use an equilibrium model, while the remaining 30% use a kinetic model. The major variants of both of these methods will be discussed in this part, but first a short overview of the reasons for modeling and simulating biomass gasification will be discussed. Furthermore, the advantages and disadvantages of various techniques are collected[7]. To obtain a desired syngas composition and production, a gasification plant operator must optimize the feedstock flow rate, agent flow rate, equivalence ratio, reactor pressure, and temperature. Any of these variables may have a significant effect on the product compositions and gasifier performance.

Furthermore, since the chemistry and fluid dynamics of gasification are very sensitive to changes in feedstock composition, moisture, ash content, particle size, and density, the permissible range for feedstock characteristics is relatively limited. In reality, laboratory experiments, pilot facilities, and field experience may and do give knowledge on the best conditions and feedstock for a reactor, but these lessons are often more time-consuming and costly than modeling.

Models of thermodynamic equilibrium

Based on the premise that the components react in a completely mixed state over an indefinite length of time, the thermodynamic equilibrium method predicts the composition of the output gases.

When compared to kinetic models, thermodynamic equilibrium calculations are simple and independent of gasifier design. In the simplest, most ideal case, general thermodynamic properties can be used for equilibrium modeling, whereas kinetic modeling requires a larger set of difficult-to-find and accurate kinetic parameters.

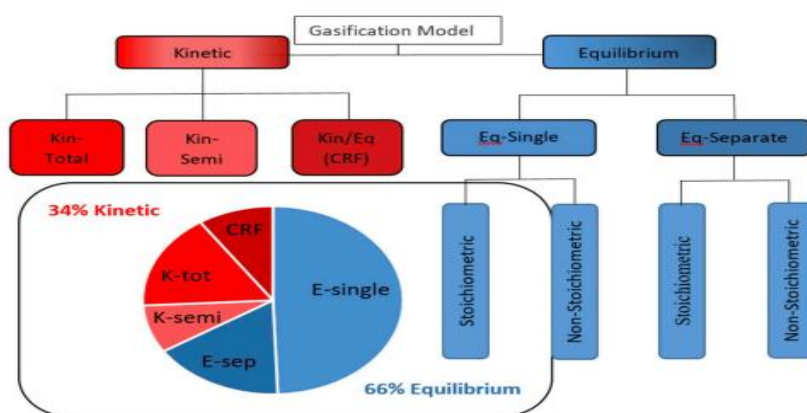


Figure 4: A categorization of gasification model types.

Stoichiometric vs non-stoichiometric models

Stoichiometric and nonstoichiometric models are the most often mentioned subcategories of equilibrium models. According to this study and a complementary more thorough theoretical examination of the S versus NS technique elsewhere, the NS method is used in about 70% of equilibrium simulations in the literature, while the S method is used in the remaining 20%. S and NS models, on the other hand, provide almost similar predictions in practically all actual biomass gasification situations, as has been thoroughly shown elsewhere. As a result, the second classification proposed in this paper, namely Eq-single and Eq-separate models, is more important. The yield and product composition anticipated by the model are usually affected by the model option between an Eq-sing and an Eq-sep. Given these facts, it's possible that past evaluations and research have paid too much attention to a model choice that has little impact on model prediction. The equilibrium of a preselected set of reactions is computed in the stoichiometric case, while the equilibrium of a preselected set of chemical species is computed in the nonstoichiometric case[8].

The nonstoichiometric technique has the following specific steps:

1. Make a list of all of the species that will be included in the simulation (in principle, all the chemical species that the modeler deems might be in the gasifier effluent in non-negligible amounts)
2. Then, for a particular feed composition (which may be described simply as the elemental composition of the feed at the reaction temperature and pressure), calculate the resultant minimal Gibbs energy distribution among all these chemical species.

Models that are eq-single vs. models that are eq-separate Consistent framework may be categorized as Eq-sep or Eq-sing methods, in conjunction to stoichiometric or nonstoichiometric. This classified based about whether the char detonation is modeled as achieving a distinguishable balance point independent of the reduction of the VM and un-combusted char, as in the Eq-sep situation, or whether the combustion and reduction reactions achieve a single global equilibrium as one reactive chemical system, as in the case of the Eq-sep scenario.

LITERATURE REVIEW

Massimiliano Materazzi studied the most significant barrier to using fluid bed gasification for waste treatment is tar generation and ash disposal, which can only be met with expensive cleaning systems and additional processing. Any use of plasma in a different heat process allows for efficient crack propagation of complex organic life to primary synthesis gas constituents while lowering electric power consumption. This research looked at the advantages of a two-stage thermal methodology over a single-stage approach in terms of thermodynamics. The simple truth that the foremost thermal waste decomposition is carried out in conditions of optimized stoichiometric ratio for the gasification reactants is one of them. Besides which, staggering the oxidant injection into two separate intake levels improves the system's efficiency and lowers plasma power consumption. After the two-stage process, a flexible model capable of providing reliable quantitative predictions of product yield and composition has been developed. This same method follows a systematic structure that incorporates atom conservation principles and equilibrium calculation routines, taking into account all conversion stages from waste feed to final products. Experimental data from a demonstrator plant was also used to verify the model. The study successfully demonstrated that a multiple gasification system improves the system's gas yield and carbon conversion efficiency, both of which are critical in single-stage systems, while simultaneously increasing performance parameters[9].

Marco Formica studied the Aspen plus was used to create a novel steady-state zero-dimensional simulation model for a full-scale woody biomass gasification facility with fixed-bed downdraft gasifier. The model takes into account the technical features of all of the plant's components and operates in line with the plant's current primary control logics. The simulation findings are consistent with those found during a large-scale experiment. Following model validation, the effect of operational factors such as the equivalent ratio, biomass moisture content, and producer gas air temperature on syngas composition was investigated in order to evaluate the experimental plant's operative behavior and energy performance. It is feasible to achieve greater values of the gasifying air temperature and an increase in overall gasification performance by recovering the sensible heat of the syngas at the gasifier's output[10].

DISCUSSION

Even if the study is attempting the more difficult job of developing a kinetic model, it may be prudent to additionally run an equilibrium model for the same application. Equilibrium may play the same function in gasification as it does in any other chemical system, showing the thermodynamic limitations of operation and how they are affected by operating parameters and inputs. The inability to assess the effect of hydrodynamic factors on gasification when simply utilizing equilibrium modeling is a disadvantage. A kinetic model is needed if the aim is to optimize or understand the impact of factors such particle size distributions, feed density, and reactivity on the output gas composition, carbon conversion, and system performance. However, kinetic models often include difficult-to-find kinetic and transport parameters. Even if these parameters are measured, the resultant model will be constrained to the particular gasifier sort and design, feedstock, agent, and operating range combination wherein the rate expression form associated parameter values are valid to some extent.

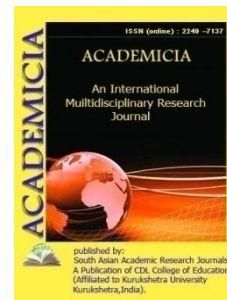
CONCLUSION

A new categorization of the most significant gasification modeling methods was provided, as well as representative data on their usage frequency. But even though the best model to use relies on a variety of variables like the simulation's objectives, the kind of gasifier, feedstock, and operating parameters, a few basic conclusions may be made. Equilibrium models, in particular, are an excellent place to start when modeling downdraft gasification. Along with its relatively simple shape and the relatively high operating temperature they usually utilize, downdraft gasifiers often function close to equilibrium. Additionally, both pyrolysis and gasification products are pushed through the oxidation zone with downdraft gasifiers, resulting in equilibrium after a short time. Due to the obvious critical significance of tar avoidance in creating viable and ecologically acceptable biomass and waste gasification technologies, tar modeling is expected and become one of the greatest active areas of study. The most pressing issue facing the biomass gasification modeling community is developing modeling methods that can sufficiently offer scientific understanding and/or practical operator advice here about how to control tar formation.

REFERENCES

1. D. Baruah and D. C. Baruah, "Modeling of biomass gasification: A review," *Renewable and Sustainable Energy Reviews*. 2014, doi: 10.1016/j.rser.2014.07.129.
2. M. Hawrot-Paw, A. Koniuszy, M. Mikiciuk, M. Izwikow, T. Stawicki, and P. Sędlak, "Analysis of ecotoxic influence of waste from the biomass gasification process," *Environ. Sci. Pollut. Res.*, vol. 24, no. 17, pp. 15022–15030, 2017, doi: 10.1007/s11356-017-9011-8.
3. A. Gómez-Barea and B. Leckner, "Modeling of biomass gasification in fluidized bed," *Progress in Energy and Combustion Science*. 2010, doi: 10.1016/j.peccs.2009.12.002.
4. G. Mirmoshtaghi, H. Li, E. Thorin, and E. Dahlquist, "Evaluation of different biomass gasification modeling approaches for fluidized bed gasifiers," *Biomass and Bioenergy*, 2016, doi: 10.1016/j.biombioe.2016.05.002.
5. S. Sharma and P. N. Sheth, "Air-steam biomass gasification: Experiments, modeling and simulation," *Energy Convers. Manag.*, 2016, doi: 10.1016/j.enconman.2015.12.030.
6. R. Mikulandrić, D. Böhning, R. Böhme, L. Helsen, M. Beckmann, and D. Lončar, "Dynamic

- modelling of biomass gasification in a co-current fixed bed gasifier,” *Energy Convers. Manag.*, 2016, doi: 10.1016/j.enconman.2016.04.067.
7. K. Weber, T. Li, T. Løvås, C. Perlman, L. Seidel, and F. Mauss, “Stochastic reactor modeling of biomass pyrolysis and gasification,” *J. Anal. Appl. Pyrolysis*, 2017, doi: 10.1016/j.jaap.2017.01.003.
 8. Q. Miao, J. Zhu, S. Barghi, C. Wu, X. Yin, and Z. Zhou, “Modeling biomass gasification in circulating fluidized beds,” *Renew. Energy*, 2013, doi: 10.1016/j.renene.2012.08.020.
 9. M. Materazzi, P. Lettieri, L. Mazzei, R. Taylor, and C. Chapman, “Thermodynamic modelling and evaluation of a two-stage thermal process for waste gasification,” *Fuel*, vol. 108, pp. 356–369, 2013, doi: 10.1016/j.fuel.2013.02.037.
 10. M. Formica, S. Frigo, and R. Gabbrielli, “Development of a new steady state zero-dimensional simulation model for woody biomass gasification in a full scale plant,” *Energy Convers. Manag.*, vol. 120, pp. 358–369, 2016, doi: 10.1016/j.enconman.2016.05.009.



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FUNCTIONAL-STYLISTIC COLOR LIMITS THE USE OF PHRASES IN CERTAIN SPEECH CIRCLES AND STYLES

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ABSTRACT

The phenomenon of polysemy present in linguistics is inherent in both speech and expression, but the degree of distribution of this phenomenon in vocabulary and phraseology is not the same. The article provides information on the phenomenon of ambiguity, in particular, on the expression of this phenomenon among somatic phraseological units in the Uzbek language. Somatic phraseology, that is, words related to the name of parts of the human body, describes the phenomenon of ambiguity. In world and Uzbek linguistics, there are some comments on the work carried out in this direction. Numerous phraseological expressions of the somatic component in the Uzbek language were used to explain the causes of this phenomenon, as well as the methodological branch. The article analyzes ambiguous phrases with the components "eye", "hand", "mouth" in the Uzbek language. The results of the analysis are confirmed by examples from fiction. The homonymy of somatic phrases allowed them to be studied by analogy, relying on the material of linguistic dictionaries of the Uzbek language, which, in turn, helped to better understand the semantic and grammatical nature of phraseological meanings. The study of polysemantic meanings in each of them on the basis of distributed analysis methods has proved that the secondary meaning, separated from the leading meaning, has the right to exist in the language as an independent lexical unit.

KEYWORDS: *Somatism, Somatic Phraseology, Phraseological Meanings, Methodology, Methodological Colorfulness.*

INTRODUCTION

Phrasema often not only expresses and evaluates a reality, but also signals the specific linguistic features of a particular style of speech. The functional-stylistic component is less relevant to the structure of phraseological meaning than the expressive-evaluative component of the phrase, because it is outside the meaning of the phrase. Functional-methodological component is included in the classification and interpretation of phrases only in rare places. It is known that the explanations given to lexical units (words) in dictionaries are given in a neutral style, regardless of the functional direction of the word. However, such a lexicographical rule for the interpretation of phrases is not always correct, because the state of expression of a positive or negative assessment of a phrase is specific to the oral style or other style of speech, its classification is also reflected in the interpretation. For example, the meaning of the phrase “putting both hands on the nose” could be interpreted as “nothing, a dry return” in neutral style, except for its expressive-assessment and functional-stylistic color. In Annotated dictionary of the Uzbek language and ADUL-5, the interpretation of this phrase is also referred to as “dry, nothing” [ADUL, 1, 152; ADUL-5, 2, 382]. However, the phrase «return without incident» is more appropriate for this phrase, which includes words typical of the oral style. In this regard, the interpretation of this phrase in the dictionary of Sh. interpretation [Phraseological dictionary of the Uyghur, 74-75] is somewhat closer to its functional-stylistic nature.

The following two comments on the verbal phrase «not to give a day» // «do not give a day» reflect its content more: [PhDUL, 130]; “He does not give a day: he does not allow to live in peace, he always pushes and suffers” [ADUL, 1, 405; ADUL-5, 2, 428].

The interpretation of the phrase «not in one's own self» in four lexicographic sources complements the other: 2, 495; ADUL5, 5, 135]; 2. He does not have it - «incredibly, very much» [PhDUL, 326] 3. He does not have joy - рад до безумия[URD, 193]; 4. Hedoesnothave [joy] - он находится на седмом небе от радости”[BURPhD, 293].

The functional direction of phrases should be taken into account, especially in the interpretation of phraseological synonyms, because they do not have the same dimension in terms of functional-stylistic, expressive. For example, the phrase «stubborn» is synonymous with the phrase «unable to think» But while one of these phrases («stubborn») is stylistically neutral, equally applicable to both oral and biblical styles, the latter is more biblical. However, they are cited in Sh. Rakhmatullayev's dictionary and interpreted in the same way as «inability to think long and come to a definite conclusion» [PhDUL, 330]. Similarly, although the expressions “to argue” are synonymous, to “reach the level of conflict” without taking into account their functional-methodological aspect [PhDUL, 18], The interpretation of “reaching the level of quarreling, controversy” [PhDUL, 232] seems to be less plausible.

It seems that the relationship between the two components of the stylistic meaning of expressions in our language is different. Accordingly, its expressive-evaluative color is not always the main criterion in determining the functional-stylistic character of a phrase.

The interpretation of these two synonymous phrases in other dictionaries is also not functionally and stylistically required. While the phrase “to go to hell” was not used in an Annotated dictionary of the Uzbek language [ADUL, 1, 27], this phrase was recorded in Annotated dictionary of the Uzbek language -5 [ADUL-5, 1, 40]. The phrase “to go argue (adi-badigabormoq)” is said to belong to the style of speech and is interpreted as “to mourn, to fight”

[ADUL, 2, 19], but in OTIL-5 for some reason this phrase was dropped [ADUL- 5, 3, 440]. M. Sodikova's dictionary also contains the phrase «misunderstandable speaking (adi – badigapirmoq)», which emphasizes the specificity of the speech, the tone of disapproval, and the phrase «adi-badi», which is semantically close to that phrase not recorded [BURPhD, 14]. Although the phrase “go to San-manga” is mentioned, it is forgotten that it is specific to the spoken word or emphasizes the ottenka of meaning [BURPhD, 228].

When linguists talk about the functional-stylistic division of phrases, they often divide them into lexical units - inter-stylistic, biblical, colloquial and simple colloquial types, such as words [1]. This does not seem to take into account the specifics of the use of phrases in cases other than words.

Common words such as «home», «water», «bread» have zero stylistic color, they are called intellectual lexicon because they express only a certain concept and do not have additional emotional-expressive color. [2]. They are methodologically, expressively-color-neutral, and functionally general-style or inter-stylistic in nature, as they can be used in all functional styles of language, and such common words can also be found in biblical, formal styles. Among the phrases, only a few [«open letter», «open heart», «be an open way», «break up», «intervene», «start a family», «shake the family», «beautiful world»Etc.] can be used freely in all styles. This is self-evident, because, as V.D. Devkin rightly points out, there can be no pure neutrality in the field of phraseology [3].

For example, phrases such as «stand on feet», «break the gap», «lock the foot», «pass from hand to hand», «open spaces» do not have emotional and evaluative properties. but these expressions are also expressive in relation to their imagery. Accordingly, these phrases cannot be classified as stylistically neutral or general-style: “Otaqo’zi scolded you did not read my son’s work,you destroy it before you read, I’ll do feud to scientific leader, you are locking my son’s foot- said that»Yoqubov.Diyonat]; - «... You will still go and fry with your worries again, you will burn, you will shed tears» [Mirmuhsin. Umid];«...- You were sheddingtearsnow that if the Aziz wrestler came, I would go back» [S.Ahmad. Ufq]

In our opinion, it is expedient to divide phrases into two groups in terms of functional and stylistic color:

a) Phrases related to a particular style in terms of usage: “raise your hand”, “fall into a trap”, “play a role”, “be a dead soul”, “strike a blow” ,“ Stitching the collar ”,“ taking off the foot ”,“ falling on the field ”,“ not falling asleep for seven ”,“ like pulling a piece of dough ”,“ light hand ”,“ butterfly flew ”,“ show with tip of the foot”etc .;

b) Phrases that are not functionally related to a particular style: «in one of two sentences», «to die», «to come down from the sky», «to fall down», «to play the drum».

The phrases in the first group can be divided into biblical, colloquial, and simple colloquial types, respectively.

In linguistics, there are different views on the recognition of the expressive-evaluative and functional-stylistic coloring of phrases as components of stylistic meaning, the relationship between them. For example, according to A.I. Molotkov, the expressive-emotional color of phrases is not directly related to their use in certain speech styles: -not related to the modern

description. The phrase acquires one or another expressive-emotional color in the process of speech, regardless of its simple, outdated, dialectal features”[4].

Another group of scholars argues that these two components [the two colors] are inextricably linked, that they act as a whole in the semantic structure of the phrase [5].

As mentioned earlier, these two components [two colors] in a phrase can be compared to different aspects of the same event in the same phrase. Sometimes the expressive-evaluative color of a phrase interacts with its functional-stylistic color, and a cause-and-effect relationship develops between them, that is, one requires the other. produces. The brighter the expressive-evaluative color of the phrase, the more it is functionally and stylistically limited [for example, compare: «dog-like», «dog-like», «dog-like» such as «pig in the grave», «sucking the dirt of his teeth»]. Or the “market has not passed” with a negative rating [ADUL, 1, 127; ADUL-5, 1, 299], “self-marketing” [ADUL, 2, 126; ADUL-5, 1, 299] “sprinkling poison” [ADUL, 1, 302; Phrases such as ADUL-5, 2, 142] remain more characteristic of the style of speech.

In most cases, the combination of the two evaluation tenses present in the phrases is not taken into account, they operate separately, independently of each other. For example, even if a phrase has an emotional color or a positive tone, not everything may be biblical, or, conversely, a phrase with a negative, negative color may always be typical of the style of speech. 'Imaydi. The following examples confirm our opinion: «the dog's next leg» [ADUL, 1, 334; ADUL-5, 2, 241], “dog touched” [ADUL, 1, 334; ADUL-5, 2, 241] “the calf ran to the hayloft” [ADUL, 1, 146; Phrases such as OTIL-5, 1, 364] have a negative connotation, but they are more specific to the biblical style of the Uzbek language: “My lord,” said Begijon in despair. - Forgive me. I turned it into a dog ...”[Said Ahmad. Wheel]; «If you know, digesting dog soup is like death» [B.Khudoyberganov. Female Harmony] et al.

Similarly, «throwing the skullcap into the sky», «walking the skullcap in half», «falling into the mouth», «opening the mouth», «pointing to the mouth», «no strings attached» Phrases such as “gain prestige”, “gain prestige” are typical of the biblical style, with a positive expressive-evaluative tone.

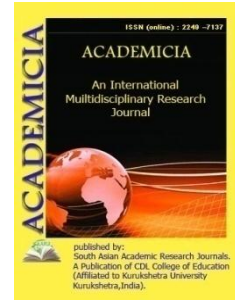
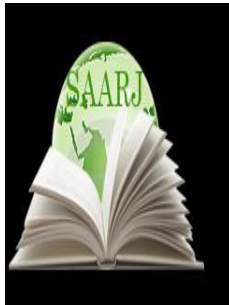
“My eyes were flying”, “to make friend with a leper”, “warm your breath”, “show a number”, “shut up”, “kick your feet”, “All of the phrases “enjoyed” and “fell asleep” are mostly in the style of speech, but the last two of these phrases have a positive tone, and the rest have a negative tone: “Shut up! - Now Madamin felt it and shouted angrily”[B.Khudoyberganov. Female Harmony] et al. The phrase «my eyes are flying» means enantiosema, which means both positive and negative assessment.

“Stuttering”, [BURPhD, 324], “hitting the armpit” [BURPhD, 322], “mouthless” [BURPHD, 206], “let the devil strike” [URD, 105], «slap in the face», [URD, 104] express the negative and partly positive [«demon» assessment of the person, his behavior, but all of them are characterized by a simple style of speech. can be classified.

REFERENCES

1. Efimov A.I. Stylistics of artistic speech. - M.: Moscow State University Publishing House, 1961. - P. 284–285; Shanskiy N.M. Phraseology of modern Russian language. - M.: Higher School, 1985. - P. 143-144; Fomina M.I. Modern Russian. Lexicology. - M.: Higher School, 1990. - P. 357-361; Balaaev M., Djanpeisov E., Tomanov M., Manasbaev B. Stylistics of

- the Kazakh language. - Olmaota, 1966. - P. 94-96; Shmelev D.N. Problems of semantic analysis of the dictionary. - M.: Nauka, 1973. - B. 146.
2. Shomaksudov A., Rasulov I., Kungurov R., Rustamov. Stylistics of the Uzbek language. - Tashkent: Teacher, 1983. - P. 63-64.
 3. Devkin V.D. Conversational speech in German. - M.: Higher School, 1973. -P. 41.
 4. Molotkov A.I. Fundamentals of Russian phraseology. -L.: Nauka, 1977. - p. 250.
 5. Proshin A.V. Some features of the manifestation of stylistic decline of phraseological units in comparison with words // Phraseological questions. Number 2. - Samarkand: SamSU, 1972. - P. 7-12; L.V. Kovaleva Problems of functional and expressive interdependence of phraseological units in Russian // Problems of phraseology. - Tula, 1980. -P. 106-110 and others.
 6. See Bazarova M.M. Linguistic features of speech units that express the content of positive wishes in the Uzbek language [based on prayer and speech etiquette]. Filol. candidate of sciences ... diss. author. - Tashkent, 2007.- P. 4-17.
 7. Five-volume annotated dictionary of the Uzbek language. The first volume. T., National Encyclopedia of Uzbekistan, 2006, p. 384. In this dictionary article with the abbreviation OTIL, in parentheses - the title and page of the work.
 8. Yuldashev B. Problems of methodology of phraseology. - Samarkand: SamSU edition, 2007.
 9. Raxmatullaev Sh. Annotated phraseological dictionary of the Uzbek language. - Tashkent: Teacher, 1978.-P. 49-50.



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SINGAPORE'S ROAD TO GOOD GOVERNANCE

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ABSTRACT

This article analyzes the key factors that determine Singapore's path to Good Governance and its success. The purpose of this article is to discuss the level of trust and governance in Singapore and how their political leaders have responded to the various challenges facing their country. The article concludes that the higher level of trust and governance in Singapore can be attributed to its effective political leadership, which has benefited and succeeded in curbing corruption during its 50 years in power and in the context of its policy.

KEYWORDS: Singapore, Public Service, Corruption, Social Development, Good Governance, Government Bodies, Effectiveness, Dynamic Governance, Model Of Development, Strategic Thinking.

INTRODUCTION

Nowadays, there is a growing interest in learning Asian models of development, especially in Third World countries. Singapore is a unique case because, unlike most other Asian countries, it has been able to break away from rampant corruption as a way of life. It is the most widely discussed Asian model due to its unchallenged position as the least corrupt country in Asia¹. What stands behind the development and success of Singapore? How work is being done in Singapore, how all state plans and programs are being implemented? What can other states learn from Singapore's development path?

In fact, Singapore was a poor Third World country in 1960 with a GDP per capita of \$443². However, today Singapore is among the most affluent countries in Asia with a GDP per capita of \$58,480³. Singapore's exemplary public service cadre is regarded as one of the most disciplined bureaucracies in the world, because of its *efficiency, low levels of corruption and a high standard of accountability* to the government and the political leadership of the country. Its contribution since independence to the success of Singapore is widely recognised. This is particularly noteworthy because the economic success of Singapore has been and continues to be strongly

driven by a government that is heavily involved in a number of key sectors, such as housing, education, and industrial policy⁴.

Methods

Understanding of significant role of government bodies, Singapore transformed governance system and public sector. They created an environment, which sustain social development and growth. Before making ambiguous goals, they recognized their weakness and current realities honestly as well as take in account future possible threats and challenges. Therefore, Singapore's leadership is conceptualizing a long-term strategy with eventual results. In shaping national development concept, they conceptualize three vital capabilities of governance: *thinking ahead*, *thinking again*, and *thinking across*. These three capacities of government make Singapore as a long-term success.

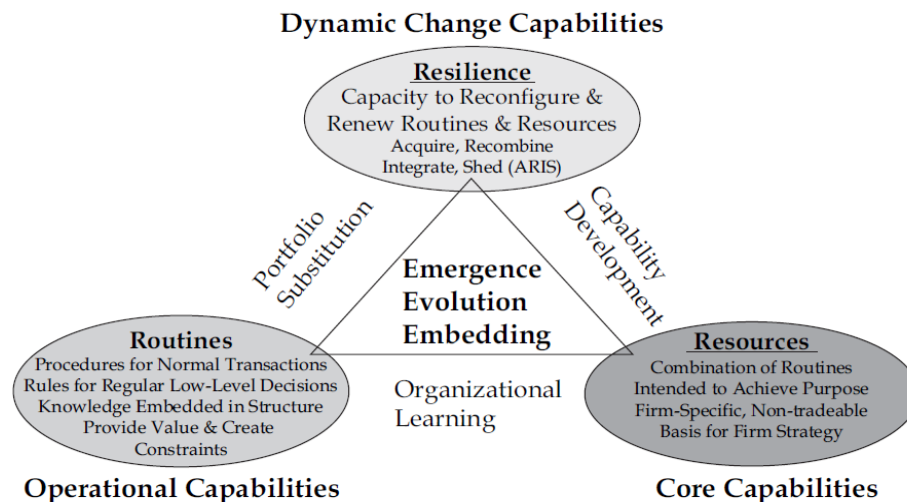
Thinking ahead is clarifying long-term goals of nation and strategy vision for future. It demands a deep understanding of current level of development, making scenarios of future changing's through analyzing current changes in the world. Strategic vision is critical for attaining sound results as measures we take can be ineffective and outdated because of abrupt changes in all spheres.

Thinking again is an ability to accept reality, find mistakes, and rethink to take new measures. Thinking again in this matter means thinking out of box and approach to problem with various ways before choosing the best one. Singapore government uses this capacity to address unemployment problem. In that period many Singaporeans were lack of motivation and responsibility to their work. They lost hope for better live and future. Singapore government bodies concerned about unemployment issue and tried to create equal opportunities for all people. They used different approaches to strengthen people's belief in themselves and their emotional condition. One of them was to engage population to be active in nation development. Understanding the fact that they did not have necessary skills to contribute to the development of the country, made them work on themselves and improve their capacity and working skills. As a result, even older generation began to learn new knowledge, skills and broaden their outlook.

Thinking across is a key element in the process of forming strategy of national development. It is openness to new ideas, willingness to learn from the experience of others, analyzing their approach, mistakes and make a conclusion. It is not blind imitation of successful models rather than it is learning from others and adapted it to fit local condition and renew it to achieve new goals. In Singapore case, they adjusted experience of a work-based welfare program Wisconsin Works⁵. It assisted to achieve national goals such as finding job, family support and social mobility of people. Understanding their commitment to provide basic infrastructure and condition needed for an ordinary citizen to live, work, and eventually raise the standard of living, government transformed industrial economy into a new innovative economy.

Another important lesson from Singaporeans is *dynamism*. It demands not only transformation and redevelopment periodically but also right policy to implement properly in all sphere. Innovative needs to be new, surprising and beneficial. Therefore, governance must be dynamic. In this turn, public sector officials who implement policy, provide service and ensure security should be dynamic and innovative. When we look to the process of working public sector, it seemed slowly and in a bureaucratic way. Singapore dynamic governance approach managed to work dynamic, stay relevant despite of hierarchical governance, formal rules, and detailed

procedure. They created three organizational capabilities of public sector into one framework as shown in figure 1.1⁶.



Routines are regular ways of doing the repetitive tasks of voluminous daily business activities, which are often executed semi-automatically in response to internal or external input flows. They involve recognizable patterns of interdependent actions involving multiple people and organizational units.⁷

Routines form operational capabilities to define rules and procedures in order to achieve fulfill tasks and transactions regularly, quickly, feasibly and in high standard. In turn, resources are also important factor as they are the main tacit assets such knowledge and skills which come from experience and continuous learning. They play an important role as they enable an organization to formulate and execute strategies to achieve its mission and desired goals. Third capability of dynamic governance is a strategic resilience. *Resilience* is not about responding to a one-time crisis or setback, but it is about continuously anticipating and adjusting to deep secular trends that may impair the effectiveness of an organization.⁸ Resources are the main potential (knowledge, skills) used for implementing programs, renew and readopt. Dynamic governance methods might be used not only in state government system, but also companies, organizations can use these methods to increase effectiveness and income. For instance, a university can adapt a new curriculum and new standards to meet the changing requirements of global economy. Dynamic change capabilities for manufacturers might comprise research and development, mergers and acquisition integration, and customer relationship management and human resources planning and management. These three capabilities develop a condition to execute all-purpose and make them reality.

The effectiveness of these capabilities is checked through achieved results, executed plans, implemented tasks. Describing the Singapore's model of success, Neo Boon Siong, professor of Lee Kuan Yew School of Public Policy National University of Singapore, pointed out that: "The main secret of Singapore's success, if there is one, is that policies are made to be executed and that they are actually implemented. Observers of Singapore often put it much more simply: "everything works here". Policy options are generated, evaluated and designed with

implementation as the main driver”. The implementation of policies affects the reputation of government agencies and the image of the leader. If they cannot achieve their goals, they lose their legacy in front of the population. For this reason, the public sector is considered as the main actor of government. After gaining Independence in 1959, Prime Minister Lee Kuan Yew recognizing the effective execution of policy, said to civil servants that:

“You and I have a vested interest in the survival of the democratic state. We, the elected Ministers, have to work through you and with you to translate our plans and policies into reality. You should give of your best in the service of the people... If we do not do our best, then we have only ourselves to blame when the people lose faith, not just in you, the public service, and in us, the democratic political leadership, but also in the democratic system of which you and I are working parts.”⁹

Decision-making and execution process

As many countries in Singapore decisions are made by Cabinet of Ministries after collectively discussion with ministries and public sector agencies. Cabinet of Ministries allocate power and resource to responsible ministries for implementation. In this process it is important to understand that government gives a political power to execute and shield civil servants from political interference. It gives from more freedom to think rationally and strategically, creates an environment for *Good Governance*, political support and collectively responsibility for common future. People know their role and contribution to the development of nation. That makes them continuous learn, grow professionally, think innovatively, find right solutions.

The figure below shows three stages of policy execution process in Singapore decision making and implementation process cycle.

1. Identifying issues for policy review
 - a. Reacting to external crisis or policy consequences
 - b. Identifying improvement opportunities
 - c. Surfacing issues from consideration of future scenarios
 - d. Identifying and sponsoring strategic issues
 - e. Learning from leadership exposure to different views and practices
2. Influencing design of policy options
 - a. Setting standards for policy analysis and design
 - b. Recommendation courses of actions through staff analysis and papers
 - c. Studying policy options through inter-agency project teams
 - d. Engaging external advisers and experts
 - e. Forming review committees and conducting public consultations
3. Implementing policy decisions
 - a. Selecting key leaders
 - b. Structuring an appropriate organization

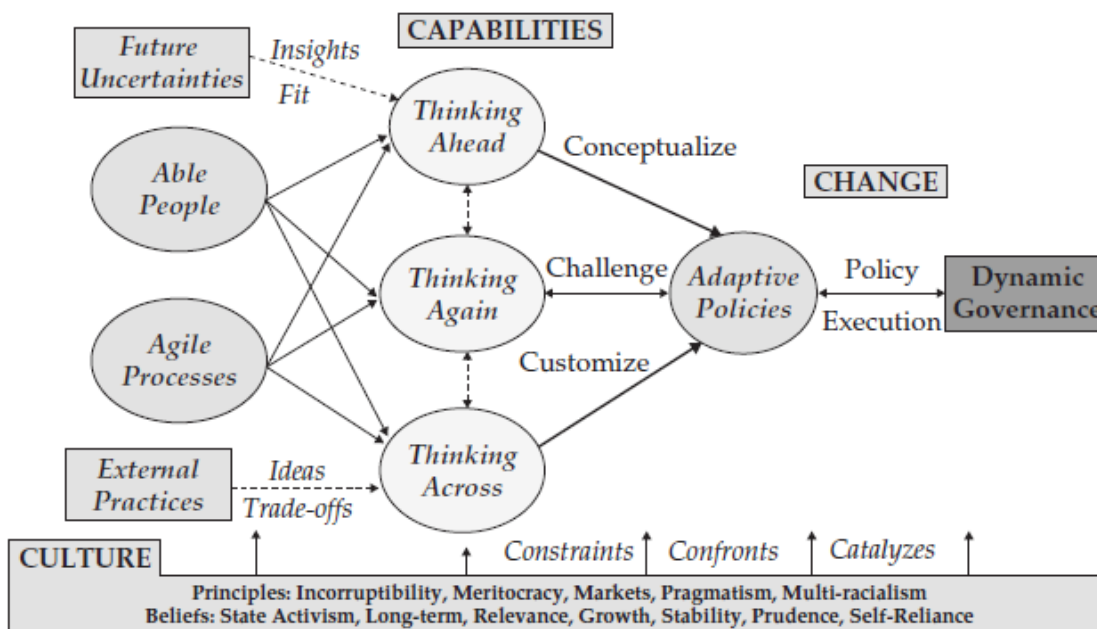
- c. Planning major strategies and the resources needed
- d. Initiating projects, processes and programs
- e. Monitoring progress and gathering feedback¹⁰

In first stage, it is critical important to understand clearly the main purpose of policy and stages of road you should go in order to achieve intended outcomes. As without clear understanding of them, civil servants might undermine discipline or lose hope in intellectual and mental capabilities. They might think why we need to change if everything works well and as a result, government bodies might involve in a red tape. Another prominent factor of strategic thinking is that developing scenarios for future. It is widely believed that scenarios are predictions or planning of the future. Making scenarios is drawing future implication through analyzing impact of today's decisions. While you are making scenarios, you should pay attention to today's trends and learn every possible impact on this. It is useful hint and learn in terms of everything ranging from business scenarios to international relations. Develop making scenarios make people think where they are going, where their destinations, what they should do, and what kind of measures they should take.

In the policy analysis and design step, leader and civil servant should accept the reality like the way they are. They should consider their weakness in order to turns them into strengths. Therefore, civil servants should be realistic and simultaneously they should acquire rationalism, pragmatism and result oriented willingness. Next step is one of the principles of Good Governance is public engagement in decision-making and implementation process. Public awareness is a key driver to engage people in development of country. Singapore government consulate with educated and demanding population through various ways before the policy approved and implemented. It might gather feedbacks, interviews with opinion-makers, senior generations, open discussion at the web sites, posting e-portals, social networks etc.

Last step is an implementation of decisions, in this step; the main task is selecting leaders and experts for implementation. As Lee Kuan Yew believed that "best man for the most important tasks".¹¹ Selected key leaders develop a detailed plan of policy proposals with Review committee who is responsible for gather feedbacks, analyze, and give recommendations. After a detailed plan approved, the team identify human and financial resources, they initiate specific detailed programs and projects for implementation of policy. In the implementation process, agency gather feedbacks from population in order to identify opportunities for improvement and meet the expectations of people. As we can see, in all processes public involvement is the basic element because all intentions, policy and programs for human prosperity and development of nation who live in this country. Human interests are above everything.

Figure.1.2. Framework for dynamic governance system



Dynamic governance system is a combination of culture, change and capabilities as shown in Figure 1.2. This systematic linkage reinforces their government system.

Government leaders should change mindset and cultural values of people to be hopeful, optimistic and hard worker. Uzbekistan in order to achieve desired goals should change attitude of people towards life, work such as break social constraints ranging from improvement the role of women in family and society, combat against nepotism and corruption, openness to new ideas and changing's. Moreover, government should formulate critical pillars of organizational capabilities of populations from early age: think critically, learn continuously and be dynamic. One of the attributes of the Good Governance is to be critical to a given policy starting from initial formulation stages. The ability of being open to different perspectives and analyzing the issue thoroughly prevents policy from the failure. For this, it is highly recommended to develop critical thinking in our education system. As in Uzbekistan inherited repetitive learning system from Soviet Union which lacks of critical thinking. Students are expected to repeat what they read and what has taught and not question it. Because of our culture and mentality, students venerate their professors. This is, of course, a very good part of education system and it helps to keep discipline in the class; however, students with this feature tend to receive all information delivered by professors without thinking and questioning them. This kind of system can impede professional and personal development of students and, consequently, produce graduates with a narrow and outdated view. On the other hand, young people who think critically, can find and compare information from different sources, contemplate ideas and make conclusions. Meanwhile, constructive feedbacks communicated to their professors will be mutually beneficial leading both students and professors to work on their knowledge and skills continuously.

Continuous the previous recommendation, we would like to suggest evaluating public policy issues from different perspectives. Each problem has economic, social, cultural, political and environmental and other types of consequences and all of them interconnected. One cannot resolve an issue only by allocating finances or locating environmental solutions. The issue must be considered from various fields and points of views. Supporting the functionality of existing research centers and networking among them can be crucial step taken towards the nation development. Researchers can study this problem from economic, ecological and innovative perspectives and they can share their finding with each other. It creates a scientific and dynamic environment that broadens researchers' outlook and builds a capacity that while addressing one problem considering all external and internal factors of problem.

Dynamic governance is not one time change or one-time success, but it is continuous learning, innovating and improving and making life better, making the country in better place to live. As professor of Lee Kuan Yew School of Public Policy National University of Singapore, Boon Siong Neo mentioned, "We cannot change the past and we cannot determine the future. We can only hope to be better prepared to face the future by starting the dynamic journey of change today."

REFERENCES:

1. Ari-VeikkoAnttiroiko., Good governance in context: Learning from anti-corruption policies of Finland and Singapore, Tampere University November 015//<https://www.researchgate.net/publication/284030530>
2. Jon S.T. Quah., Trust and Governance in the Philippines and Singapore: a comparative analysis.,
3. <https://worldpopulationreview.com/country-rankings/richest-asian-countries>
4. Dr N. C. Saxena., THE Singapore Public Service and National Development., United Nations Development Programme 2011.
5. Boon Siong Neo, Geraldine Chen, Dynamic governance: embedding culture, capabilities and change in Singapore, World Scientific Publishing, 2007 P 4.
6. D Lavie (2006). "Capability Reconfiguration: An Analysis of Incumbent Responses to Technological Change," *Academy of Management Review*, Vol. 31.
7. MS Feldman and BT Pentland (2003). "Reconceptualizing Organizational Routines as a Source of Flexibility and Change," *Administrative Science Quarterly*, Vol. 48, pp. 94–118.
8. G Hamel and L Valikangas (2003). "The Quest for Resilience," *Harvard Business Review*, September, pp. 52–63.
9. Speech by Lee Kuan Yew, "The Trouble with the Civil Service," at the Opening of the Civil Service Political Study Centre on 15 August 1959.
10. Boon Siong Neo, Geraldine Chen, Dynamic governance: embedding culture, capabilities and change in Singapore, World Scientific Publishing, 2007 P. 200.
11. Ibid



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ANAPHORA, EPIPHORA AND THEIR LINGVOPOETIC FEATURES IN HALIMA AHMEDOVA'S POETRY

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ABSTRACT

This article explores these features of anaphora and epiphora, which are types of repetition. The meanings that emerge from them, the types of repetitions according to their place of use, are analyzed. Anaphora and epiphora are considered as stylistic devices and are said to serve as an emotional color and poetic tone to the language units that make up oral and written speech. These ideas are proved by the example of anaphora and epiphora types of repetition used in the poems of the poet Halima Ahmedova.

KEYWORDS: Repetition, Anaphora, Assonance, Consonance, Rhyme, Tautology, Imagery.

INTRODUCTION

It is important to clarify the meaning of the word used in each style of our language in the eyes of the listener or reader. This can be achieved by emphasizing the meaning, highlighting it, and re-applying it where necessary. In this sense, repetition is one of the most actively used stylistic methods in art. "The function of repetition in artistic style is not limited to distinguishing and emphasizing a particular event or situation. In art, as in all stylistic devices, repetition is the task of giving emotional units, special tones, and charms to language units. If possible, in addition to carrying out these tasks, he should be able to give the author or the protagonist a subjective attitude to reality. " [3, 55-56] There are several types of repetition, depending on where the language units, especially the word, sometimes the phrase, are repeated, and in total they number about thirty. There are different forms of repetition in the scientific literature, such as alliteration, anaphora, epiphora, rhyme, assonance, consonance, tautology.

Accordingly, the word, phrase, or sentence that appears at the beginning of a poem or verse is repeated at the beginning of each verse or verse. The poetess Halima Ahmedova, who has a special place in the world of literature with her appropriate repetitions and uniquely attractive

verses, has often used this type of repetition - anaphora in her poems. Undoubtedly, this provides the poem with an attractive tone and color. The simplicity of the anaphoras used by the poet makes the scene that comes to life in the poet's eyes more vivid and clear:

There is forty-six springs I like

This is a monument to my enemy

A chorus growing right in front of my eyes

There is silence in this...

There is hope in that.

Still struggling to give up

There is a lot of grass in the pot

It's hard not to say something.

There is debate between light and dark is heated

They live without each other for days... [1, 102]

The repetition of the word in these verses of the poet was methodologically anaphora, and artistically, it emphasized the expression of the idea in the poem, as well as provided melody.

Clean...

Remained in the transparent heart of childhood

With the wings of an elegant butterfly

The mountains wept with longing

With the song of the cuckoo in the cage.

Clean -

The chain of insults is broken

In the heat of the moment

In the eyes of a beggar who comforts hunger

In the bliss of the shining light

Clean -

It is easy to clean

In contrast to the moon playing in the shadows...

The wind blew the silk curtain

From the bright window of the dark night

Clean... [1, 98]

From the above examples, it can be seen that anaphora is used not only as a stylistic tool to reinforce the idea, but also as a factor that determines the compositional basis of the poem. For

example, the idea expressed in the poet's poem "Clean" is that the author's address is reflected in the word "clean" repeated in the first verse of each verse, and only this word itself clarifies what the author means. The following lines complete the first verse and explain it. And, of course, in the process of repeating the word, a unique tone and rhythm is formed. Another type of artistic repetition is the epiphora, in which an epiphora is formed by the repetition of vowels or consonants at the end of words, and by the repetition of a particular word, phrase, or sentence at the end of a line. Literally, the epiphora is the opposite of anaphora. "Anaphora is used in oral and written speech, and the epiphora is mainly used in written speech." [4, 64] In this sense, the epiphora is the most frequently used repetition in poetry.

I wish I could one day my dream *end*
 My tongue doesn't say what's in my heart at the *end*
 My life my guest left at the *end*
 Bury me in the rose petals[2, 8]

The epiphora in this quartet is formed by the use of the last word repeated at the end of each line.

The longing that gnawed at the heart of the night,
The longing to drink the sunshine,
The longing that has ruined my life,
 I know your longing.
 Do you know that I am a soil?
You are always burning in the dark,
You are bleeding in my heart,
You are the one who denies me out of love.
 I know your longing
 Do you know that I am a soil?[1, 11]

In this example, at the end of the verse, miss, no, and repeat the words you

In this example, the epiphora is formed at the end of the verses with the words nostalgia, no, and you repeated. It is used to create melody, thoughtfulness and emphasis. At first glance, the word repeated at the end of the paragraph reminds me of a radif. In many cases, it is difficult to separate the two concepts. Because a radif is also a word or a combination of words that is repeated at the end of a poem. But for a repeated word to be a radif, the word before it must be rhymed, and one radif must be repeated from the beginning to the end of the poem. Epiphora has no such requirement. It does not require rhyming the word that comes before it. That is, it can be used after non-synonymous words and can be observed during a paragraph.

Are you the one who made my soul miserable?

Are you the one who turned my heart to stone

Are you the one who erased the word happiness from forehead?!

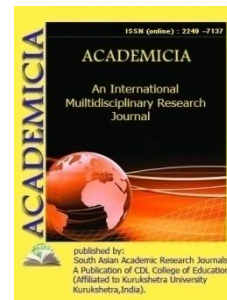
The color of the water of lies

The foot of life crushed by my shoulders. [1, 40]

Analyses show that in Halima Ahmedova's poetry, various forms of repetition are appropriate, skillfully used for a specific purpose. This, as mentioned above, gave the poem a special charm as a means of melody, charm, and musical refinement. In short, while repetition does not create a specific image when used in a work of art, it is a means to their creation, to the refinement of expression, to the expressive and effective expression of thought.

REFERENCES:

1. Ahmedova H. Umidsiyasi – T.: Nihol, 2008
2. Ahmedova H. Erkdorichasi – T.: G‘afur G‘ulomnomidagi Adabiyotvasan‘atnashriyoti, 1996
3. Karimov S. Badiiyuslubvatilning ifodasivirvositalari. – Samarqand: 1994
4. Sultonsaidova S., Sharipova O‘. O‘zbek tilistilistikasi. – T.: Yurist-media markaznashriyoti, 2009



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USE OF GAMES IN LEARNING FOREIGN LANGUAGE AT THE UNIVERSITY

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ABSTRACT

The article discusses the possibilities of using word games in the process of teaching a foreign language at a university. The main classifications of games are given, with the main focus on games of a lexical nature. The article substantiates the conditions allowing to use word games as efficiently as possible in foreign language classes, as well as examples of games at different stages of work with students.

KEYWORDS: *Teaching A Foreign Language, Game Technique Of Teaching A Foreign Language, Language Games, Lexical Games, Teaching Adults.*

INTRODUCTION

Mastering a foreign language at a university implies the formation of a number of competencies among students. In particular, graduates should be able to communicate verbally and in writing in a foreign language and solve the problems of interpersonal and intercultural interaction. Consequently, students must have certain knowledge (for example, knowledge of linguistic means) and mentality (use the formulas of verbal communication, formulating their point of view, etc.), and also be able to correlate language means with specific situations of intercultural speech communication.

The solution to this complex, "global" problem occurs during the entire period of teaching a foreign language at the university and requires the use of rational and effective approaches and technologies, forms and methods of teaching. In this context, it is customary to talk about the use of new information and communication technologies, active teaching methods, and a differentiated approach. However, the "basic element" is the methods and techniques of teaching a foreign language, which the teacher uses in the classroom, directly working with students.

Students' knowledge and possession of linguistic means, their use in communication depends on how effectively this material was presented, consolidated, worked out.

A method that allows: a) to motivate students to study the subject, b) promotes the development of language and speech competence, c) promotes faster and more durable assimilation of the material, is a game. Is the use of games in a student audience justified? And if so, which games will best promote language development?

In modern science, games are considered as a method that can be effectively used in teaching a foreign language to both children and adults. It would be appropriate to give classifications of games, which will allow you to navigate which games can contribute to the development of certain language skills.

So, M.F.Stronin distinguishes the following types of games: 1. Lexical. 2. Grammar. 3. Phonetic. 4. Spelling. 5. Creative [5. 81p.].

The first four can be attributed to the so-called linguistic, the purpose of which is the formation of relevant skills. Creative games are complex in nature, imply the creative application of the acquired knowledge and skills in a game situation.

There are other classifications of games. A. V. Konyshova divides games according to their goals into linguistic and speech (communicative) games. E.V. Dushina talks about linguistic games and divides them into non-communicative, pre-communicative and communicative, depending on the competencies being formed [2.56p.]. Obviously, in all classifications we are talking about 1) games, in the process of which there is the assimilation of material (new lexical units, grammatical structures), the development of individual language skills (phonetic, grammatical) and 2) games aimed at transferring the studied material and worked skills in non-standard situations, in communication within the game. At the same time, it is important to take into account the principle of didactic sequence: first, tasks are performed for memorization, for reproduction (including according to the model), and then for the creative application of the studied material.

For the games, which will be discussed in the article, we suggest the name "word games" - they are all associated with a word, its spelling, meaning, compatibility with other words (in Stronin's terminology, both lexical and spelling games can be referred to here). Word games allow learners to:

- expand vocabulary by getting to know new lexical units;
- To assimilate familiar lexical units more firmly;
- practice the spelling of words;
- To intensify speech-thinking activity;
- gets acquainted with the compatibility of lexical units, set expressions, phraseological units.

Word games include the following:

1. Anagrams
2. Crosswords
3. Search for words among alphabetic chaos (Wordsearch)

4. Hangman
5. "Missing letters" (guess the word only by vowels / consonants).
6. "Words" (composing shorter words from one long one, often for a while).
7. "Unscramble" (composing a word from an existing set of letters).
8. Wordchain (compiling a list of words by replacing one letter in each subsequent word, possibly based on definitions).
9. Constructor (composing words from morphemes presented on separate cards).
10. "One letter - many words" (students name words they know by a certain letter of the alphabet).
11. "Last letter" (name a word starting with the last letter of the previous one; it is worth noting that in English, taking into account the unpronounceable -e at the end of a word, it may be suggested to start a word with the last sound of the previous one).
13. Hot Chair (guess the word by its definition, synonyms, antonyms, etc.) and others.

Some of the games involve group work, team competition (for example, Hot Chair, Constructor, etc.),

Some work in pairs; games such as "Hangman", "Anagrams", "Wordchain" are appropriate to carry out frontally, presenting the material on the board.

In general, students find the use of games in English classes "an interesting, effective method to help them remember the material better."

Of course, word play in English classes at a university should not be an end in itself, although in some cases it can serve as a kind of "relaxation" after hard work. By organizing a game in a lesson on

foreign language at the university, the teacher should take into account the general methodological principles, as well as the principles of pedagogy of teaching adults (after all, the student audience often claims to be "adult", and at the same time equally willingly responds to the techniques and methods used with children):

- Adults need to know why they are learning this or that material. Therefore, the teacher should be ready to explain how the game will help students in learning a foreign language;
- Adults see learning as a solution to problems, they learn from their own experience, "in practice", and

The use of word games can provide more opportunities for this than simply doing the exercises from the textbook;

- The game should be well thought out, have clear rules and simple conditions, be supervised by a teacher;
- The game should be conducted in a friendly atmosphere, providing the student with opportunities for self-expression, self-development;

- The game should contain an element of competition (under the initial condition of equality of participants / teams), which can activate the mental activity of students, encourage their active participation.

Here are examples of the use of various games at different stages of organizing a foreign language lesson. At the warm-up stage, when the teacher's task is to update the students' knowledge, experience on a particular topic, "attunement" to work, students can be invited to play "Missing Letters", "Unscramble", "Constructor".

In this case, the word must either be already familiar to most students, or it can be predicted based on the topic. For example, the word "adventure" in the game "Missing Letters" might appear on the board as ". d v. n t. r. " as part of the discussion of the general topic "adventure holidays".

Games like Word search, crosswords, unscramble are often used when practicing vocabulary on a specific topic. In school and foreign textbooks / workbooks, such a task is not uncommon, however, textbooks for higher education, especially professional ones, do not often offer students such an exercise-game. A rather effective technique is when, as a creative task, students themselves create a "letter chaos" / crossword puzzle and offer it in class for work in small groups.

The team game Hot Chair can be offered to students at the completion of work on a topic, when lexical units / phrases have already been repeatedly presented to students in texts and exercises. The essence of the game is as follows:

the team representative needs to guess the word written on the board, which may be suggested by the teacher or another team, according to the prompts and explanations of their team. The student sits with his back to the blackboard and does not see the word. Associations and ways to explain a word that come to mind of modern students sometimes amaze with originality and creativity, showing that students are trying to actualize and transfer knowledge from other subject areas in a foreign language. It is necessary to encourage students to express ideas in a foreign language, thus they are involved in communication, practice the skills of constructing sentences, certain speech formulas. At the same stage, you can play the "gallows"; usually students are actively thinking, suggesting options, not wanting the game to end in a loss.

Word Chain can be played with entry-level students as it often contains short, simple words of 3-4 letters. However, if definitions of mutable words are used, the task becomes more difficult for students. Some games can be used to introduce new words by focusing on their spelling.

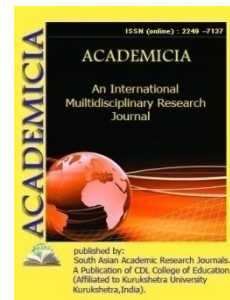
In conclusion I can say that the task of the teacher is to find the maximum of pedagogical situations in which the student's desire for active cognitive activity can be realized. The game helps communication, it can contribute to the acquisition of new knowledge, the correct assessment of actions, the development of a person's skills, perception, memory, thinking, imagination, emotions, such traits as collectivism, activity, discipline, observation, attentiveness. The game is simple and a way of knowing the surrounding reality for a person close to him should be the most natural way available to mastering certain knowledge, skills, and abilities. It is, of course, not the only one, but one of the most important teaching assistants, designed to awaken students' interest in the material being studied and to keep this interest throughout the entire study.

The teacher can be advised not to "take the full blow" in composing the game on himself, but to delegate part of the work to students - for example, on the choice of lexical units in the game within the framework of the topic. Thus, they feel involved, responsible for the correct presentation of the material, for the success of the game. And in this case, the use of the game in a foreign language lesson actually becomes an effective technique.

Thus, the use of the game in a foreign language lesson makes the educational process of higher quality, more successful, since the game involves all students in cognitive activity and stimulates students to learn a foreign language.

LIST OF USED LITERATURE

1. Akhramenko, E.V. The use of games in teaching a foreign language - 2018. -225-228 p.
2. Dushina E.V. Linguistic games at the lessons of the Russian and foreign languages in the aspect of the formation of communicative competence of students - 2014. - № 4 (38). - S. 54-58.
3. Maslyko E.A. et al. Handbook of a foreign language teacher / - Mn., 1996. - 522p.
4. Nikitin B.P. "Educational games", Pedagogy, 2001
5. Stronin M.F. Educational games in the English lesson. M.: Education, 1984.112p.
6. Savinkina L.S. "Individual approach to underachieving students and undisciplined", 2002.



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THE PROBLEM WITH THE FOUR CONDITIONALS OR CAUSALITY IN ENGLISH

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ABSTRACT

*This article touches on the problem of expressing **causality** in the English language by means of various conditional constructions, such as causal, temporary and concessive shades. Logical-semantic, functional-semantic and functional-grammatical analysis of means of expressing semantics conditions allowed the author to identify those aspects of it that seem important for the formation of a cognitive-functional model of representation of conditional relationships.*

KEYWORDS: *Causality; Conditional Constructions; The Concept Of Condition; Concessional Meaning; Conjunction; Cause; Goal; Concession; Consequence; Objective Modality; Semantic Heterogeneity.*

INTRODUCTION

Starting a conversation about the specifics of the representation of the category of conditionality in the English language, it should be said that in modern linguistics, a certain experience has been accumulated in the analysis of conditional constructions.

Conditional relations have been studied by linguists in various aspects: in the historical plane - from the point of view of the origin of constructions expressing conditional relations; in comparative terms; in terms of identifying means of expressing conditional semantics at the level of a simple and complex sentence, as well as in a wide context; in terms of the formation of various types of complex subordinate sentences with conditional and causal relationships.

Traditionally, when linguists study the means of expressing a condition, the object of study is complex sentences (CS) with subordinate clauses. CS with subordinate clauses are complex structures, within which the subordinate part (situation-condition) and the main part (situation-consequence) are informationally equal, while the subordinate clause is focused on the predicate of the main part.

The content of the subordinate clause is qualified as a hypothesis, that is, a situation that conditionally corresponds to reality. The relationship between the clause and the main sentences are interpreted as a necessary, natural, obligatory connection. In logic, such relations are considered as a sign of implication.

Thus, in the most general form, the meanings of conditionality (which are also called logical) include the meanings of cause, effect, condition, purpose and concession. Their common feature is that "in sentences with the meaning of conditionality, two situations are correlated, of which one is made dependent on the other" or, in a more generalized formulation, "two states of affairs such that one state of affairs is accompanied by another or leads to it."

The word "condition", are polysemantic and difficult to define, therefore the very presence of these words in the definition cannot be perceived unambiguously and unconditionally be considered an indicator of the concept of a condition. In addition, the concept of a condition itself does not have a full-fledged definition and an exhaustive description: most often there is a description of a condition in conjunction with a description of a cause, and this relationship is characterized as follows: conditionality, causality, i.e. causality in the broad sense of the word, assumes such a connection of situations in which one serves as a sufficient basis for the implementation of the other.

In many works on linguistics, it is said about the possibility of complicating the semantics of a condition with causal, temporary, yielding shades. This is due to the fact that these meanings are included, together with the value of the condition, in one semantic class, that is, they are varieties of the generalized meaning of the condition. In particular, the differences between conditional and other types of sentences can be rather unstable, and standard indicators of a conditional meaning, primarily conjunctions, as well as verb forms in certain contexts have a different meaning.

Conditional meanings differ in the degree of semantic complexity. The most elementary among them are usually the meanings of cause and effect, which boil down to the fact that "phenomenon A causes phenomenon B". The goal additionally presupposes the presence of an agent who sets this goal in front of himself. The condition differs from the cause and the purpose by the assumption of the possibility of an alternative development of events, which either still exists (in the case of a real condition), or took place sometime earlier (in the case of an unreal condition).

Let us compare one of the proposed interpretations of the meaning of an unreal condition, expressed in sentences like *"If you came yesterday, you would find her"*: *"It could have been A, but / however [for this] there had to be B; but it was not, therefore there could not be A."* The most difficult among the meanings of causality is the concessional meaning, in which the meaning of "contradiction" is layered on the "meaning" (causal / conditional) implication; in other words, "in the subordinate clause, a cause is expressed, which should have entailed the opposite effect." Therefore, in the sentence *"Having caught a cold, he did not go to work"* the relationship between situations is interpreted as *causal*, and in the sentence *"Having caught a cold, he (anyway) went to work"* - as *concessive*.

This kind of "implicative" dependence between situations presupposes their obligatory chronological ordering, namely: the conditioning situation either precedes the one which is conditioned by it, or is simultaneous with the latter. Thus, conditional relationships are based on temporal-taxis, representing more or less their semantic complication and modification; Consider

the following explicit formulation: "The causal statement" P caused Q "can be interpreted as a conjunction of two statements: 1) the succession of one event after another in time and 2) the presence of the corresponding general law ".

The feeling of a connection between temporal relations and relations of conditionality was reflected in the famous Latin proverb "post hoc, ergo propter hoc" ("after this means, because of this"). E.V. Paducheva comes to the same conclusion, believing that "the circumstance of time after that hints at some reason."

In the works of V. B. Evtyukhin (school AB Bon-darko), conditioning as a whole (cause, condition, goal, assignment, effect) is considered as a functional-semantic category of syntactic type, since 1) as well as categories of morphological type, categories of syntactic types are structures based on opposing forms and meanings; 2) syntactic constructions are the main way of expression; 3) when expressing syntactic categories, morphological forms of different types can be used; 4) morphological categories, working within the expression forms of the syntactic category, transform their paradigmatic meaning and connection. Conditionality relations (including conditions) are interpreted as bi-situational and asymmetrical: one part of the minimal structure is conditional, and the other is conditional; asymmetry is marked with subordinate conjunctions and prepositions.

Wherein the semantics of conditional relations is described as objectively / subjectively motivated hypotheticalness (of varying degrees of activity), allowing for different signs (presence / absence of negation).

As a result, "conditioning" is defined as "an undeniably semantic category of language, as one of the most important categories of linguistic thinking. Logical-semantic, functional-semantic and formal-logical analysis of the means of expressing the semantics of a condition made it possible to identify those aspects of it that are important for the formation of a cognitive-functional model of representation of conditional relations, namely, cognitive, functional and pragmatic.

Cognitive (conceptual) aspect semantics of the condition manifests itself before all through the ratio of conceptual categories "condition / effect", which is realized in discourse as a "condition due to", which means their interaction and interdependence and is reflected both in conditional semantics in general, and at the base of each of the semantic functions (SF) we have identified.

In this case, the functional aspect of the semantics of the condition consists in the implementation of the dominant principle "reality / unreality".

"Imposing" on these values the modality of "assessing the situation from the point of view of its possibility, necessity, desirability, etc." does not fundamentally change the type of condition / consequence (real, hypothetical, unreal).

Finally, the pragmatic aspect of the functional semantics of the condition includes the epistemic attitude (positive, neutral and negative), which reflects "the speaker's assessment of the degree of his confidence in the reliability of what is being reported."

The functional-grammatical approach to the interpretation of conditional relations operates with the concept of functional grammar, the concept of functional-semantic fields (FSF). The functional-semantic field is a two-sided (content-formal) unity formed by the grammatical (morphological and syntactic) means of a given language together with lexico-grammatical and

word-formative elements interacting with them, belonging to the same semantic zone. This approach allows assume the following: at the base of the FSF conditions is the ratio of the universal concepts "condition-effect", which at the level of linguistic content categorization are presented by FGC conditions. The expression plan of the FSF condition includes various semantic-structural grammatical unity. The core of the FSF conditions are complex sentences (CS) with subordinate clauses introduced by unions "if, unless, supposing (suppose) that, assuming (assume) that, in case, provided (providing) that, etc.", as the most specialized constituent for expressing a given value, conveying it most uniformly and systematically used. Wherein The "functional dominant of the field" (the component with the highest frequency of use) is a sentence with a clause introduced by the union if. The periphery of the field includes multilevel lexical and grammatical means of representation of conditional relations: CS with non-union connection (inversion); complex sentences, in particular with an imperative; simple sentences, including structures with gerund, participle, infinitive and prepositional-substantive combinations; simple proposals within the SFU.

The FSA of the condition (as part of the group of fields of "conditioning") is in relations of interconnection and intersection with the complex of FSA of modal-being relations, in particular, with the FSA of modality and its segment - the field of objective modality. At the heart of the content plan of the FSA modality, which has a heterogeneous structure and covers a whole complex of modal meanings, lies the FSC modality, which in the broadest sense expresses the speaker's assessment of the way of existence of the connection between the object of reality and its signs, as well as the degree the knowledge or desirability of this connection by the speaker.

Within the framework of the functional-semantic approach of the FSC, modalities are considered as a universal-linguistic category that correlates with the corresponding conceptual category and representing in the content plan a multifaceted association of more particular functional and semantic unities. In terms of expression, this FSC covers the system of grammatical forms of the verb mood, as well as syntactic and lexical means.

The content plan of the field of objective modality is formed by the relationship between the concepts of reality / unreality and potential (hypothetical). Objective modality shows how the speaker qualifies the reflected reality in his utterance, thereby establishing the relationship of the content of the utterance to reality in terms of its reality or unreality. This type of modality contains the component "it is so" and is present in every utterance.

From the above it follows that

- 1) When speaking about the attitude to reality, we mean "reality in the representation of the speaker";
- 2) the attitude towards reality, associated with modality, receives a qualitative definiteness when it is indicated that this attitude is manifested in the dominant signs of reality / unreality ..

At the same time, the work of N.A. Davydova "Representation of conditional relations in an English discourse" is of particular interest, in which the author models the functional-semantic field of a condition in modern English. In the FSA conditions in English, N. A. Davydova distinguishes the micro field of a real condition, a micro field of a hypothetical condition, and a micro field of an unreal condition. Each micro field implements semantic functions, the content of which "is made up of the meanings of linguistic units, their components and combinations."

As the author notes, the principle of opposition lies at the heart of identifying semantic functions in micro fields of a condition: positive - negative condition, positive - negative consequence.

We will give examples of different statements that differ in linguistic semantic content when expressing conditions, guided by the classification described by N.A. Davydova:

(1) a) an affirmative conditional attributable clause in the indicative expresses a sufficient condition, that is, such, the presence

which is associated with the implementation of some consequence, positive or negative: *If anything happens to us, he will know who is responsible for it;*

b) a conditional clause in a negative form expresses a necessary condition, the absence of which is associated with the failure of the corresponding positive or negative consequence: *"But if we don't get him back, it's*

a publicity nightmare ". Or consider the following example: *If I don't leave, he won't / will return*). Here my "non-departure" will entail his non-return or, with the affirmative form of the verb in the main clause, his return.

In the CS indicative mood with subordinate clauses, the verb can be presented in any tense required "by sense", including in the past: *It was a sick and violent history. If the Indians were peaceful and tried to cooperate with the colonists, they were subject to strange diseases - smallpox, measles, yellow fever, influenza, tuberculosis - for which they had no natural defenses. If they did not cooperate, they were slaughtered by men using weapons more sophisticated than arrows and poison darts (Jerome*

K. Jerome. Three Men in a Boat).

(2) CS with subordinate clauses with the Subjunctive I non-perfect form in the dependent part and the Subjunctive II non-perfect form in the main part express the following: its factor: *If I had (didn't have) the book, I should / would (not) give it to you.*

(3) The counterfactual consequence-condition related to the past tense is expressed by Subjunctive I perfect in the dependent part of the PSD and the form Subjunctive II perfect in the main part of the CS.

If I had (not) had the book, I should (not) have given it to you.

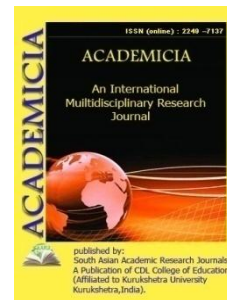
CS expresses an unreal condition and an unreal consequence that follows from it, (in (2) and (3), as in (1), the presence and absence of explicit negation marks the sign (+ or -) of the corresponding condition / consequence).

Thus, on the basis of the review made, we can conclude that, despite the fact that the conditional relations underlying the semantics of the condition and having a universal character, being included in the conceptual picture of the human world, are characterized by, in addition to semantic heterogeneity, a significant variety of means of expression that require clarification and detailed description.

THE LIST OF USED LITERATURE

1. Belichova-Krzhizhkova EO About the modality of a sentence in the Russian language // Actual problems of Russian syntax. - M.: Moscow State University, 1984. - S. 49–78.

2. Belichova-Krzhizhkova H. The system of causal relationships between sentences in Russian and Czech languages // New in foreign linguistics. - M., 1985. - Vol. 15. - P. 54–76.
3. Belyaeva E. I. Functional-semantic fields of modality in English and Russian languages. - Voronezh: Voronezh State University Publishing House, 1985. - 180 p.
4. Biryulin LA, Kordi EE Basic types of modal meanings identified in linguistic literature // Theory of functional grammar. Temporality. Modality. - L.: Nauka, 1990. - P. 67-71.
5. Bondarko A. B. Preface. Temporality // Theory of functional grammar: Temporality. Modality. / Ed. A. V. Bondarko. - L.: Science, Leningrad branch, 1990. - S. 3–58.
6. Bondarko A. B. Principles of functional grammar and aspects of aspectology. — M.: URSS, 2003. -- 208 p.
7. Davydova N. A. Representation of conditional relations in English discourse: Dis. Cand. philol. Sciences. - M., 2006. - 254 p.
8. Evtyukhin VB Grouping of conditional fields: cause, condition, purpose, effect, assignment // Theory of functional grammar: Locativity. Beingness. Possessiveness. Conditionality. - SPb.: Nauka, 1996. - 230 p.
9. Zaliznyak A. A. Polysemy in language and ways of its presentation. - M.: Languages of Slavic cultures, 2006. -- 672 p.
10. Brief Encyclopedia of Philosophy / Ed. E. F. Gubsky, G. V. Korableva, V. A. Lutchenko. - M.: Progress, 1994. -- 576 p.
11. Lyapon MV The semantic structure of a complex sentence and text. - Moscow: Nauka, 1986. -- 200 p.
12. Paducheva E. V. Semantic research (Semantics of type and time in Russian; Semantics of Narrative). - M.: School "Languages of Russian culture", 1996. - 464 p.
13. Podlesskaya V. I. Implicative constructions: some problems of typological classification. // Questions of linguistics. - 1995. - No. 6.
14. Razlogova EE Explicit and implicit propositional attitudes in causal and conditional constructions // Logical analysis of language. Knowledge and opinion. - M., 1988. - S. 31–39.
15. Sannikov V.Z. Semantics and pragmatics of the IF Union // Russian language in scientific coverage. - 2001. - No. 2. - S. 68–89.
16. Slyusareva NA Problems of functional morphology of modern English language. - Moscow: Nauka, 1986. - 215 p.
17. Tenier L. Fundamentals of structural syntax. - M.: Progress, 1988. - 656 p.
18. Khrakovsky V.S. Consecutive constructions: semantics, syntax, typology // Typology of concessive constructions: Monograph / Ed. V. S. Khrakovsky. - M.: Science, 2004. -- 625 p.



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ABDULLA QODIRIY ASARIDA MA'RIFATPARVARLIK MASALASI

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ABSTRACT

The article discusses the origins of the Jadid movement and its impact on the literature of the period. The main idea of Jadidism, that is, the desire to enlighten the people, is reflected in the works and their heroes. In the literature of this period, ignorance was cited as an important cause of the tragedy of the nation, and it was revealed that it was fought against. It is based on the fact that the views put forward by the representatives of the Jadid movement are extremely important even today.

KEYWORDS: *Jadid Movement, Literature Of The Period, Ignorance, Tragedy Of The Nation, Fate Of The Nation, Enlightened Scholars.*

INTRODUCTION

Our President Sh.M.Mirziyoyev in his address to parliament in 2020 24-th year: "in 2020, the 145-year old date of birth of the scientist and writer Mahmudkhuja Behbudiy, who raised the torch of enlightenment in difficult moments of the history of our people, is widely celebrated. In general, we need an intensive movement, an in-depth study of the heritage of our great-grandfathers. The more we learn about this spiritual treasure, the more we find the right answers to many questions that still concern us today. The more actively we promote this invaluable wealth, the more our people, especially our young people, will realize the value of today's peaceful and free life."

In fact, as we get deeper and deeper into the content of the works of our jadid ancestors, we can see that the problems raised in them remain relevant even today, although these works have been more than a hundred and fifty years since they came to the world. The nation's failure to seek the solution of the jadids, the problems associated with women's education still cast a shadow on the development of society. By the end of the XIX beginning of the XX century, a difficult and extremely turbulent historical environment arose in Turkestan, which undermined the fate of the

nation. The reasons for this were, first of all, that the Russian empire, with the aim of destroying Turkistan and strengthening its colonialism there, pursued a very chauvinistic policy of Russification of the population, dividing the common people from men, breaking its pride, on the one hand, when on the other hand, in the Muslim fanaticism, the spirit of resistance to secular knowledge and progress, on the losing national pride, native language, literature, centuries-old traditions of the people occupied by colonialist states in the history of mankind, the tendency to destroy considered the priority. The oppressed people are accustomed to such views of the tier evil. In such a political turbulent situation, a group of intellectuals of the people, the original Sons of the nation, the progressive movement emerged. The selfless lochins of the people tried to awaken the Native people, to grieve for their future, although their wings were burning. They united under the so-called "jadid" great name and went a long and laborious path for spirituality, for pride and freedom without a head-on collar.

Reflecting such a difficult situation at the beginning of the XX century, literature differs from literature of all other epochs by the fact that ideas such as awakening the general public, expelling the people from a low standard of living, thinking about the interests of the nation, the Uzbek people want to see among the peoples with scientific potential are put forward. In all the works of our creators, such as the Almighty, the Fitrat, the Steppe, lies the idea that enlightenment of the people will pave the way to its civilization. And such artists as Avloni and Hamza not only through their own works, but also through practical actions in this regard (theater, newspaper, organization of magazines, opening of schools, etc.) through those who tried to enlighten the people. As we read each of their works, the black spots of the past, the height of the tragedies of that time, will hurt our dim. In particular, in the work of Abdulla Qadiri "The past days", it should be noted that Yusufbek Haji spoke of himself: "the tax collection of two coins from the fire... do not let it remain after a week... the right to lay down the counterparty in the tax collection, to hang it when it is seen in accordance with the suction given to me... there is a conscience to come, there is religion, there is faith. Let our people swallow the Earth. On the tip of Azizbek's amulet, he forgot about his yesterday's atrocities..." [1,108] - or if not, "- I could not create any contentment other than torment myself by spending lives for the peace of this land. I could not imagine that we would be our people, who do not know the Union, who eat each other alone in their own interests, and who do not disappear from the comfort of Turkistan, who are mercenaries, secular and ambitious. In this case, if we go and pour water on each other's tags, it is close-that Russian march will smear our Turkestan with his dirty feet, and we will wear with our own hands the Russian neck of our next generation. Our blind and foolish fathers descended, of course, from the curse of God - the impostor, my son! The Holy godfather of the grandfathers going to make our Turkestan a pig, and now we will definitely go to the wrath of the dog creator!..." [1,296] through the image of Yusufbek Haji and his speeches like those above, the silent tribulations of Qadiri's experiences of that time, the rebellion of the heart, are clogged up like poison in our joints.

Professor Naim Karimov, while expressing his thoughts about the events of that period, touched upon the tragic point: "during this period the despotic regime had driven one child of the people to the other, forced him to write summons over it, to keep an eye on every step of it, and when necessary to carry it to the brink of a bottomless pit.

"Divide et impera". "Break up and rule" - this was the motto of the colonialists at all times.

Tsar and Shura authorities were also no exception in this sense. On the contrary, they, unlike other colonialist states, constantly sow the seeds of discord among the people and destroy those who have his mind, conscience, or reputation and future.”[2,455]

Nabijan Baqiy describes the tragedy of the jadid period as follows: “during the time of the murder, our culture, art, literature, science were destroyed: prominent state and public figures, the original children of the Uzbek people were gathered and sorted. As if the victims had no namesakes!.. Who were they?... Do you know who they were?...Abdulla Qadiri was one of those, but only" [3,358]

If we pay attention to the above views and comments, we can say that the eternal tragedy of the people who threw their lives into the fire of hell by all means tried to bring their people out of this disgusting swamp, tied their hands without touching the shackles of the enemy, tried to spare their lives to someone else's soul Who did we live to believe?!

Indeed, the fact is that during the reign of the Khan times and the tyrannical councils, the people had a completely backward and sad state, the fraction of the males suffered by an ordinary people, the rise to the position of the king of Zoroastrianism, who had not yet learned in the hope of career, property, the illiteracy of almost the majority of the people, Qushboshi - we witness that period, when he was stumbling in a restless sleep.

Through the image of the Fatherland in the "The past days", the pain in the people's hearts of the ill-wishers irritates our hearts. Throwing stones of slander against the father, the box and others, plunging into the swamp of conspiracy, turning into an innocent culprit, and even the most severe, to be sentenced to death, of course, at that time, incompetence, career-giving, oppression and violence prevail in the country. The main goal of Abdulla Qadiri was also to change this disgusting system with a base-vein. The image of Uzbekayim is also of special importance in the work. The fact that he was given the euphoria, extreme arrogance, the misfortune of luxury, property, the fact that he made his dear charming unhappy behind him, until he brought not only the father, but also the honesty of his family to the brink of a precipice, the nation testifies to the women's blightlessness, the lack of their religious and secular knowledge. Here is my Uzbek mother-in-law, who keeps her place in the family higher than her husband, who has gone off to the rags, who has taken her child's life to the level of being above the level of her desire for air, who dreams of life as a treatise, does not touch the face of her mother-in-law of the present!

"I will bequeath it to you. Work in the enlightenment, wipe the head of teachers! Raise discord in the middle! The phrase" do not put children of Turkistan without knowledge " is an obvious proof of the idea of the jadids. They were truly teachers of the nation. They became a bridge that brought the nation out of the spiritual abyss with its enlightenment and education, which led to the centuries-old Bliss, preserving the nation from destruction and disaster.

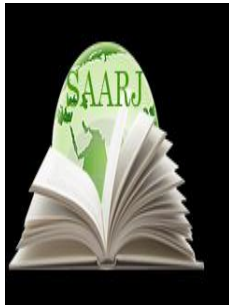
In short, the image of Zebi in the work of the Chulpon "The night and day", the image of Mirzo Hamdambay, Abdukodirboy, Mahmudhon, Sarah, Eshon, Zaynab, the image of Maryam in the work of Niyazi "The victims of toxic life or work" and "Is advokat easy?" through the various images in Fitrat's work, it is reflected in the comprehensive development of society that enlightenment of the people living in this society plays a big role. In general, for the jadids, it was the main goal to educate the people, especially the women who brought up the nation.

The jadids not only ideologically spread the foundations of the above-mentioned national ideology to the consciousness of the people, but also penetrated the hearts of the people through their works and took a deep place, returning the lost male, making the younger generation a scientific potential, blindly obeying the existing system.

It is known that for the colonial states in the history of mankind, the tendency to destroy national pride, native language, literature of the people is considered a priority. Because the worldview of the people can be changed by exactly these means.

REFERENCES:

- A.Qodiriy. (2019). "O'tkan kunlar" Toshkent: "Navro'z"
- Karimov, N. (2003). "Cho'lpon" Toshkent: "Sharq"
- N.Boqiy. (2021). "Qatlnoma" Toshkent: "Azon kitoblari"



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"SHAJARAYI TURK"-AS A HISTORICAL SOURCE

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ABSTRACT

This article discusses the book "Shajarayi Turk", which is considered an important source in the field of history. The book also contains the names of about 40 Turkish-Mongol peoples and their genealogies. Another important aspect of the book is that it is written in a very simple language. There is a Turkish proverb: "The arrow cut its own navel", which means that there is no one worthy of writing the history of this period. And he starts writing this book himself. The book consists of a short introduction and 9 chapters.

KEYWORDS: *Oguzkhan, Mangul, Uyghur, Tutak, Genghis Khan, Kipchak, nine, Turkish-Mongol people.*

INTRODUCTION

There are many historical books in the world. In particular, there are many historical books dedicated to the history of the Turkish peoples. Many historians and scholars have left behind unique books in this area. One of them is the king and scientist Abu al-Ghazi Bahadur ibn Arab Muhammadkhan (1603-1664). Abu-l-Gazi-Khan was a nobleman and a crown prince. He ruled Khorezm for almost 20 years (1644-1664), but left his mark in history not as a supreme ruler, but as a great scientist. In fact, Abu-l-Gazi-Khan was a man of broad and profound knowledge. He started the Khorezm School of historiography. He wrote two historical books: "Shajarayi turk" ("Turklar shajarasi") or ("Shajarayi turk va mo'g'ul tarixi") and "Shajarayi tarokima" ("Turkmanlar shajarasi"). It is believed that the book "Shajarayi tarokima" was written in 1658-1661. This book provides valuable information about the origins of the Turkish tribes, especially the Turkmen people. The book summarizes the history of the legendary king of all Turks, Oguzkhan, and his descendants, as well as the origins of the Turkmen tribes. According to Abu-l-Gazi-Khan, the Shajarayi Tarokima was written at the request of Turkmen mullahs, sheikhs and beys. There are parts of this book that are similar to "Shajarayi Turk". For example: some of the events in the first chapter and the second chapter are written in the same way. Another

interesting aspect is that both books consist of 9 chapters. The second book of Abulgazi Bahodirkhan, "Shajarayi Turk" was written in 1663-1664. It describes the socio-political history of Khorezm in the first half of the XVI-XVII centuries. Regarding the reasons for writing the Shajarayi Turk, the author himself says: "But the indifference of our fathers and brothers and the ignorance of the Khorezm people are the two reasons why our church and Abdullah's fathers did not finish their history from the place where our fathers left us." , - he noted.

Abu-l-Gazi-Khan also mentioned that he started writing this book himself: We decided to offer this history to one person. We couldn't find anyone worthy. It was necessary. That's why we said it ourselves. There is a Turkish proverb: "The arrow cut its own navel", which means that there is no one worthy of writing the history of this period. And he starts writing this book himself. The book consists of a short introduction and 9 chapters. These chapters describe the dhikr (events) of those who ruled in the land of Khorezm from the creation of Adam to the descendants of Shayban. Abu-l-Gazi-Khan has already written a part of chapters VII, VIII and IX (history of events up to 1644). His book was left unfinished in 1664, when he fell seriously ill and died shortly thereafter. According to his testament, the book was completed by another man on the orders of Anushakhan (1664-1674) and a scientist named Mahmud ibn Mullo Muhammad Urganji, a continuation of Chapters I-VI and IX (events of 1644-1664). The following notes are written about this in the book: For this reason, Abulmuzaffar valmansur Anushakhan ibn Abulgazikhan, the deceased and the forgiving, said, ", - it is noted. The book contains a number of historical books written before Abu-l-Gazi-Khan. There are 18 of them. Only two of them are mentioned: Sharafiddin Ali Yazdi's ("Muqaddimayi zafarnoma") and the famous Iranian historian Rashiddin's "Jome ut-tavorix" ("History Complex"). This indicates that these books were used in the writing of the book. It is worth noting that the book has some similarities with the book of Mirzo Ulugbek (1394-1449) "Tarikh-i araba 'ulus" ("History of the Four Nations"). Evidence that he used this book as well, or that he made extensive use of this book in writing both books. The Turkish book consists of a light translation of the part of Rashid's book "Jome ut-tavorix" about the origin and emergence of the Turks. In addition, in writing the original part, chapters VII, VIII and IX, the author made extensive use of the information he knew and collected from inquiries. Chapter IX of the book is directly devoted to the socio-political history of 1512-1663. He gave a brief explanation of why the book was written in nine chapters. The foreword to the book states:

The date is one thousand seventy-four Hijri, so we started this book and named it Shajarayi Turk. We did nine chapters. These nine chapters are wonderful. For him, the rulers say, "Nothing is higher than nine, in the end it is nine." The sentence states that the number nine is sacred to the Turkish-Mongol peoples. There were different customs associated with the number nine. For example: the names of nine Uyghur people, gifts (nine horses, nine weddings, nine different dishes, etc.). According to Abu-l-Gazi-Khan, this custom was established in honor of 9 Turkish khans: Karakhan, Oguzkhan, Aykhan, Kunkhan, Tengiz and others. This information is ethnographically very important. There is another important piece of information in "Shajarayi Turk". It is reported that after the death of Turkhan, Tutak was replaced by him. One day, when Tutak is out hunting and eating deer, a piece of meat falls to the ground, and when he eats it, the meat becomes sweeter than before. From the time of Tutak, the Turkish people used to add salt to food. In this book, he gives the following description of the history of naming the Mongol people: "The original word of Mongol is Mangul. The meaning of "Ul" is a simple tongue, that

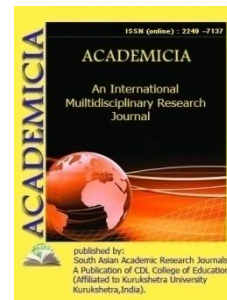
is, a sad simple temak. " The book begins with praise and blessings on Allah and His Messenger Muhammad (peace and blessings of Allah be upon him) in keeping with the traditions of the Middle East. Religious legends such as the creation of Adam, the flood of Noah, as well as the origin of the Turkish peoples, the birth of Oguzkhan, the relationship between Karakhan and Oguzkhan, Oguzkhan's Turan and India, The marches to Iran, Damascus, Egypt, the birth and political emergence of Genghis Khan, his relations with the Khorezmshahs, the conquest of Movarounnahr, Khorezm and Khorasan, the rule of his sons and grandsons in the conquered lands, and the kings of the Shayban dynasty who ruled in Khorezm important, reliable and valuable historical information.

Abu-l-Gazi-Khan also provided important information about how he entered the political arena in Khorezm. The play deals with the crisis of the Khorezm state and the personality of Jaloliddin Manguberdi (1098-1231). The Shajarayi Turk is considered to be an important source for all Turkish scholars, as it contains a wealth of valuable information about the customs, traditions, language, way of life, occupation and culture of the Turkish-Mongol tribes. This is very important ethnographically. The book also contains the names of about 40 Turkish-Mongol peoples and their genealogies. Another important aspect of the book is that it is written in a very simple language. He wrote in Shajarayi Turk that he did not use Chigatay Turkish: "I told this story in Turkish so that all great people and ordinary people could understand it. I didn't add a word of Persian or Arabic to Chigatoy Turkish. "This means that the book was written in pure Turkish, which is confirmed by the following information: We have not done any of this, so whoever reads and listens to this book will surely become a Turk. Shajarayi Turk is highly regarded by literary critics, orientalist and linguists. This book was first published in Kazan in 1825 by Count Ramantsev in the original text. The book "Shajarayi Turk" was translated into English, Russian, German, French and many other languages.

In short, "Shajarayi Turk" is rich important informations about the period from ancient times to the time of the Khanates, and this book is being studied with great interest by many scientists. To this day, the book has not lost its historical significance. Abu al-Ghazi Bahadurkhan's book "Shajarayi turk" deserves recognition as an important historical source.

REFERENCES:

1. Abulg'oziy Bohodirxon . "Shajarayi turk" ("Turklar shajarasi")Toshkent. 《 Cho'lpon》 . 1992.
2. Abulg'oziy Bohodirxon . "Shajarayi tarokima" ("TurkmanlarShajarasi"). Toshkent . 《 Cho'lpon》 . 1993.
3. Arminiy Vamberi . "Buxoro yoxud Movarounnahr tarixi". 2- jild. Toshkent. "INFO CAPITAL GROUP" . 2019.
4. U. Tursonov, B. O'rinboyev . "O'zbek adabiy tili tarixi".Toshkent . 《 O'qtuvchi》 .1982.
5. Sotim Avaz . "Shajarayi turk" hayratlari va saboqlari. 《 Sharq yulduzi》 . 2017. 7-son



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THE FIRST HORSE CLUBS IN SURKHAN OAKH

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ABSTRACT

The article deals with the establishment of equestrian clubs in the Surkhandarya oasis in the last century, the activities of masters of sports who grew up in them, the popularity of equestrian sports in the oasis, the worthy participation of oasis athletes in regional, national and union equestrian competitions.

KEYWORDS: *Master of sports, spartakiada, riders, "girl chase" competition, "Cotton holiday" sports competitions, "Pakhtakor" sports society, "Spartak" sports society, chavgon, "Boks", "Bazzafil", "Bedakur".*

INTRODUCTION

Equestrian sport is one of the ancient sports of the Uzbek people, which demonstrates the courage, bravery, agility and pride of the young man.

Today, the development of equestrian sports is clearly visible. In Tashkent, Fergana, Jizzakh, Kashkadarya and Surkhandarya regions, equestrian competitions and kupkars are often held. Sufficient attention is paid to improving the breed of horses, replenishing the ranks of athletes and riders at the expense of young people. This work, in turn, is yielding positive results, and world-famous riders are emerging. If we take the Surkhan oasis as an example, we can see that a lot of positive changes are taking place there.

The end of the third quarter and the fourth quarter of the last century entered the pages of history as a unique positive stage in the development of equestrian sports in the Surkhandarya oasis. In 1966, the first equestrian club was established in our region. The site for the club was selected and allocated from the collective farm named after U. Aliyev (former) in Sariosiya district. That year, work began with the participation of only two riders. It can be said that the opening of this

club was the prelude to the great work of the following years, the foundation of future great victories.

Since then, it has been observed that the level of interest in equestrian sports among the people is extremely high. In a short time, the number of members of the club exceeded thirty. As early as 1967, one of the members of the club, Robak Sigov, was nominated for Master of Sports. Badilla Buriev and Shamil Murtazaev became masters of sports of the first level. [1]

The members of the club went to the Republican Games in 1967 in preparation for it. They finished second in the Spartakiad. It was a huge success for the club members who had just started work. Soon the participants of the club took the first place in the competitions among rural athletes.

Of course, after that, the members of the club worked hard to further consolidate the achievements. Particular attention was paid to increasing the number of club members at the expense of energetic and talented young people.

Efforts were made to ensure that the athletes' skills continued to improve. It should be noted that the selfless man, the coach of the club, master of sports Stepan Vasilevich Ilyasov played a significant role in this work.

Of course, great things could not be accomplished by desire alone. In the first club, favorable conditions were created for training. Young people capable of equestrian sports are constantly involved in the club. Secondly, special attention was paid to the selection and care of purebred racehorses. Because good riders needed good horses. This later served as the basis for great success.

Later, taking into account the growing interest in equestrian sports in the district, a branch of the equestrian club was opened on the territory of the former collective farm "Communism". This, in turn, was a factor in the further expansion of the ranks of riders.

In 1971, a cotton festival was held in the Republic. It can be said that this holiday, with its richness in sports performances, aroused great interest among many. In particular, equestrian competitions attracted a lot of attention. Surkhandarya riders, who took an active part in these competitions, spoke again. The national team of our region, consisting of talented riders, took first place in these festive competitions and raised the flag of victory. Members of the regional equestrian club took an active part in 13 rounds of the competition program in classical equestrian sports. For example, Badilla Buriev, a student of school No. 56 in Sariosiya district, won the first prize in the crowd jumping competition, further strengthening the team's position. Mirza Tursunov, Mamat Khudoynazarov, Shamil Murtazoev and other skilful members of the team achieved great success in the competitions on jumping over obstacles. [2]

The second day of the competition began with the national equestrian sports. It is well known that overturning an opponent on horseback requires strength, agility and skill from the rider. Two participants of the regional team took part in the competitions in this round. Turob Mamashukurov and Ergash Suvonov from Surkhandarya impressed the audience, beating all rivals. They took first place with great honor and superiority.

Flyura Otakhonova and Ergash Suvonov from Surkhandarya took the second place in the competition "Kyz Kuvmoq".

Then began the championship in kupkari, one of the most popular and favorite types of equestrian sport. In this case, the riders of our region showed real skill. For example, such skilled riders as Turob Mamashukurov, Rakhmon Khushbokov, Layli Berdiev, Nurmon Boymurodov, Mamarayim Juraev, Rakhmat Omonov, Odima Zoirov, Bekmazar Kurbanov, Ergash Suvonov defeated the riders of Bukhara, Namangan and Kashkadarya regions one after another. Thus, for the first time, Surkhandarya athletes won the grand prize of the Republican "Cotton Holiday" sports competitions - the mobile cup.

MATERIALS AND METHODS

Speaking about the development and progress of equestrian sports in the Surkhandarya oasis, it is worth mentioning the organizers who have sacrificed and cared for this cause. The services of such leading officials as B. Omonov, U. Mamajonov, B. Kholmatov from Sariosiya were invaluable in the formation of a strong team of skilled riders in the region. Zokir Valitov, former chairman of the Pakhtakor Voluntary Sports Association of Sarnosiy district, has not only helped to increase the number of riders, but also to improve their skills, increase the number of thoroughbred horses and ultimately ensure the success of the team. In addition, it is worth mentioning the services of A.Dilmatov, T.Khalikov, B.Tashkulov.

Later, interest in equestrian sports began to be observed not only in Sariosiya district, but also in other districts. This time, in December 1970, the regional cotton festival was held in the territory of the collective farm "Namuna" in Termez district. The festival was attended by many spectators from different districts of the region. Renowned riders from almost all districts also came to demonstrate their skills. Then the riders had a great time. The riders raced a thousand meters. They rode along a special path. Thousands of spectators watched the riders without taking their eyes off them, shouting. F.Boymurodov, a rider from Namuna collective farm in Termez district, was the first to cross the finish line and won the race. The second place was taken by K.Murodov from Sherabad and Muhammadi Boykulov from Baysun. The riders also took an active part in the kupkari competitions held on the same day. In this case, the great interest in the masses was once again proved. It was a very interesting show. Kuldosh Yodgorov from Zharkurgan demonstrated in practice that he is a great rider and took the first place. Odina Zoirov, the Republican champion in equestrian sports, was awarded the second place. [3]

It should be noted that in those years, in the competitions in the classic equestrian sports, the riders of our oasis have always steadfastly defended the honor of our region. The coach of one of the sports clubs in Sariosiya district, master of sports Sharof Badalov, masters of sports from Sariosiya Isak Sodikov, Fayzulla Mirzaev raised the flag of victory in many competitions in classical equestrian sports. In other words, the same riders contributed to the further strengthening of the prestige of the regional team.

Later, an equestrian club was opened at the Istara farm in Qizirik district. Five breeds of horses were brought to the club from the former Union Central Horse Plant. Since the 1970s, there has been a growing interest and encouragement to establish equestrian clubs in the districts of the region. For example, the establishment of equestrian clubs in the collective farms named after Juma Pirnazarov in Sariosiya district, named after Akhunboboev in DeNOV district, named after P. Nabiev in Muzrabad district can be a bright proof of our opinion. Turob Mamashukurov, Zokir Valitov, Yuri Turin and Vladimir Favorsky were instrumental in finding, selecting and admitting talented young people to the clubs, improving their sports skills. Through their direct

efforts, many breeds of horses were brought from Dnepropetrovsk, Rostov-on-Don, as well as from the neighboring Republic of Turkmenistan. All of this work required a great deal of effort, hard work, and a love of sports. Shukur Irmatov, an experienced specialist and chairman of the Pakhtakor (former) Voluntary Rural Youth Sports Society, led the event. [4.26.]

The number of equestrian clubs increased to ten by 1970 due to the efforts of direct equestrian enthusiasts. There were 100 good horses and 135 of them. Thirteen of the trainees were first-class athletes. By 1990, equestrian sport had risen to a higher level in terms of quality and quantity. At that time, the number of equestrian clubs reached 14, the number of horses - 600, and the number of active riders - 856. 80 breeds of horses were brought from abroad. At that time, the number of masters of sports was 32, and the number of first-class athletes was 113. The heyday of equestrian sports was observed in those years. [5]

Analysis of evidence and figures shows that in 1970-1999 in the Surkhandarya oasis there was a great increase in the development of equestrian sports. In particular, in 1977 the establishment of a horse-drawn carriage in a beautiful place in Termez district paved the way for even greater work. It is no exaggeration to say that this was one of the most beautiful and envied horsemen of Uzbekistan. An equestrian school was established on the basis of Otchopar. Hundreds of young people began to develop skills at this school. This school has repeatedly helped the champions of Uzbekistan, masters of sports - Muhammadi Buriev, brothers Kholiddin za Isok Sodikov, Mirza Tursunov, Fayzulla Mirzaev, Adham Alpomishev, Muhiddin Jabborov, Valery Chekalin, Svetlana Chekhalima to conquer the ladder of mastery.

Boxes, Bazzafil, Bedakur and other thoroughbred horses, trained at the Termez equestrian sports school, have consistently won the Republican and former Soviet championships and spartakiads. In fact, our horses, nicknamed "Bazzafil" and "Bedakur", took part in the 1976 Olympic Games in Montreal, where they won under the leadership of Valery Dvoryaninov and won a gold medal.

RESULTS AND DISCUSSION

In the last quarter of the last century, kupkari developed rapidly in the territory of our region, and dozens or even hundreds of famous riders emerged. Significant progress has also been made in the breeding and breeding of domestic horses. During these years, Surkhandarya riders have won seventeen consecutive competitions in Tashkent on the occasion of the Harvest Festival. In addition, the riders of our oasis have won five kupkari competitions between the former Soviet republics. These competitions were held in 1974 in Bishkek (Kyrgyzstan), in 1976 in Almaty (Kazakhstan), in 1982 in Dushanbe (Tajikistan), in 1985 in Pyatigorsk (Russia), in 1987 in Tashkent (Uzbekistan). It should be noted that the national team of Uzbekistan, which took part in these prestigious competitions, consisted mainly of skilled riders from Surkhandarya. Fans still remember that the honor of the national team was defended by the famous runner, coach Turob Mamashukurov, Odina Zoirov, Ergash Suvonov, Holly and Saman Yusupov, Kurbanmurad Kholmurodov, Tovashar Niyazov, Chori Norboev, Shoberdi Gundaev, Tura Kholmatov, Omon Juraev. [6]

It is necessary to speak again and again about the Termez equestrian, which has made a great contribution not only to the region, but also to the development of equestrian sports in our country. 300 hectares of land were allocated for the horse-drawn carriage. A new garden was built here. Initially, 50 students from grades 5-10 were involved in the equestrian school

established under the auspices. Famous equestrian coaches began to teach them equestrian sports. The famous riders who grew up later belonged to this school.

Karim Mardonov and Muhiddin Jabborov, students of this equestrian school, became candidates for masters of sports at the Republican Youth Games in Tashkent in May 1980, and Turgun Sunnatov and Bahodir Hayitov became first-class athletes.

In October 1979, equestrian competitions for the Republican Prize were held in Termez. It was attended by more than 120 masters and famous riders from the Central Asian Republics and all regions of the country. Horsemen from Surkhandarya, such as Kholiddin Sodiqov, Mirza Tursunov, Marat Mamadiyrov, demonstrated their skills in these competitions and became masters of sports.

In May 1954, the Central Asian Equestrian Championship for the prize of Uzbekistan was held in Tashkent and Chirchik. Along with the national teams of Kazakhstan, Turkmenistan, Kyrgyzstan and Uzbekistan, riders from Surkhandarya, Tashkent, Fergana and Andijan regions also took part in the championship. Olga Fedulova and Bakhtiyor Yorov, our young riders, became masters of sports. Olga Fedulova, Alexander Fedulov and Valery Chekalin have been included in the national team of Uzbekistan. [7]

Valery Chekalin, who competed in the former Union Championships, took third place and won a bronze medal.

It should be noted that in those years, the members of the equestrian club, which was opened on the territory of the Akhunboboev collective farm in Denau district, also achieved great success. In a short period of time, the number of young people participating in the sports club has significantly expanded. Here the training of horses became an intensive part of the training of young athletes. Master of sports Jura Mamatov and a leading specialist in equestrian sports Fayzulla Mirzaev enthusiastically joined this work. Directly under their leadership there was a strong movement. At that time, the club had 16 horses at its disposal. Seven of them were thoroughbred horses. Complex exercises such as putting horses into play, jumping from heights, and overcoming obstacles were performed on a regular basis. There were 20 riders involved in these exercises. They learned to move left-handed on horseback. Young riders Munira Jalitova, Abdusamad Rakhmatov, Nemat Jumaev, Abdurahmon Hayitov have achieved significant success. They took an active part in regional competitions and won the right to participate in Republican competitions. Club members have won over the years.

As we turn the pages of history, we come across interesting facts and figures. Here we would like to cite another example from the past many years. In October 1975, equestrian competitions among riders of the former Soviet Union were held in Rostov-on-Don. On the field, the chagon game was getting hotter and hotter. The riders were working hard to bring extra points to their teams. The referee's whistle blows when the game reaches its climax. He scored an eleven-meter penalty kick towards the goal. The captain of the national team of Uzbekistan Kurbanmurad Kholmurodov scored the penalty kick. People still remember that the ball was clearly aimed at the goal. A few minutes later, the referee's whistle blows. It was a sign that the game was over. So, in this game, the hands of the Uzbek riders were high. At the equestrian competitions held here, riders from the Central Asian Republics competed in kupkari, equestrian basketball and Surkhan games. In these games, our compatriot Kurbanmurad chapagon Kholmurodov actively

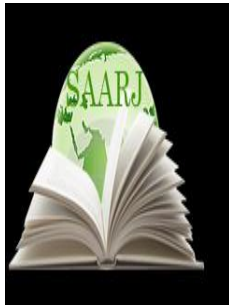
participated in the national team of the Republic and achieved great success and won the national championship. From then on, this rider's stellar career in equestrian sports began. [8.78-82.]

CONCLUSIONS

In conclusion, the last quarter of the last century went down in history as a memorable period in the development of equestrian sports in the Surkhandarya oasis. During these years, the classic types of equestrian sports became widespread in our region and developed rapidly. Our riders, who rode fast on the fields of the world, showed great skill. At the same time, thousands of our young people began to look at equestrian sports with great interest and love. Secondly, they also have extensive experience in the restoration, cultivation, reproduction and maintenance of the park. The acquired skills helped him a lot in his later work.

REFERENCES

1. Toshpulatov J. The riders are Uzbek guys. A new generation. T., 2009.
2. Toshpulatov J. Physical culture and sports in Surkhandarya. Termez, 1991.
3. Denau field archive. (Interview with Kamilov Yuldash, 22, Ziyoli Street, Denau). May 17, 2020.
4. State archive of Surkhandarya region. Fund 221, List 1, Page 58 Unit, 26 Sheets.
5. Alekseev N. M., Organization of work in unified collectives of physical culture, M., 1971.
6. Abdumalikov R., Yusupov T. T., Akramov A. K., "Ways to Expand the Physical Education Movement," T., Medicine; 1988
7. Borshin N. A., Ishakov M. F.— The activity of the Komsomol of Uzbekistan on the development of physical culture and sports in the republic (1924-1974) .— Tashkent, "Young Guard", 1975.
8. Nazirov, B. S. (2020). Master who devoted his life to sports. ISJ Theoretical & Applied Science, 06 (86), p.78-82.



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FACTORS OF INCREASING SOCIO-ECONOMIC EFFICIENCY IN SERVICE ENTERPRISES

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ABSTRACT

This article classifies the factors influencing the socio-economic efficiency of service enterprises, structural changes in the industry, sources and directions of socio-economic efficiency, the role of the human factor in improving socio-economic efficiency, labor potential and quality of services to consumers, service processes, areas for improvement have been explored.

KEYWORDS: *Service Economy, Socio-Economic Efficiency, Factors, Labor Potential, Service Quality, Service Process, Consumers.*

INTRODUCTION

In the current situation, the socio-economic development of sectors and industries of the country should be based on a qualitatively new system, and this system should be characterized by specific laws of operation and regulation. The regulation of the service process and the formation of a special institutional system of new approaches will allow to achieve the set strategic indicators of development in all sectors and areas of activity.

The new economic relations that have emerged in the country on the basis of economic reforms implemented during the years of independence have created favorable conditions for the development of the service sector. That is, economic reforms have allowed to improve the activities of service enterprises and organizations, the emergence of new forms and methods of service.

Today, in the process of modernization of the economy of the republic, the steady economic development of enterprises in the service sector requires the improvement of mechanisms to increase socio-economic efficiency, which is an important factor in ensuring the intensity of their economic activities. In this process, the tasks related to the mechanism of improving the efficiency of service enterprises, increasing labor productivity in enterprises, economical use of

economic resources, achieving efficiency in the use of labor resources, ensuring the quality and efficiency of services produced, fully meeting the needs of consumers is one of the problems. This is one of the urgent tasks to increase socio-economic efficiency by improving service processes in the industry.

LITERATURE REVIEW

The scientific literature has scientifically and theoretically and methodologically studied some aspects of the efficient use of resources in the service economy, the achievement of socio-economic efficiency of services, improving the quality and competitiveness of services provided by businesses and improving service processes.

Avanesova G.A. [1, p. 215] in her work explored the effective use of resources in the service sector, increasing socio-economic efficiency in the field, improving the quality of services provided to consumers in accordance with their needs, achieving labor efficiency.

In the work of Erofeeva A.P. [3, p. 141] to improve the process of service in enterprises, ensuring the competitive advantage of service entities, the relationship of quality of services in the industry with their consumer characteristics, criteria and indicators of service quality assessment the processes of modernization of personnel management system are studied.

The textbook, edited by Pardaev M.K. [4, p. 133], examines the problems of development of services, services and tourism, ways of efficient use of labor resources in the service sector, factors and directions to increase labor productivity. Also, the social, economic and institutional bases of the development of the service and tourism sectors have been scientifically studied in this regard.

Qualitative and quantitative assessment of economic growth factors in the service sector, based on previous research in this article, to determine the contribution of each of these factors to the growth of the service sector and industry is still an important scientific issue. The works of the abovementioned authors identify general aspects of economic growth based on an assessment of the impact of various factors on socio-economic efficiency. In this study, the factors and directions of increasing socio-economic efficiency in service enterprises have not been systematically studied. Accordingly, the scientific essence of our research is that ways to increase socio-economic efficiency in service enterprises have been studied.

RESEARCH METHODOLOGY

The study used a dialectical and systematic approach to the study of economic systems and ratios, complex assessment, comparative and comparative analysis, statistical and dynamic approaches, and grouping methods to increase economic socio-economic efficiency in service enterprises.

Economic efficiency reflects the results of the activities of entrepreneurs, while social efficiency reflects the social efficiency of economic entities, its impact on various aspects of society. At the same time, social and economic efficiency were found to be somewhat interrelated. In addition, the indicators of economic efficiency in the service economy were classified and factors for improving labor efficiency were studied.

Analysis and results

For the successful implementation of strategic tasks in the field of increasing socio-economic efficiency in service enterprises, the study of factors influencing the full use of resources is of paramount importance for improving the scientifically based framework for planning and analysis of social and economic indicators and production processes.

High rates of efficiency of the organization of economic activity in the enterprises as a whole provide scientifically based use of complex factors influencing socio-economic efficiency. This is especially relevant today. It is especially important to develop measures to ensure that most companies operating in the country survive at the expense of resources that do not require large expenditures.

However, in modern management theory and practice, theoretical and practical developments on this topic are insufficient. This leads to the fact that at present, the issues of assessing the impact of various factors are either addressed from the point of view of common sense, without taking into account the real state of the economic situation or a generalized presentation of various similar indicators. The question of the correct classification of factors influencing socio-economic efficiency is important. It should be noted in the structure of such a classification that these factors are affected not separately but interrelatedly.

The theoretical significance of the classification of factors affecting socio-economic efficiency is that it allows to fully reveal the essence of efficiency, taking into account certain areas of enterprise activity, to determine the ratio between factors, to highlight the characteristics of individual factors. The use of such a classification allows to determine the individual impact of each factor on the basis of prevention of recurrence, as well as to take into account the effectiveness of factors that allow to accurately identify and use the growth of socio-economic efficiency as a whole.

Recommendations for the classification of factors for increasing the efficiency of human resource use in service enterprises have been made several times in the economic literature. According to the general principle, this classification was, in their essence, a combination of factors in a larger or smaller range in an enlarged group. Factors affecting socio-economic efficiency in service enterprises should be classified according to the purpose of the study. In the analysis process, this classification is used not only to assess the achievement of the planned level, but also to determine the actual impact of individual factors on socio-economic efficiency [1, p. 137].

There are various factors and key areas for increasing socio-economic efficiency in service enterprises. The available factors can be divided into groups according to three characteristics: by source, by key areas of production development and improvement, by the role of factors, and by the level of implementation.

The classification of influencing factors according to the sources of increasing socio-economic efficiency helps to determine at what expense social labor savings can be achieved. In this regard, the main factors include: labor capacity, material capacity, capacity of funds and reduction of capital requirements, rational use of resources and time savings. However, such classification does not meet sufficient demand. To find answers to these questions, it is necessary to group the total factors of increasing socio-economic efficiency by key areas of production development. They consist of a set of physiological, technical and technological, organizational-

economic and socio-psychological measures aimed at saving social labor. These areas are diverse. The most important are:

- improving the content of services;
- development of innovative activity, increase in technical and economic level of service processes, reduction of time of introduction of innovations;
- increase the level of specialization, cooperation and territorial location of service processes;
- improving the management structure, financing, economic evaluation, lending and incentives;
- to increase the professional activity and initiative of employees based on the development of cognitive factors.

Modernization of service processes and deepening of reforms in the sector are the main directions of increasing socio-economic efficiency. One of the main directions of increasing production efficiency in service enterprises is to accelerate the development of science and technology. The technical and technological factor provides at least two-thirds of the increase in labor productivity.

TABLE1. CLASSIFICATION OF FACTORS AFFECTING THE PRODUCTIVITY OF EMPLOYEES IN SERVICE ENTERPRISES¹

Factors	The content of the factors
Physiological	Gender, age, health, mental ability, physiological ability, etc.
Technical and technological	The nature of the issues to be addressed, the complexity of labor, technical innovation, the level of use of scientific and technical achievements, the technical and economic level of production, the level of armament with funds, etc.
Organizational	Working conditions, ratio of personnel categories, size of the enterprise, work schedule, length of service, qualifications of employees, level of staff use, etc.
Socio-economic	Material incentives for workers, insurance, social benefits, living standards and quality of life, and more.
Socio-psychological	The spiritual environment in the team, the psychophysiological state of the employee, status and recognition, the organizational culture of the enterprise, employee satisfaction with the work, the prospects for promotion, and more.

Therefore, it is a key factor in increasing socio-economic efficiency in the industry, and also involves the identification of factors that affect the efficiency of staff labor. Based on their economic nature, we propose the following classification of factors influencing the labor efficiency of employees in service enterprises (Table 1).

Today, in order to comprehensively study and understand the social and economic efficiency of the service sector, it is necessary to develop its own criteria and indicators. However, this does not mean that the criteria and indicators of social and economic efficiency are not interrelated. On the contrary, they are inextricably linked and complement each other.

If economic efficiency in the service sector is not calculated and measured in terms of quality, it is impossible to carry out the work set for its steady increase. Criteria and indicators of efficiency in service enterprises, such as certain sectors of the economy, are divided into criteria of economic and social efficiency. In the study of economic efficiency in the service sector, it is important to correctly understand and calculate its essence, criteria and indicators. If economic efficiency is not qualitatively calculated and measured, it will not be possible to carry out the planned measures to increase it on a regular basis.

There is currently no single approach to setting general criteria for the efficiency of service enterprises. According to some economists, the criterion for the effectiveness of economic activity is to fully meet the needs of the population with a high level of service and rational use of all resources.

While many economists say that the level of satisfaction of consumer demand for consumer goods is a general criterion of service efficiency, others say that the efficiency of the service process should be determined by a system of interrelated key indicators, the amount of gross income generated by this system, which fully reflects the amount of services provided to the population.

A comprehensive analysis of the efficiency of business enterprises should not be limited to its criteria, as the criterion mainly reflects the essence and main objectives of efficiency, but can not serve as a means of measurement and evaluation. These tasks are performed by performance indicators.

Achieving high efficiency in service enterprises on the basis of full and quality satisfaction of the population's demand for services through the efficient use of material, financial and labor resources is the main criterion for the effectiveness of service activities (Table 2).

The growth of economic efficiency is an objective law of development of any form of production, because the development of society requires an increase in the volume and quality of products, a decrease in production and transaction costs, an increase in capital to implement expanded reproduction. The essence of economic efficiency is the result obtained per unit of resource expended. It is well known that results and costs summarize key aspects of the recycling process, with the service enterprise interested in achieving high efficiency at low cost. This network is a general economic principle of the process of mass production and circulation, which emerges as a law that increases the efficiency of activities, which consists of the relationship between the use of resources and its consequences. [3, p. 45].

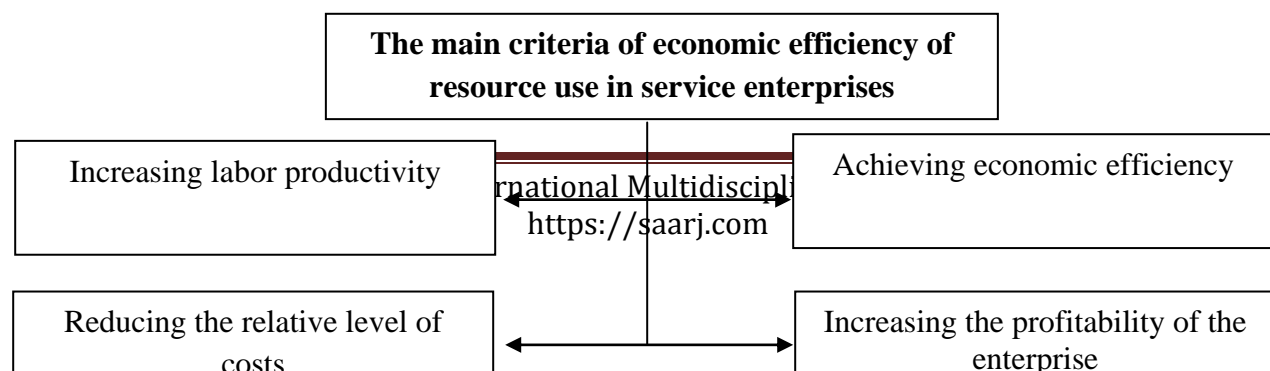


TABLE 2. DIAGRAM OF THE MAIN CRITERIA FOR COST-EFFECTIVENESS OF RESOURCE USE IN SERVICE ENTERPRISES²

Although the concepts of social efficiency and effectiveness are found in many economic literatures, there is still no clear answer to the question of how the criteria and indicators of social efficiency and effectiveness are evaluated and calculated.

In general, the achievement of the social goal of a society, which aims at the comprehensive and harmonious development of man, is a criterion of social effectiveness. There are different views on this concept. At the current stage of development of society, the criterion of social effectiveness is a tool that promotes the development of a harmoniously developed person. Social effectiveness has not one, but several criteria. Its first criterion is the level of satisfaction of the needs of the people and the improvement of the social structure of society, while the second criterion is the reduction of consumption processes that indirectly affect the growth of efficiency (Table 3).

In our opinion, it is understood to fully meet the demand for socially effective goods and services as a service sector by providing high sales services, improving the working conditions of the service enterprise with quality business activities, increasing the level of staff funding and service culture.

It is understood that the efficiency of resource use in service enterprises is directly related to and inextricably linked to the above criteria of economic and social efficiency, and is reflected in the economic relations of the balance of social and economic efficiency in achieving economic results.

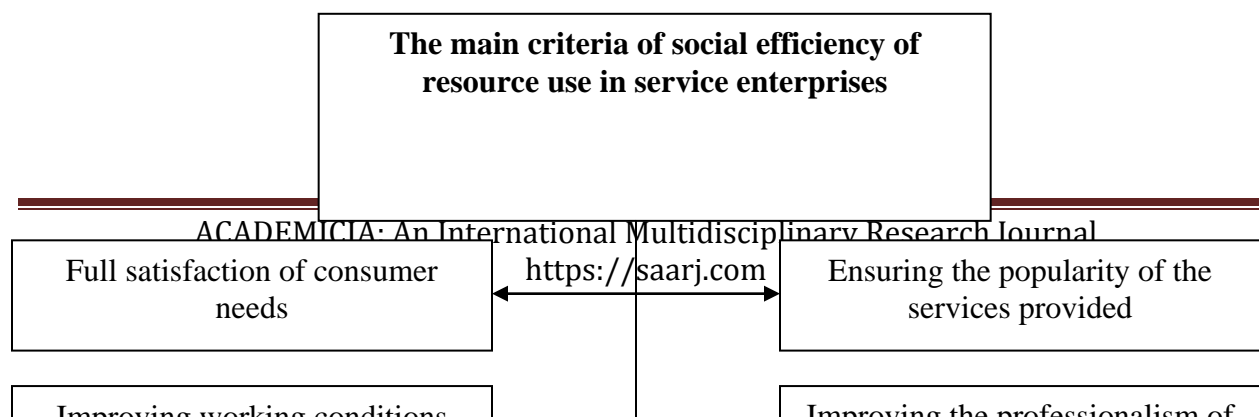


TABLE 3. DIAGRAM OF THE MAIN CRITERIA FOR SOCIAL EFFICIENCY OF RESOURCE USE IN SERVICE ENTERPRISES³

Economic efficiency is the result of the activities of economic entities, social efficiency is the social efficiency of economic entities, its impact on various aspects of society. In this case, social and economic efficiency were considered to be to some extent inextricably linked. Social efficiency is the improvement of the social life of the people, which serves to increase economic efficiency [6, p. 95].

Ultimately, it has a positive impact on the employee's ability to work and creates conditions for increasing labor productivity. Accordingly, there must be an economic basis for the implementation of a clear social program. This economic basis is achieved by increasing the economic efficiency of service enterprises.

Thus, the new essence of effective activity in the service economy can be summarized as follows: the achievement of performance efficiency is not determined by the content of the concept of efficiency, but is assessed by indicators of social efficiency. These indicators have a broader meaning than indicators of economic efficiency. Changes in the quality indicators that make up the efficiency show the need to assess the effectiveness of business entities. Accordingly, social efficiency cannot be reduced to a precise quantitative measure. This can only express the economic nature of efficiency in the traditional way, its social and socio-economic aspects are difficult to measure by quantitative criteria. Such an approach is now widespread in economics. At the same time, research on the evaluation of efficiency in the service economy is becoming more relevant, and the demand for research in this area, in our opinion, is much higher.

In the system of indicators of social and economic efficiency of service enterprises, the indicators of efficient use of economic resources have a special place.

The relationship between the growth rate of labor productivity in service enterprises and the reduction of labor capacity of the product is characterized by the following formula:

$$MY_{yc} = \frac{M_{cu2} \times 100}{100 - M_{cu2}}, \quad (1)$$

there: MY_{yc} – labor productivity growth rate;

M_{cu2} – labor capacity.

$$MC_{nac} = \frac{MY_{yc} \times 100}{100 + MY_{yc}}, \quad (2)$$

there: MY_{yc} – the rate of growth of labor productivity relative to the base period (%);

MC_{nac} – decrease in labor capacity over the base period (%);

The total increase in labor productivity (ΔMY) in service enterprises is divided by the increase in the volume of services provided and the decrease in the number of employees, and it is determined by the following formula:

$$\Delta MY = \frac{100 \times (\Delta B + \Delta HC_k)}{100 + C_k}, \quad (3)$$

there: ΔB – increase in production volume in the reporting period at the enterprise, %.

ΔHC_k – reduction in the number of employees in enterprises, %.

If the number of employees in the enterprise does not decrease, and vice versa increases, then the percentage of the number of employees is expressed in reverse.

The contribution of net product growth due to increased labor productivity in service enterprises D_{cm}

$$D_{cm} = \left(1 - \frac{\Delta Y_u}{\Delta Y_{cm}} \right) \times 100\%, \quad (4)$$

there: ΔY_u – the growth rate of the number of employees in service enterprises %;

ΔY_{cm} – growth rate of pure product production, %.

For a comprehensive and comprehensive analysis of the efficiency of service enterprises, generalized indicators are used along with its specific indicators. Generalized indicators in the economic literature include such indicators as: profitability of the enterprise, the relative level of costs, the efficiency of fixed and working capital, the fund efficiency of all resources expended.

Profitability of the enterprise is one of the performance indicators of the service enterprise. Profitability of the enterprise (R_k) is determined by the percentage of net profit in the service sector to the total amount of fixed and current assets of the enterprise:

$$R_k = \frac{C\Phi \times 100}{\sum A\Phi + \sum HAA}, \quad (5)$$

there: $C\Phi$ – net profit margin

$\sum A\Phi$ – the total value of fixed assets;

$\sum HAA$ – the amount of current assets under the norm.

Achieving the ultimate social goal of a society that aims to create opportunities for all-round and integrated human development is a key criterion of social effectiveness.

The next criterion of social efficiency in the sectors and industries of the economy is to reduce consumer spending, which indirectly affects the achievement of social production efficiency.

Social efficiency in the service sector cannot be measured on the basis of a single criterion, as the criteria for the social efficiency of the development of the sector are different. If the criterion of social efficiency reflects its content and objectives, the indicators serve as a tool for evaluating efficiency [4, p. 114].

Statistical indicators of social efficiency in service enterprises and organizations can be divided into the following groups:

1. Statistical indicators of consumer satisfaction;
2. Indicators of reduction of service time;
3. Statistical indicators of improvement of working conditions and nature.

Indicators that fully meet the needs of consumers include the following: volume of services per capita; volume of gross services per capita; growth rate of services provided; indicators of reduction of service time; coefficient of reduction of time spent by consumers in service enterprises and organizations; time spent on service of one consumer; the time spent for each customer to re-visit the service facility. This figure indicates a decline in social effectiveness; the amount of time spent for a person who needs to be serviced once in a moderate amount.

Indicators of working conditions and the nature of work in service enterprises include: automation of labor processes (the level of application of new equipment and technologies); the level of modernity of buildings and structures of enterprises; the level of use of advanced labor experience in the service process; level of advanced techniques and technologies, equipment and mechanisms; qualification, education and professional level of employees engaged in service; the level of organization of training, retraining, advanced training of personnel required for the service sector.

CONCLUSION AND RECOMMENDATIONS

In the system of indicators of social and economic efficiency of service enterprises, the indicators of efficient use of economic resources have a special place.

To increase the socio-economic efficiency of service enterprises, it is necessary to implement the following measures:

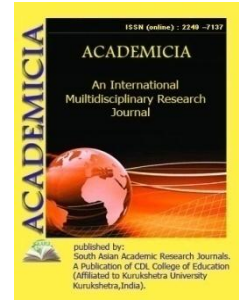
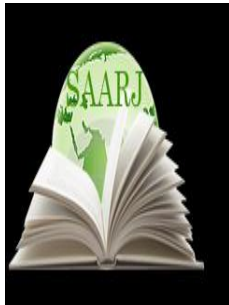
- ensuring the balance of jobs in terms of quantity and quality with available labor resources;
- creation of effective ways to increase the volume of production or services based on the participation of labor resources in labor activities;
- mechanization and automation of service processes;
- improving the conditions and forms of employment;
- improving the quality of labor resources;

- improving the professional level of labor resources.
- Increasing labor productivity in service enterprises should be done in the following stages:
- definition of goals and principles of increase of labor productivity;
- development of the necessary tools (planning the service process, evaluating the effectiveness of the use of reserves to increase productivity, etc.);
- identification of reserves and opportunities to increase labor productivity;
- labor productivity growth planning (targeting of planning indicators, system of other indicators of measurement (for example, product quality, quality of life, innovations), methods of assessment and control, list of specific actions to be taken, identification of responsible persons);
- development of measures to ensure continuity of labor productivity monitoring and control of its dynamics;
- evaluate the effectiveness of measures to increase productivity.

Thus, the intensification of service processes aimed at increasing efficiency in service enterprises is of particular importance. This process requires the use of innovative management methods and technologies in the production of services. This process will not only increase the use of innovative factors of service, but also improve the quality of services provided.

REFERENCES

1. Avanesova G.A. Servisnaya deyatel'nost': Istoricheskaya I sovremennayapraktika, predprinimatel'stvo, menedjment: ucheb. Posobiye dlya studentovvuzov/ G.A. Avanesova. – M.: Aspekt press, 2004. – 317 s.
2. Vatolkina, N. Sh. Metody otsenki kachestva uslug: sravnitel'nayakarakteristika / N. Sh. Vatolkina // Russian Journal of Management. – 2016. – T.4., № 3. – S. 374-382.
3. Erofeevaa A.P. Modernizatsiya sistemy upravleniyapersonalomnapredpriyatiyakhsferyuslug. Dissertatsiya na soiskaniyeuchenoy stepenikandidata eknomicheskikh nauk. – Velikii Novgorod: 2014. – S. 141.
4. Pardaeв M.K. vaboshkalar. Khizmat kursatish, servis va turizam sohalarinirivojlantirish: muammolarvaularningyechimlari. Ukuv kullanna. – T.: «Iktisod-moliya», 2008. - B. 133.
5. Sarkisov S.E. Menedjment: slovar` spravochnik. – M.: ANKIL, 2005 –S. 551.
6. Upravleniya I organizatsiya v sfereuslug: teorii I praktika»: Service manejment and Operation – 2-e mejnarodizd. (per.sangnar.naukryad. V.V. Kulibanovoi) / K.Khaksiver, B.Render, R.S.Rassel, R.G.Merdik –Spb i.dr: Piterbukh. 2002. –S. 496.
7. EmirsonG. Dvenadsat`printsipovproizvoditel`nosti. – M.:Ekonomika, 1992, –S. 216.



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THEORETICAL ISSUES OF ENTERPRISES INNOVATION AND ITS MANAGEMENT IN INCREASING THE COMPETITIVENESS OF PRODUCTS OF INDUSTRIAL ENTERPRISES

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ABSTRACT

This article discusses issues related to the competitiveness of industrial products, the role and management of innovation, clarifies the meaning of the terms and develops relevant scientific conclusions and recommendations.

KEYWORDS: *Innovation, Innovation Potential, Combination, News Diffusion, Science And Technology Development, Technology, Competitiveness, Economics, Economic Growth.*

INTRODUCTION

In the context of digitalization of the country's economy, the wide use and management of the innovative potential of industrial enterprises play an important role in increasing the competitiveness of industrial products. Numerous scientific studies can show that innovation is recognized as one of the most important factors driving economic development. At the same time, it should be noted that innovation is a separate source of growth that ensures the development of not only the economy but also the entire system.

Main part

Since the late 70s of the twentieth century, the concept of "innovative potential" began to actively enter the science, and a number of scientists have conducted research in this area. It should be noted that although there are a number of definitions of innovation, there is no single universally accepted definition of this concept. Each scientist approached from the perspective of his or her own research and the characteristics of his or her own state. Therefore, the absence of a universal innovation theory [1] has led to the emergence of many meanings and concepts. The first scientist to define the concept of innovation was J. Schumpeter. In 1911, he described

innovation in his Theory of Economic Development. He used the terms "creative state" and "new combinations" [2] and meant:

- ☐ production of a new product or improvement of product quality;
- ☐ creation of a new method of production;
- ☐ conquest of new markets;
- ☐ conquest of new markets for raw materials and semi-finished products;
- ☐ Implement organizational changes.

In the development of the world economy, the management of large companies and any changes in their economic activities will increase the positive and negative effects on the world economy. "By the beginning of the 21st century, more than 80,000 companies with more than 700,000 foreign branches are registered, and the total foreign exchange reserves of multinational companies are several times greater than the combined reserves of all the world's central banks. A 1-2% shift in the amount of money in the private sector could change the parity of any two national currencies. " The management structures of companies are based on the internal interrelationships of companies. According to UN experts, more than 60% of foreign branches and companies of TMCs belong to the United States, Britain and Japan. A list of well-known and well-known US companies has been compiled and compiled by Forchun magazine. It is evaluated on a 10-point scale and studied on eight indicators. They are formed on the basis of indicators such as quality of management, quality of products and services, introduction of innovations into the life of the company, attracting talented people to the company, promoting sustainable development, promoting narrow and large-scale development of society. In their joint research, James D. Mooney and A. K. Reilly focused on modern management at General Motors. The main goal of the research is to increase the efficiency of the organization in the broadest sense. Today, a new direction of the corporation is to study the problems of the general public management of the corporation. In the late twentieth century, modern management systems began to be introduced in 1,200 large firms. Transnational companies are located in the United States, Western Europe, Japan, they have undergone the process of diversification and localization of their activities. Large corporations have new innovation centers, such as the Central Service. These centers began to be established after the companies deepened their specialization processes. They began to take on new responsibilities in the company's operations. The centers create a unified management system, which includes such departments as the service structure of the organization, marketing department, planning, public relations department, legal department, management structures. Their main task is to service production, minimize production costs, develop ways to achieve high profitability. Innovation centers serve to accelerate scientific and technological progress, the development of scientific research, experimental and design development. As a result of the activities of such innovation centers, computer technology began to enter the activities of multinational companies. As a result, new technological platforms have been formed with the application of new technologies in practice. It is understood that the automation of working machines, the modernization of technological lines and blocks, the introduction of information technology (IT), its widespread use in the production of programmed robots and microprocessors. As a result, compact automated production systems began to take shape. And to achieve high efficiency, multi-nomenclature and multi-series

production has been developed. Flexible-manufacturing systems are manufacturing processes that are highly automated and have no losses in compact production.

Compact manufacturing was formed in the 1970s under the influence of intensification of production with the application of new technologies in many large companies. Compact production was one of the most popular types in the United States and now in Japan. Compact production is changing and evolving from year to year through the practical application of new technologies.

RESULTS AND DISCUSSION

German researchers Jürgen Hauschildt and Klaus Brockhoff are among the scientists who have conducted research on innovation. How the process of producing the innovations described by them [3] is important. It is especially important that Brockhoff distinguishes between the origin of the idea, the invention itself, and the processes that shape the production of a ready-to-sell product. In the above steps, he described the concept of innovation in more detail, taking invention and product creation as the basis for understanding innovation. Each stage involves the decision-making process of accepting or rejecting an idea, its technological suitability, and the proposed economic achievement. Broadly defined as a set of scientific and technical capabilities of the economic system, the existence of a fund of ideas and developments, which characterizes the scientific and technical potential, the level of development of this system, depending on the quality and quantity of resources. In the process of practical implementation of innovations, the application of scientific and technical potential occurs. Scientific and technical potential is characterized, on the one hand, by the real possibilities of objective use of the achievements of the state in science and technology (FTT), and, on the other hand - by its direct participation in it.

The analysis of the work of scientists conducting research in this area revealed the following conclusions and differences in the views of scientists on the subject, object of innovation:

First, scientists B.Twiss, V.Rappoport, V.L.Makarov, I.E.Artemev, who considered innovation as a process, believed that innovation is a process that occurs as a result of new changes in social and economic life as a result of social activity. However, the innovation process consists of a series of stages and cycles. One of the innovations will come in before it is completed, continuous innovations such as the theory of “news diffusion” will be developed and will continue to penetrate all systems.

Second, according to scientists N.I. Lapin, A.I. Kabanova, A.N. as a system. As a result of innovative activities, the use of new types of raw materials, the emergence of new types of products, services and the creation of new jobs.

Thirdly, S.D. Beshelov, F.G. Gurvich considered that innovation is a result. According to them, the results achieved as a result of innovative changes in the management of enterprises and economic, social, scientific and technical changes were considered important.

Fourth, according to scientists F.Valenta, Yu.V.Yakovets, L.Vodachek, who believe that innovation is a change, under the influence of innovations there are clearly targeted changes.

Hence, the concept of scientific potential is inextricably linked with the concept of scientific and technical potential. Scientific potential is a set of resources and conditions aimed at the implementation of scientific and fundamental research. Scientific and technical potential is a set

of conditions and resources (primarily scientific and technical) for the implementation of applied research, including experimental design and technical work.

Thus, scientific, scientific-technical and innovative potentials are interrelated and complementary components of a single innovation cycle: the emergence of ideas - fundamental research - applied research - experimental design and technical developments - experimental design - industrial testing - mastery in production - serial production - commercialization - practical application of the product (machinery, equipment, technology).

Innovative activity of any system is one of the main directions that ensures its profitability, high rate of development and competitiveness. The concept of innovative potential includes the number of organizations engaged in various developments and research, productivity, efficiency, intellectual property, innovation specialists, scientists, staff, funding and material production base, scientific information in the country and abroad, innovation and innovation activities is a resource for innovative activities that includes information, scientific schools and their role in national and world science [4].

CONCLUSIONS

In our opinion, innovative potential is the development of new developments, discoveries or inventions, utility models, their introduction into any business entity, regardless of the enterprise, organization or industry in general, the form of ownership, organizational and legal status, size. is the sum of all available intellectual, financial, personnel, information, logistical and other resources and capabilities for effective use in its activities.

as a set of resources that can be involved in the implementation of innovative activities;

as an opportunity to carry out innovative activities;

as a preparation for innovative activities;

as an opportunity and readiness to implement innovative activities;

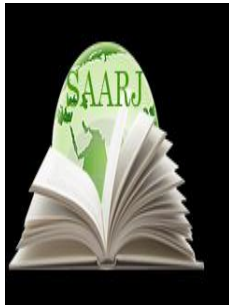
as the ability to carry out innovative activities.

In conclusion, the above approaches have the power to interact, to have innovative activities, the ability to have a number of opportunities, which in turn is one of the important conditions that provide the opportunity and the necessary level of readiness to realize innovative potential.

REFERENCES

1. Decree of the President of the Republic of Uzbekistan No. PF-5924: "On measures to further improve and popularize physical culture and sports in the Republic of Uzbekistan" dated January 24, 2020.
2. APPENDIX 1 to the Decree of the President of the Republic of Uzbekistan No. PF-5924 CONCEPT of development of physical culture and sports in the Republic of Uzbekistan till 2025. January 24, 2020
3. Umarmulov, KodirjonMaxamadaminovich, 2018. "A Study on the Dynamics of Foreign Trade and the Issues of Regional Economic Integration in Central Asia," Working Papers 18-5, Korea Institute for International Economic Policy.

4. Umarkulov, K. M. (2018). *A Study on the Dynamics of Foreign Trade and the Issues of Regional Economic Integration in Central Asia* (No. 18-5).
5. Umarkulov, K. M. (2018). A Study on the Dynamics of Foreign Trade and the Issues of Regional Economic Integration in Central Asia. *[KIEP] Working Paper*, 18(05), 0-0.
6. Revetria, R. O. B. E. R. T. O., Maxamadaminovich, U. K., & Mirzaliyeva, G. U. L. N. O. R. A. (2014, January). Production Advantages in Textile and Light Industry and Features of Effective using of them in Uzbekistan. In *Proceedings of the 8th International Conference on Management, Marketing and Finances (MMF'14), Cambridge, MA, USA* (pp. 29-31).
7. Soliyev, I. I., & Ganiev, B. B. (2021). KEY FACTORS INFLUENCING ECONOMIC DEVELOPMENT.
8. Kurbonovich, Tozhiboev K., and Tolliboev S. T. Ogli. "Effective Use of Investment in the Development of the Territory of the Economy." *JournalNX*, 2021, pp. 121-125.
9. Tukhtasinova, D.R. (2019). Theoretical Bases Of Improvement Of Anti-Crisis Management Technology In Enterprises. *Approbation*, (4), 77-79.
10. Tukhtasinova, D.R. (2018). Innovation And Modernization Of The Economy. In *The Role Of Human Capital In Socio-Economic Development* (pp. 124-127).
11. Муминова, Э. А., & Тухтасинова, Д. Р. (2016). The problems of financing enterprises in the condition of innovative activity. *Символнауки*, (12-1).
12. Muminova, Elnorakhon And Tukhtasinova, Dildora (2019) "The Issues Of Development Of Financing Of Investment Projects By Commercial Banks," *Scientific Bulletin of Namangan State University: Vol. 1 : Iss. 8 , Article 23*. Available at: <https://uzjournals.edu.uz/namdu/vol1/iss8/23>
13. Rakhmonazarov P., Akhunova M. Theoretical Aspects Of Sustainable Development Of Regional Economic Ecosystems And Assessment Methods // *Scientific Bulletin of Namangan State University*. – 2019. – T. 1. – №. 8. – C. 136-143.
14. Ахунова, М. Х. (2020). The Role Of Freedom Economic Zones In Creating Investment Climate. In *Financial-Legal And Innovative Aspects Of Investment Of The Region's Economy* (Pp. 393-398).



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PEDAGOGICAL AND PSYCHOLOGICAL FACTORS OF THE ORGANIZATION OF SCIENCE CIRCLES

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ABSTRACT

Our approach to the problem has to do with trying to raise its relevance in terms of a systematic approach to the organization of extracurricular activities that is relevant to the current socio-cultural situation. In organizing extracurricular activities in the middle grades, the teacher should take into account the psychological characteristics of students. This helps him not only to build the learning process competently, but also to ensure that students master the learning materials with high quality. In this article pedagogical and psychological factors of the organization of science circles is researched and illuminated.

KEYWORDS: *Extracurricular Activities, Circles, Science, Pedagogical, Psychological, Groups, Mother Tongue.*

INTRODUCTION

Extensive work is being done in our country to bring up and bring up a harmoniously developed young generation that is physically healthy, spiritually mature, independent-minded, has deep knowledge and a modern outlook and is able to take responsibility for the fate and future of our country being carried out.

At the same time, the implementation of five initiatives, including comprehensive measures aimed at creating additional conditions for the education of young people, in the rapidly developing socio-political, socio-economic and other spheres in the country. reforms to further develop the talents of adolescents, to train highly qualified personnel, to further increase the effectiveness of out-of-school education in the public education system, to develop high moral qualities in students, to organize their leisure time meaningfully One of the priorities of today is

to ensure their active participation in the development of the country, preparing them for independent life through vocational guidance.^[1]

An important requirement today is to develop scientifically based methods of the organization process, taking as a scientific basis the pedagogical and psychological factors of the organization of science circles. Equipping field leaders with specialized knowledge and skills requires a theoretical and practical justification of key aspects of out-of-school education management. This situation helps to properly address the problems that arise in the management process, as well as out-of-school education.

MAIN PART

Extracurricular education can rightly be called an integral part of modern society. It requires constant attention and support from society and the state as an education that organically integrates the upbringing, education and development of the student's personality.

Extracurricular activities on the subject of mother tongue perform the following tasks:

- improving the knowledge, skills and abilities acquired in native language classes;
- broadening students' worldviews;
- increase interest in the subject;
- Effective use of free time;
- meeting cognitive needs;
- Creativity, independence of students;
- Linguistic knowledge;
- developing oral and written speaking skills;
- To form love and respect for their homeland and people.

An important factor in the successful implementation of these tasks is to take into account the psychological and pedagogical features of teaching circle lessons in the native language.

In organizing extracurricular activities in the middle grades, the teacher should take into account the psychological characteristics of students. This helps him not only to organize the learning process competently, but also to ensure high-quality mastery of learning materials by students.

Based on the spiritual and physical development of the student, he develops scientific-theoretical and logical thinking, develops objective and mental actions, and develops problem-solving skills by performing extracurricular tasks. Students who take part in the club develop the ability to adjust their actions to the planned result, to critically evaluate the results of its activities^[2].

The tasks of forming a creative approach to learning in schoolchildren, the formation of activity and independence in the search for knowledge are especially relevant today. High school plays an important role in developing the independence of thinking, activating each student's cognitive interest and his or her creative abilities.

The modern stage of historical development is characterized by huge dynamism, global contradictions, radical changes in all spheres of social life. This has led to the emergence of various uncontrolled processes that require a rethinking of areas of public life, established views and opinions, including in education and upbringing. Many pedagogical innovations are aimed at schools and teachers, distracting attention from the assimilation of knowledge, developing the child, creating conditions for a full life of childhood, the ability to think, communicate, understand others and themselves, and the ability to form a willing individual (as the main goal of education) is an important factor in making independent responsible decisions. In this context, the systematic conduct of extracurricular activities in the native language remains relevant. Unfortunately, at present, such work is not carried out at the school level.

"The mother tongue is the greatest teacher," said the great scientist Kdushinsky. Indeed, language enriches and develops a child's spiritual world both before and during school, introducing him or her to the moral norms of life, the customs and attitudes of people. From an early age, children develop language skills, speech creativity, aesthetic sense, love of art.^[3]

Unfortunately, the enormous educational potential of the mother tongue is not yet fully exploited in school. The number of problems that occur in secondary schools is very high. Some of them are of a general nature, others are related to the teaching of individual academic subjects.

All this cannot but affect the organization of extracurricular activities on the mother tongue in school. The fact is that the problem of organizing extracurricular activities in the native language has been studied to some extent by some teachers.

Our approach to the problem has to do with trying to raise its relevance in terms of a systematic approach to the organization of extracurricular activities that is relevant to the current socio-cultural situation. In organizing extracurricular activities in the middle grades, the teacher should take into account the psychological characteristics of students. This helps him not only to build the learning process competently, but also to ensure that students master the learning materials with high quality.

Psychological factors of the organization of science circles:

- knowledge of the characteristics of a person of a certain age allows to correctly determine the content and form of extracurricular activities in the field of mother tongue.
- students show great social activism aimed at acquiring certain forms of behavior and values. Reading new, interesting, books, they strive to understand them.
- memory develops in the direction of intellectualization, memorization becomes purposeful, speech management develops^[4].

In the process of working on the circle, it is necessary to take into account both the psychological characteristics of the individual and the psychological characteristics of the team: his level of development, organizational, psychological, intellectual and emotional unity, the focus of the team. The relationship between the zones is considered an important tool.

Classroom activities are a well-organized, sustained process aimed at assessing the student's ability, taking into account their desires and interests, and shaping their abilities and creative abilities. In this process, the further development of the student's abilities creates a favorable

pedagogical environment that allows him to achieve a brighter manifestation of his inner potential and promotes the free organization of activities by him. ^[5].

Pedagogical sources emphasize that extracurricular activities are a unique form of organization of spiritual and educational, general secondary education and upbringing among students.

Pedagogical factors of the organization of science circles:

- creation of a pedagogical environment between teacher and student;
- formation of knowledge, skills and abilities in science;
- meaningful organization of leisure time of students;
- determination of measures for the full realization of the abilities and potential of students;
 - achieving the enrichment of the educational process with theoretical resources and improving the methodological support;
 - establishment of mutual exchange of experience between teachers;
 - joint organization of spiritual and educational events on various topics.

The concept of “extracurricular education” was first associated with the establishment of public libraries, public houses, public universities, Sunday schools, working clubs and other cultural and educational institutions for adults in a number of European countries began in the second half of the XIX century.

During the former Soviet regime, out-of-school education was included in the general system of public education, and its activities were first supervised by an institution called the Political-Enlightenment Department and then the Department of Cultural and Enlightenment Affairs. increased

Out-of-school education is regulated by out-of-school educational institutions. The first out-of-school educational institution in the former Soviet Union was established in 1918 in Moscow as a “biological station for young nature lovers” and in Leningrad (now St. Petersburg) as an “art school”. Beginning of 1923, student houses (called “Pioneer Houses”) were established. 1935 - students in the Kharkov Palace (Palace of Pioneer's name) began its activity. Later, out-of-school educational institutions as state, public and referral-methodical structures worked in close cooperation with general secondary schools and children's organizations. Such institutions differ from each other in their activities with children and adolescents in the fields of science, technology, culture, sports and tourism. The following types of out-of-school educational institutions are popular: student palaces and houses; children's clubs organized under the houses of culture and clubs of trade unions; children's parks; special educational institutions (young technicians, young naturalists and children's excursion and tourist stations, children's and youth sports schools, children's railways, clubs for young motorists and young sailors, children's camps, etc., as well as children's libraries, theaters including ^[6].

During this period, the activities of out-of-school educational institutions were organized on the basis of standard programs, which carried out work in the following areas:

- 1) public-organizational work, holidays, lectures, film festivals, competitions, contests, meetings, exhibitions, games, etc.;

- 2) outreach activities among activists of children's organizations, mentors, group leaders and primary school leaders (teachers), teachers, leaders of clubs and so on, as well as out-of-school educational achievements generalization and popularization;
- 3) educational work - providing theoretical resources for the activities of various clubs, societies, societies, song and dance ensembles, theaters, orchestras, etc.

The work carried out by these institutions had the following content:

- 1) socio-political - the Red Army, museums of local lore, war and labor glory, history of children's organizations, international friendship clubs, agitation brigades, etc.;
- 2) educational circles, clubs, student scientific societies, exhibitions of children's art, etc.;
- 3) assistance to socially useful constructions and farms based on agricultural production, landscaping, training and production brigades, museums and research institutions, etc.
- 4) physical culture, sports and tourist clubs, clubs, societies, military games, competitions for the prize of children's newspapers, etc.
- 5) artistic and creative - ensembles, choreographic ensembles, orchestras, puppet theaters, music clubs, Olympiads, competitions, festivals and others.

The study of the sources of the problem revealed that the following factors play a leading role in the organization of the out-of-school education system: social development of society and social relations to the development of education; the system of continuing education of the republic and its content; history of formation of the system of out-of-school educational institutions and experience of foreign countries; economic situation and financial support of preschool educational institutions; the level of provision of out-of-school educational institutions with qualified pedagogical staff; educational and awareness of advanced technology in their activities implemented in order possession; the existence of the necessary subjective conditions for the full expression of personal abilities and abilities of students in these educational institutions; students' ability to self-assess and work on themselves; the establishment of interaction between the family and the general public in the organization of extracurricular activities, etc.

Extracurricular activities are voluntary forms of extracurricular activities conducted by students under the guidance of a teacher in order to expand and supplement the topics covered in the curriculum of the circle.

Achieving deep and solid mastery of the basics of science by students, the organization of independent work with the help of additional textbooks, visual aids, observation and experimentation on selected topics, the development of students' interests and knowledge. The organization of differentiated education, taking into account the needs of students, the development of their creative abilities, independent and logical thinking, the development of oral and written speaking skills, the expansion of the scientific worldview, career guidance, the consciousness of students and in order to inculcate in the heart the idea of national independence, to link education with productive physical and mental labor, the general circle conducts extracurricular activities .

There are 3 types of extracurricular activities:

1. Individual lessons with individual students
2. Classes with a group of students.
3. Mass classes with students.

The types of extracurricular activities mentioned above are inextricably linked, complementary and demanding.

Type of extracurricular activities	The content of extracurricular activities
Some students alone within order classes	In addition to the club's academic literature study, testing of computer knowledge with the help of educational, modeling, control programs, organization of creative research through multimedia, purposeful observation and experiments, lectures and demonstration materials on various topics
Students' groups with classes	Creating a circle "Harmonious person" in grades 5-6, "Mother tongue - my soul" in 7th grade, "Our encyclopedia - our law" in 8th grade and "Navoi - a great genius" in grades 9-11 .
Students with the media classes.	Different topics evenings, holidays, lectures, "Attention to the language - attention to the people", "Poetry of sharp-witted people", quizzes.

CONCLUSION

The didactic purpose of this circle is to increase students' interest in academic subjects, expand their scientific outlook, work independently on additional textbooks, to form a conscious attitude to the native language and literature, to reveal their hidden abilities, conscious choice of profession, independent and creative thinking, increase of linguistic knowledge, study of works of writers and poets, increase of oral literacy .

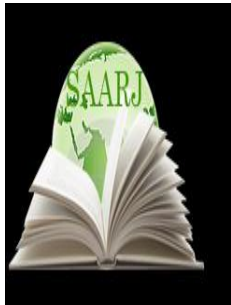
The general name of the circle is "Language and speech" and in grades 5-7 "Mother tongue" taking into account the subject, age and psychological characteristics, interests and needs of students A circle will be formed.

REFERENCES

1. Resolution of the President of the Republic of Uzbekistan dated September 30, 2019 No PQ-4467 "On measures to radically increase the effectiveness of out-of-school education in the public education system"
2. Inoyatov U.I. "Psychological and pedagogical factors of improving the management of secondary special vocational education". Vocational Education, 2002. Issue 1. 6-7 p.
3. Jajeva S. A., Jajeva D. D. Methodological aspect of organizing extracurricular activities in the Russian language // Concept: scientific and methodological electronic journal of the official website of the heuristic Olympiads "Sovenok" and "Breakthrough". - May 2012,

ART 1262. - Kirov, 2012 - URL: <http://www.covenok.ru/koncept/2012/1262.htm>. - State. reg. El No. FS 77-46214. - ISSN 2225-1618.

4. https://otherreferats.allbest.ru/pedagogics/00150773_0.html
5. Vinokurova A. V. , Titova E. V , “Psychological aspects of pedagogical activity in primary school”, 2015, Moscow, <https://urok.1sept.ru/articles/633202>
6. Z.Omonova, “Character and its educational significance for the professional development of students in the course of the club” - Tashkent, 2012, pages 26-28



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HUMANITARIAN POLICY OF UZBEKISTAN IN PROVIDING THE WELL-BEING OF OUR PEOPLE

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ABSTRACT

When a person is born, he wants to live a happy and prosperous life. It is no secret that our people have suffered many hardships during the long period of oppression, deprived of many rights and freedoms. During the years of independence, strong social protection of the population has become a top priority of public policy. During the past period of independence in the country, social protection of the population was carried out mainly in three directions. The sole purpose of all reforms in the Republic of Uzbekistan was to create a normal lifestyle for citizens, to provide continuous economic support to the poor and needy.

KEYWORDS: *Welfare Of The People, Humanitarian Policy, Social Protection, Low-Income, Human Interest, Strategic Task, Disabled, Pensioners, Lonely Elderly, Women With Young Children, Living Standards Of The Population.*

INTRODUCTION

When a person is born, he wants to live a happy and prosperous life. It is no secret that our people have suffered many hardships during the long period of oppression, deprived of many rights and freedoms.

Therefore, after gaining independence, first of all, special attention was paid to ensuring the welfare of our people.

During the years of independence, strong social protection of the population has become a top priority of public policy. The only goal of all the reforms implemented in the Republic of Uzbekistan over the past years has been to create a normal lifestyle for citizens, to provide continuous economic support to the poor and needy. "Before the introduction of market mechanisms," said Islam Karimov in his 1992 book "Uzbekistan's own path to independence and development," social protection measures must be taken. A state is considered humane only if it can protect its population. The state should provide timely assistance to people, especially those in need, the socially vulnerable, orphans, children, students, pensioners and the disabled, single mothers, large families and low-income families "[1, p. 41].

It is known that the policy of social protection has been declared a priority of state policy since the early days of independence. The purpose of this direction is, first of all, the interests of man, his full satisfaction. Strong social policy, regulation of relations in the social sphere, full expression of the human factor, creation of decent living conditions for the population have become a strategic task of the country's leadership. The social protection of the poor, the needy, the disabled, pensioners, the lonely elderly, and the material and moral support of women with young children have undoubtedly shown their results.

During the past period of independence in the country, social protection of the population was carried out mainly in three directions. First of all, there was the liberalization of prices, the devaluation of property. Under these conditions, the minimum and average levels of income of the population have been steadily increasing. Second, the measures taken to protect the domestic consumer market, to maintain a certain level of consumption of basic types of food and non-food products, provided social protection to the population. Third, measures have been taken to provide social protection to pensioners, the disabled, the needy, large families and low-income families, the unemployed.

In particular, the President of the Republic of Uzbekistan Shavkat Miromonovich Mirziyoyev continues this work, paying special attention to social protection and employment. Speaking about the urgency of the work on social protection, the President said, "The most important socio-economic task is to implement the program to increase employment, approved by the chambers of the Oliy Majlis. We need to create more than a million new jobs by the end of the year.

The issue of employment of 480,000 graduates of professional colleges requires special control. [2].

The positive work carried out in Uzbekistan under the leadership of President Shavkat Mirziyoyev has quickly shown its results and led to an increase in public confidence in the future. Speaking about the positive achievements in the field of social protection of the population under the state program for 2016, the President said, "As part of the program, about 9 million women of childbearing age and about 10 million children have undergone medical examinations and rehabilitation.

In particular, cochlear implantation operations were performed at more than 350 children with hearing impairments at the Republican Specialized Pediatric Research and Practice Medical

Center. 21 billion soums were spent for this purpose. But what matters to us is not how much money is spent, but the health of hundreds of our children.

Among such activities, 700,000 children were vaccinated against pneumococcal infection and other infectious diseases.

Within the framework of the program, great work has been done to create the necessary conditions for our women, to build modern housing and social infrastructure in rural areas on the basis of standard projects.

At the same time, \$ 100 million has been attracted with foreign investment to provide rural areas with drinking water and modernize water networks in districts and cities. ”[3]

The announcement of 2017 in our country as the "Year of dialogue with the people and the interests of man" also has great significance. “The main goal of these reforms is to ensure a decent standard of living and quality of life for the population. The main priority is to consistently implement the noble idea that "human interests take precedence over everything else."

Today, the main goal of our life, which is reflected in our Constitution, is to ensure the full protection of human interests. In order to ensure the interests of the people, first of all, it is necessary to communicate with people, with the people, to know their worries, dreams, problems and needs. The people should serve our people, not government agencies, and this fact should be well understood by leaders at all levels. ”[4]

The fourth direction of the "Strategy of actions on five priorities of development of Uzbekistan for 2017-2021" [5], adopted on February 7, 2017, is called "Priorities for the development of the social sphere", which includes increasing real incomes and purchasing power, low-income families. further reduction of the number and level of income inequality of the population;

creation of new jobs and employment of the population, first of all, graduates of secondary special and higher educational institutions, ensuring balanced development of the labor market infrastructure, reducing unemployment;

Improving the social protection and health care system, increasing the socio-political activity of women;

Provision of compulsory social guarantees to the population, strengthening social protection of the needy and state support of the elderly and people with disabilities, improving social services, development of public-private partnership in the provision of social services to the population;

Increasing the socio-political activity of women, strengthening their role in government and society, ensuring the employment of women, graduates of professional colleges, their broad involvement in entrepreneurial activities, further strengthening the family base;

further development and improvement of the system of medical and social assistance to pensioners, the disabled, lonely elderly and other needy groups of the population to ensure their full life;

The President also noted that the living conditions of the population, especially young families, citizens living in dilapidated houses and other citizens in need of housing, should be improved

through the provision of mortgage loans on favorable terms and the construction of affordable housing in urban and rural areas. is an example of humanity and devotion to the field.

Regarding the work done in 2017 "Year of dialogue with the people and the interests of man", the President said, "During 2017, the issue of creating new jobs, which is very important for us, was in the center of our attention. In 2017, more than 336,000 new jobs were created due to the construction of new industrial enterprises, commissioning of service facilities, development of small business and private entrepreneurship.

It is obvious that we have given priority to employment, so we need to pay special attention not only to quantity but also to quality.

The implementation of the adopted programs on reforming the social sphere, which is a very important direction of state policy in Uzbekistan, is gradually being ensured. It is known that the housing problem has long plagued our population, especially public sector workers, low-income families. There is a fact that we have almost ignored this serious social problem. Taking into account the needs and desires of our people, this year we have launched a project to build affordable housing on the basis of soft mortgage loans.

In total, more than 3.5 million square meters of standard houses and multi-storey houses have been built in our cities and villages. If we compare this figure with previous years, we can see that 20 times more houses were built than in 2007, 3.5 times more than in 2010, when the standard housing program was launched, and 2 times more than in 2014. It is worth noting that for the first time in the last 25 years, we have begun to build affordable, multi-storey housing for the population. In 2017 alone, more than 800,000 square meters of such housing were built and commissioned. In Tashkent alone, 420,000 square meters of multi-storey housing have been commissioned this year. This is almost three times more than last year. "[6] The mahalla is a social institution that reflects the character, lifestyle and content of the Uzbek people, and usually unites, organizes, directs and encourages the nation to act on a community basis.

MATERIALS AND METHODS

In accordance with the Decree of the President of the Republic of Uzbekistan Shavkat Mirziyoyev "On radical improvement of activities in the field of support of women and strengthening the institution of the family" from April 1, 2018 instead of advisers on religious enlightenment and spiritual and moral education In 2000 and more civic gatherings, the position of a specialist in working with women and strengthening the spiritual and moral values in families was introduced. At the same time, the fact that the service houses of the mahalla supervisors are located in the mahalla and they are given a car at a discount is an example of the great attention paid to the mahalla.

Speaking about further strengthening social protection, the President said, "Economic development and social protection are inextricably linked concepts and cannot be imagined in isolation. Improving the living conditions of the population, providing them with decent housing, improving the welfare of our people will always be in the center of our attention. "[7]

In 2019, it can be observed that the following tasks have been implemented for the further development of the social sphere.

- The procedure for full payment of pensions to working pensioners has been introduced. The amount of benefits for people in need and in need of social assistance has been doubled.

- Last year, 634 private medical institutions were established due to the increase in the number of medical activities from 50 to 126 and the provision of a number of benefits.

“Large-scale construction and beautification works have been carried out in 479 villages and auls, 116 urban mahallas within the framework of the “Obod Qishloq” and “Obod Mahalla” programs.

- 6.1 trillion soums or 1.5 trillion soums more than in 2018 were spent on this.

- 17,100 houses were built in rural areas, 17,600 in cities, a total of 34,700, or almost 3 times more than in 2016.

- More than 116 billion soums were paid to 5,000 low-income families in need of improved housing, including women with disabilities, to purchase affordable housing on the basis of mortgage loans.

The reforms we are carrying out are being praised by the world community.

In particular, one of the world's leading publications - "Economist" magazine recognized Uzbekistan as the country with the most rapid reforms in 2019 - "Country of the Year".

Touching upon the positive work to be done in 2020, the President said, “In 2020, 5.5 thousand women will be provided with soft loans worth 100 billion soums for small business projects. To do this, we allocate resources to banks from the state budget.

In addition, 1,576 women will receive an initial payment from the budget to acquire new housing.

The training of our sisters in need of social protection in Women's Entrepreneurship Centers will be organized in short training courses within the framework of 5 important initiatives”[8].

We all need to understand one thing in depth: such priorities that we have set ourselves are very complex and truly huge goals.

At the same time, over time, the world is changing, and the demands of our people for a better life are growing. Now we cannot please our people with yesterday's result.

Today, every day requires research and innovation. Only by working on the basis of such requirements can the life of our people be changed for the better. Our President is also showing humanity and dedication to reducing poverty in Uzbekistan.

In 2020, \$ 700 million in poverty reduction programs will be implemented. This was stated by President of Uzbekistan Shavkat Mirziyoyev in his speech at the celebration of International Women's Day.

Poverty reduction has been identified as a priority in Uzbekistan, and we have begun to implement large-scale measures in this direction. We need to clearly understand one fact - to reduce poverty, we must first reduce unemployment. First of all, it is necessary to train the population in modern professions, increase their economic and financial literacy, inspire people, especially women, to entrepreneurship, - said the President. President of the Republic of Uzbekistan Shavkat Mirziyoyev on March 26, 2020 approved Decree No. PF-5975 on measures

to radically update the state policy on economic development and poverty reduction. According to the decree, 100 billion soums will be allocated to the Ministry of Economic Development and Poverty Reduction in 2020 to finance measures to reduce poverty.

RESULTS AND DISCUSSION

On April 20, President of the Republic of Uzbekistan Shavkat Mirziyoyev held a video conference on ensuring the full operation of enterprises in industry, construction and infrastructure.

It was noted that families who are temporarily unemployed and in need of assistance should be identified and the scope of providing them with food and medicine on a targeted basis should be further expanded. It is natural that during the current pandemic, the number of unemployed, the population in need of assistance and support will increase. Along with the fight against the disease, various countries are doing everything possible to save jobs and prevent a sharp economic downturn. put forward an initiative to set up the movement.

- In the coming days, the holy month of Ramadan will come. Helping needy and needy families this month is both a debt and an obligation. Therefore, in this holy month, every entrepreneur should actively support the population in need of social protection, especially their neighbors, - said the head of state.

As a result, donations and donations during Ramadan will be targeted, and funds for iftars and food will be directed to the poor. Depending on the opportunity, one entrepreneur can help, for example, 10 families a month, and another 20 families, and most importantly, hire members of needy families. As part of charitable activities, charitable assistance is provided to lonely elderly people, people with disabilities and the unemployed, people who have lost their regular income due to quarantine, and low-income families.

A video conference chaired by Shavkat Mirziyoyev was held on May 13, 2020 on the issues of mitigating the negative impact of the coronavirus pandemic on living standards and sectors of the economy. The meeting also paid special attention to the issue of social protection. "Tasks have been set to ensure the rights of employees of quarantined institutions, quarantined citizens and their caregivers, to increase the number of social pensioners by at least 10 percent or 60,000. Parents caring for their quarantined children are paid a temporary incapacity benefit. At a time of declining economic activity, the issue of employment requires special attention. Therefore, an additional 200 billion soums will be allocated from the Anti-Crisis Fund to the Public Works Fund." [9]

A video conference was held on July 8, 2020 under the chairmanship of Shavkat Mirziyoyev. The meeting focused on the work being done to reduce poverty. The head of state noted the need to "employ at least 257,000 needy families, provide loans to 37,000 households in the framework of family business" [10]. In 2021, the comprehensive work on comprehensive social protection and poverty reduction will be continued. At the solemn ceremony dedicated to the 30th anniversary of state independence of the Republic of Uzbekistan on August 31, 2021, President Shavkat Mirziyoyev in his speech "Independence of our country is a source of strength and inspiration for us, the basis of development and prosperity." has ushered in a new era of Uzbekistan. "

At a meeting with voters in Surkhandarya on October 8, 2021, President Shavkat Mirziyoyev acknowledged that "the state will allocate 50 trillion soums for economic and social development of Surkhandarya region in the next five years" [11].

CONCLUSIONS

In conclusion, it should be noted that the humanitarian policy of Uzbekistan to ensure the well-being of our people serves for the well-being and happiness of our people.

REFERENCES

1. Karimov I. Uzbekistan for the great future.-Tashkent: Uzbekistan, 1998. –P. 41.
2. Speech by the Prime Minister of the Republic of Uzbekistan Shavkat Miromonovich Mirziyoyev at the joint session of the Legislative Chamber and the Senate of the Oliy Majlis. September 8, 2016.
3. Speech by the President-elect of the Republic of Uzbekistan Shavkat Mirziyoyev at the solemn ceremony dedicated to the 24th anniversary of the adoption of the Constitution of the Republic of Uzbekistan. December 7, 2016.
4. Report of the President of the Republic of Uzbekistan Shavkat Mirziyoyev at the enlarged meeting of the Cabinet of Ministers on the main results of socio-economic development of the country in 2016 and the most important priorities of the economic program for 2017. January 15, 2017.
5. Action Strategy for the five priority areas of development of Uzbekistan for 2017-2021, adopted on February 7, 2017.
6. The next Address of the President of the Republic of Uzbekistan Shavkat Mirziyoyev to the Chambers of the Oliy Majlis. December 22, 2017.
7. The next Address of the President of the Republic of Uzbekistan Shavkat Mirziyoyev to the Chambers of the Oliy Majlis. December 28, 2018.
8. The next Address of the President of the Republic of Uzbekistan Shavkat Mirziyoyev to the Chambers of the Oliy Majlis. January 25, 2020.
9. The word of the people. May 14, 2020.
10. The word of the people. July 9, 2020.
11. Surkhan morning. October 13, 2021.



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RURAL DEVELOPMENT SCHEMES AND RESPONSIBILITY OF LOCAL SELF GOVERNMENT: A CRITICAL ASSESSMENT ON MGNREGA

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ABSTRACT

Various developmental programmes have been taken up by government with a vision for rural development. Despite planned efforts for rural development expected target seems to be very far in one sense. The problems of poverty, illiteracy, erosion, environmental degradation, pollution, unemployment, hunger, starvation, death, mass migration, inequality, etc. prevail in rural India, in the context of India's effort for rural development.

KEYWORDS: *Starvation, Death, Mass Migration, Inequality*

INTRODUCTION

As a term 'Rural' fundamentally means an area where people live in a non-urban style and majority people engage in agriculture and allied activities. 'Development' refers to improvement in the standard of living where equality of income is increasing along with the developing capacity of the people to sustain continuous improvements. In other words, development implies change that is desirable (Bulbuli, 2015). There are at least three basic elements which are considered to constitute the meaning of rural development. They are as follows (Tripathi, 2000): **Basic Necessities of life:** People have certain basic needs, without which it would be impossible for them to survive. The basic necessities include food, clothes, shelter, basic literacy, primary health care, and security of life and property. **Self-respect:** Every person and every nation seeks some sort of self-respect, dignity or honour. Absence or denial of self-respect indicates lack of development. **Freedom:** In this context, freedom refers to political or ideological freedom, economic freedom and freedom from social servitude. As long as society is bound by the servitude of men to nature, ignorance, other men, institutions and dogmatic beliefs, it cannot claim to have achieved the goal of 'development'.

Integrated rural development has been defined by Sharma and Malhotra as a systematic approach aiming at total development of the area and the people by bringing about the necessary institutional, attitudinal changes and by delivering a package of service through extension methods to encompass not only the economic field, i.e., development of agriculture, rural industries, etc., but also the establishment of the required special infrastructure and services in the areas of health and nutrition, education and literacy, basic amenities, family planning, etc. with an ultimate objective of improving quality of life in the rural areas (Sharma and Malhotra, 1977). Thus Rural Development can be defined as integrated development of area and the people through optimum development and utilization (and consideration when necessary) of local resources – physical, biological and human and by bringing about necessary institutional, structural and attitudinal changes by delivery of a package of service to encompass not only the economic field, i.e., agricultural, allied activities, rural industries, but also establishment of required social infrastructure and service in the area of health and nutrition, sanitation, housing, drinking water, literacy, with ultimate objective of improving quality of rural poor and the rural weak. Thus, rural development means to the process of improving living condition (Tripathy, 2000).

Objective of the study

This paper attempted

- To understand various schemes of rural development programmes undertaken by government of India
- To examine the developmental schemes that focus of socio economic development
- To review the Mahatma Gandhi National Rural Employment Guarantee Act

REVIEW OF LITERATURE

Since independence, Government of India has undertaken various strategies for the all-round development of the rural areas in the Five-Year Plans. During the First Five Year Plan the Government of India launched the Community Development Programme (CDP) on 2 October, 1952. Under this programmes the first 55 Community Development Projects were inaugurated (Mukta, 1995). With the passage of time, more and more such projects were developed and at the end of the first plan about 5,028 Blocks were developed to cover almost all villages of the country. The CDP could not make much headway as it failed to entrust the villages into the spirit of self-help, self-reliance and cooperative effort. Till the 5th plan, various strategies for agriculture development like High Yielding Varieties Programme (HYVP) and the Intensive Agricultural District Programme (IADP) had been taken to yield best results out of these (Rajakuttet *et al.*, 2002). Since the sixth plan onwards, various strategies for self-employment, rural housing and wage employment have been introduced. Among these strategies Indira Awaas Yojana (IAY), Swarnjayanti Gram Swarozgar Yojana (SGSY) and Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) are the most notable ones (Jamge, 2002).

Housing is one of the basic requirements for human survival. For a normal citizen owning a house provides significant economic security and status in society. IAY was initially a sub-scheme of Rural Landless Employment Guarantee Programme (RLEGP) and there after it became a part of Jawahar Rozgar Yojana (JRY) (Indira Awaas Yojan, 1988). Since January 1996 it

has been implemented as an independent scheme for rural housing and thereby providing them one of the basic necessities of human life. The objective of Indira AwaasYojana is primarily to help construction of dwelling units by members of Scheduled Castes/ Schedule Tribes, freed bonded labourers and also non- SC/ST rural poor below the poverty line by providing them with grant-in-aid (Ugra, 1995). Swarnjayanti Gram SwarozgarYojana (SGSY) was undertaken in 1 April 1999 by restructuring the existing schemes namely, Integrated Rural Development Programme (IRDP), Training of Rural Youth for Self Employment (TRYSEM), Development of Women & Children in Rural Areas (DWCRA), Supply of Improved Toolkits to Rural Artisans (SITRA), Ganga KalyanYojana (GKY), Million Wells Scheme (MWS) (Swarnjayanti Gram SwarozgarYojana, 1999). Firka Development Scheme: The Firka development scheme emphasized the attainment of the Gandhian ideal of “Village Swaraj” by bringing about not only the education, economic, sanitary and other improvements of village along with the revitalization of the spirit of people and to make them self-confident and self-reliant. The scheme involved close co-ordination with the various government services like agriculture, irrigation, industries, medical and communication departments. In 1953-54 the scheme was merged with the National Extension Services (Sahu, 2003).

Rural Development Programmes in Plan Period: According to Census Report 2011, 68.84 per cent of the total population of India still lives in villages which are characterized by massive poverty. India started her planned economic development through Five Years Plans in the year 1950-51. The economy of the country is dominated by the rural and traditional economic sectors. But the productivity of these sectors is not satisfactory. The existence of massive unemployment and poverty is the common feature of Indian economy in general and rural economy in particular (Tewari, and Sinha, 1988). Community Development Programme (CDP): The Community Development Programme was launched on 2nd October, 1952 during the First Five years plan. The first 55 Community Development Projects were inaugurated throughout the country where each project was having 3 Development Blocks. With the passage of time, more and more such projects were developed and at the end of the Fifth Plan about 5,028 Blocks were developed to cover almost all villages of the country (Vasant, 1993). National Extension Service (NES): One year later of Community Development Programme, in 1953, the Government of India launched another programme of rural development known as the National Extension Service. This programme had similar aim with the Community Development Programme (Raju, 1999). Intensive Agricultural District Programme (IADP): In the year 1960, on the basis of the report of the Ford Foundation Team known as “India’s Food Crisis and Steps to Meet it” a significant feature took place and a new programme known as “Intensive Agricultural District Programme” based on the principles of concentration and better management of resources and efforts in potential and responsive areas with assured water supply was introduced (Das, 2007).

Intensive Agricultural Area Programme (IAAP): Intensive Agricultural Area Programme (IAAP) was launched in 1964-65 in order to bring about a progressive increase in the production of main crops in selected area by an intensive package approach i.e. the use of inter related factors physical, social and institutional-in-strategic combination which were likely to exert an impact on agriculture production (Laxmi and Venkata, 1999). High Yielding Varieties Programme (HYVP): The High Yielding Varieties Programme (HYVP) was launched in the country from the kharif seasons of 1966-67 as a major plank of new agricultural strategy under the economic planning system. The basic objective of the programme was to attain self-sufficiency in food by

the end of 1970-71 (Ibid). Small Farmers Development Agency (SFDA): The schemes to ameliorate the small and 'sub marginal' farmers and agricultural labourers were sanctioned during 1970-71 but in most cases the programmes only began to be implemented during 1970-71. To administer the programmes, two new agencies the Small Farmers Development Agencies (SFDA) and the Marginal Farmers and Agricultural Labourers Agency (MFAL) were set up as corporate bodies (Maheshwari, 1995). Marginal Farmers and Agricultural Labourers Development Agency (MFALDA): The Marginal Farmers and Agricultural Labourers Development Agency (MFALDA) was set up along with SFDA on the recommendation made by Rural Credit Review Committee (1969). The focus of the attention of MFALDA agency was to identify eligible marginal farmers and agricultural labourers to be covered by the project, to investigate their problems, to formulate economic programmes for providing gainful employment to them, to promote rural industries, etc. (Ibid).

Drought Prone Area Programme (DPAP): Drought Prone Areas in India are marked by degraded environment with soil erosion, water and moisture stress and lack of adequate protective cover which resulted in damaged crops, low soil productivity and scarcity of fodder and drinking water. All these adversely affect the living standard of the people which demands ameliorative action. Hence, a special programme named Drought Prone Area Programme (DPAP) was introduced in 1970-71 in the country. Cash Programme for Rural Development: This Programme was sponsored by Central Government and implemented through the agency of state government in April, 1971 for a period of 3 years. The objectives behind this scheme were – (a) direct generation of employment for 1000 persons, on an average, continuously over a working season of 10 months in a year in all rural districts of the country (Uday, 1987). Integrated Tribal Development Agencies (ITDA): The characteristic of economic backwardness of tribal population has always been the centre of attention among policy makers and planners of the country. Though from 1st to 3rd Five Years Plans different efforts were taken for the development of tribal people but these efforts did not bring about substantive change among the majority of the tribal population (Venkata, 1988).

Modified Area Development Approach (MADA): Article 46 of the Constitution of India enjoins up on the state to promote with special care the educational and economic interest of the weaker sections and in particular scheduled castes and scheduled tribes and to protect them from social injustice and all forms of exploitation. A new programme called Modified Area Development Approach (MADA) was launched in 1978-79 for the all-round development of the tribal who are outside the Sub-plan areas (Jamge, 2002). Command Area Development Programme (CADP): The Command Area Development Programme (CADP) was introduced in the country in 1974-75 with a view to realise a fast and optimum utilization of the irrigation potential created in the major irrigation projects. The basic concept of this programme was to set up agriculture production, create additional employment opportunities and boost up level of income in the rural areas (Maheshwari, 1985). 20-point Programme: The 20-point Economic programme was announced on 1st July 1975. The prime concerns of this programme were – (a) to ensure social Justice (b) to relieve unemployment (c) to eradicate poverty (Mathur, 2000).

Integrated Rural Development Programme (IRDP): The sixth plan proposed to integrate multiplicity of agencies for providing rural employment such as Employment Guarantee Scheme (EGS), Small Farmers Development Agency, (SFDA), Marginal Farmers and Agricultural Labourers Development Agency (MFALDA), Drought Prone Area Programme (DPAP),

Command Area Development Programme (CADP), Desert Development Programme (DDP) etc.(Laxmi and Jaya, 1999).DWCRA: The programme of Development of Women and Children in Rural Areas (DWCRA) aims to improve the socio-economic status of the poor women in the rural areas through creation of group of women for income generating activities on a self-sustaining basis (Dhar, 2008).National Rural Employment Programme (NREP): The National Rural Employment Programme (NREP) replaced and restructured the Food for Work Programme in October 1980. NREP was a centrally sponsored scheme implemented with 50:50 sharing basis between the Centre and the states. This programme was conceived as wage-employment programme. The main objectives of NREP were- (a) generating additional gainful employment opportunities to the extent of 300-400 million man-day's as per year for the unemployed and underemployed persons in the rural areas (MRD, 2000).Rural Landless Employment Guarantee Programme (RLEGP): The Rural Landless Employment Guarantee Programme (RLEGP) was launched on 15th August, 1983 with the objective to generate gainful employment opportunities, to create productive assets in rural areas and also for the improvement of overall quality of rural life. In 1989-90, the RLEGP and NREP were merged with JawaharRozgarYojana (Maheshawari, 1995).

Jawahar Rozgar Yojana (JRY):It was launched on 28th April, 1989, by the then Prime Minister Late. Rajiv Gandhi. In the programme all the existing rural wage employment programme were merged into JRY. The NREP and RLEGP were merged within the single umbrella. The main features of JRY are- (i) The JRY has set a target for reaching every single panchayat (Vithal, 2001).National Social Assistance Programme (NSAP): This multi-dimensional programme was launched by 15th August, 1995 for the poor old age pension, family benefit in case of death of the bread earner and maternity benefit. It is a centrally sponsored programme with 100 percent central funding and it is intended to ensure that social protection to the beneficiaries throughout the country (Publication Division 1998).Rural Group Life Insurance Scheme (RGLIS): The Government of India had launched a new scheme, namely Rural Group Life Insurance Scheme (RGLIS) on 15th August, 1995 in order to provide life insurance coverage to the rural poor of the country. The objective of the scheme is to promote social insurance in the rural areas with the active involvement of the Panchayat and to partly alleviate the distress caused by the death of the bread earner among the rural poor (Economic Survey, 2002-03).Indira AwaasYojana (IAY). It was launched during 1985-86 as a sub-scheme of RLEGP. IAY thereafter continued as a sub-scheme of JawaharRozgarYojana (JRY) since its launching in April, 1989. IAY was de-linked from JRY and made an independent scheme with effect from 1st January 1996. The Indira AwaasYojana (IAY) is a flagship scheme of the Ministry of Rural Development to provide houses to the poor in the rural areas (Krishna, 1980).Swarnjayanti Gram SwarozgarYojana (SGSY):It was launched on 1st April, 1999 by restructuring the existing schemes namely Integrated Rural Development Programme (IRDP), Training of Rural Youth for Self Employment (TRYSEM), Development of Women & Children in Rural Areas (DWCRA), Supply of Improved Toolkits to Rural Artisans (SITRA), Ganga KalyanYojana (GKY), Million Wells Scheme (MWS) (MRD, 1999).

Jawahar Gram SamridhiYojana (JGSY):JawaharRozgarYojana (JRY) has been restructured with effect from April 1999, and has been renamed as Jawahar Gram SamridhiYojana (JGSY). This is basically a wage employment programme. The primary objective of JGSY is creation of demand

driven village infrastructure including durable assets at the village level to enable the rural poor to increase the opportunities for sustained employment. Sampoorna Grameen Rozgar Yojana (SGRY): It was launched in September 2001. It is to provide wage employment in rural areas and also food security, along with the creation of durable community, social and economic assets. The scheme is being implemented on a cost sharing ratio of 75:25 between the Centre and the states (Chattopadhyay, 1985). Pradhan Mantri Gram Sadak Yojana (PMGSY): It was launched on 25 December 2000 as a 100 percent centrally sponsored scheme. The primary objective of PMGSY is to provide all weather connectivity to all the eligible unconnected habitations in the rural areas. It is targeted on village level development in five critical areas i.e., health, primary education, drinking water, housing and rural roads with the overall objective of improving the quality of life of people living in the rural areas (Economic Survey, 2002-05). Food for work Programme (FFW): It was initially launched on February 2001 for five months and was further extended. The programme aims at augmenting food security through wage employment in the drought affected rural areas in eight states. The centre makes available appropriate quantity of food grains free of cost for each of the drought affected states as additionally under the programme (Dhar, 2008). Annapurna: The Annapurna Scheme came into effect from 1 April 2000 as a 100 percent centrally sponsored scheme. It aims at providing food security to meet the requirement of those senior citizens who though eligible for pension scheme under the NOAPS, are not getting the same. Food grains are provided to the beneficiaries at subsidized rates of Rs. 2 per kg of wheat and Rs. 3 per kg of rice (Gopal, 1997). National Food for Work Programme (NFFWP): It was launched as Centrally Sponsored Scheme in November, 2004 in the 150 most backward districts to generate additional supplementary wage employment with food security. States received food grains under NFFWP free of cost. The focus of the programme is mostly related to works relating to water conservation, drought proofing (including afforestation and tree plantation), land development, flood control / protection (including drainage in waterlogged areas) and rural connectivity in terms of all-weather roads (Deb, 1986).

Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)

National Rural Employment Guarantee Act (NREGA): It was implemented from 2 February 2006 after passing of the NREG act in the parliament in September 2005. The act was notified in 200 districts in the first phase with effect from 2 February 2006 and then extended to additional 130 districts in the financial year 2007-08. The remaining districts have been notified under NREGA with effect from 1 April 2008. National Rural Employment Guarantee Act (NREGA) was renamed as Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in the year 2009. This is for the first time a job guarantee scheme has been introduced in the country for the social economic upliftment of the rural folk (Operational Guidelines, 2008). This scheme was notified in 5th September 2005 by the government of India. And, it came into being in 2nd February 2006. It was introduced in phased basis. In the first phase, 200 districts were assigned to take up the scheme. In the second phases, 130 districts were included in 1st April 2007 and further it was extended to different districts of the country from 1st April 2008 as a third phased. It is the biggest poverty alleviation programme in the world in terms of the capacity in employing peoples and the economic sanctions to create rural assets. It is started with an initial outlay of Rs. 11,300 Crore in the year 2006-07. Article 39, the right to work enshrined in the Directive principles of state policy in the constitution of India is realized by the people under this Act (Devkanta, 2020). It has a set striking objectives and goals that involve both the

approach and outcomes of community development. The scheme further aims at strengthening decentralization and deepening process of democracy by making grass root level democratic institutions, such as Panchayati Raj Institutes (PRIs) as the principal implementer of MGNREGA with greater accountability in governance for better results (Kabita, 2017). It is an environment friendly government sponsored scheme which aims at the creation of clean environment through the various undertaking works like plantation works, perennial works (plantation of fruit trees), and renovation of drainage for agricultural purposes etc. To acquaint the MGNREGA functionaries with the new provision mentioned in the operation guidelines 2013, the Minister in accordance with the National Institute of Rural Development (NIRD) & Panchayati Raj (PR) conducted Ten Training of Trainers Programme (TOTs). It created State Resource Teams (SRTs) to develop an expert/ trainers in the subject matters of MGNREGA implementation in the States. Among the ten programmes, seven were conducted at NIRD and PR, Hyderabad and three at North East Region. For Manipur the training of SRTs was conducted during the period 08-10 January, 2014. It was the eight TOTs at NIRD and PR, Guwahati. State MIS officers, Accountant, State Institute of Rural Development–Faculty (SIRD), State Nodal officer, Social Audits and training Coordinator attended the training programme. (Ghosh, 2009).

Critical assessment and findings

- Currently, MGNREGA wage rates of 17 states are less than the corresponding state minimum wages. Various judgements have upheld that the MGNREGA wage rate cannot be less than the minimum agricultural wage rate of the state. Fund transfer delays even in the processing of signed, for which the Management Information System (MIS) does not calculate compensation. Despite the order of the Supreme Court and initiatives and GO (Government Order) by the Union Ministry of Finance, no provision has yet been worked out in the MIS for calculation of full wage delays and payment of compensation for the same (Debmalya, 2018).
- Besides, the ministry withholds wage payments for workers of states that do not meet administrative requirements within the stipulated time period (for instance, submission of the previous financial year's audited fund statements, utilisation certificates, bank reconciliation certificates etc.). The increase in corruption and weakening accountability has roots in the excessive dependence of implementation of MGNREGA. It has also painted a picture that is far from the truth on the ground. One needs to think about delinking the implementation of MGNREGA from real-time MIS (Ibid).
- There are a huge number of unemployment allowances being shown in the MIS currently. But inaction from the Central government in ensuring payments of the same has shown that the government wants to use the MIS as per its convenience and is not honouring its own database. Genuine job cards are being randomly deleted as there is a huge administrative pressure to meet 100 per cent Direct Benefit Transfer (DBT) implementation targets in MGNREGA (Ibid).
- A real-time MIS-based implementation and a centralised payment system has further left the representatives of the Panchayati Raj Institutions with literally no role in implementation, monitoring and grievance redress of MGNREGA schemes. It has become a burden as they hardly have any power to resolve issues or make payments (Ibid).

- The over-centralisation of the scheme has completely depoliticised the implementation of MGNREGA and local accountabilities have been completely diminished. MGNREGA could be a tool to establish decentralised governance. But, with the administration almost dictating its implementation, it is literally a burden now for the people and especially for the local elected representatives (Ibid).
- The governments always use the bottom-up people's planning strategy to gain political mileage but never honour local priorities while implementing the schemes. Further linking MGNREGA to construction of PradhanMantriAwasYojana (PMAY), individual household toilets, anganwadi centres and rural 'haats' have been destroying the spirit of the programme and gram sabhas and gram panchayats' plans are never honoured (Ibid).

CONCLUSION

The above analysis reveals that various strategies have been adopted by the Government of India for rural development in the plan period. The above mentioned strategies can be broadly grouped as development of agricultural, area development, wage employment, self-employment and basic necessities of life. But these strategies failed to function properly throughout the country due to various reasons such as frequent changes of programmes, illiteracy and ignorance of the common people, political interference and bureaucratic attitude etc. These strategies are expected to bring tremendous changes in the development of rural people in India but it still presents a dismal picture while looking into the implementation of the schemes in various states. In spite of these strategies adopted by the Government of India for the economic upliftment of rural people, poverty is still having a strong hold in the rural areas. It is basically an agro based state in which almost all the villages demonstrating both homogeneous and heterogeneous features of rural life (Thaha, *et al.*, 1992). Keeping aside all the diversified features, the Government of the state as well as the Centre has made attempts to bring progressive changes in the villages by adopting different strategies. The ridiculously low wage rates have resulted in lack of interest among workers in working for MGNREGA schemes, making way for contractors and middle men to take control, locally.

REFERENCES:

- Bulbuli Boruah (2015) Strategies of rural development: A study of IAY, SGSY & MGNREGA in the Golaghat District of Assam, Unpublished Ph. D thesis, Department of Political Science, Dibrugarh University
- Chattopadhyay B.C., (1985). Rural Development Planning in India, S.Chand & Co. Ltd., New Delhi,.
- Das Basanti, (2007). Government Programmes for Rural Development, Discovery Publishing House, New Delhi, , PP. 17-18
- Deb K., (1986). Rural Development in India, Since Independence, Sterling Publishers Pvt. Ltd, Banglore,.
- Debmalaya Nandt (2018) MGNREGA is failing: 10 reasons why, *Downtoearth*, online available at <https://www.downtoearth.org.in/blog/economy/mgnrega-is-failing-10-reasons-why-62035> accessed on 13 Sept 2020

Devkanta Meitei, P. (2020) Faith of the beneficiaries under MGNREG Scheme in Top Chingtha Gram Panchayat, SKWC Journal of Social Science, Vol.- XVII, Issue 1, Jan-June 2020, p. 53

Dhar P. K., (2008). Indian Economy, its growing Dimensions, Kalyani Publishers, Sixteenth Enlarged Edition, New Delhi, May, pp. 345-346

Economic Survey, 2002-03, p.215

Economic Survey, 2002-05, p. 228

Ghosh, J. (2009). Equity and Inclusion through public expenditure: the potential of the NREGA. In International Conference on NREGA, Ministry of Rural Development and ICAR. Accessed from www.macroscan.com/pol/jan09/pdf/NREGS.Pdf on May 30, 2015)

Gopal Lai Jain, (1997). Rural Development, Mangal Deep Publications, Jaipur, (India)

Indira AwaasYojan (1988). Guidelines, Government of India, Ministry of Rural Areas, and Employment, New Delhi, p. 1

Jamge D.L (2002). Rural development through government schemes with special reference to Nanded District, Unpublished Ph. D thesis, Department of Commerce, Swami RamanandTeerthMarathwada University, Nanded

Kabita Devi (2017). Rural poverty reduction in Nachou Gram Panchayat of Bishnupur District, Manipur: Grounded view points. Department of Anthropology school of Human and Environmental Sciences Manipur University: Imhal-795003

Krishna Raj, (1980).Antyodaya' Yojana, Vol. XXII, Nos. 14-15, March

LaxmiNarasaiah M. and G. Venkata Naidu, (1999). Role of Banking in Rural Development, Discovery Publishing House, New Delhi,.

Maheshawari S R, (1995). Rural Development in India, 2nd edition, Sage Publications India, New Delhi, PP. 107-108

Maheswari S, (1985). Rural Development in India, SAGE Publications New Delhi, p. 97.

Mathur, B. L. (2000). Economic Policy and Development Publisher, Jaipur, p. 227.

MRD (1999).Swarnjayanti Gram SwarozgarYojana,(As per Reserve Bank of India Guidelines),1999

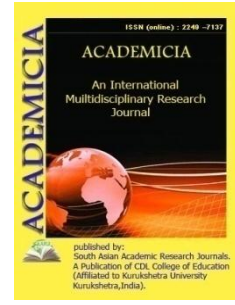
MRD (2000). Rural Housing Schemes, National Mission for Rural Housing and Habitat, Ministry of Rural Development, Government of India, p.8

Mukta Mittal (ed.), (1995). Rural Development in India, Anmol Publications Pvt. Ltd., New Delhi,

Operational Guidelines (2008). NREGA, Ministry of Rural Development, Department of Rural Development, Government of India

Publication Division, (1998). National Social Assistance Programme, Government of India, pp. 350-354

- Rajakutt, S., S. Chatterjee, D.P.R. Reddy, (2002). A Study on Wage Employment Programme in Kurnool (Andhra Pradesh) and Surat (Gujarat) Districts, National Institute of Rural Development, Hyderabad.
- Raju, B. (1999). The Rich Have Benefited from Programmes for the Poor, Southern Economist, Feb. 1.
- Sahu B. K., (2003). Rural Development in India, Anmol Publications Pvt. Ltd, New Delhi, p.37
- Sharma S.K. and Malhotra S.L., (1977). Integrated Rural Development: Approaches, Strategy and Perspectives, Abhinav Publications, New Delhi, pp. 16- 17.
- Singh Katar, (2009). Rural Development, Principal, Policies and Management, Sage Publications India Pvt. Ltd., New Delhi, pp. 3-4.
- Swarnjayanti Gram Swarozgar Yojana, (1999). As per Reserve Bank of India Guidelines
- Tewari, R. T. and R.C. Sinha, (1988). Rural Development in India, Ashish Publishing House, New Delhi, p. 03.
- Thaha M., D. Shanthudu, R. Hermon, S. Seetharaman, (1992). Status of Micro Level Planning in India, National Institute of Rural Development, Hyderabad,
- Tripathi, S. N. (ed.), (2000). Rural Development, Discovery Publishing House, New Delhi,.
- Uday Bhaskar Reddy, (1987). "The Role of voluntary Agencies in Rural Development", the Indian Journal of Public Administration, Vol. 33 No. 3 July-Sep., pp. 547
- Ugra Mohan Jha, (1995). Rural Development in India, Problems and Prospects, Anmol Publications Pvt. Ltd., New Delhi
- Vasant Desai, (1993). A Study of Rural Economics Himalaya Publishing House, Bombay, p. 355
- Venkata Reddy, K. (1988). Rural Development in India, Poverty and Development, Himalaya Publishing House, New Delhi, p. 60
- Vithal, C. P. (2001). Management of Panchayati Raj Finances in Andhra Pradesh: A Study in Medak District, National Institute of Rural Development, Hyderabad.



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THE STRUCTURE OF PROFESSIONAL COMPETENCE OF PEDAGOGUES AND PSYCHOLOGICAL REQUIREMENTS

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ABSTRACT

This article presents the pedagogical basis of the professional competence of pedagogues and its structure, the means and methods of formation of competence in teachers, and the current problems of socio-psychological features of the formation of competence.

KEYWORDS: *Pedagogue, Education, Qualification, Purpose, Method, Technology, Competence, Pedagogical-Psychological, Social.*

INTRODUCTION

You can't imagine a modern teacher who is specially trained, professionally competent, and uses psychological knowledge, skills and abilities in the educational process on the basis of the principles of effectiveness. The essence of the concept of "competence". Being able to withstand strong competition, which is a priority in the labor market in the context of market relations, requires every specialist to have professional competence, which is constantly increasing. Professional competence does not mean the acquisition of specific knowledge and skills by a specialist, but the acquisition of integrative knowledge and actions in each independent area. Competence also requires the constant enrichment of professional knowledge, the ability to learn new information, to understand important social requirements, to be able to search for new information, process it and apply it in their work.

A number of studies have directly explored the professional competence and specificity of the educator. Such research includes the research conducted by A.K. Markova and B. Nazarova. In her research, A.K. Markova states that the professional competence of a teacher consists of the following components. In Uzbekistan, the professional competence of teachers, their peculiarities, including the research conducted by B. Nazarova and S. Musinov, are of particular importance. According to the researcher, the basis of professional competence of a teacher is the

following. Self-improvement and self-development are important in gaining professional and pedagogical competence. Self-improvement tasks are defined through self-analysis, management, and self-assessment. Stages of pedagogical work on self-development of professional competence:

As an educator specialist:

- Improving the pedagogical and psychological process on the basis of a clear goal, aspiration;
- increase the effectiveness of the process of pedagogical psychology, increase their activity;
- acquisition of constantly updated pedagogical and psychological knowledge; be aware of the psychological basis of advanced technology, methods and tools;
- effective implementation of the latest pedagogical and psychological innovations in science and technology;
- Improving professional pedagogical and psychological skills and competencies; the practical action he takes to seek psychological prevention and resolution of negative pedagogical conflicts represents his work on himself.

Educators need a project-based approach to work in a consistent, effective way. It is desirable that they be able to formulate the following model based on a project approach. The model outlines the steps to be taken and the tasks to be performed at each stage. The effective solution of the tasks set for each stage allows you to move on to the next stage. Self-analysis is also important for a teacher to become professionally competent.

Self-analysis is the study of the nature of one's own practical actions organized by the educator in professional activities. Through self-analysis, the educator is able to make an objective self-assessment. for it is also important that educators have the skills of self-assessment in order to acquire the qualities of professional competence.

Self-Assessment (SAA) is an individual's self-assessment through self-analysis. Self-assessment is the calculation of a person's personal capabilities, objective self-assessment, and self-satisfaction. Self-esteem should help a person develop his or her abilities on his or her own. Self-assessment is difficult, but it can be done directly. As with any professional, there are a number of factors that can affect a teacher's ability to evaluate themselves effectively.

Another important component of the overall structure of professional psychological competence in pedagogical activity is social competence, because the modern teacher not only imparts knowledge, information, but also acts as a mediator between the developing individual and society. The “child-society” relationship, the purposefulness of the interaction, also depends on how competent and efficient the teacher is in social life. Key functions of social competence include adaptation, social orientation, and a combination of personal and social experiences.

The level of social competence of an individual is important in the process of interaction and organization of activities. At the same time, according to psychologists, the formation of the level of social competence of people in the process of adaptation of citizens to the new social conditions of globalization plays a special role. Environmental, political, ideological, and social changes not only determine the development of social thinking, but also affect people's self-awareness, life values, and personal problems. The task of psychology is to create programs

aimed at increasing the level of competence of a person in solving problems related to socialization and social adaptation. In our view, this task is particularly relevant to the work of educators, who are responsible not only for themselves, but also for the formation of their students as well-rounded individuals.

Social competence is one of the most important forms of psychological competence studied in modern psychology. It also reflects the creative qualities of man as a subject of social partnership and cooperation. Mechanisms of formation of competent social behavior of the subject, tendencies of manifestation, motivation, interest in the content are characterized, first of all, by the influence of the nature of "human-society" interaction on social development. A number of studies, in particular, A.K.Markova, S. Musinov and B. Nazarova, have noted the structural foundations of pedagogical competence. The professional competence of the teacher ensures the effective and successful organization of the pedagogical (teaching and education) process. In order to gain professional competence, a teacher must focus on consistent self-improvement. The "Individual Development Program" helps the educator to develop himself.

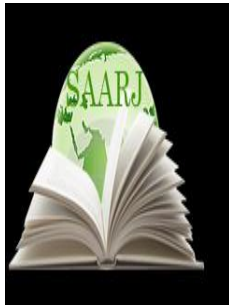
Because in this program, the qualities of competence that a teacher has and the qualities that need to be developed, the BKM can be clearly and objectively expressed. A number of studies, in particular, AK Markova, S. Musinov and B. Nazarova, have noted the structural foundations of pedagogical competence. The professional competence of the teacher ensures the effective and successful organization of the pedagogical (teaching and education) process.

In order to gain professional competence, a teacher must focus on consistent self-improvement. The "Individual Development Program" helps the educator to develop himself. Because in this program, the qualities of competence that a teacher has and the qualities that need to be developed, the BKM can be clearly and objectively expressed. Many arguments have been made that the development of professional psychological competence depends not only on the amount and quantity of psychological knowledge, skills and abilities, but also on the subject's aspirations to acquire and implement a competent model of professional behavior. In this case, the nature of a particular individual subject, the direction of values, way of thinking, worldview, beliefs, ideals, self-concept, self-awareness, motivation to be competent play an important role. In particular, the content of motivational characteristics is important in determining the effectiveness of competence.

It is important to pay attention to the desire of a person to develop their professional and personal qualities. An analysis of the scientific literature in the field of motivational psychology, devoted to the study of the development of professional qualities of the individual, shows that there are many types of motivational tendencies involved in the management and control of this process.

REFERENCES

1. Aliyev A. Pedagogik madaniyat: metod va mahorat qirralari // J. Xalq ta'limi. – T., 2007.
2. Davleshin M.G. Zamonaviy maktab o'qituvchisining psixologiyasi. –T.: O'zbekiston, 1999
3. Bogolyubov V.I. Theoretical foundations for the design of modern pedagogical technologies: Based on the material of English-language sources: Avtoref.dis. ... Doctor of Pedagogical Sciences. - Pyatigorsk, 1999.
4. Vigotsky L.S. Pedagogical psychology. –M.: Pedagogy, 1977



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NECESSARY CONDITIONS FOR THE IMPLEMENTATION OF THE DIVERSIFICATION STRATEGY IN THE ECONOMY

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ABSTRACT

This article discusses the types of diversification strategies and their role in the economy, as well as the concept of diversification. The experience of our country during the years of independence shows that in any country, the industrial sector, which is the basis of the economy, must develop on the basis of active integration. In other words, the development of the enterprise requires the use of diversification strategies to expand the scope of activities. Diversification strategy means that the company is expanding its activities. The degree of diversification can vary.

KEYWORDS: *Diversification, Economy, Uzbekistan, Strategy, State, Competition, Export, Agriculture, Industry*

INTRODUCTION

The process of economic diversification around the world began to develop in the mid-1950s. Initially, diversification took place in the United States, Japan, and Western Europe in the fields of industry, transportation, construction, and finance. Therefore, the nature of diversification is determined by the socio-economic factors of these countries, as well as the general factors that belong to other countries (scientific and technological revolution, the struggle for high profits, competition, not to lag behind in technical progress, etc.). In diversification, firms, especially monopolies, become more diversified. They start out in high-income, fast-growing industries. In addition to producing products, companies also begin to produce the raw materials needed for these products. They spend money on low-income sectors that save a lot of money.

Without increasing the competitiveness of our economy, it is impossible to carry out such a strategic task as bringing the economy of our country to the level of developed democracies in the medium term. Comprehensive measures are being taken to ensure the competitiveness of the country's economy.

The Development Strategy Program for the five priority areas of development of the Republic of Uzbekistan for 2017-2021, selected by the head of state, includes an active investment policy aimed at modernization, technical and technological renewal of production, implementation of production projects and high-tech. It is planned to accelerate the development of processing industries, primarily the production of high value-added finished products based on deep processing of local raw materials.

The experience of our country during the years of independence shows that in any country, the industrial sector, which is the basis of the economy, must develop on the basis of active integration. The positive changes that have taken place in our economy have led to a significant diversification of its structure. Petroleum, chemical, automotive, modern agricultural machinery, building materials industry, railway machinery, consumer electronics, pharmaceuticals, food, textiles, footwear and a number of other completely new industries. the establishment of which laid the groundwork for this.

As a result, over the years of independence, industrial production has increased 4.6 times, and in the last 10 years, the average annual growth rate of the industrial sector has exceeded the GDP growth rate. while high, it was 8.9 percent. In the 1990s, agriculture accounted for about 33 percent of the country's gross domestic product, while industrial output did not exceed 14 percent. Industrial production also included cotton ginning and the production of agricultural machinery.

Today, as a result of reforms, the share of industry in GDP has reached 32.9%, while the share of agriculture in GDP, despite the rapid growth, has reached 17.6%. The share of the broadcasting sector reached 49.5%.

The main task, as noted by the head of state, is to accelerate the development of industry through diversification in the economy and increase its share in GDP to 40% by 2030, reduce energy consumption by about 2 times due to the widespread introduction of modern energy-saving technologies. to achieve.

It should be noted that localization in the production of finished products plays an important role in more sustainable and consistent development of the economy, reducing its dependence on external factors, accelerating the introduction of new efficient technologies in production processes. That is why localization in Uzbekistan is one of the main directions of industrial development. This will ensure the extensive use of local raw materials and production resources, as well as the production of import-substituting, modern and competitive products.

Our country has a great potential for agriculture. Therefore, in recent years, extensive work has been done to reform agriculture and introduce market mechanisms.

In particular, the Strategy of Agricultural Development of the Republic of Uzbekistan for 2020-2030, the concept of efficient use of land and water resources in agriculture and other organizational and legal measures were adopted. The goal is not only to provide economic benefits, but also to ensure food security and increase the well-being of the people.

It is no exaggeration to say that the Resolution of the President of the Republic of Uzbekistan "On Additional Measures for the Implementation of the "Agricultural Diversification and Modernization" Project with the Participation of the International Fund for Agricultural Development" signed on 15 September this year is an important step in this direction.

At the same time, the establishment of new high-tech production facilities, more active involvement of the regions in the development of competitive and export-oriented modern industrial products, production, engineering communications, road transport, social infrastructure and logistics services. In order to expand the attraction of foreign direct investment to ensure rapid development, 14 free economic zones and 96 small industrial zones have been established in the country.

It is advisable to increase the above figures, first of all, to use the diversification strategy in order to achieve further development of the economy. In other words, the development of the enterprise requires the use of diversification strategies to expand the scope of activities. Diversification strategy means that the company is expanding its activities. The degree of diversification can vary. The degree of diversification can be in the following forms: limited diversification, linked diversification, unbound diversification.

-bounded diversification- usually occurs when an enterprise leads one business, but other businesses that do not have a large volume also develop;

-related diversification is the development of several activities that are somehow interconnected (production, technology, sales, etc.).

-Unconnected diversification is the development of several different unrelated activities. For example, in the field of consumer services, in addition to manufacturing activities.

The content of the diversification strategy is based on the following objectives:

The essence of a diversification strategy is to distribute the assets and capital of a company between different areas of activity to reduce the risk of losing future income. The main advantages of an unrelated diversification strategy are that the company can find and develop more profitable businesses in the future, as well as reduce the impact of seasonal declines in core business sales. The disadvantages (or risks) of such a diversification strategy are the need to allocate large resources to develop a new line of business and investment.

An international diversification strategy can take one of two forms, described above: linked or unbound. But we talk about it separately because it means a lot to the company. International diversification is one of the main strategic ways to diversify the company's activities. They will move on to it once national diversification is complete. This process requires high management skills and a properly built management structure.

Selection and analysis of new production lines for the enterprise. Management needs to determine which markets are potentially promising and attractive to enter, what opportunities and resources are available in them, and how this will affect the overall profitability of the company.

Exploration of opportunities for useful combination of value chain blocks of different business units. To increase the operational and strategic efficiency of management, SEBs should look for opportunities to use and redistribute resources. For example, using one company's strong market brand to promote another.

Implement measures to increase the value of the company at the expense of existing divisions. Management should seriously assess the existing environmental conditions and opportunities of

existing companies, abandon inefficient areas, strengthen the position of promising products by developing internal resources and purchasing ancillary enterprises.

Key Methods of Diversification Buying an existing SEB is the most expensive and fastest way to get a business ready and working without additional effort to overcome industry barriers. Creating an SEB based on internal capabilities Identify internal resources to create a business unit from scratch. It is usually applied when the company has sufficient funds and powers to overcome market barriers in the area selected for the activity. This is also common for companies that have valuable resources for their chosen field.

The creation of joint ventures is applied in complex and high-tech industries that require significantly more resources than the enterprise has: They are in poorly studied industries with high levels of risk and uncertainty; diversification applies to operations in another country.

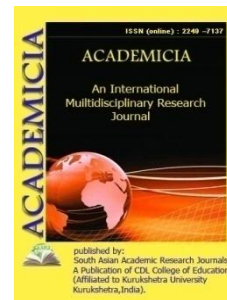
Types of diversification strategies are: Elements of the associated diversification value chain involve entering a new market by forming a business unit that is similar to the elements present in the corporate portfolio.

Unrelated diversification involves entering a new market by acquiring a business unit that is incompatible with the corporation's current trends in the value chain, but has the potential to increase the profitability of the entire company.

Thus, the diversification strategy is related to new products designed for new markets. Of course, this strategy is difficult and risky because it takes the enterprise into new areas. Their success requires the involvement of large human and financial resources.

LIST OF USED LITERATURE

1. <https://uz.wikipedia.org/wiki/Diversifikatsiya>
2. Ergashev "BOZOR IQTISODIYOTI"
3. M. Yulsoqov "Rivojlanishstrategiyasi" o'quv-uslubiy majmua.
4. 4. Strategy of actions on the five main directions of development of the Republic of Uzbekistan for 2017-2021
5. <http://library.ziynet.uz/static/lib/reader-pdf/web/viewer.html?file=http://library.ziynet.uz/uploads/books/835095/5c1ddc14aad58.pdf>



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CONTENT, FORM AND MEANS OF FORMATION OF BASIC COMPETENCES IN PRIMARY SCHOOL STUDENTS

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ABSTRACT

In selecting learning technologies for the formation of core competencies in students, the science teacher identifies the core competencies identified for that class in the calendar theme plan. After that, the method of teaching is chosen, taking into account the topic to be studied and the competencies to be formed. This article discusses the content, form, and means of developing core competencies in primary school students.

KEYWORDS: *Primary School Students, Basic Competencies, Development, Content, Form, Means, Higher Education, Pedagogical Principles, Interactive Methods, Interactive Lessons.*

INTRODUCTION

The study of pedagogy today and the relationship of time to it is becoming a separate scientific problem. A person, as an independent creative activity and a skilled expert in his field, must be able to influence the development of the nation's social thinking. Independent creative activity, creativity serves as a criterion for ensuring the level of preparation of students for social life on the basis of social knowledge and consciousness. The system of higher pedagogical education is an important step in this direction, especially in pedagogical faculties, where the formation and development of professional skills, ethics, etiquette and necessary qualities of future primary school teachers is a priority.

Interactive approach. Teachers create a comfortable environment for better organization of the teaching process. Students are given the opportunity to exchange ideas. They discuss and resolve the issues that need to be resolved together. They find a solution together to get out of the situation. They demonstrate their knowledge to each other based on the information they receive.

Design method. The design method is a system of teaching in which students acquire knowledge, skills, and competencies in the planning, construction, and execution of a practical task that is constantly becoming more complex. Students carry out a wide range of problem-solving (creative, information, communication and problem-related) projects. For this method to be highly effective, it is necessary to have a high level of motivation in the project. personal competencies are formed:

- Teamwork;
- Feelings of responsibility;
- Self-confidence;
- Fast thinking;
- Be able to see the progress of the process;
- Ability to observe;
- Motivation.

The problem-based modular teaching method involves the practical application of theoretical knowledge. This method forms the didactic basis of various models of teaching and differs in the use of teaching aids and pedagogical techniques. It refers to the division of the subject into relatively small parts - modules. The main purpose of education aimed at the development of the student's personality is in fact the development of additional competencies such as thinking, mastering, writing and arithmetic of children from the primary school. A person who enters into social relations and actively participates in social development is called a person. A person who is born as an individual then becomes a person. In the notion of the individual, a person's lineage is embodied.

The design method is a system of teaching in which students acquire knowledge, skills, and competencies in the planning, construction, and execution of a practical task that is constantly becoming more complex. Students carry out a wide range of problem-solving (creative, informational, communication and problem-related) projects. For this method to be highly effective, students must have a high level of motivation in the project. The following personal competencies are formed: teamwork ; activity; sense of responsibility; self-confidence; teaching; quick thinking; ability to see the process; ability to observe; foresight; diagnosis; accelerates the activation of knowledge; helps to attract new and interconnected ideas freely and openly.

Communicative competence - adherence to etiquette in communication; to be able to listen to the opinion of the interlocutor, to express one's opinion; self-control adherence to the culture of communication in communication; including elements such as respect for the opinion of the interlocutor in the conversation, which is manifested through the study of the proverbs related to language. National and multicultural competence - continuous self-development of physical, spiritual, mental, intellectual and creative development, striving for perfection, independent learning throughout life, continuous improvement of cognitive skills and life experience it involves acquiring the skills to go, alternatively evaluate one's own behavior, and make independent decisions.

National and multicultural competence refers to the ability to find, sort, process, store, use, secure, and develop the capacity for media culture to obtain the necessary information from media sources.

Complete a variety of problem-solving assignments in a variety of academic disciplines, such as reporting, writing test questions, and more. Students will be able to complete a variety of challenging assignments independently in a variety of disciplines at several stages of the education system. For example, in general secondary education, time is allocated for practical training. As students participate in these hands-on activities, they will develop the basic skills to participate independently in production. In later stages of education, such as lyceums and vocational colleges, they are in a variety of internships, completing problem-solving assignments independently, compiling reports, and writing essays. In higher education, students participate in industrial, graduate and pedagogical internships. Pedagogical internships are organized for 14 weeks for final students in the fields of music, fine and applied arts, labor education, primary education and psychological education, where the field of education is the humanities.

During the internship, students organize and observe a variety of lessons and extracurricular activities, analyze, write conclusions. During the internship, they prepare for lessons independently, initially under the supervision of a teacher, and during the main period, independently develop lesson and extracurricular activities and implement them in the educational process. At the end of the internship, reports will be prepared and presentations will be made.

And when faced with a difficult situation, they are constantly looking for solutions. Here are some suggestions on how to look or get an appointment for hair extensions. The following are the names of independent creative works that can be effectively used in the training of future primary school teachers in higher education. They can be successfully implemented taking into account different regional, regional, local characteristics.

- Production of various shapes, toys, objects from paper, cardboard, wires and fabrics, as well as various natural and artificial materials on the basis of the subject of labor education methods;
- to draw and describe various processes, landscapes, objects and objects in fine and applied arts classes;
- Participate in the development of methodological developments in the education system, the educational process and the organization of educational work (during the internship);
- Development and implementation of electronic trainings;
- Presentation of articles, lectures, theses in scientific, practical, methodological, pedagogical and psychological content in thematic conferences and conferences in magazines, newspapers, collections;
- Participate in the preparation of scientific reports (for research on the basis of economic contracts);
- Participate in the development of methodological recommendations, developments for the improvement of individual parts of the curriculum and program of the educational institution (preschool, general secondary, secondary special, vocational education);

- Design, development, construction of didactic tools of education. Preparation of technological and perforation maps, creation of slides;
- In the development and implementation of guidelines for improving the organization of various activities of students (games, games, labor, sports, health, creativity, production, community, etc.) to participate;
- Participation in various pedagogical, psychological, didactic, methodological and scientific research and observation, experimental work;
- Participate in tests, questionnaires, interview questionnaires, observation cards, interviews, discussion and editing;
- participation in science olympiads, competitions, various contests, scientific-methodical conferences and seminars.

Active participation of the educational institution in various cultural, spiritual and educational events, hashars, etc. with representatives of public organizations, mahallas, authorities. In general, the following suggestions and recommendations can be made for the successful organization of independent creative work of future primary school teachers at the level of modern requirements. The diversity of independent creative work plays an important role in preparing future primary school teachers for professional pedagogical activities, as the more creative tasks students complete during their studies, the more diverse aspects of independent pedagogical activity become. Particular attention should be paid to the continuity, continuity and continuity of the organization of independent creative activity of students. Because in such cases, it is advisable to follow the principles of "simple to complex" and "easy to difficult" in the performance of problematic tasks. Students are encouraged to keep copies of independent creative work done during extracurricular and classroom activities, spiritual and educational activities, and internships, as they can also be used as direct examples in independent pedagogical activities.

In conclusion, in order to effectively address the issue of ensuring the acquisition of professional skills and abilities of students, special attention should be paid to the forms of organization of independent practical creative activity. This will help alleviate the problem of training an aspiring creative elementary school teacher. In general, primary school students need to use interactive methods with the content, form, and means of developing core competencies.

LIST OF REFERENCES:

- Jurayev Z.H, Tolipov O., Sharipov Sh .. Scientific and pedagogical bases of vocational guidance of students in the system of continuing education. - T.: Fan, 2004, 120-p.
- Haydarov IA The purpose, tasks, methods and means of continuous professional orientation. // "School and Life" magazine, 2012, № pages 7-8, 5-6.
- Pronina E. N., Lukashevich.V. V. Psychology and pedagogy. Textbook for university students. - M.: Elit, 2004.
- Full article: Global teaching competencies in primary education. <https://www.tandfonline.com/doi/full/10.1080/03057925.2020.1869520>
- Speech Competence of Primary School Students: Cognitive Approach. https://www.researchgate.net/publication/342823728_Speech_Competence_of_Primary_School_Students_Cognitive_Approach



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COGNITIVE COMPETENCE AS A SCAFFOLD TO BE BOOSTING CRITICAL THINKING

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ABSTRACT

This paper sheds light on critical thinking and creative thinking as two of the core elements of the cognitive competence, and also it looks back to some reviews about these two core features of cognitive competence, highlighting important points on it. Because we know that cognitive competence is not a self-regulated but is a learned process either naturally or unnaturally, still with some facing challenges in enhancing this quality. Hence, cognitive competence could be hailed as an important quality for nurturing critical thinking abilities and skills in children.

KEYWORDS: *Cognitive Competence, Critical Thinking, Self-Discipline, Self-Development, Techniques For Applying Critical Thinking, Effective Communication*

INTRODUCTION

As we are fully aware of different thinking that could be made up cognitive thinking, and also might as well greatly assist in improving critical thinking, divided into various types of thinking such as creative thinking, analytical thinking, critical thinking, concrete thinking, abstract thinking, divergent thinking and convergent thinking. So, according to Stefan Mitrovich, he had already pointed out that creative thinking an ability to conceive new and innovative ideas by breaking from established thoughts, theories, rules, and procedures. People who use this thinking often hear that they think outside the box. [1]. However, we are discussing interrelations between creative and critical thinking, hence we will be much more elaborating on these types of thinking. Besides, he also noted that critical thinking is not just a breaking down the actual received information, but evaluating and giving a fair judgment on some complicated cases with pitting some wits on it to find a solution to the problematic case. A way of observing problems or situations from a fresh perspective that means unorthodox solutions (which may look unsettling at first). Creative thinking is often stimulated both by an unstructured process like brainstorming,

and by a structured process like heuristic program. Moreover, it can be mean observing something during a new way. It's the very definition of "thinking outside the box." [2]

MATERIALS AND METHODS

Motivating and engaging students is the goal of most teachers—priming them to receive instruction, or otherwise align themselves to a pre-set process you've sketched out that you hope will yield a learning goal you selected beforehand.

In this process we are looking at the technique that is so called Brain Shifter to help to increase the capacity of level of critical thinking in children as they are at a turning point that could be guided towards easily at their early ages. And the following stages how to set up Brain Shifter method:

Purpose:

Create new ideas that you never thought about before. Bonus: Laugh and have fun in your group while you learn more about yourself and the group.

Instructions:

- 1) Start by putting up a large paper on a wall (at least A1 size)
- 2) Get in to character by changing your mindset and try to think like another person. For example, imagine that you are a child, a lawyer, a salsa dancer or why not a superhero? The ambitious ones can also dress up as their chosen character to give extra effect to their brainstorm.
- 3) Start by drawing your thoughts on the paper. Let's say you have chosen to be a dancer, then you could for example dance salsa while you draw your ideas on the idea-mind map. Be sure to take turns in the group.
- 4). When the time runs out you should kill your darlings and select the best idea by using Idea voting.

Do:

- Think and play around as much as you can.
- Use a lot of colors when you draw the mind map.
- Always build on the ideas of others in order to make this a crazy idea-mind map

Don't:

- Forget to challenge your comfort zone by choosing new characters.

Timeframe

Total time for the brainstorm will be 1 hour. A 45 minutes' session with a 10 min break, 15 minutes to kill your darlings.

During the break you need to do 5 handstand pushups times 3. Take a glass of water and start again. The purpose with this energizer is to get blood to your brain as well as helping you stay in shape.

Facilitator's role

Take time on actual brainstorm and to signal when it's time for a break. The Facilitator should also bring props for the people in your group to fully get into their characters.

Reflection questions

- How was it?
- Did you feel that this was valuable for your work? In what way? [3]

The machine project to create a unite atmosphere and joyful collaboration inside the classroom, as well as facilitating the needs to overcome extreme shyness in either in public or on board.

THE MACHINE PROJECT:**Quick introduction**

The Machine is an exercise to get the creativity flowing.

Purpose

A short break in work creates energy.

Instructions

One person starts making a sound and a movement, such as a “woop”-sound, flapping one arm.

The next person connects to the first part in our machine, also making a sound and a movement.

You keep repeating the sound/movement until everyone in the group is connected, making it a giant moving noisy machine! Works best with big groups.

RESULTS AND DISCUSSIONS

So, it is a lucid that critical thinking is the analysis of facts to form a judgment. The subject is complex; several different definitions exist, which generally include the rational, skeptical, and unbiased analysis or evaluation of factual evidence. Critical thinking is self-directed, self-disciplined self-monitored, and self-corrective thinking. It presupposes assent to rigorous standards of excellence and mindful command of their use. It entails effective communication and problem-solving abilities as well as a commitment to overcome native egocentrism and socio centristism [4]. Someone with critical thinking skills can:

Understand the links between ideas, determine the importance and relevance of arguments and ideas, recognize build and appraise arguments, identify inconsistencies and errors in reasoning, approach problems in a consistent and systematic way, reflect on the justification of their own assumptions, beliefs and values. One of the most important aspects of critical thinking is to decide what you are aiming to achieve and then make a decision based on a range of possibilities.

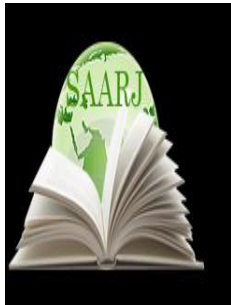
Once you have clarified that aim for yourself you should use it as the starting point in all future situations requiring thought and, possibly, further decision making. Where needed, make your workmates, family or those around you aware of your intention to pursue this goal. You must then discipline yourself to keep on track until changing circumstances mean you have to revisit the start of the decision making process.

However, there are things that get in the way of simple decision making. We all carry with us a range of likes and dislikes, learnt behavior and personal preferences developed throughout our lives; they are the hallmarks of being human. A major contribution to ensuring we think critically is to be aware of these personal characteristics, preferences and biases and make allowance for them when considering possible next steps, whether they are at the pre-action consideration stage or as part of a rethink caused by unexpected or unforeseen impediments to continued progress. The more clearly we are aware of ourselves, our strengths and weaknesses, the more likely our critical thinking will be productive.[5]. It might be thought that we are overextending our demands on critical thinking in expecting that it can help to construct focused meaning rather than examining the information given and the knowledge we have acquired to see if we can, if necessary, construct a meaning that will be acceptable and useful.

After all, almost no information we have available to us, either externally or internally, carries any guarantee of its life or appropriateness. Neat step-by-step instructions may provide some sort of trellis on which our basic understanding of critical thinking can blossom but it doesn't and cannot provide any assurance of certainty, utility or longevity.

REFERENCES

1. <https://blog.mindvalley.com/author/stefan/>
2. Creative Thinking skills – A Review article By: Ola W. A. Gafour , Walid A. S. Gafour May, 2020
3. <https://projectofhow.com/methods/brain-bottling-shifter/>
4. https://en.wikipedia.org/wiki/Critical_thinking/
5. <https://www.skillsyouneed.com/learn/critical-thinking.html>



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HOW TO IMPROVE LISTENING SKILLS FOR ESL STUDENTS?

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ABSTRACT

In this article, we will teach ESL students how to understand English speech by ear, how to choose and listen to a podcast appropriate to the topic and level of English, the usefulness of listening lessons, how to learn English correctly from audio materials, what podcasts are, detailed information about the term ESL is given.

KEYWORDS: *ESL, Term, Category, Representative, Nationality, Education, Perfect, Vocabulary, Grammar, Stability, Listening, Skill, Task, Skill, Celebrity, Fluent Speaking, Attention, Podcasts.*

INTRODUCTION

ESL - this term refers to English as a second language and requires students to be taught English in countries where English is the main language of communication. Canada, the United Kingdom, the United States, Australia, etc. fall into this category, where English is spoken everywhere, but students learning English are of different nationalities c. These students must be fluent in English to meet the requirements of education and employment.

When learning English, many face difficulties in understanding and listening to English. In addition, the person can read and write perfectly without error.

Learning English can be relatively easy in some ways. For example, memorizing vocabulary or learning grammar are issues that can be easily learned with consistency. However, learning to understand the words of others is not at all easy to know by listening to words called Listening.

Listening to English is one of the key skills in the whole foreign language learning process. Listening encourages a person to speak, that is, develops another basic skill - speech.

The most important thing to remember is that listening to English is a skill, and the task for the requirements is to develop it.

The only way to develop hearing ability is to teach the listener to differentiate and understand the words in a sentence.

To improve ESL students' listening in English, they must first learn the techniques of working with text.

The following guidelines will help you work with text and develop listening skills:

1. Students should always listen. Even if students are very busy, they should take time to listen for 30 minutes a day. The main thing here is regularity.

2. Before students start listening, they need to adjust the performance, they need to separate the world, concentration is the most necessary detail. Students should promise themselves that in the next 30 minutes, they will only practice their listening skills.

Hearing ability is the ability to hear and understand English. Listening is one of the basic skills of learning English.

Once a student begins to learn English, he or she must select texts for listening that are appropriate for the level of knowledge of that language.

Once the student has stopped working with the text, he or she can listen to many audio and video tutorials in the foreign language, such as dialogues, thematic texts, and audio stories, in order to master the ability to listen and speak fluently in a foreign language. should listen to them again.

This is the main reason why audio books in English are so popular among students. The more they listen, the faster they become accustomed to foreign speech and begin to understand it. And given that most free audio books are spoken by non-professional native language experts, they can also listen to people with different pronunciations. Someone whispers, someone makes vague sounds, someone speaks too fast - it's a great exercise for your listening ability.

If students really want to learn, they must listen to English every day. We all know that this is the most important step needed to develop a student's listening ability. Listening to the English language used allows you to learn more about its natural use.

The main way to develop English language skills through active listening is to listen to conversational topics from a variety of sources. This then introduces students to unfamiliar dictionaries and broader accents.

ESL students need to develop a strategy in a specific direction. This strategy should have a step-by-step tracking system.

ESL students who are learning English should not lose focus when listening to any audio for their own benefit.

One of the biggest challenges for students learning a language is speaking it, working it out loud. The main reason is embarrassment or embarrassment for saying something wrong and an inability to think about what to say in the first place.

But there is no better way to learn a language than to speak it, as they can learn countless words and, if they wish, must memorize an English dictionary completely. If the students are never practicing it, if they don't speak the same language to other people, it will be difficult for them to use it when they need to.

As we have said many times about listening, students can find the best learning tool to listen to songs and audios because the brain is ready to memorize the lyrics of the songs without the person having to feel them. When they listen to a song, they like it over and over again. This is something that is done automatically, even before you speak.

Listening Rules:

- 1) Students listen to the audio recording a maximum of 2 times and try to understand the main meaning of what is being said.
- 2) Each student reads the text of the audio recording and analyzes each word in detail, using dictionaries if necessary.
- 3) The student likes the audio recording again and listens to it again based on the text, pausing in places that are difficult to understand.

It is very important to listen carefully to the pronunciation of each phrase, to compare it with its analogue in the text in order to understand how to pronounce it.

- 4) The final step is to listen to the writing without relying on the text to reinforce the material.
- 5) If this is the case, then the final stage can be a stage of performing various tasks related to the text, which is better to do without relying on it.

When a student chooses audio recordings, of course, they have to choose according to their level. We encourage teachers to select podcasts based on their level to improve this skill.

1. The student must choose the right level of interesting material
2. You need to find the best way to work with the podcast

In their spare time, language learners can listen to audio recordings or use other tactics:

- Listen to the audio material and try to understand as much information as possible from it. If this is difficult, try to understand the main message of the post.
- Find, read the text of a message and translate phrases they do not know.
- Turn on the sound again and try to listen to the text they know.
- Tell your friends, family, or yourself what you have heard in the mirror, trying to imitate the speaker's speech.

This tactic does not seem to take much time. The student spends only 15-20 minutes analyzing the five-minute audio material.

The reader is also involved in the order in which these processes are performed

The main tasks of the teacher in the class are:

- Listening to a variety of listening comprehension tasks to engage the learner, drawing attention and knowing the vocabulary before listening;

- listening assistance - teaching to listen to important moments and the information they need while listening and removing difficulties in paying attention to some;

- Listening, after the hearing, as well as the conclusions after the hearing, not only to strengthen the audit, but also to verify that there was a reason for the audit.

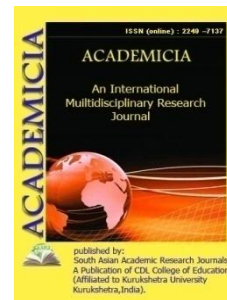
In fact, it is better to start learning a foreign language at a very young age. As the brain activity of young children continues to develop steadily, they are able to absorb new information much faster than adults, whose brain activity is fully formed. It is advisable to plan the lesson taking into account these features. For example, the use of games, pictures, songs, poems, and cartoons is an effective way to teach a foreign language to preschool children.

During the audition, students will be able to:

- find out what we are talking about at the scene;
- pay attention to what is unclear and raises questions about it;
- determination or denial obtained during the hearing;
- It is necessary to draw conclusions and bring.

REFERENCES

1. © 2021 samarapedsovet.ru - Sayt -Akademik. Lug'atlar va entsiklopediyalar
2. David A. J, Eggen, P Kauchak. Methods for Teaching: Promoting student learning [M] 2002.
3. Liu wang. ertong xinglixue kaocha[J]. 2017-18.
4. Feng Wang , Applying Technology to Inquiry-Based Learning in Early Childhood Education [J]. Early Childhood Educ
5. <https://t.me/masofatalim>
6. Andrei Boychuk - founder of Immigrant Bribery - a platform for Ukrainian immigrants in the United States



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STUDY AND ANALYSIS OF THE CONVERSION PROCESS OF PROPANO-BUTANE MIXTURE IN HIGH SILICATE ZEOLITIC CATALYSTS OF DIFFERENT SILICATE MODULES AND DIFFERENT STRUCTURES

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ABSTRACT

The catalytic aromatization reaction of the propane-butane fraction was carried out on a mesoporous catalyst containing Pt, Zn, Ga and Cd / N-ZSM-5 under the following optimal conditions: Catalytic conversion of propane-butane alkanes at atmospheric pressure went. The reaction was carried out under conditions of temperature 723 to 873 K and volumetric velocity of the raw material from 50 to 150 h. The conversion reaction of a mixture of alkanes containing C₂H₆ = 2.2; C₃H₈ = 73.7; N-S₄N₁₀ = 24.1%. In high-silicate zeolite catalysts with the structure ZSM-5 ([SiO]₂ / [Al]₂ O₃ = 30, 50, 70 and 100) and ZSM-11 ([SiO]₂ / [Al]₂ O₃ = 100), the catalytic contacts the relationship between their structural and acidic characteristics and their activity in the formation of conversion products was studied. Depending on the silicate modulus, it was found that the conversion rate of the alkane mixture S₂-S₄ varies and is 96% at [T = 823K and v = 100 s]⁻¹. The distribution curves of the volume of the pores to the equivalent diameters were compared. The largest part of the pores is 13 to 20 diametri in diameter. YuK zeolites also have medium (25-50 Å) and large (50-90 Å) mesocytes. The distribution corresponds to 32–35 bo'yicha along the curves. The sizes of the largest mesocytes for these catalysts vary - from 63 to 80 Å.

KEYWORDS: Propane, Butane, Chromatographic Analysis, Volumetric Velocity, High Silicon Zeolite, Catalyst, Texture Characteristic, Meso Porosity, Acidity Center, IR Spectrum, Adsorption-Desorption Of Benzene, Adsorption Of Ammonia, Propane Adsorption Isotherms, Propane Adsorbers.

INTRODUCTION

The most efficient way to process propane-butane fractions is to chemically process them to obtain aromatic hydrocarbons. Aromatic hydrocarbons are important primary products in the main organic synthesis industry. At present, aromatic hydrocarbons are processed into liquid products of oil catalytic reforming and pyrolysis processes. Changes in the petrochemical complex raw material base are leading to a shortage of these hydrocarbons. Therefore, the search for alternative energy sources to replace petroleum products to obtain aromatic hydrocarbons remains an important task. Alternative sources today are natural gas and petroleum gases. A number of scientists are conducting research on the catalytic synthesis of aromatic hydrocarbons [1-5]. In this reaction, high-silicon zeolites containing Zn, Zr, and Pt have high catalytic activity [2,5,6]. The disadvantage of the catalytic interaction of these systems is that the reaction produces a certain amount of methane and high molecular weight aromatic hydrocarbons (naphthalene, alkyl naphthalene). As a result, the stable service life of catalysts is reduced.

Currently, scientists around the world are interested in the process of obtaining aromatic hydrocarbons from natural gas and petroleum gases in one step.

Zeolite catalysts, especially those modified with metals and metal oxides, are widely used in petroleum refining and petrochemistry [7-11]. The traditional method of obtaining such catalytic systems is to absorb the metal salts into the zeolite and gradually decompose the introduced precursor [12 - 19]. However, in this method, the modifiers are not evenly distributed throughout the entire volume of the zeolite, but are localized on the surface of the zeolite crystals. This reduces the performance efficiency of the catalyst. However, the acidity centers of the catalyst also play an important role in the catalytic activity of the catalytic system. Hydrothermal synthesis is important in ensuring the isomorphic exchange of aluminum or silicon in the zeolite crystal lattice for modifiers. The acidity and texture characteristics of the catalyst are improved due to isomorphic exchange in hydrothermal synthesis. This paper presents the results of the study of the kinetic laws of the catalytic aromatization reaction of propane in the catalyst Pt, Zn, Ga and Cd / N- ZSM-5.

A large value of selectivity for aromatic hydrocarbons was obtained by adding $Zn^{(2+)}$ cations. In [120, 121], the catalytic properties of Zn / N-ZSM-5 samples prepared by ion exchange and pentacyl in the first-burned form $Zn^{(2+)}$ during propane conversion were compared. , while the selectivity of aromatization doubles. During the modification of the propane and butane mixture, 5% Zn / N-ZSM-5, in which case $[S]_{-}(AY) = 65.1\%$. Synthesis of high silica-zeolite catalysts (YUKs) was carried out in steel autoclaves at a temperature of 448 K for 6 days. The initial reaction mixture was prepared and mixed by adding an aqueous solution of aluminum salts $Al_2(SO_4)_3 \times 18H_2O$ analytical and hexamethylenediamine to the liquid glass (29% SiO_2 ; 9% Na_2O ; 62% H_2O). The pH of the reaction mixture was adjusted by the addition of HNO_3 solution. YUKTs powder (1.5 g) was added to the reaction mixture.

The aim of this work is to obtain a mesocellular catalyst containing Zn, Ga and Cd / N- ZSM-5, to study its physicochemical and catalytic properties in the aromatization reaction of propane.

EXPERIMENTAL PART

A mixture of gases: ethane - 2.2%, propane - 73.7%, N -butane - 24.1% by weight, the lower alkanes were used as raw materials for the conversion reaction. The studies were performed in a

reactor with a flow rate of 5 cm^3 at atmospheric pressure. The reactor was heated using a quartz furnace located in a thermostat. The temperature in the quartz furnace was measured with VRT-3. After passing through the catalyst mixture, the reaction products and the remaining unconverted raw material go to the water condenser for condensation. The liquid reaction products are placed in a Dewar tube filled with ice and collected in a collector. The volume of exhaust gases was measured using a GSB-400 gas meter, and a gas sample was taken for analysis using a metering valve. Catalytic conversion of low molecular weight alkanes was carried out under atmospheric pressure at a reaction temperature of 723 to 873 K and a bulk rate of the raw material from 50 to 150 h. The reaction products were obtained for analysis after 30 min. VTK fractions, C₉₊ hydrocarbons, naphthalene and methylnaphthalene. C₂-C₄ alkane conversion products were analyzed using gas chromatography on a chromium chromatograph with a thermal conductivity detector. Analysis of gaseous products - in a column filled with Al₂O₃ (0.25-0.5 mm, column length - 4 m, inner diameter - 3 mm), in the temperature programming mode from 298 to 423 K, with heater, speed 12 degrees / min. Carrier (He) gas velocity - 50 cm^3 / min. The chromatogram of gaseous products is shown in Figure 2.5. Liquid hydrocarbons were analyzed on a S₂₊ base at a temperature programming mode of 352 to 473 K at a rate of $12^\circ \text{C} / \text{min}$, and then at an isothermal mode at 473 K on a PFMS-4 stationary phase packed column. The chromatogram of gaseous products is shown in Figure 2.5. ZSM-5 and $[\text{SiO}]_2 / [\text{Al}]_2 \text{O}_3 = 50$ structured YuK zeolite were used as the basis for catalytic studies. Modification of zeolite was carried out by impregnation with solutions of salts and acids of the corresponding metals, as well as by obtaining five modified catalysts with boric acid: 5% V-VKTs; 5% Mn- VKTs; 1% Rt- VKTs; 1% Rt - 5% Mn / VKTs; 1% Pt - 5% Sn / VKTs. The catalytic activity of the obtained zeolite catalysts was studied in units of flow at atmospheric pressure. During the experiments, the effect of process temperature and voltmetric consumption rate on the conversion rate and the selectivity of aromatic hydrocarbon formation was studied.

Additives of various metals - Zn, Pd, Mo, W and Zn - increase the service life of pentacycl catalysts by 2-10 times [1]. Cadmium ions are added to zeolite to activate aromatization activity and selectivity. At $T = 873 \text{ K}$ $v = 110 \text{ Cd} / \text{N-ZSM-5}$, the selectivity in the propane and butane mixture converts to a mixture of aromatic hydrocarbons at 64.1%, with a conversion of 80–84%. Metal-containing zeolite catalysts were prepared by soaking zeolite in an N-shaped salt or with solutions of certain salts or acids. A certain amount of zeolite was mixed with a certain amount of modifying solution, and the mixture was kept for two hours with constant stirring. The mixture was then immersed in a water bath. After that, the sample obtained is dried at 383 K for 6 hours and baked in a muffle furnace at 793 K for 8 hours. Thus 1% Pt-H / ZSM-5 with the following content; 5% B- H / ZSM-5; 5% Mn - H / ZSM-5, catalysts were obtained: (as a modifier we used solutions of H₄ PtCl₆, boric acid H₃ [BO]₃ and manganese nitrate salt $[\text{Mn}(\text{NO})_3]_2 \times 6 \text{H}_2\text{O}$). The second catalyst was 5% Mn with 1% 1% Pt-H / ZSM-5 and 5% Sn 1% Pt-H / ZSM-5. Platinum-modified zeolite catalysts were activated prior to the experiment at atmospheric oxygen flow at 573 K for 3 h and then at hydrogen flow at 793 K for 4 h.

IC spectroscopy and X-ray analysis were performed using physicochemical methods to study YuKTs: IR spectra of the studied zeolites (Figure 2.1) were recorded on a UR-20 spectrophotometer in the mid-wavelength part of the spectrum at 400-2000 cm⁻¹, where the

absorption ranges were AlO_4 of the base. $[\text{SiO}]_4$ are the principal oscillations of the tetrahedron. To do this, 1-2 mg of the sample and 400 mgKBr of potassium bromide are poured into a special ring placed in a mold, then the sample ring is inserted into the holder and placed on a spectrophotometer. Absorption lines in the observed spectrum can be divided into 2 types of oscillations.

The first type of oscillations corresponds to oscillations at 1120 cm^{-1} , 820 cm^{-1} and 470 cm^{-1} found in the whole zeolite spectrum. The strong absorption range at the apex of 1120 cm^{-1} is related to the antisymmetric oscillations of the tetrahedron $[\text{SiO}]_4$, while the 820 cm^{-1} length 3104 cm^{-1} tetrahedra represents the oscillations mainly involved. - The presence of strong absorption lines $1300\text{--}900$, 820 , $400\text{--}600\text{ cm}^{-1}$ in the region of all spectra testifies to the fact that all samples belong to zeolites.

- that all tested specimens belong to the ZSM constructive type, since all IR spectra obtained include the absorption peaks line 560 cm^{-1} . the ratio of the optical absorption ranges to 560 and 460 cm^{-1} ($1560 / 1460$) [173], the crystallization rate of all studied samples was calculated: $\text{SiO}_2 / \text{Al}_2\text{O}_3$ (3) for ZSM-5 zeolites with a ratio of 30, 50, 70, 100; crystallinity level 89, 2, respectively; 93.3; 91.5; 88.2% are equal. For the ZSM-11 catalyst ($\text{SiO}_2 / \text{Al}_2\text{O}_3 = 100$), the crystallization rate is 88.1%. There are no significant differences in IR spectra for ZSM-5 and ZSM-11 zeolites; therefore X-ray analyzes were performed to improve the structure of the zeolites in detail. X-ray analyzes (Mo-anode, Ni-filter) were performed using Dron-3. Processing of the diffraction lines of zeolites was carried out by determining the distances and intensities of the lines (peaks) of the studied zeolite sample by comparing the distance lines between the planes (their position and relative intensity) with the corresponding line sample.

Thermal desorption measurements were set by programming heating the sample and recording the signal from the detector on a flat potentiometer sheet PDP 4-002 (or on the lines of the KSP-4 potentiometer). The chromatographic version of thermal desorption is that the catalyst sample, which is a molecule of a previously adsorbed substance, is heated at a certain constant rate in a stream of carrier gas and it passes through a detector. During desorption, the detector signal is recorded on a diagram sheet of the potentiometer.

A test sample of 0.3–0.5 g was placed in a quartz reactor and purified with carrier gas (He) at 373 K for 2 h. Carrier gas velocity $170\text{ cm}^{-1} / \text{min}$. The sample reactor was then cooled to 373 K and ammonia adsorption was performed until the sample was completely saturated. With the sample, the reactor was cooled to 298 K . Thermal desorption of NH_3 was carried out at a rate of $170\text{ cm}^{-1} / \text{min}$ of carrier gas (helium) with a programmed heating of the sample at -10 degrees / min.

After device inspection, the adsorbent (35-45 mg) was trained at 723 K in vacuum to remove contaminants for 6 h. The catalyst thus transferred is considered ready for adsorption measurements. Benzene and propane were used as adsorbates. Adsorption of benzene was studied at 293 K . The adsorption value is calculated according to the following formula.

$$a = (Dlxf) / m$$

$a = \text{mmol} / \text{g}$ adsorption amount;

$f = \text{spiral constant mmol} / \text{mm}$;

DI = elongation of the spiral, mm;

m = sample weight, g

The size distribution of the pores was calculated from the desorption networks of benzene adsorption isotherms using the Thomson-Kelvin equation:

$$d_{\text{ekv}} = (4\sigma V_m) / (RT \lg P_s / P)$$

d_ekv = equivalent pore diameter. Å;

σ is the surface tension of benzene, dyn / cm;

V_m - molar volume of liquid, cm³ / mol;

P - equilibrium pressure, mm.Hg

Saturated vapor pressure of P_s-adsorbate, mm of mercury column

Changes in the structure of micropores were determined by the theory of volumetric filling according to the Dubinina-Radushkevich equation [71]:

$$\lg a = \lg \frac{W_0}{V_M} - 0,434 \frac{BT^3}{\beta^3} \left(\lg \frac{P_s}{P} \right)^3$$

a is the value of adsorption at temperature and equilibrium pressure R-mol / g

W_0 - total volume of micropores, cm³ / g;

V_M is the molar volume of the adsorbate, mol / cm³

T is the temperature of the experiment, in K;

R is the equilibrium pressure of the adsorbate, mm of mercury;

P_s is the saturated vapor pressure of the adsorbate, mm of mercury

b is the proximity coefficient;

The B-parameter reflects the size of the micro-pores in the sample, the smaller the micro-pores in the adsorbent, the lower the B-value.

The B-coefficient is directly related to the adsorption energy (E):

$$B = (2,303 R/E)^3$$

When constructing the dependencies in the coordinates lga - (lg (lgP_s) / P) ^ 3, B-parameters for the studied zeolite catalysts were determined.

The total volume of the adsorption gap (W_s) and the volume of the micro-pores (V_ (m.g).) Were determined from the experimental adsorption isotherm [23, 180]:

$$W_s = a_s x V_m; V_ (p.p) = W_s - V_ (m.g.); M_ (m.g) = a_0 x V_m;$$

a_s-adsorption value P_s / P_s = 1, such as mmol / g;

V_m is the volume of millimol adsorbate in the liquid state, cm³ / mmol;

a_0 is the value of adsorption at the relative pressure corresponding to the onset of capillary condensation in the transition pores, mmol / g.

$V_{(p.p)}$ is the volume of the passing mesentery.

Propane adsorption was performed in the temperature range of 293–393 K.

The adsorption temperature of propane was determined from the adsorption isosters

$$a = \text{const}, \ln p = -\frac{q}{RT} + B$$

The chemical composition of the sample was analyzed by energy-dispersion spectrometer and radiographic method with a scanning electron microscope.

Acidic, alkaline and thermal activation of bentonite is a common method in obtaining porous sorbents for the synthesis of organic and inorganic substances.

EXPERIMENTAL RESULTS AND THEIR DISCUSSION

It is known from the scientific literature that the catalytic properties of modified catalysts are directly related to their acidic properties. The acidity centers of zeolite catalysts are an important factor in determining their catalytic activity, as such centers are of 2 types. Weak and strong acid centers. The study of the acidic properties of catalysts by the TPD method of ammonia showed that ammonia is adsorbed in two forms on YuK zeolites, indicating the presence of two peaks in the TPD curve (Figure 3.3). Low-temperature peaks in the 393–613 K region indicate desorption of ammonia from weakly acidic centers, and high-temperature peaks in the 613–823 K region indicate strong Brønsted and Lewis acid centers. []. The amount of desorbed ammonia in the specified temperature range can serve to measure the number of these and other centers, and the maximum state of the ammonia in the TPD curve and the activation energy of NH_3 desorption ($E_{(a.des)}$) are given in Table 1.1.

It follows from the data presented that with an increase in the silicate modulus of zeolite from 30 to 100, a decrease in the total concentration of acid fields is

observed from 1.08 to 0.38 mmol / g. As the ratio of $[\text{SiO}]_2 / [\text{Al}]_2 \text{O}_3$ increases from 30 to 50, the strength of the acid centers increases.

Table 1.1. Thermal desorption of ammonia in high silica zeolite catalysts (sample heating rate 10 degrees / min)

Катализатор	Максимальный температурный диапазон К		десорбированный аммиак микролитры, ммоль / г			NH ₃ десорбция энергия, кДж / моль	
ZSM – 5 SiO ₂ /Al ₂ O ₃	1	2	1	2	1+2	1	2
1. M=30	448	688	0,67	0,41	1,08	28	108
2. M=50	493	708	0,41	0,33	0,74	80	150
3. M=70	473	703	0,38	0,23	0,61	25	115
4. M=100	473	698	0,20	0,18	0,38	30	123
5. ZSM – 11	453	683	0,17	0,15	0,32	24	122

The catalytic properties of TsSK were studied in a unit of catalytic bed flow with atmospheric pressure, temperature 673–873 K, and volumetric velocity of the raw material 150 s⁻¹. A 70-module ZSM-5 type zeolite sample was used for the study. The structure of the original zeolite was modified by the method of mechanical-chemical activation in a spherical vibrating mill for 24 h and by the introduction of amorphous matrices into the mechanized zeolite to obtain three CSKs:

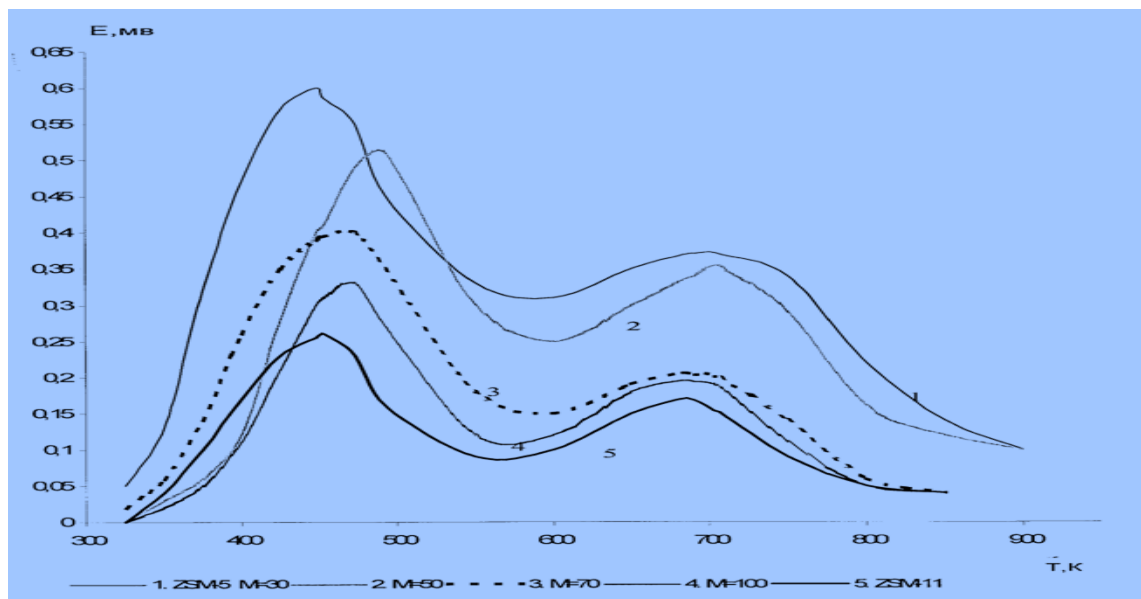


Figure 3.3

Thermal desorption spectra of ammonia adsorbed at 373K in zeolites with different $[\text{SiO}]_2 / [\text{Al}]_2 \text{O}_3$ ratios.

Theoretical calculations of cluster quantum chemical models, as well as data obtained using IR spectroscopy and NMR [40, 45], showed that three major types of hydroxyl groups represent the presence of zeolites in large pores (one, two, or three aluminum atoms). As the ratio of $[\text{SiO}]_2 / [\text{Al}]_2 \text{O}_3$ increases, the acidity of the bridged hydroxyl groups increases, because as the number of negatively charged alumino-oxygen tetrahedrons in the zeolite lattice decreases, the negative charges of the ON groups decrease, their polarity increases, and their polarity increases. This is confirmed by the results of the strength of the acid fields with an increase in the modulus of the silicate from 30 to 50.

Thermal desorption measurements of acid characteristics of zeolite catalysts 1.2. are given in the table.

катализатор	температура максимумов пиков, К		количество десорбированного аммиака, ммоль/г			энергия активации десорбции аммиака, кДж/моль	
	1	2	1	2	1+2	1	2
1. ВКЦ-1	473	703	0,38	0,23	0,61	25	115
2. ВКЦ-2	473	708	0,35	0,22	0,57	25	131
3. ЦСК-1	458	688	0,29	0,17	0,46	30	105
4. ЦСК-2	483	703	0,27	0,20	0,47	41	115
5. ЦСК-3	473	703	0,30	0,20	0,5	28	115
6. Al ₂ O ₃	453	-	0,31	-	0,31	-	-
7. псевдобемит	453	-	0,28	-	0,28	-	-

The original zeolite YuKTs -1 have two different weak and strong acidic centers with activation energy of ammonia desorption - 25 and 115 kJ / mol and acid concentrations - 0.38 and 0.23 mmol / g. As a result of mechanical-chemical purification of zeolite, the total concentration of acidic centers decreases, mainly due to a decrease in the concentration of weak acid centers, while the concentration of strong acidic centers remains practically unchanged.

Table 3.14 Structural properties of catalysts in zeolite

катализатор	ВКЦ-1	ВКЦ-2	ЦСК-1	ЦСК-2	ЦСК-3	Al ₂ O ₃	псевдобемит
адсорбционные измерения							
1. Предельная адсорбционная емкость, W_s , см ³ /г	0,08	0,19	0,31	0,27	0,39	0,38	0,40
2. Объем микропор, V_m , см ³ /г	0,04	0,05	0,07	0,08	0,08	-	-
3. Объем переходных пор, $V_{п.п.}$, см ³ /г	0,04	0,14	0,24	0,19	0,31	-	-
4. Коэффициенты В, вычисленные из уравнения Дубинина-Радушкевича							
$B_1 \cdot 10^8$	0,29	0,69	1,16	1,86	1,32	-	-
$B_2 \cdot 10^8$	2,45	2,18	-	-	-	-	-
5. Диаметр мезопор, Å							
1	17	12	-	-	13	13	-
2	32	28	23	23	38	35	25
3	63	-	-	-	50-70	75	-

Figure 3.28 shows the isotherms of propane adsorption in primary pentacyl, mechanized zeolite, CSK, and matrices, of which the maximum value of propane adsorption is observed in the sample YuKTs-1 and is 1.48 mmol / g (at $R = 60$ mm Hg). Implementation of mechanochemical activation leads to a slight decrease in the propane adsorption capacity of zeolite.

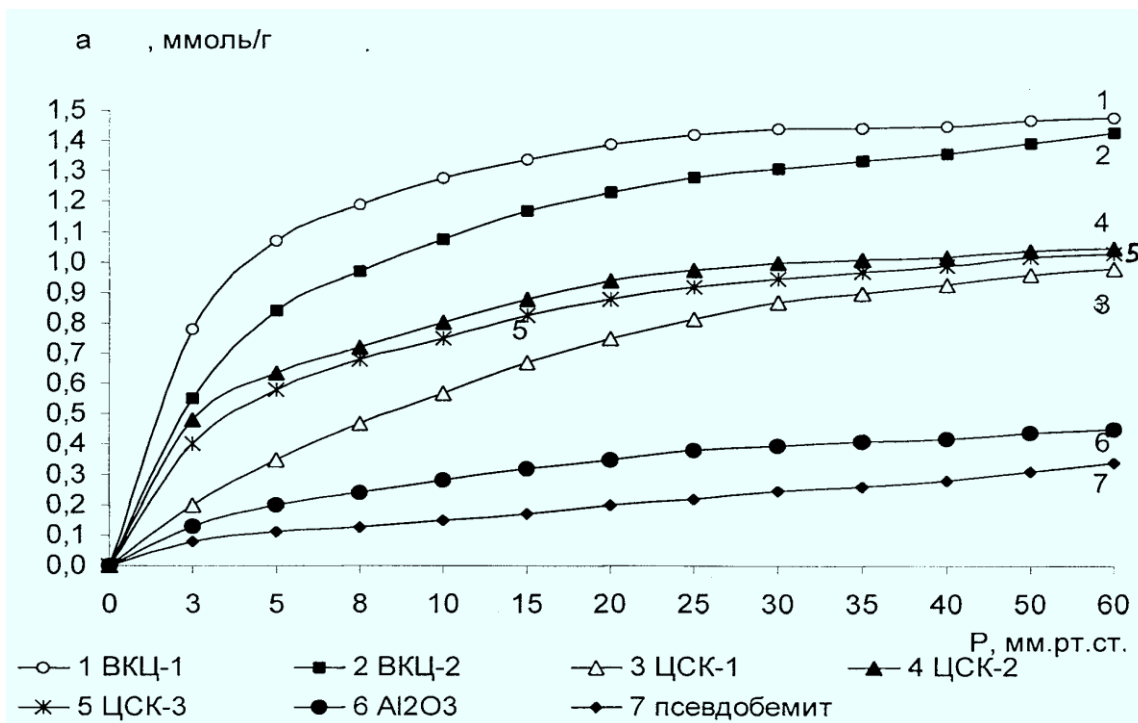


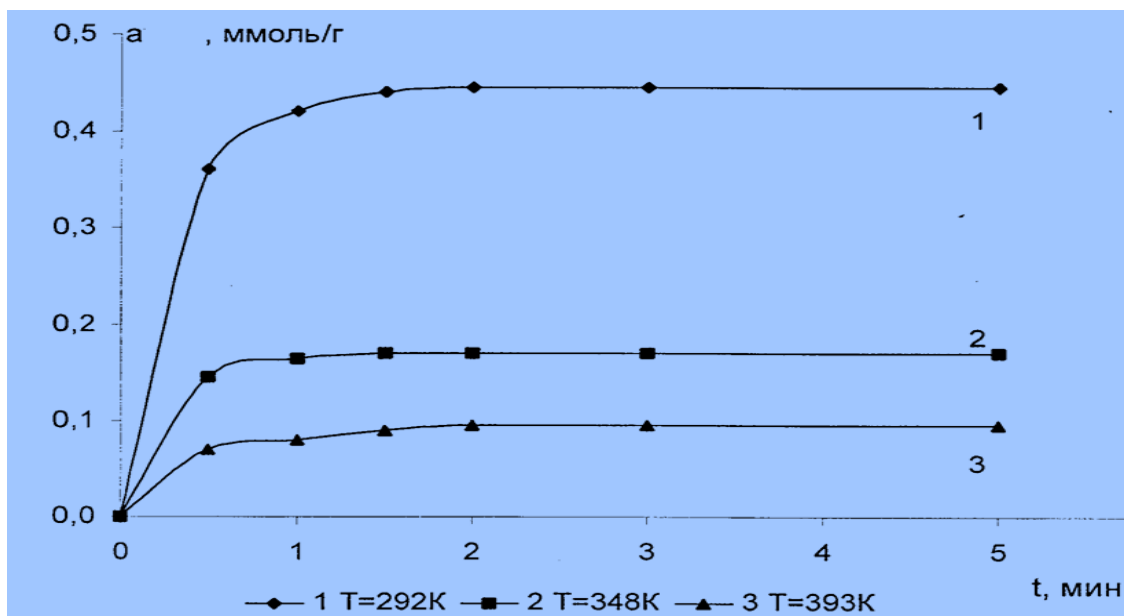
Figure 3.28 Isotherms of propane adsorption in zeolites, CSK and matrices ($T = 292$ K)

When zeolites are introduced into the matrices, the amount of adsorbed propane is significantly reduced, and the isotherms for mechanically active zeolite (TsSK-2, TsSK-3) zeolite catalysts are higher than the TsSK-1 isotherm. Propane is also absorbed into small amounts of carriers. For the UD Al₂O₃ matrix, the adsorption capacity of propane is high. Figure 3.29 shows the kinetic isotherms of propane adsorption on the TsSK-2 catalyst at $T = 292, 348$ and 393 K.

As can be seen from the figure, an increase in the experimental temperature leads to a decrease in the time required to establish the adsorption equilibrium and a decrease in the amount of adsorbed substance. The same property is retained for all the catalysts studied. The calculation of propane adsorption values on pure zeolite in CSK is based on the rules given in paragraph 3.2. The results of the calculations are shown in Figure 3.30, which means that the value of propane adsorption in zeolite containing CSK is higher than the original YuKTs-1 and YuKTs-2.

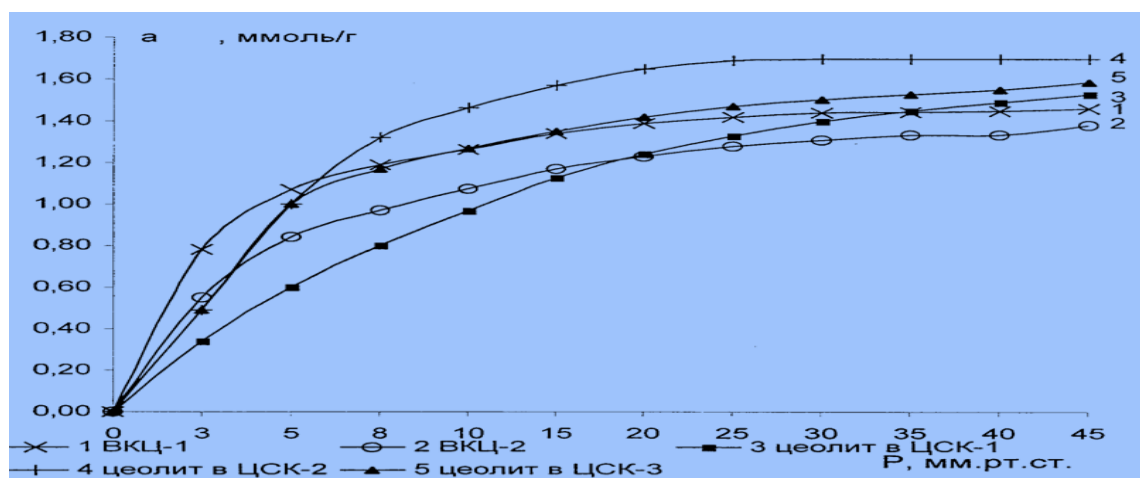
The highest adsorption capacity has a zeolite of 1.7 mmol / g with a propane adsorption value of $R = 50$ mm Hg in TsSK-2. The isotherm of adsorption on zeolite in TsSK-3 is slightly lower and also lower in TsSK-1. Thus, the mechanochemically activated zeolite that is part of the CSK has more adsorption capacity for propane than the zeolite introduced into the CSK without prior activation. The kinetic curves of propane adsorption on zeolites containing CSK drawn at $R = 2$ mm Hg and $T = 292$ K are shown in Figure 3.31. shown.

As can be seen from the figure, as at high pressure, the amount of adsorbed propane is higher in the initial pentacyl of YuKTs-1 than in YuKTs-2. The adsorption rate is also high in YuKT-1 and the time to establish the adsorption equilibrium in both zeolites is the same and is 6 minutes. The kinetic curves of activated zeolite in TsSK-2 and TsSK-3 are higher than in YuKTs-2, and the value of propane adsorption in TsSK-3 is 1.4 times higher than in YuKTs-2. and the value of propane adsorption in zeolite at TsSK-2 is almost twice that for YuKTs-2. Among all the samples studied, the highest rate of propane adsorption was observed in zeolite containing TsSK-2. The rate and amount of propane adsorbed on pentacyl containing TsSK-1 ($R = 2$ mm Hg) is the smallest of all the samples studied.



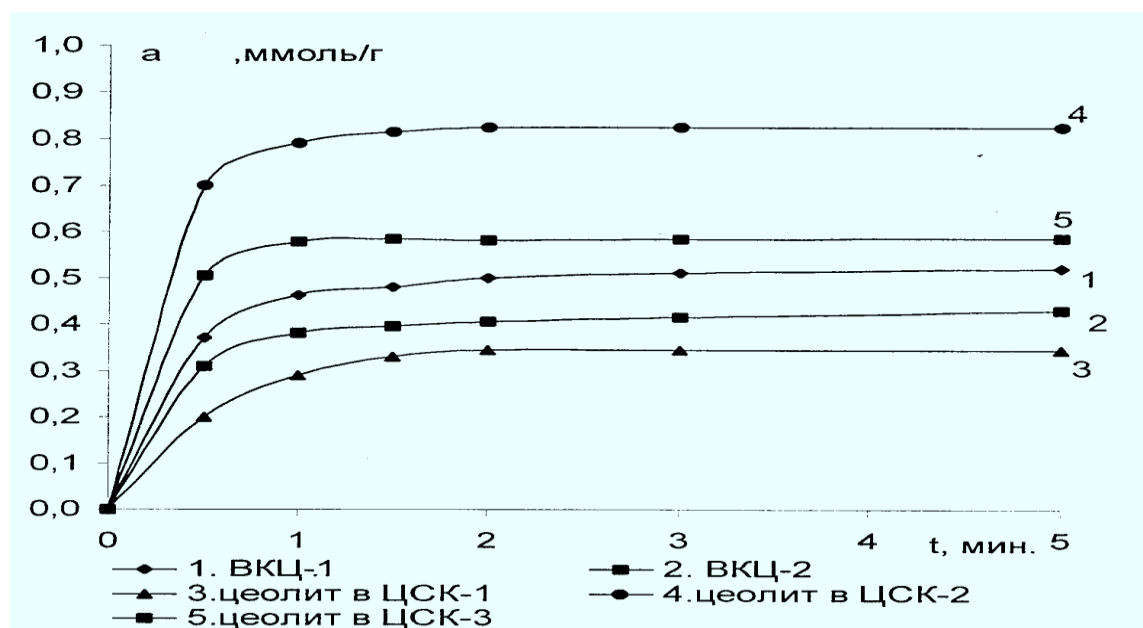
3.29 -image

Kinetic curves of propane adsorption in TsSK-2



3.30 -Picture

Isotherms of propane adsorption on zeolite in CSK ($T = 292$ K)



3.31 -Picture

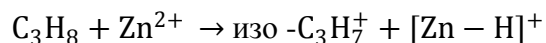
Kinetic curves of propane adsorption in primary YuKTs and pure zeolite in TSK ($T = 292$ K).

A comparison of the adsorption properties of zeolite catalysts with the structural properties showed that for CSK there is a clear relationship between the B coefficients of the Dubinin-Radushkevich equation and the amount of adsorbed propane: the higher the B coefficient, the more adsorbed the propane is. Pure zeolite in TsSK and TsSK ($TsSK -2 > TsSK -3 > TsSK -1$).

In practice, a similar sequence is obtained by comparing the adsorption properties of TsSK with the number of strongly acidic sites and their selectivity for arenas: $TsSK -2 > TsSK -3 > TsSK -1$.

Thus, the introduction of mechanically-chemically activated zeolite into the CSK leads to a change in its structural, adsorption and acidic properties, which in turn affects the CSK activity in the aromatization reaction.

Indeed, the results of calculating the rate of accumulation of aromatic hydrocarbons in continuous conversion showed that the aromatization of isobutane in Zn and Ga -pentacil is 9 and 12.5 times faster than in the normal forms, respectively [142]. Separation of a hydride ion from an alkane molecule in the presence of Zn^{2+} cations can occur according to the following scheme [120, 143]:

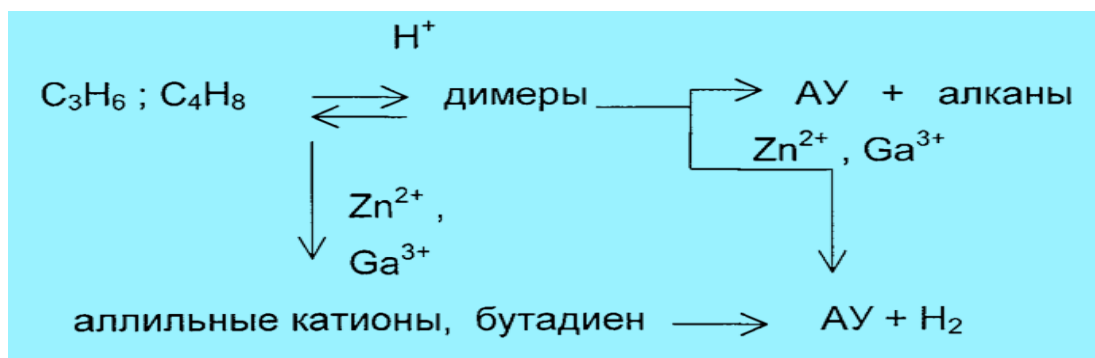


In this case, the cation Zn^{2+} acts as an acceptor of hydride ions. In addition to the first stage, dehydrogenation of saturated carbons, Zn and Ga, which are part of pentacil, is involved in the separation phase of the hydride ion from olefin molecules with the formation of allyl intermediates:



Based on the experimental data, a scheme for the conversion of lower olefins in pentacil modified with Zn and Ga was proposed.

[144]:

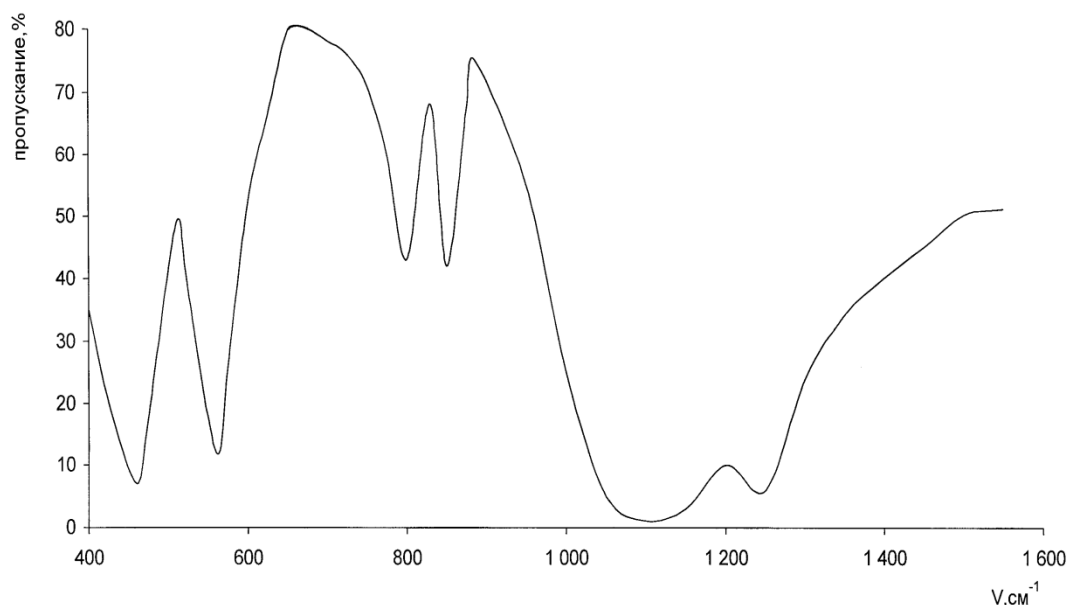


It follows from the scheme that aromatic hydrocarbons are formed as a result of the sequential separation of hydride ions from high-molecular-weight olefin molecules, as well as the interaction of two allyl structures with the simultaneous destruction of a hydrogen molecule.

IC spectroscopy and X-ray analysis were performed using physicochemical methods to study YuKTs: IR spectra of the studied zeolites (Figure 2.1) were recorded on a UR-20 spectrophotometer in the mid-wavelength part of the spectrum at 400-2000 cm^{-1} , where the absorption ranges were AIO_4 of the base. $[SiO]_4$ are the principal oscillations of the tetrahedron.

To do this, 1-2 mg of the sample and 400 mg KBr of potassium bromide are poured into a special ring placed in a mold, then the sample ring is inserted into the holder and placed on a spectrophotometer. Absorption lines in the observed spectrum can be divided into 2 types of oscillations [23, 171]:

1. $[SiO]_4$ oscillations within a tetrahedron, they are primary structural units. These oscillations do not reflect the specific properties of the zeolite structure.
2. Vibrations in the external connections of tetrahedrons. The second type depends on the zeolite structure, the ability to join in secondary structural units, as well as in structures that form entrance pores in the zeolite cavity. The first type of oscillations corresponds to oscillations at 1120 cm^{-1} , 820 cm^{-1} and 470 cm^{-1} found in the whole zeolite spectrum. The strong absorption range at the peak of 1120 cm^{-1} is related to the antisymmetric oscillations of the $[SiO]_4$ tetrahedron, while the 820 cm^{-1} length 3104 cm^{-1} tetrahedra represents the oscillations mainly involved [1]. The location of this group is affected by the Si / Al ratio in the zeolite content.

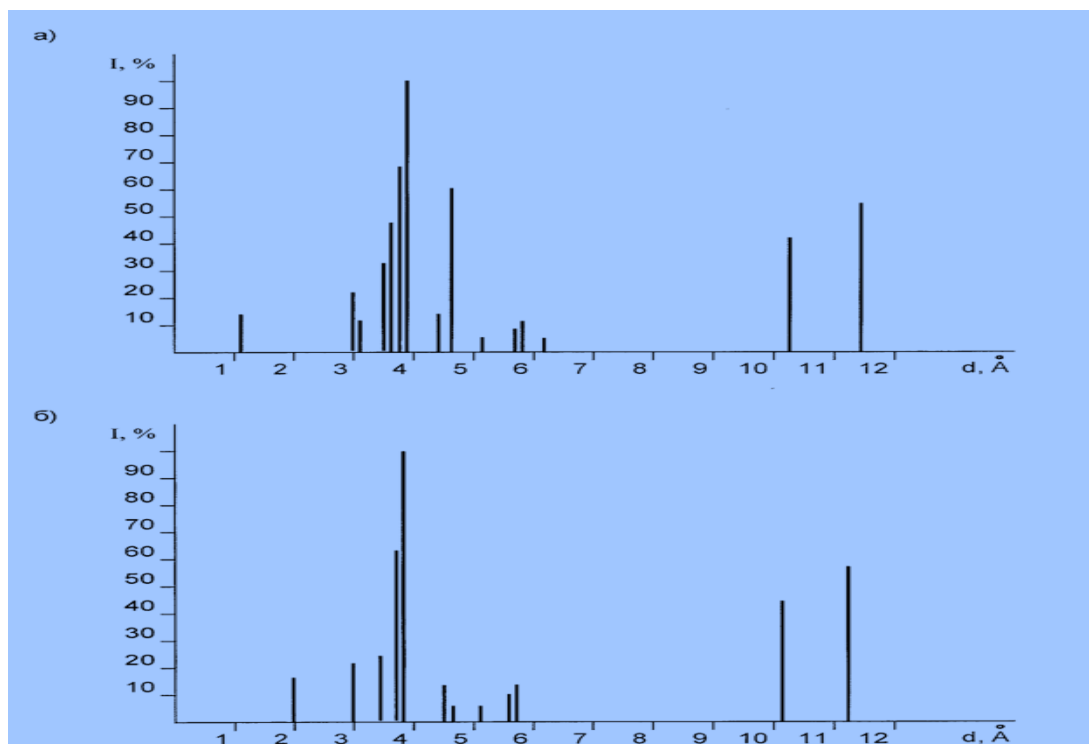


2.1 -Picture .

IR spectrum of zeolite synthesized ZSM -5 ($\text{SiO}_2 / \text{Al}_2\text{O}_3 = 70$).

As the composition of the al tetrahedron coordinated atoms increases, the assimilation ranges shift to the low frequency region [23s. 482]. Intensive absorption lines correspond to bending oscillations in a tetrahedron of 460 cm^{-1} $[\text{SiO}]_4$. The second type of vibration, which is sensitive to the nature of the dependence on the type of environment of the secondary connecting units in the tetrahedron, topology, and zeolite, corresponds to absorption 560 cm^{-1} lines. - The presence of strong absorption lines $1300\text{-}900$, 820 , $400\text{-}600 \text{ cm}^{-1}$ in the region of all spectra testifies to the fact that all samples belong to zeolites.

- that all tested specimens belong to the ZSM constructive type, since all IR spectra obtained include the absorption peaks line 560 cm^{-1} . the ratio of the optical absorption ranges to 560 and 460 cm^{-1} (I_{560} / I_{460}) [173], the crystallization rate of all studied samples was calculated: $\text{SiO}_2 / \text{Al}_2\text{O}_3$ for ZSM-5 zeolites with a ratio of 30, 50, 70, 100; crystallinity level 89, 2, respectively; 93.3; 91.5; 88.2% are equal. For the ZSM-11 catalyst ($\text{SiO}_2 / \text{Al}_2\text{O}_3 = 100$), the crystallization rate is 88.1%. There are no significant differences in IR spectra for ZSM-5 and ZSM-11 zeolites; therefore X-ray analyzes were performed to improve the structure of the zeolites in detail. X-ray analyzes (Mo-anode, Ni-filter) were performed using Dron-3. Processing of the diffraction lines of zeolites was carried out by comparing the distance between the planes (their position and relative intensity) with a sample of the corresponding lines and determining the distances and intensities of the lines (peaks) of the studied zeolite sample. Figure 2.2 shows the signs of linear X-ray diffraction of zeolites ZSM-5 and ZSM -11. Compared with the data in Table [23], the relationship between the relative intensity of the line and the distance between the planes (d , Å) made it possible to determine the structural types ZSM -5 and ZSM -11.



2.2-image.

Signs of X-ray diffraction of synthesized zeolites noted

(a- ZSM -5; b- ZSM -11).

The marked diffraction characteristics of these samples are that for ZSM-5 there are three intensive lines in the region of small plane distances (d , Å: 3.84; 3.74; 3.62). There are only two intensity lines for the zeolite ZSM-11 (d , Å: 3.86; 3.73). The crystals of ZSM-11 zeolite differ from the crystals of other pentacycls by more perfect symmetry, with fewer lines in their diffractogram. VTK fractions, $C_{(9+)}$ hydrocarbons, naphthalene and methylnaphthalene. C_2 - C_4 alkane conversion products were analyzed using gas chromatography on a chromium chromatograph with a thermal conductivity detector. Analysis of gaseous products - in a column filled with Al₂O₃ (3) (0.25-0.5 mm, column length - 4 m, inner diameter - 3 mm), in the temperature programming mode from 298 to 423 K, with heater, speed 12 degrees / min. Carrier (He) gas velocity - 50 cm³ / min. The chromatogram of gaseous products is shown in Figure 2.5.

Liquid hydrocarbons were analyzed on a S2 + base at a temperature of 352 to 473 K in the programming mode at a rate of 12 °C / min and then in an isothermal mode at 473 K on a PFMS-4 stationary phase packed column. The chromatogram of gaseous products is shown in Figure 2.5.

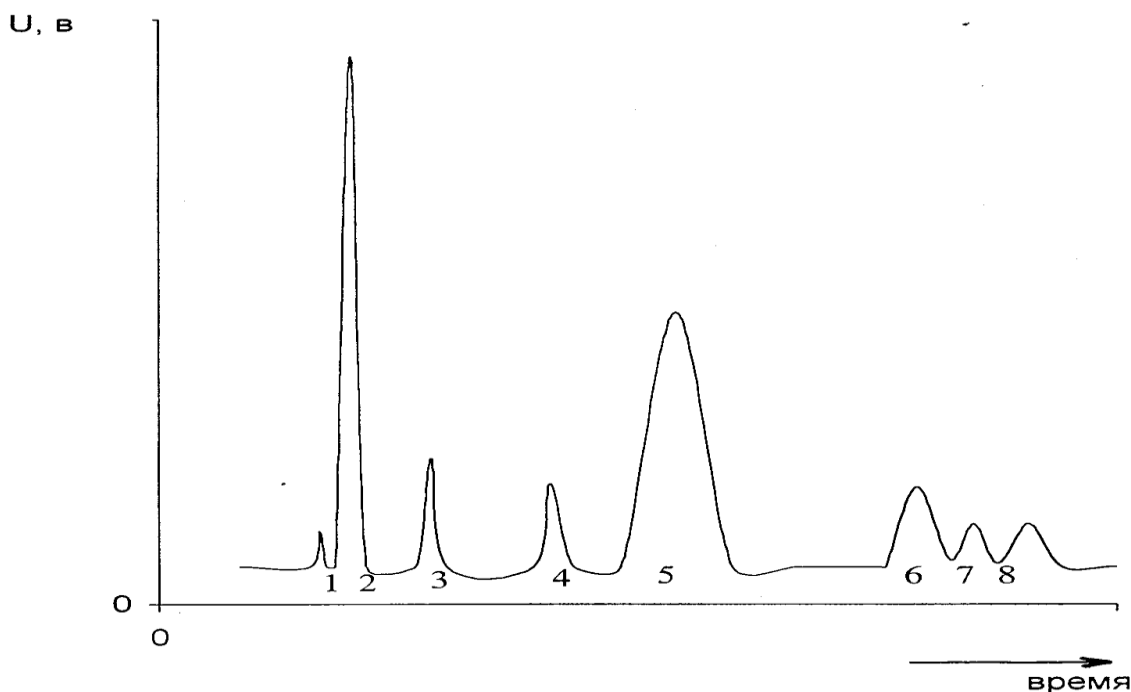


Figure 2.5 Chromatogram of gaseous products of alkane conversion S2 -S4

1. hydrogen 2. methane 3. ethane 4. ethylene 5. propane
6. propylene 7. Butane 8. Butylene

Carrier gas (He) velocity - 45 cm / min. The chromatogram of the liquid products is shown in Figure 2.6. Quantitative analysis of reaction products was performed using the internal optimization method [175]. The calculation consisted of converting half-width products to 100% of the height of all peaks of the chromatogram.

$$C_i = \frac{(k_i h_i I_i)}{(\sum k_i h_i I_i)} \times 100\% \quad C_j = \frac{(k_j h_j I_j)}{(\sum k_j h_j I_j)} \times 100\%$$

C_i is the concentration of i-components in the gas phase, % by weight;

S_j - j is the concentration of components in the liquid phase, % by weight;

i, j are half-width peaks

h_i, h_j - peak heights

where k is the coefficient determined by the sensitivity of the detector to a particular component.

In the calculation, we used the detector sensitivity correction factors given in [176]. The experimental data are as follows.

- 1) Calculate the mass of gas formed as a result of the reaction:

$$m = \frac{V \times M_r}{22,4}$$

V-Volume of gas

M_r - Molar mass of gas

22.4-Volume of gas under normal conditions

The mass of liquid hydrocarbons was determined by weighing the products formed at the end of each experiment. m_j can also be calculated using the following formula:

$$m_{ж} = V_{ж} \times \rho$$

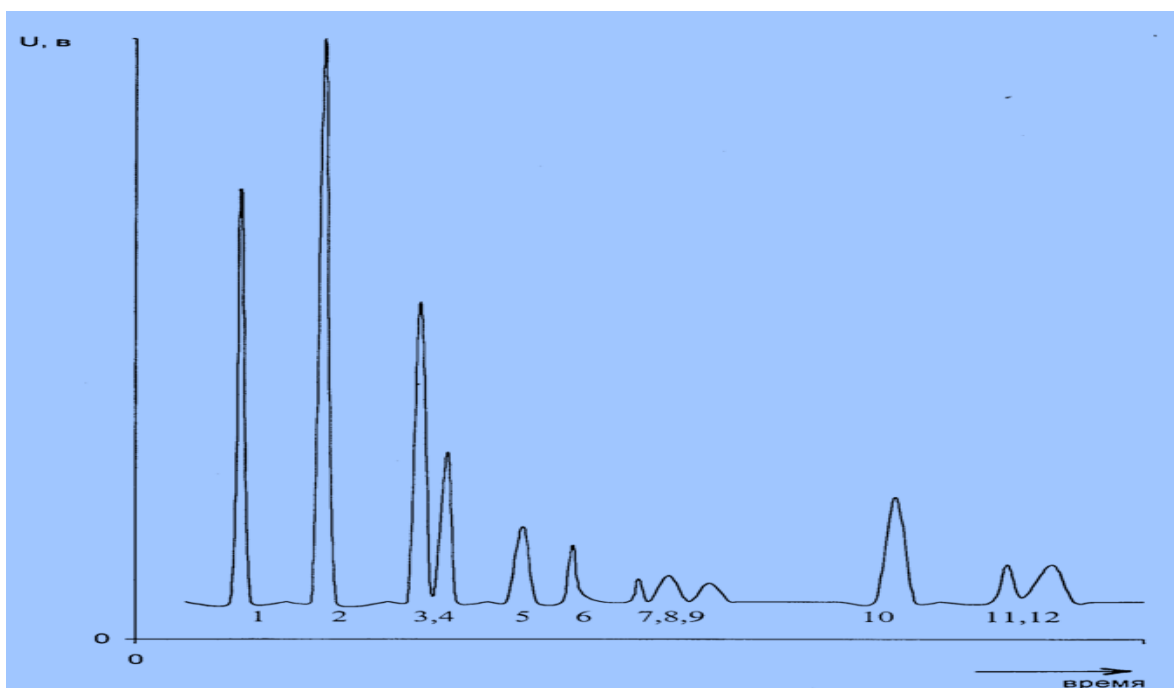
V_j = volume of liquid hydrocarbons cm^3

ρ = average density, g / cm^3

$\rho = \sum \rho_j \times p_j$

p_j = part of a large component

ρ_j = component density g / cm^3



1. benzene 2. toluene 3. m, p -xylene 4. o-xylene
5. methylethylene 6. pseudocumole 7. m-diethylbenzene
8. p-diethylbenzene 9. 1,2-dimethyl-3-ethylbenzene
10. naphthalene 11. α -methyl naphthalene 12. β -methyl-naphthalene

Figure 2.6 - S2 -S4 alkane conversion and chromatogram of liquid products

Mass fraction of gaseous products:

$$dr = m_2 / (m_r + m_{ж})$$

Mass fraction of liquid hydrocarbons: $d_j = 1 - dr$

Component concentration in the amount of hydrocarbons: $C_{-}(i) = d_r C_{-}(I)$

j-component concentration of hydrocarbons: $S_j = d_j C_{-}^i$

The conversion rate (X) is calculated according to the following formula:

$$X = \frac{(M - m_{\max c})}{M} \times 100\%$$

M is the total concentration of reaction products;

product - the total concentration of propane and butane in the reaction products;

mchish - the total concentration of ethane, propane and butane in the raw material. component selection is calculated according to the formula i, j [177-179]:

$$S_{i,j} = m_{i,j} / M_{\text{олинди}}$$

$m_{-}(i, j)$ - concentration of component i, j in reaction products,

M_{olindi} is the concentration of the converted raw material

Output i, j component (A): $A = S_{-}i \times X$

Table 3.1-8 | $[\text{SiO}]_{-2} / [\text{Al}]_{-2}$ Transformation of alkane mixture in high silica zeolite decanted by ZSM -5 with $O_{-3} = 70$.

Харорат К	73	23	73	23	73	73	73	73	73
Ҳажмий тезлик $V_{\text{ч}^{-1}}$	00	00	00	00	00	0	5	00	50
Конверсия, %	7	4	7	5	7	6	1	7	4
Селективлик масса %									
Водород						2			
Метан	5	4	1	6	9	8	5	1	9
Этан	3	6	2	0	7	5	5	2	7
Этилен			0					0	
Пропилен					,5				
Бутен									
Бензол				,5	0	,5	3		
Толуол									

	0		1	0		0	5	1	0
Ксилол		,5					0		
Алкилбензол									
Нафталин углеводородлар									
C ₁ -C ₂ алканлар	9	1	3	6	6	3	0	3	7
C ₂ -C ₄ алкенлар	9	5	5	3	3			5	9
C ₆ -C ₁₂ аренлар	5	1	0	9	8	1	8	0	4
C ₆ -C ₁₂ чиқадиган аренлар	2	8	6	7	7	0	4	6	8
C ₂ -C ₄ чиқадиган алкенлар		2	3	2	3			3	4

CONCLUSION

1. The conversion reaction of a mixture of alkanes containing C₂H₆ = 2.2; C₃H₈ = 73.7; N-S₄N₁₀ = 24.1%. In high-silicate zeolite catalysts with the structure ZSM-5 ([SiO]₂ / [Al]₂ O₃ = 30, 50, 70 and 100) and ZSM-11 ([SiO]₂ / [Al]₂ O₃ = 100), the catalytic contacts the relationship between their structural and acidic characteristics and their activity in the formation of conversion products was studied.

2. In this process, the effect of technological parameters (reaction temperature and volumetric rate) on the activity and selectivity of zeolite catalysts was studied.

3. All used YuK zeolite catalysts are in N-form state. The results of the conversion of a mixture of low molecular weight alkanes with [SiO]₂ / [Al]₂ O₃ = 70 in ZSM-5 zeolite are given in Table 3.1.

4. With a significant yield of liquid products, the change of raw material begins at a temperature of 673 K. At this temperature, the conversion rate of low molecular weight alkanes [S]₂-S₄ is 47%. The reaction produces gaseous products: methane, ethane, ethylene, propylene, butene and liquid catalysis: benzene, toluene, xylenes (BTC fraction), alkylbenzenes, naphthalene and alkyl naphthalenes. The selectivity for the formation of aromatic hydrocarbons (S_{AY}) at a temperature of 673 K and $v = 100 \text{ s}^{-1}$ is 25.4%, alkenes [S]₂-S₄ 19.1% by weight. An increase in the reaction temperature from 673 K to 873 K leads to an increase in the conversion rate, while at 873 K the conversion reaches 97%. An increase in the selectivity of the formation of benzene and naphthalene hydrocarbons is also observed.

5. As a result of the work carried out, it was found that the role of the meso-porous structure of the matrix in the CSK is not limited to the function of "transport".

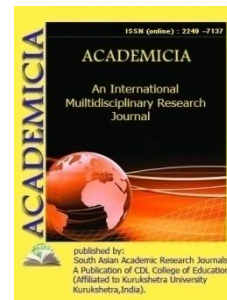
6. The introduction of the matrix leads to an increase in the size and volume of the zeolite pores, thereby increasing the reactive penetration of the acidic centers located inside the zeolite pores.

7. The close connection of the "zeolite-matrix" in the macropores of TSSK creates conditions for full use of the specific properties of zeolite in catalytic conversion.

REFERENCES

1. Recent progress in methane dehydroaromatization: from laboratory curiosities to promising technology / S. Ma, X. Guo, L. Zhao, S. Scott, X. Bao // *J. Energy Chem.* – 2013. – V. 22. – № 1. – P. 1–20.
2. Spivey J.J., Hutchings G. Catalytic aromatization of methane // *Chem. Soc. Rev.* – 2014. – V. 43. – P. 792–803.
3. Direct conversion of natural gas to higher hydrocarbons: a review// S. Majhi, P. Mohanty, H. Wang, K.K. Pant // *J. Energy Chem.*– 2013. – V. 22. – P. 543–554.
4. Металлцеолитные катализаторы дегидроароматизации метана // Н.А. Мамонов, Е.В. Фадеева, Д.А. Григорьев, М.Н. Михайлов, Л.М. Кустов, С.А. Алхимов // *Успехи химии.* – 2013. – Т. 82. – № 6. – С. 567–585.
5. Файзуллаев Н. И., Туробжонов С. М. Метан ванефтинингйўлдошгазлариникаталитикароматлаш // *Кимёвакимётехнологияси.* 2015. – No. 2. – Б. 3–11.
6. Catalytic chemistry for Methane Dehydroaromatization (MDA) on a bifunctional Mo/HZSM5 catalyst in a packed bed / C. Karakaya, S.H. Morejudo, H. Zhu, R.J. Kee // *Ind. Eng. Chem. Res.* –2016. – V. 55. – P. 9895–9906.
7. Methane dehydroaromatization by Mo/HZSM5: Mono or bifunctional catalysis? / N. Kosinov, F.J.A.G. Coumans, E.A. Uslamin, A.S.G. Wijkema, B. Mezari, E.J.M. Hensen // *ACS Catal.* – 2017. – V. 7. – № 1. – P. 520–529.
8. Дергачев А.А., Лapidус А.Л. Каталитическая ароматизация низших алканов // *Рос.хим. журн. (Журн. Рос. хим. об-ва им. Д.И. Менделеева).* 2008. Т. LII. № 4. С. 15–21.
9. Ахметов А.Ф., Каратун О.Н. Модифицированные пентасилсодержащие катализаторы для ароматизации углеводородных газов // *Химия и технология топлив и масел.* 2001. № 5. С. 33–36.
10. Victor de O. Rodrigues, Arnaldo C. Faro Junior. On catalyst activation and
11. reaction mechanisms in propane aromatization on Ga/HZSM5 catalysts // *Applied Catalysis A: General* 435–436. 2012. Pp. 68–77.
12. Дергачев А.А., Лapidус А.Л. Превращения низкомолекулярных алифатических углеводородов на цеолитных катализаторах // *Газохимия.* 2008. № 4. С. 16–20.
13. Восмеригова Л.Н., Волынкина А.Н., Восмеригов А.В., Зайковский В.И. Ароматизация этана и пропана на металлсодержащих цеолитах структурного типа ZSM-5 // *НефтеГазоХимия.* 2015. № 1. С. 37–41.

14. Козлов А.М., Худяков Д.С., Липидус А.Л., Дергачев А.А. Ароматизация пропан-бутановой фракции на пентасиле, модифицированном солями цинка // Технологии нефти и газа. 2011. № 1. С. 7–10.
15. M. Tian, T.Q. Zhao, P.L. Chin, B.S. Liu, A.S.-C. Cheung, Methane and propane co-conversion study over zinc, molybdenum and gallium modified HZSM-5 catalysts using time-of-flight mass-spectrometry // Chemical Physics Letters 592. 2014. Pp. 36–40.
16. Fayzullayev N.I., S.M.Turobjonov. Catalytic Aromatization of Methane // International Journal of Chemical and Physical Science. -2015. -Vol. 4, No-4. P 27-34
17. Fayzullayev N.I., B.Sh. Shukurov., A. Normuminov. Kinetics and Mechanism of the Reaction of Catalytic Dehydroaromatization of Methane // Petroleum Science and Engineering. India. -2017; N6: 36-42pp.
18. Файзуллаев Н. И., Туробжонов С. М. Метан ванефтингйўлдошгазлари-ни каталитикароматлаш // Кимёвакимётехнологияси. 2015. – No. 2. – Б. 3–11.
19. Fayzullaev N. I., Shukurov B. Sh. Catalytic aromatization of methane with non-mo-contained catalysts // Austrian journal of technical and natural sciences. № 7–8. - 2018. – PP-73-80.
20. N. I. Fayzullaev., B. Sh. Shukurov., A. O'. Normuminov. Kinetics and mechanism of the reaction of catalytic dehydroaromatization of methane // International Journal of Oil, Gas and Coal Engineering. 2017; 5(6): 124-129. <http://www.sciencepublishinggroup.com/j/ogce>. doi: 10.11648/j.ogce.20170506.11



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RESULTS OF AN EXPERIMENTAL SAMPLE TEST OF AN ADVANCED PERFORATED DEEP SOFTENER

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ABSTRACT

An insight provided at the article reviews of some profound investigation on the scientific basis about how to create a hole drainage at a certain depth (60-80 cm) before plowing in saline soils, followed by moderate saline washing, easy removal of harmful salts from the soil by saving water. In addition, some striking data was revealed about how to utilize less water in the autumn saline wash, improved techniques for the removal of toxic salts from the soil to the maximum extent and the technology of its application.

KEYWORDS: *Drainage, Perforated Drainage, Conical Tip Cylinder With Complex Surface, Perforator, Sinker, Contour, Coverage Width.*

INTRODUCTION

Nowadays there are 4.2 million hectares of irrigated land in the country, of which 45% are saline areas of varying degrees. Annually, saline washing is carried out on more than 680,000 hectares in the country. In Bukhara region, 85.8% of the 274,612 hectares of irrigated land are saline to varying degrees, so 180,000 hectares are saline washed annually [1].

The formation of saline soils and their negative consequences are enormous. It is well known that reclamation measures and the implementation of these measures through mechanization are one of the most pressing issues of today.

In the Bukhara region, the total salinity of soils was 86%, but instead of decreasing from year to year, in some areas there is an increase.



Figure 1. Advanced perforator.

During the operation of the device, its columns have the same working depth of 70-80 cm into the soil, and the working body attached to the columns forms a perforated drain with a diameter of 70-72 mm

If the agro-technical requirement for a hole drain is long-term operation without draining the drain, the requirement for the device is to create a quality hole drain as well as minimize the resistance forces acting on the traction tractor. By using this device before the autumn saline wash, it is possible to easily leak harmful salts from the soil through the perforated drains and discharge them into the drainage pipes, open collector ditches. However, it should be borne in mind that temporary ditches must be built around the mechanically heavy soils, through which the discharge into the collector ditches gives good results. In the spring activities, of course, temporary ditches prepared for saline washing are prepared by adding contours to the soil for planting, thus bringing the land use coefficient to the previous level. The technical characteristics of the perforated drainage device created with this in mind are given in Table 4.2 below.

The main working body of the advanced hole forming device is formed at an angle of 30° - 32° with a borer geometric shape, rotating movement is provided by a hinge mounted on a steel rope and a conical end, creating a quality hole drainage that meets agro-technical requirements

for hole drainage which in turn ensures that the perforated drainage walls are strong and operate without cracking.

TABLE 4.2 TECHNICAL DESCRIPTION OF THE ADVANCED PERFORATOR

N	Name and unit of measurement	Value of indicators
1.	Type	Dangling
2.	Aggregate tractor class	3-4
3.	Coverage width, m	4,0
4.	Operating speed, km / h	4-5
5.	Basic time productivity, ha / h	2,4-3,2
6.	Mass, kg	1025 \pm 50
7.	Processing depth, cm	70-80
8.	External dimensions, mm:	
	width	4000
	length	1000
	height	1450

To carry out this process, the centrifugal force generated by the rotational motion of the perforator working bodies of complex geometric shape simultaneously compresses and strengthens the walls of the perforated drain and reduces the resistance of the soil to the work-piece.



Figure 2 Holes.

The use of the improved perforated drainage device in the conditions of Bukhara region prevents salinization of arable lands, reduces the salinity of saline soils at different levels and increases productivity. The main task of the research is to increase crop yields by achieving water savings and improving land reclamation by using the proposed device to prevent salinization and re-salinization for the regional agro-clusters, farms in sufficient quantities and using it before the autumn saline wash.

Tests of the improved prototype of the perforated pit drill TIAME Bukhara branch of the training and experimental farm of the existing experimental farm with a hole drain opener TTChYu 3-70 compared to the device.

In the tests, a two-hole drainage device was used in conjunction with a New Holland T7060 tractor, with a speed of 4-5 km / h and a working depth of 70 cm. the area worked within the unit and the coefficients of fuel consumption, shift and operating time utilization were determined. Soil moisture, hardness, and density were studied prior to testing.

The results obtained during the experimental studies are presented in Table 4.3 below.

Moisture and hardness of the field soil tested

TABLE 4.3

N	Name of indicators Value of indicators	Value of indicators
1.	Soil moisture (cm) per layer,%; 0-20 20-40 40-70	14,8 16,1 17,8
2.	Soil stratum (cm) hardness, MPa; 0-20 20-40 40-70	1,21 1,32 1,94

The results of the tests are given in Table 4.4 below. Analysis of the test results showed that the improved borehole TTChYu 3-70 hole-forming device TDOQ 1-70 ensured the formation of quality holes in the soil, clearly, mechanism with it the formation of drainage holes formed on the field surface and at the bottom of the treated layer 70, respectively. The diameter of the hole increased to 70.8-71 cm and 72.8-73 cm. This can be explained mainly by the fact that the device, which creates a hole drainage by an improved perforator TTChYu 3-70, is completely layered in the soil relative to TDOQ 1-70.

Results of the developed advanced borehole tester tests

TABLE 4.4

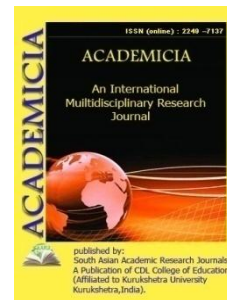
T/p	Name of Indicators	Value of indicators				
		According to the initial requirement	A device that creates a perforated drain TDHQQ 1-70.		Advanced perforator TTChYu 3-70.	
1	2	3	4	5	6	7
1.	Traffic speed, km / h	4-5	4,6	5,5	4,2	5,3
2.	Processing depth, cm: M_{av} $\pm \sigma$	12-20 -	51,8 2,34	51,4 2,42	70,7 2,17	70,1 2,26
4.	the quality of the drainage hole formed at the bottom of the treated layer, cm	<70	60,6	71,2	72,8	74,2
5.	Gravity resistance:	< 40	32,8	34,20	56,24	70,20

	- general, kN - specific, kN / m		8,2	8,55	7,06	7,25
6.	Productivity, ha / h: - main time -in operation	-	2,24 1,43	3,00 1,92	2,32 1,67	3,08 2,22
7.	Fuel consumption, kg / ha	-	34,43	35,98	27,29	29,71

It should also be noted that the improved borehole TTChYu 3-70 device TDHQQ 1-70 compared to the applied one, the productivity during operation was 1.16-1.17 times higher, respectively, and one 27.29-29.71 kg of fuel was used to create a quality drainage hole per hectare of cultivated area.

REFERENCES

1. Мирзиёев Ш.М. “Эркин ва фаровон демократик Ўзбекистон давлатини биргаликда барпо этамиз”. Тошкент, Ўзбекистон, 2016.-56 б.; *Mirziyoev Sh. "Together we will build a free and prosperous democratic state of Uzbekistan." Tashkent, Uzbekistan, 2016.-56 p.*
2. Н.М.Муродов, Ф.Ў.Жўраев фойдали моделга патент №FAP00727 Туйнукли дренаж очувчи қурилма, Ўзбекистон Республикаси фойдали моделга патент давлат ресторида рўйхатга олинган 05.04.2012 йил Тошкент.; *Murodov N., Juraev F. Patent for utility model №FAP00727 Perforated drainage opening device, patent for utility model of the Republic of Uzbekistan registered in the state restaurant 05.04.2012 Tashkent.*
3. Хамидов М.Х., Жўраев Ф.У. “Устройство и принципы работы дренажно-кротового орудия”. //Ирригация ва Меллиорация. –Тошкент, 2017. №1 (7). –Б.9-12.; *Khamidov M., Zhuraev F. "The device and principles of operation of the drainage mole tool." // Irrigation wa Melioration. –Toshkent, 2017. No. 1 (7). –B.9-12.*
4. Жураев Ф.Ў., Ражабов Я.Ж. Фойдали моделга патент № FAP20200172 Туйнукли дренаж очувчи қурилма, Ўзбекистон Республикаси фойдали моделга патент давлат реесторида рўйхатга олинган 05.07.2020 йил Тошкент.; *Juraev F., Rajabov Ya. Utility model patent № FAP20200172 Perforated drainage opening device, registered in the State Register of Utility Model Patents of the Republic of Uzbekistan 05.07.2020 Tashkent.*



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OBTAINATION OF CARBOXYMETHYLCHITOSAN FROM INANIMATE BEES AND STUDY OF ITS PROPERTIES BY CONDUCTOMETRY, UV-SPECTROSCOPY

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ABSTRACT

*This article presents the preparation of carboxymethylchitosan from a new promising source - dry dead bee chitosan. The issue of rational use of natural resources in Uzbekistan is one of the priorities of state policy. Such a statement of the task imposes tasks on many scientists involved in this object. Our country has a large number of reserves of biopolymers, the expansion of their application and in-depth study of the fundamental is of great scientific and practical importance. The physicochemical properties of carboxymethylchitosan obtained from the extinct apiary *Apis Milliferra*, in particular the degree of deacetylation, were studied by conductometric analysis and UV spectroscopy. In the study, for the first time on the basis of chitosan obtained from inanimate bees of local raw materials, its product carboxymethylchitosan was synthesized and its properties were studied.*

KEYWORDS: *Dead Bee, Chitin, Chitosan, Carboxymethylchitosan, Conductometry, Biopolymer, Cellulose, UV Spectroscopy, Monochloroacetic Acid.*

INTRODUCTION

Currently, the practical application of natural biopolymers and their various derivatives is expanding. Cellulose and chitosan-type polysaccharides are being extensively studied in the textile, food, and medical fields. Today, they are the subject of research by many scientists.

It is known that chitosan (ChS) and its derivatives are widely used in the field of medicine, agriculture, etc. Chitosan derivatives, in particular, carboxymethyl chitosan (CMC), which has a high biological activity and pronounced antibacterial and anticoagulant properties, attract particular attention of researchers [1]. CMCS possessing minimal toxicity and stability is widely used in almost all areas, such as medicine, food industry, agriculture, nuclear energy and textile industry [2-4].

The identification of such characteristics determines the comparative study of the structural morphology of the chitosan and CMCS samples. In this regard, water-soluble samples of CMCS were synthesized and studied by conductometric analysis [5].

In terms of prevalence in nature, chitosan is second only to cellulose and is obtained from products that are completely regenerated in nature. Chitosan is widely used in medicine, agriculture, textile industry, fabric dyeing, and floral printing [6]. In the world, much attention is paid to chitosan derivatives obtained by chemical, physical or enzymatic modification of chitosan [7-9].

The main part

In connection with the widespread use of water-soluble derivatives of the chemical modification of chitin (CT), the synthesis of carboxymethylchitin (CMCT) is of great interest, a feature of which is that this polymer can be equally useful and non-toxic both for humans and for the environment. Of particular importance is the development of the most effective methods for modifying CMHT for the development of approaches and methods for the preparation of water-soluble derivatives of CT, which contain both elements of the parent structure and new functional groups [10-11].

Today, the development of experimental methods makes it possible to obtain water-soluble, hydrophilic, biologically active, environmentally friendly, harmless and other drugs with special properties. One of the most important tasks is to obtain samples of carboxymethylchitosan (CMCS) with different levels of deacetylation and water solubility based on chitosan on a global scale, as well as to expand their application and scope [9].

Recently, we obtained chitosan from the dead bees *Apis Mellifera* and determined the chemical composition of the natural dry dead bees [12].

In our study, we measured 0,25 g of chitosan synthesized from the dead *Apis Mellifera* bees collected and dried in spring. Isopropyl alcohol was mixed with water in a 1:1 ratio, measured in a volume of 20 ml, placed on chitosan, and stirred for 0.5 h in a magnetic stirrer at room temperature. Then a beaker was filled with 10 ml of 20% NaOH solution and stirred at 28 ° C for 1 hour. Measured 0,28 g of monochloroacetic acid (MCA), slowly adding to the glass and stirring at 65 ° C for 2.5–3 hours.

The mixture was left for 8-9 hours. Then it was neutralized with 1,5 ml of glacial acetic acid, washed thoroughly with absolute alcohol and filtered on a Buchner funnel. After drying at room temperature, was measured. Took 0,26 g of carboxymethylchitosan with a yield of 79%.

Carboxymethylchitosan, obtained by this method from the chitosan of the dead bees, is an odorless, yellowish powdery substance.

In the second method, 0,25 g of chitosan was measured and mixed in 12,5 ml of isopropyl alcohol (1:50). The resulting suspension was stirred in a mixer for 0.5 hours. Then add 10 ml of 30% NaOH solution to the beaker and stir for 1 h.

We added 0,28 g of MCHAA to the suspension little by little and stirred at 65°C for 3-4 hours. The reaction mixture was left for 9–10 h.

Ice was neutralized in acetic acid until pH = 7 (2ml). Absolutely washed in alcohol, filtered in a Büchner funnel and dried at room temperature, yield 65%.

0,05 g of CMCS -1 was dissolved in 25 ml of 0,02 N NaOH. It was then titrated with 0,1 N NaOH to determine electrical conductivity values every 30 s. From the graph, it is possible to determine the degree of its exchange from the volume of alkali used for the titration of the carboxyl group in the CMCS molecule.

Conclusions and feedback.

The degree of deacetylation of carboxymethylchitosan has been determined by conductometric titration. Take an analytical weighed sample of carboxymethylchitosan 0,05 g. A standard solution of 0,1 M HCl has been prepared from a fixed channel. The normality of the alkali solution has been determined using a standard solution of hydrochloric acid. The sample has been transferred to a beaker and dissolved in 0,1 N 25 ml HCl. To plot the titration curve, 100 µl of pre-titrated alkali (0,1 N NaOH) has been added every 30 seconds.

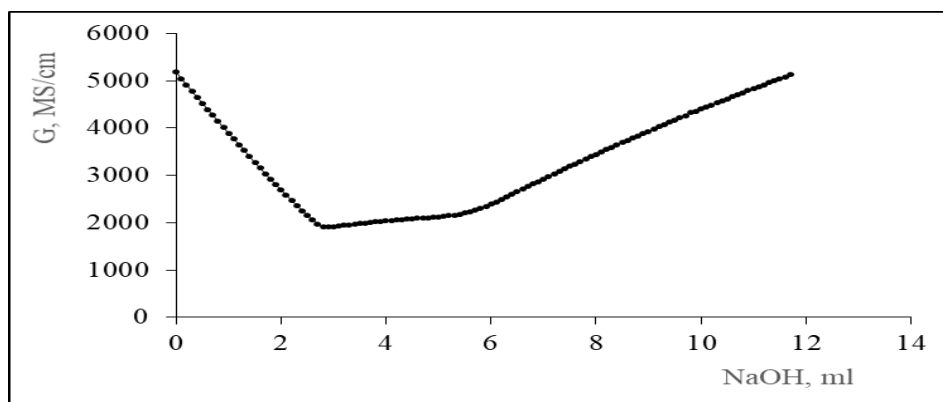


Figure 1. Conductometric titration curves

solution CMCS.

The conductometric titration curve of carboxymethylchitosan obtained at a temperature of 65 °C, a reaction time of 4 hours and a XZ / CMHZ ratio of 1: 1 is described as a dashed line corresponding to a certain range of titrant consumption (Figure).

$$x = N1 \cdot V1 - N2 \cdot V2,$$

$$CD = \frac{x}{x + \frac{m \cdot 0.9 - x \cdot 161}{203}} \cdot 100\%,$$

where V_1 is the volume of acid, ml; V_2 is the volume of alkali required for titration, ml; N_1 - acid normality, mol-eq / ml; N_2 - alkali normality, moleq / ml; m is the mass of carboxymethylchitosan, mg.

At the initial stage of titration of CMHZ with NaOH solution, the interval from 0 to V_1 corresponds to the volume of the base added to neutralize the strong acid (H_3O^+) present in the solution (Figure-1). Further, characteristic segments (V_1 - V_2) are observed, which correspond to the titration of carboxymethyl groups (CH_2COOH). Titration required for neutralization ($NH_3^+ + NH_2R + NHR_2$; where $R - CH_2COOH$) corresponds to the volume of the base (NaOH). During subsequent titration, an increase in the electrical conductivity Gsm is observed, which characterizes the excess of a strong electrolyte (NaOH) [13].

The difference in the structure of chitosan and carboxymethylchitosan polymer chains is also reflected in their UV spectroscopy values (Figure 2).

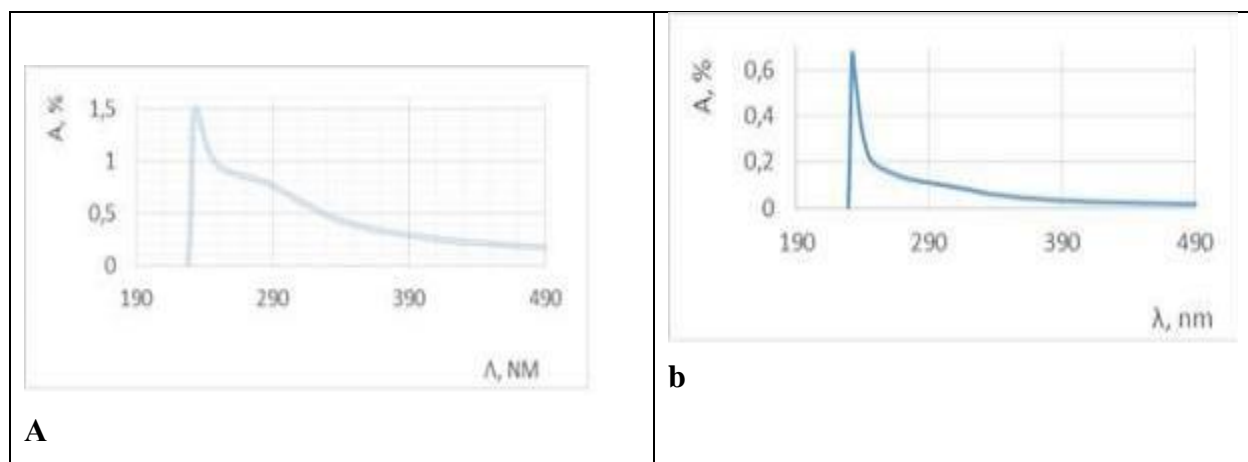


Figure 2. UV spectroscopy of chitosan and carboxymethylchitosan

a- Chitosan b -CMCS;

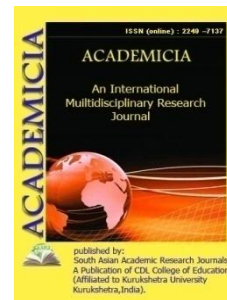
CONCLUSION

In summary, the natural biopolymer carboxymethylchitosan has synthesized from inanimate bees in a new way and it has been studied by conductometry, UV methods. During the carboxymethylation of chitosan, the concentration of the alkaline solution, the temperature, the duration of the carboxymethylation reaction and the amount of monochloroacetic acid (MHCC) have been controlled by selecting the ratio XZ: MHSK. When the NaOH concentration has been increased from 20% to 30%, the solubility of the chitosan sample obtained by alkaline treatment increased from 70-75% to 85%.

REFERENCES

1. Albulov A.I., Komarov B.A., Samuilenko A.Ya. et al. // *Materials in the conference "New perspectives in the study of chitin and chitosan."* M.: VNIRO, 1999. P.7-8.
2. Sattarova D.M., Sattarov T.A., Kodir Khanov M.R., Rashidova S.Sh. "Prospects for the formation of o-carboxymethylchitosan nanofibers bombyxmori for medical purposes." *Scientific Bulletin of NamSU*. 2020 yil 10-sleep. S.102-108

3. Mouria V.K., Inamdar N.N., Tiwari A., "Carboxymethyl chitosan and its applications" Review article, Adv. Material. Letters, (2010), Vol.1, Issue 1, p.11-33
4. Riccardo Muzzarelli, MirnaCucchiara and CorradoMuzzarelli. N-Carboxymethyl Chitosan in innovative cosmeceutical products. J.Appl.Cosmetal(2002),20.201-208.
5. Klicheva O.B., Rashidova S.Sh. "Synthesis of carboxymethylated chitin Bombix mory." - Conference of young scientists Actual problems of the chemistry of natural compounds. Tashkent, 2015.- p. 119
6. G.A. Ikhtiyarova "Production, properties and application of biodegradable chitin and chitosan polymers". Monograph. Bukhara 2017.- P.48-55.
7. Ed. KG Skryabin, GA Vikhareva, VP Varlamov "Chitin and chitosan: production, properties and application". Moscow: Nauka, 2002. –368p.
8. Rashidova S.Sh., Milusheva R.Yu. Chitin and chitosan Bombyxmori: synthesis, properties and applications. Tashkent. Fan, 2009 .-- 246s.
9. V. A. Alexandrova, L.N. Shirokova. "Modern perspectives in the study of chitin and chitosan" Mat. XI Int. conf. 2014.S. 17-21
10. Chen R.H., Hwa H. D. Effect of Molecular-Weight of Chitosan with the Same Degree of Deacetylation on the Thermal, Mechanical, and Permeability Properties of the Prepared Membrane // Carbohydr. Polymer 1996. V. 29. №4
11. Kurbanova F.N., Ikhtiyarova G.A., Mengliev A.S., Nazarov S. Obtaining an ecologically pure biopolymer carboxymethyl chitosan from ApisMellifera-«Actual problems and innovative technologies in the field of natural sciences »- November-2020 P.85
12. Ikhtiyarova GA, FM Nuritdinova, F.N. Kurbanova, AS Mengliev. "Laboratory technology for the separation of chitin and chitosan from extinct bees" - Modern innovation: reduction of acetylene compounds and chemical technology. International Conference.Toshkent-2018. 138-140.
13. Klitschko OB Author's abstract dissertation "Synthesis, properties and application of O-carboxymethylchitosane" - Tashkent - 2017. P.14.



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MENTAL THINKING IN A LITERARY TEXT

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ABSTRACT

From the end of the twentieth century and the beginning of the twenty-first century, there has been a growing interest and empirical research in the study of individual language in the context of speech. The manifestation of subjective reality in speech, that is, the reflection of linguistic identity in speech acts, is associated with the awareness of the language owner of the synchronous and diachronic language base, as well as associative-verbal ability. The study of the internal and external "I" as a dual phenomenon, the planning of the individual's speech and the analysis of the state of speech realization are among the urgent issues. The communicative process (creator and reader) is not only an exchange of ideas and informational contact, but also a moment directly related to human emotions, moods, feelings and total views about existence. It is precisely as a result of the psycho-emotional aura of the text that the reader creates a world free from the reality of his being.

KEYWORDS: *Literary Text, Dialogue And Monologue, Poetic Tone, Author And Reader, Mental Thinking, Lexical Character, Speech Argument, Linguopoetic Approach, Communicative-Linguistic Personality, Theory Of Speech Communication, Linguistic Pragmatics, Act Of Genetic Motivation.*

INTRODUCTION

In linguistic scattered research, dialogue and monologue are analyzed as the main form of speech communication and the most important component of the compositional-speech structure of the literary text, as well as the component that forms the character traits of the work of art. A set of international and local scattered and progressive general philological researches has been formed.

Main part

The fact that the literary text is composed of aesthetically valuable communication and the poetic tone of the work is characterized by its anthropocentricity, social significance and figurative modeling by the author is able to embody a special artistic landscape of the world. Indeed, the literary text is characterized not only by the author and the reader, but also by the total combination of lexical characters within the literary text, and as a result of views on this issue, a number of ideas have been formed. Therefore, in the linguopoetic analysis of a literary text, as a result of anthropocentric principle and linguopoetic interpretation, it is a fact that there is a linguistic person “behind the text” (V.Karaulov).

RESULTS AND DISCUSSIONS

Mental thinking as an artistic phenomenon is voiced as a textual exchange of ideas between the author and the recipient. In this regard, the formation of the image, character and types embodied in the work of art on the basis of verbal arguments, as well as its artistic expression allows to analyze the image as a linguistic entity in the set of features given in the text. At the same time, the main issues are raised in the study and research of the linguistic personality at the artistic level as a subject of textual communication. Also, a comprehensive analysis of trends in linguistic research has shown that innovative paradigms of modern linguistics (functional, communicative-pragmatic, linguoculturological, lingvopoetic and other approaches) open up prospects for further study of this phenomenon of literary genres. In general, our views will be on the priority of the functional-communicative and lingvopoetic approach in the analysis of dialogue and monologue. In this case, dialogue is manifested as a sphere of manifestation of human speech activity, and its participants are manifested in different types of activities, but primarily as communicative-linguistic individuals. At the same time, dialogue is studied in terms of the theory of speech activity, the theory of speech communication, linguistic pragmatics, the theory of speech genres that study human behavior in society, and therefore has a bright anthropocentric direction.

The creator behind the text understands the world with his own eyes and consciousness and realizes it in the text based on his inner lexicon. In particular, the ideas he wants to convey and express are expressed in different forms of the text (monologue, dialogue, polylogue). Based on its speech units, it shapes the text idioethnically and poetically actualizes it in linguistic units.

–Yes, Nihu, you’re dressed up, are you going to a party? – I said fondly.

–I was born today, – he said, blinking his dark eyes and smiling.

–Iya, you are a jubilee, but don’t hurry, now ... (U. Hoshimov. World affairs).

Indeed, its pragmatic and aesthetic influences through text are formed in dialogues, where the total totality of artistic information is concentrated. If in the text there are units of exhortation, it fully reflects the appeal of the literary text and the secondary reality formed on the basis of the creative inner world. The “*iya*” consonant is an act of genetic urge that is actively used in the Uzbek language, is a unit that fully embodies our national language and mental characteristics, and performs the full function of emotional lexicon in the literary text. If we repeat the moment of dialogue in the example and embody it on the basis of our imagination and consciousness, it is not difficult to understand the age-specific actions of communicators in the process of conversation, their propensity for phonographic adaptations in the process of using the act of

encouragement. In particular, the first speaker used the adjective “*iya*” very briefly, using it in a way that was specific to the age of the second communicator in front of him and to the specific (age of the communicant). If this aspect, that is, the sound of *ya* in the vowel *ya*, lengthens and the tone falls towards the end of the sound, we can observe that it generally turns into a secondary sema of wonder, ridicule and hatred (meaningful “atomic” particles). However, the linguistic-verbal aspects of such cases in all parts of speech cannot be shown in the text, and the phonetic potential of any language is not sufficient for this.

– *Did you hear that the dentists were lucky?*

– *What the hell happened?! – said his uncle, glad that the conversation had turned away.*

– *Iya, don't you know yet? – A new class of robbers has emerged in the city. On the tram, on the bus, on the street - when he sees a man with gold teeth, he puts a hammer in his mouth and pulls out his teeth.* (S.Ahmad. Karakoz Majnun).

Russian linguist S. Kartsevsky points out that sign and expression (meaning) cannot completely overlap. Their boundaries do not intersect at all points, and a character can have multiple functions or a single meaning can be represented using different characters. Any character has the ability to be “homonymous” and “synonymous” at the same time. Indeed, if we pay attention to the verbal expression of the act of urge (*iya*) used in the above examples elsewhere, we realize that the scholar's views are correct.

– *Well, opajon, I'll come to work tomorrow.*

– *We're leaving now.*

– *Iye, after all ...* (T. Malik. Demon streets of Satan.)

It should be noted that the main directions of dialogic research in modern linguistics are described and generalized, and there is a need for multidimensional research based on its anthropocentric, textual and linguocultural approaches. In the literary text, new views are being formed on the comprehensive structural-semantic, functional, pragmatic and lingpoetic description of dialogue. At the same time, dialogue analysis in fiction is becoming increasingly important in the study of dialogue theory, text theory, speech communication theory, modern genre studies, literary text lingvopoetics, and the peculiarities of national (mental) thinking. The specific features, tasks and types of dialogue in the literary text, as well as the specificity in the formation of the literary text along the theme plan are very important. Also, the study and analysis of the heroes of a literary work as linguistic individuals through dialogue shows the poetic perfection in the linguistic tricks of the creator. In particular, the activity of the acts of encouragement in the dialogic phases and the very intentions of the creator and the arguments he wants to show. Dialogue is a dynamic structure as the main, primary form of communication, which is primarily determined by its communicative nature. Artistic dialogue, which is an integral part of the worldview created by the writer, as a secondary form of communication, becomes an important tool for the realization of the aesthetic function, originality, based on the individuality of the author. In dialogue, artistic (secondary) communication is directly related to natural (primary) communication, which is especially reflected in the parameters of the verbalization of the communication situation in the story genre.

– *I'm not going, – said the old woman. – It's going to die. Take the corpse out of the suitcase.*

–*Iya, that's interesting! My uncle is leaving today!*

The old woman entered the house in silence ... (S.Ahmad. Karakoz Majnun).

The act of encouragement used in the text embodies the character of the literary text as an integral linguistic person in general in terms of social, psychological, age, gender characteristics and activates his verbal behavior in all respects emotionally. The idiosyncrasy of the subject is embodied as an artistic representation of national interpersonal communication.

–*Balli!* - *The testy expression in Mirzo Ulugbek's eyes was replaced by warm kindness.* (O.Yakubov. Ulugbek's treasure).

Socio-psychological types of linguistic personalities of characters are identified, their relationship with functional and semantic varieties of dialogue on the one hand, and the specific features of the situation described by the writer on the other. However, the communicative and pragmatic features of character speech behavior remain underdeveloped, as the specific features of dialogicity are largely determined by the pragmatic nature. Man is also the main object of the author's aesthetic pursuits, and his stories reflect the diversity of folk characters in different life situations. The study of dialogue in a literary text turns out to be most perfect if its analysis is carried out through the prism of a linguistic personality. As a linguistic person, character is a carrier of cultural-linguistic, communicative-activity values, knowledge, attitudes and behavioral reactions. In interspecific communication, the sign is determined by the socio-psychological type of the linguistic personality, its socio-role status.

Kozimboy tried to distract.

– *You see four years of the nineteenth century, you see ninety-two years of the twentieth century. Wow, do you want to see the twenty-first century again? Ibi, where is the honesty?* (S.Ahmad. Karakoz Majnun).

The idiosyncrasy of an artistic image is based on the type of dramatic scenes in which dialogue becomes an organic way of expressing the author's thoughts, his worldview, and becomes the subject of the image. As in drama, interspecific dialogue is multifunctional and forms a special type of text, whose functions are to collect information about characterization, action development, behavioral motives and causes of characters, and to evaluate them. An integrative approach to the study of artistic dialogue, that is, its analysis in terms of structure, functions, semantics and pragmatics in terms of communicative activity, determines the relevance of this work, taking into account the specificity of the author's linguistic personality and linguistic personality. The timeliness of the research is related to the need to compare artistic dialogue with the primary, prototypical form of communication. The communicative situation, expressed in the literary text, has its own characteristics and is mainly associated with prototypical dialogue. This defines the specific features of dialogue modeling as part of a work of art. Verbal design of communicative situation parameters helps to convey the verbal behavior of the character and its verbal and nonverbal components. Dialogue is one of the main types of human communication based on verbal interactions. The theory of dialogue is actively developing in linguistics, and its complexity at the problem level shows that linguistic and linguopoetic analyzes are evolving. The multidimensional nature of dialogue is also analyzed in the fields of art history, literature, sociology, anthropology, philosophy. Dialogue is analyzed by them as a specific form of verbal communication, a field of manifestation of verbal activity, a form of language existence, and a

form of human communication with the world. The main material for the study of dialogue is a dialogic piece that reflects the specific features of the literary hero's verbal behavior. The special significance of the dialogic passage is that it represents a literary character in the interaction with the "other" (M. Bakhtin) in the situation in which "man in man" appears.

–I wrote it by heart, – replied Diyorov.

–I wanted to warn our healthy generation about the dangerous path that the mullahs are embarking on.

–Vot molodes, – said Fatkhullin, impatient. – ... a devoted patriot joins the party! (S.Ahmad. Karakoz Majnun).

In fiction, verbal communication is represented by a piece of text. The textual parameters of constructing a communicative situation include the elements that determine the main tone of the dialogue: the identifier of the addressee and the addressee, their relationship, social roles in communication, intentions, indicators of speech-related actions, the place and time of communication. The defined parameters of the communicative situation determine the speech-behavioral scenario conveyed in the author's story, which provides textual unity. We can also highlight as a separate problem the principle of the author's choice of linguistic material to model the linguistic personality of a literary hero.

–Hey, Nazirbuvi, is this going to happen, or have we sent the chairman's sheep stuffed with empty walnuts?

–Voy, Tuxtabuvi, why not? – We put it in the meeting, didn't we? (A.Qahhor. Tales from the past).

The urgency of the problems of dialogue research suggests that there are still a number of controversial issues, in particular the question of the relationship between dialogue and monologue, dialogue and speech, that dialogue has its own characteristics as a textual type. In traditional linguistics, dialogic speech has always been contrasted with monologic speech by distinguishing their distinctive features. Dialogue was defined as a form of speech in which there is a direct exchange of speech between two persons. The monologue is viewed as a self-directed form of speech (G. Vinokur) rather than intended for the other person's verbal reaction to the speaker. Later, the terms "dialogic speech" and "monologue speech" refer to the features of the two main forms of speech, and the terms "dialogue" and "monologue" refer to the artistic expression of these forms of speech. These terms are used synonymously. Dialogue, first, is a dialogic form of speech characterized by the constant activity (role of the speaker) and passivity (role of the listener) of the communication participants. Second, in the changing direction of the messages, the dialogue consists of short statements that appear spontaneously, each of which is encouraged by the one before it (the other).

–Auntie, you have to be patient in everything, – said Arslanqul softly so as not to offend. – Let's assume that sooner or later no one will catch them...

–Ah, my son has given you the patience of an apple!" – The old woman sighed and did not open her mouth. (Oybek. Navoi).

Dialogic speech is characterized by grammatical confusion, shortcomings, reduction of grammatical forms, active and meaningful gestural approach, and communicative polarization.

One participant of monologue communication is characterized by the stability of the speech activity with the external passivity of others. It is distinguished by detailed and structured, premeditative statements that have a thematic unity. In modern linguistic research, the problem of the relationship between dialogue and monologue often does not find a single solution due to the complexity of their skills, their mutual overlap. Dialogue is primary, it ensures the dominance of being and the development of communication, and is recognized as a source of “being a means of communication” (M.Bakhtin).

The bakovul elders wore a one-ton beqasam around their waists.

– **Balli**, you’re equal! – he said.

The elders did not come empty-handed.

– **Eb-ey**, what do you say, Grandpa? – said Hotam the wrestler. (T.Murod. The stars burn forever).

In modern research, dialogue is the subject of research in such areas of linguistics as communication theory, pragmalinguistics, text linguistics, syntax, stylistics, social and psycholinguistics, linguopoetics. In modern linguistics, there are three areas that study communication: actual analysis of conversation (conversation analysis), speech ethnography (speech ethnography), and speech analysis, on the basis of which the total aspects of the speech situation are studied. It is also important to note the secondary nature of the monologue over the dialogue, because, on the one hand, the monologue is the semantic origin of the dialogue, on the other hand, it is a dialogue compressed by a textual requirement. As a result, with a broad understanding of dialogue, the issue of distinguishing between dialogue and monologue is usually overshadowed. However, as the main difference between monologue and dialogue, it is necessary to recognize that monologue is a special type of communication, not an abbreviated form of communication, in order to establish and describe the parameters of monologue communication, taking communication participants as a sign of communicative equality or inequality.

The earth is washing the dishes. The pervert is accountable to his father. He was a dog! Cough again! He, let your lungs rot! (T.Malik. Demon streets of Satan).

In the reflection of the dialogue in the status of the text is explained by such factors as the constancy of the composition of the participants, space and time, situation, integrity, referential and semantic dependence of replicas and their continuity, the presence of linguistic indicators. The main difference between dialogue and monologue is that subjects change their communicative roles (speaker-addressee) and create text together. A dialogic text is an alternate chain of sentences formed by alternating the speech of two or more participants in a speech act in the role of speaker or listener. In the case of a monologue, only one of the subjects is the person performing the production of the text, the second participant in the speech act is the addressee or the recipient, either thinking or reacting immediately. Given the complex multidimensional nature of dialogue, we consider it necessary to clarify a number of concepts we use in our work.

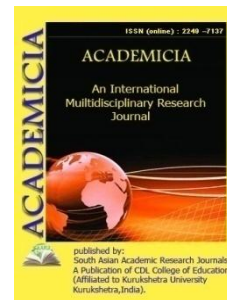
Before Tursunali’s imprisonment, a man who saw the house on horseback a year later would grab him by the collar and say, “Yopiray, he was beaten by a thief last night”. (T. Malik. Demon streets of Satan).

CONCLUSION

The importance of internal speech is that it plays a uniquely important role as the basis of oral and written speech, and is sometimes referred to as passive speech. The inactivity of internal speech is that it is self-directed and does not require the presence of a second person. At first glance, this idea may seem correct, but it also has some limitations. After all, even in the inner monologue, the presence of a representative of the second pole secretly is felt on the basis of the demand of the literary text and the factors that reveal the character.

REFERENCES

1. Arutyunova N.D. Dialogic modality and the phenomenon of citation // Human factor in language. Communication, modality, deixis. – Moscow .: Nauka, 1992.
2. Borisova I.N. Russian conversational dialogue: the problem of integrability: Author's abstract. dis. doct. philol. sciences. – Yekaterinburg, 2001.
3. Krasnykh V.V. Fundamentals of Psycholinguistics and Communication Theory. – Moscow .: Gnosis, 2001.
4. Paducheva E.V. Pragmatic aspects of the connectedness of the dialogue // Izvestiya AN. A series of literature and language. 1982.
5. Shiryaev E.N. The structure of intentional conflict dialogues of the spoken language // Problem of speech communication. – Saratov: Publishing house Sarat. University, 2000.
6. Lapasov J. Literary text and linguistic analysis. – Tashkent: Teacher, 1995
7. Mahmudov N.M. Semantic-syntactic asymmetry in simple sentences in Uzbek language. – Tashkent: Teacher, 1984
8. Yuldoshev M. Fundamentals of literary text and its lingvopoetic analysis. – Tashkent: Fan, 2007.
9. Mamajonov A. Text linguistics. – Tashkent: Fan, 1989.
10. U. Hoshimov. World affairs. – Tashkent: 2018.
11. S.Ahmad. Karakoz Majnun. – Tashkent: Sano-standard, 2016.
12. T. Malik. Demon streets of Satan. – Tashkent: Yangi asr avlodi, 2017. Yakubov. Ulugbek's treasure. – Tashkent: Tafakkur anoti, 2016.



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LABORATORY PARAMETERS OF ENDOGENOUS INTOXICATION SYNDROME AND LIVER MORPHOLOGY IN CHRONIC HBV-INFECTION

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ABSTRACT

A liver biopsy was studied in 25 patients with chronic viral hepatitis B and a number of morphological changes were revealed: tissue infiltration with lymphocytes, expansion of portal tracts due to fibrosis and moderate lymphocytic infiltration, formation of port-portal septa, stepwise necrosis, hydropic infiltration of hepatocytes, detection of opaque vitreous «hepatocytes and sandy nuclei». As HBV infection progresses, the incidence of diffuse lymphocytic infiltration, the number of port-portal septa, and graded necrosis increases. After antiviral therapy, an improvement in the morphological structure of the liver is recorded. Indicators of endogenous intoxication syndrome have a direct correlation with fibro genesis in HBV infection. In patients with chronic viral hepatitis B who did not receive antiviral drugs, the toxicity index significantly increased and the albumin content decreased in comparison with patients who took antiviral therapy.

KEYWORDS: *Chronic Viral Hepatitis B, Antiviral Therapy, Endogenous Intoxication, Morphology, Index Of Histological Activity, Albumin.*

INTRODUCTION

According to WHO, today there are more than 350 million people with markers of previous HBV infection in the world [10].

Within the framework of traditional concepts adopted in pathology, toxicology, and pharmacology, cell death was considered as a passive degenerative process that occurs as a result of irreversible damage to the cell. The toxic type of cell death is usually referred to as necrosis. Cell death - apoptosis for a long time was considered inherent only in embryonic development and morphogenesis. In most cases of chronic liver damage, including infection with hepatotropic viruses, the main mechanism of cell death is apoptosis [9].

In viral hepatitis, apoptosis can be the result of direct exposure to the virus or mediated by an immune response. Being a universal biological mechanism, apoptosis in viral hepatitis can lead to excessive death of not only hepatocytes, but also other cell populations, reflecting either a systemic immune-inflammatory response to infection or extrahepatic persistence of the virus. Apoptosis of lymphocytes and granulocytes is significantly higher in patients with chronic viral hepatitis B compared with patients with other forms of chronic hepatitis [1].

Liver fibrosis is a local or diffuse increase in the amount of connective tissue, extracellular matrix (collagen fibrous tissue in the perisinusoid space) and the main pathway for the progression of chronic diffuse liver diseases. Cells directly involved in the process of fibrosis are hepatocytes, Kupffer cells, sinusoidal endothelial cells, hepatic stellate cells [2, 4].

The evolution of fibrosis in viral hepatitis is presented as primary fibrosis of the portal tracts with subsequent spread towards the central vein and adjacent portal tracts with the formation of porto-portal and port-central septa [6, 8].

The range of pathological changes in the morphological substrate in viral hepatitis is large. Evidence has been accumulated that patients with chronic hepatitis B are characterized by an increase in angiogenesis indices and a high proliferative activity of Ito cells. Antiviral therapy in patients with hepatitis B leads to positive dynamics of morphological data, accompanied by a decrease in the proliferative activity of Ito cells, a decrease in angiogenesis values and activation of anti-metalloproteinase defense mechanisms. Regression of morphological data during AVT does not depend on the degree of liver fibrosis and the presence of HBeAg before treatment [5, 7].

Endogenous intoxication syndrome is recorded in many pathological conditions of the human body, including viral hepatitis. Cytolysis of hepatocytes with HBV liver damage leads to a decrease in its detoxification and protein synthesizing function, which leads to an increase in the syndrome of endogenous intoxication. The state of the serum albumin molecule, which characterizes its binding capacity, reliably reflects the course of endogenous intoxication syndrome and can be used as a prognosis criterion, the severity of the course and outcome of the disease, as well as the effectiveness of the therapy. The albumin binding reserve index does not depend on the albumin concentration, characterizes only the state of its molecule and is regarded as a marker of intoxication that reliably reflects the status of intoxication of the body. Its dynamics is reliably associated with the morphofunctional state of the liver. Liver dysfunction leads to an increase in the toxicity index [3, 11].

There are no data in the literature that determine the relationship between the influence of morphological changes in liver tissue on the formation and degree of endogenous intoxication syndrome in chronic viral hepatitis B.

The objective: to determine the nature of histomorphological changes in the liver parenchyma and the severity of the syndrome of endogenous intoxication in patients with chronic viral hepatitis B in the dynamics of the disease and the effect of antiviral therapy on changes in the parameters of the binding capacity of serum albumin.

Materials and methods

The study included 25 patients with newly diagnosed chronic viral hepatitis B. Patients were divided into 2 groups. The first group consisted of 11 untreated patients, who underwent NPKP 3 years after the detection of hepatitis B. Patients who formed group I were initially preparing for antiviral therapy, however, for various reasons, they had to postpone therapy to a later date. The second group consisted of 14 people who underwent PFBP 2 years after antiviral therapy.

The patients received antiviral therapy (α -interferon-2a 5 million units daily and entecavir 1,0 g/day). The indications for the appointment of combination antiviral therapy were: positive PCR for HBV DNA, markers of viral hepatitis B in ELISA, increased transaminase levels. The duration of antitherapy was 6 months.

Domestic and foreign test systems were used to determine HBV and HBV DNA markers. All patients underwent percutaneous puncture liver biopsy.

Liver biopsies were obtained by aspiration liver biopsy in patients with chronic viral hepatitis B. Histological examination was performed on paraffin sections. The material was subjected to standard histological processing with the staining of serial sections with hematoxylin, eosin, picrofuchsin according to Van Gieson. We used survey morphological descriptions of structural abnormalities in the liver. In hepatobiopsy specimens, the index of histological activity (IHA) was determined according to Knodell R.G.: 0-3 points - low, 4-8 points - minimal, 9-12 points - moderate, 13-17 points - high activity of hepatitis B.

For light microscopy, the biopsy specimen was fixed with a 10% formalin solution. Paraffin sections were stained with hematoxylin and eosin, picrofuchsin according to Van Gieson. The histological criteria of chronic hepatitis B were assessed: portal tracts, lymphoid follicles in the portal and periportal zones of the hepatic lobule, hydropic and fatty degeneration of hepatocytes, proliferation of interlobular bile ducts, and the presence of port-portal septa.

Statistical analysis of the data obtained was carried out using the Statistica for Windows 6.0 software. Quantitative indicators were compared using the Mann-Whitney method, and qualitative indicators were compared using the Pearson χ^2 test or Fisher's exact method. The equality of the sample means was checked by the Student's t-test. The criterion for statistical significance was $p < 0.05$.

Results of the study

In the first group, 7 patients (63,6%) had a history of acute viral hepatitis B. Distribution by sex: men were 8 patients (72,7%), women - 3 patients (27,3%). Occasional alcohol consumption was noted by 5 patients (45,5%). Morphological changes in liver tissue during primary biopsy in patients of the first group: tissue infiltration with lymphocytes - 100% (diffuse occurred in 5

patients (45,5%), expansion of the portal tracts due to fibrosis and moderate lymphocytic infiltration - in 9 patients (81,8 %). Portal-portal septa - in 9 patients (81,2%), stepwise necrosis - in 10 patients (90,9%). In 6 patients (54,5%), Kaunsilman's little bodies were found, "sandy kernels" were described in 5 patients (45,5%). The average index of histological activity in patients with HBV infection is 8,1 points. The index of albumin tests was $62,6 \pm 2,3\%$, and the toxicity index was $0,62 \pm 0,11$ (Table 1).

TABLE 1 MORPHOLOGICAL CHARACTERISTICS AND INDICATORS OF THE SYNDROME OF ENDOGENOUS INTOXICATION IN PATIENTS WITH CHRONIC VIRAL HEPATITIS B IN THE DYNAMICS OF THE DISEASE AND TREATMENT (%)

Specifications	First Group (n = 11)	second group (n = 14)	P
Diffuse lymphocyte infiltration of tissue	45,5	21,4	< 0,05
Expansion of portalpaths	81,8	64,3	< 0,05
Stepwise necrosis	90,9	64,3	< 0,05
Portal-portalsepta	81,2	57,1	< 0,05
Tauruscouncilman	54,5	35,7	< 0,05
"Sandcores" ofhepatocytes	45,5	14,3	< 0,001
Average index of histological activity (points)	8,1	4,7	< 0,05
Albuminbindingreserve (%)	$62,6 \pm 2,3$	$81,2 \pm 3,3$	< 0,05
Toxicityindex	$0,62 \pm 0,11$	$0,23 \pm 0,10$	< 0,001

In the second group, among patients with newly diagnosed viral hepatitis B, only 6 patients (42,8%) had epidemiological data on acute viral hepatitis B. By gender, the group included 9 men and 5 women (64,3% and 35,7% respectively).

In the study of hepatobiopsy specimens obtained after antiviral therapy, the following histiostructural changes were revealed: portal tracts in 9 biopsies (64,3%) were slightly enlarged due to fibrosis and moderate lymphocytic infiltration; stepwise necrosis of hepatocytes was observed in 9 patients (64,3%). In 100% of cases (14 patients), there is a single (78,6%) or diffuse (21,4%) lymphocyte infiltration of tissue. Locally, active and inactive port-portal septa were found in 8 patients (57,1%). Nuclear-free acidophilic bodies of Kaunsilman were observed in 5 patients (35,7%). "Sand kernels" are described in 2 patients (14,3%). The average index of histological activity in patients with HBV infection is 4,7 points. The index of albumin tests was $81,2 \pm 3,3\%$, and the toxicity index was $0,23 \pm 0,10$. The indices of the syndrome of endogenous intoxication in both groups did not reach normal values (both without antiviral therapy and after it), which indicates a disruption of the compensatory capabilities of the liver after a viral lesion, as well as the formation and progression of fibrotic changes in the organ.

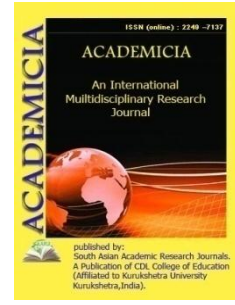
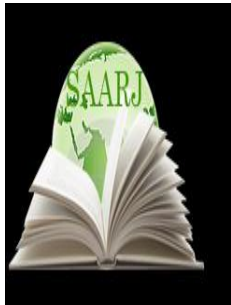
CONCLUSION

As HBV infection progresses, there is a change in histiostructural parameters of liver tissue in the form of an increase in diffuse lymphocytic infiltration, an increase in the number of port-portal septa, stepwise necrosis, which is expressed by an increase in the index of histological

activity. The use of antiviral therapy leads to a decrease in diffuse infiltration by lymphocytes, a decrease in the number of stepwise necrosis and port-portal septa, a decrease in the expansion of the portal tracts in the hepatobiopsy specimen, as well as the preservation of IGA with a tendency to decrease them. Determination of markers of endogenous intoxication syndrome in patients with chronic viral hepatitis B who have not received antiviral therapy since the detection of HBV infection records a significantly higher toxicity index and a significantly lower albumin binding reserve.

REFERENCES

1. Baranova A., Lal P., Biredinc Z.M. Non-invasive markers for hepatic fibrosis/ BMC Gastroenterol- 2011. - V.11: 91.
2. Bataller R., Brenner D.A. Liver fibrosis // Clin. Invest. - 2005. - Vol. 115. - P. 209-218.
3. Deltenre P. Studies on the epidemiology of hepatitis B and C virus infections are still needed// J Hepatology,- 2015. - № 62(6) - P. 1225-1227.
4. Herzer K. Hepatitis viruses: live and let die // Liver Int. - 2007. - Vol. 27. - P. 293-301.
5. Kroemer G., Galluzzi L., Vandenabeele P. Classification of cell death: recommendations of the Nomenclature Committee on Cell Death 2009. Cell death and Differentiation. 2009;16(1):3-11.
6. Pellicoro A., Ramachandran P., Iredale J. P. Reversibility of liver fibrosis. Fibrogenesis tissue Repair - 2012. - 5(Suppl 1): S26.
7. Pinzani M., Luong T.V. Pathogenesis of biliary fibrosis // Biochimica et Biophysica Acta. - 2018. - Vol. 1864 (4, pt. B). - P. 1279-1283.
8. Reshetnyak V.I. Primary biliary cirrhosis: clinical and laboratory criteria for its diagnosis. World Journal of Gastroenterology. 2015;21(25):7683-708.
9. Schiavon L., Narciso-Schiavon J., de Carvalho Filho R.J. Non-invasive diagnosis of liver fibrosis in chronic hepatitis C. World J Gastroenterol,- 2014. - № 20 (11) - P. 2854-2866.
10. Shetty K., Wu G.Y. Chronic viral hepatitis, diagnosis and therapeutics // Clinical Gastroenterology. - Humana Press, 2009. - P. 33.
11. Wynn A. Cellular and molecular mechanisms of fibrosis. J Pathol- 2008. - № 214(2) - P. 199-210.



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PROBLEMS OF FINANCING INVESTMENTS IN UZBEKISTAN'S ECONOMY

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ABSTRACT

This article describes the investments in the Republic of Uzbekistan and their distribution, financing and existing problems. The newly created value in the national economy, that is, national income, is spent for consumption and accumulation purposes. In a broad sense, consumption refers to the use of goods and services produced in the process of meeting the economic needs of society. The attraction of funds from the population's savings to finance many investment projects on the basis of privatization and liberalization in the economy of the country is also growing from year to year. In this regard, it should be noted that in the economies of developed countries, public funds are a necessary source of funding for investment projects.

KEYWORDS: *Investment, Sustainable Development, Consumption, Financial Resource, Savings, Modernization, Domestic, Foreign, Investment Commodity.*

INTRODUCTION

The further development of Uzbekistan and the world economy is mainly aimed at the targeted use of investments in sectors and industries and the attraction of investments into the economy of the republic, the development of their sources of financing, ensuring sustainable development of the industry. Clearly defining investment priorities, making science-based investment decisions, attracting internal and external financial resources, taking into account all conditions, on the basis of rational investment activities determine the future of the national economy. Finding the necessary financial resources for investment has become a condition of economic growth, which depends on the ratio of consumption and savings. The newly created value in the national economy, that is, national income, is spent for consumption and accumulation purposes. In a broad sense, consumption refers to the use of goods and services produced in the process of meeting the economic needs of society. The part of the consumer fund that falls into the hands of

the population in the form of personal income is used for consumption expenditures, which is the part of the population's current income that is used for living goods and services. In the process of spending their income, the population has a choice between increasing current (current) and future consumption.

Main part

Today, investing is one of the most important aspects of any business, especially in the context of modernizing the economy. Upgrading the existing material and technical base, upgrading production facilities, developing new activities are the reasons for the need for investment. The opportunity to increase consumption in the future is a fund for the current period, which means that the state's current income will be accumulated to meet future needs and earn income. Its size is determined by deducting consumer spending from the income of all farms. The higher the share of consumption expenditures in the income structure, the lower the amount of savings. The growth of the fund means that in economic terms, the funds will be directed from the purchase of consumer goods to the purchase of investment goods.

Investments are divided into domestic and foreign investments, according to their sources. Sources of domestic investment are the state budget, funds of enterprises and the population, bank loans and extra-budgetary funds, sources of foreign investment are funds of foreign countries and firms, as well as international financial institutions. Such grouping of investments by sources also allows to determine their structure by sources. Economic analysis differs in its structure according to the purposes and sources of investment in practice.

RESULTS AND DISCUSSION

While the sectoral (territorial) structure of investments reflects the share of a particular sector (territory) in investment expenditures in a given period, the structure by form of ownership reflects the share of state and non-state property in the total source and expenditure of investment.

The technological structure of investments reflects the share of expenditures on construction and installation work, equipment and inventory and other costs (design and survey work, management costs, etc.) in total investment costs. The structure of reproduction is defined as the share of investment in total construction, expansion, reconstruction and re-equipment. The expansion of privatization and the development of the private sector will result in a different property-based economy. As a result, investment from the state budget will decrease. In such cases, it is advisable to finance projects in the medical, health, science, culture, education and other social spheres, mainly from the state budget. Examples of this are the health facilities, academic lyceums and professional colleges, which have recently been built and commissioned in our country on a large scale. Of course, funds are allocated for such purposes from the state budget, local budgets and other sources.

As a result of the consistent implementation of economic reforms, the existing enterprises in the Republic are developing and becoming financially stable. Therefore, new means of self-financing are being formed at enterprises for modernization and technical and technological equipment of production, in particular, new means of self-financing of enterprises.

Self-financing of enterprises can consist of:

- retained earnings of the enterprise;
- depreciation allowance fund;
- funds formed through the issuance of shares;
- special funds.

The source of funds listed above can be used by enterprises to expand their production capacity, build new production, modernize or technologically upgrade, increase working capital. At present, the state allocates subsidies and other assistance to financially support many enterprises. The organization of the investment structure, increasing their efficiency largely depends on the investment policy pursued in the country. In macroeconomic theory, investment, together with household consumption expenditures, government expenditures, and net export expenditures, constitute or is considered to be total expenditure (aggregate demand).

$$\text{That is: } J_x = C + I + G + X_n \quad (1)$$

Here: J_x –total cost (total demand);

C –household consumption expenditures;

I –investment

G – government expenditures;

X_n –net export costs.

There are some differences in the closed and open economy as the main source of investment funds:

- Household funds and government funds in a closed economy are: (2)

where: - the main source of investment funds;

- Household funds;

- government funds.

In an open economy, this is compounded by the difference between domestic funds that are exported and those that come in in the form of investments and loans from abroad: (3)

where: - the difference between funds coming in the form of foreign investments and loans, and the share of this or that source in the volume of investment depends on the level of economic development, income level, social structure, economic tasks, economic policy strategy.

It is known that part of the gross income (GNP) created in the national economy is consumed in various forms, and part is accumulated in the above forms. Achieving equality between total investment expenditures in the national economy and gross savings, ie ensuring ICS identity, is one of the important conditions for achieving macroeconomic equilibrium. This identity is not achieved on its own, as households save money not only for use as an investment, but also for unexpected expenses, the purchase of more expensive items. That is, part of the funds will not be added to the investment. In this case, the government should cover part of the investment costs or ensure the above identity by attracting foreign investment, which should create a favorable

investment climate in the country. Effective fiscal, monetary, foreign exchange and foreign trade policies, guarantees and benefits for investors, as well as macroeconomic stability are the conditions that determine this environment. In particular, high inflation rates create a state of inflationary psychosis in society, leading to an increase in limited propensity to consume, a decrease in savings and, ultimately, the volume of investment.

The income of the population also plays an important role as a source of investment. The attraction of funds from the population's savings to finance many investment projects on the basis of privatization and liberalization in the economy of the country is also growing from year to year. In this regard, it should be noted that in the economies of developed countries, public funds are a necessary source of funding for investment projects. The development of the stock market in developed and developing countries serves as a basis for directing the population's funds to direct investment. The securities market is also being formed in the country, the accumulation of free funds of the population is carried out in commercial banks, and these funds are directed to more short-term lending.

CONCLUSIONS

The main indicators of investment activity at the level of the national economy are:

- Increased willingness of economic entities to participate in investment processes;
- growth of investment (foreign and national) in the economy;
- creation and continuous improvement of a favorable investment climate by the state;
- organization and active participation in various events aimed at organizing and strengthening investment activities (international and national fairs, business meetings, multilateral projects, advertising, etc.);
- qualitative improvement of the investment structure in the economy, etc.

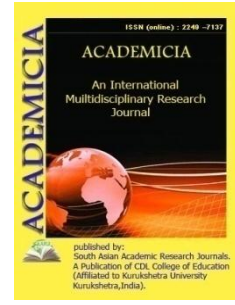
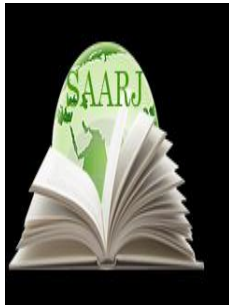
To develop investment activity in the national economy: strengthening the organizational and technological potential of the national economy; focus on non-state investment; measures such as paving the way for farms to operate independently are required. It is important to establish specific principles for ensuring and increasing investment activity.

Given the investment activity and attractiveness of the economy, these principles should include the following areas:

- identification of priorities for attracting investment based on real conditions;
- providing the investment process with a system of scientifically and practically based assessments;
- implementation of preferential credit, tax and depreciation policies;
- improvement of leasing relations and creation of favorable conditions for its use;
- Development of projects at the regional level, taking into account the real features of the national economy.

REFERENCES

1. Decree of the President of the Republic of Uzbekistan No. PF-5924: "On measures to further improve and popularize physical culture and sports in the Republic of Uzbekistan" dated January 24, 2020.
2. APPENDIX 1 to the Decree of the President of the Republic of Uzbekistan No. PF-5924 CONCEPT of development of physical culture and sports in the Republic of Uzbekistan till 2025. January 24, 2020
3. Umarmulov, KodirjonMaxamadamminovich, 2018. "A Study on the Dynamics of Foreign Trade and the Issues of Regional Economic Integration in Central Asia," Working Papers 18-5, Korea Institute for International Economic Policy.
4. Umarmulov, K. M. (2018). *A Study on the Dynamics of Foreign Trade and the Issues of Regional Economic Integration in Central Asia* (No. 18-5).
5. Umarmulov, K. M. (2018). A Study on the Dynamics of Foreign Trade and the Issues of Regional Economic Integration in Central Asia. *[KIEP] Working Paper, 18(05), 0-0*.
6. Revetria, R. O. B. E. R. T. O., Maxamadamminovich, U. K., &Mirzaliyeva, G. U. L. N. O. R. A. (2014, January). Production Advantages in Textile and Light Industry and Features of Effective using of them in Uzbekistan. In *Proceedings of the 8th International Conference on Management, Marketing and Finances (MMF'14), Cambridge, MA, USA* (pp. 29-31).
7. Сирожиддинов, К. И., &Имомов, Р. Н. (2014). Финансовая поддержка фермерских хозяйств в условиях либерализация экономики в Узбекистане. *Молодой ученый*, (1), 425-426.
8. Солиев, И. И., &Сирожиддинов, К. И. (2015). Благоприятный инвестиционный климат-важный фактор макроэкономического развития. *Молодойученый*, (17), 461-463.
9. Soliyev, I. I., &Ganiev, B. B. (2021). KEY FACTORS INFLUENCING ECONOMIC DEVELOPMENT.
10. Kurbonovich, Tozhiboev K., and Tolliboev S. T. Oglı. "Effective Use of Investment in the Development of the Territory of the Economy." *JournalNX*, 2021, pp. 121-125.



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EVALUATION ON DEVELOPING OF NEW VARIETIES AND LINES OF BREAD WHEAT TOLERANT TO DROUGHT AND HEAT ON THE RAINFED AREAS OF UZBEKISTAN

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ABSTRACT

The high correlations are studied between the productive elements of the spike and the yield on the researches. It was studied that in different years, under the influence of weather conditions, the productivity of bread wheat varieties and lines. It was found that dry weather conditions, low rainfall and lack of soil moisture lead to a decrease in wheat yields on dry lands. Due to low rainfall in autumn and winter, lack of soil moisture, seeds germinate in spring time and prolongs the growing season was heat and drought conditions.

KEYWORDS: Bread Wheat, Rainfed Lands, Rainfall, Vegetation Period, Heading, Spike, Spikelets, Drought, Heat, Heat And Drought Tolerant, Unfavorable Factor, Valuable Traits, Yield, Variety, Samples.

INTRODUCTION

The total area of arable land in Uzbekistan is 754,000 hectares. All arable lands in the country are divided into 4 zones according to altitude, soil and weather conditions: **1. Plain flat region.** This region is not provided with precipitation, and the annual rainfall is 250-300 mm. Strong weather and soil drought occur in the region in spring and summer. **2.The hill step regions.** Annual precipitation in this area is 300-350 mm.**3.Foothill region.** The annual rainfall in this region is 400-450 mm.**4. Mountainous region.** Annual precipitation in this region of dryland is 450-500 mm and more.

Today in Uzbekistan there is a low yield and grain quality of wheat varieties grown on more than 220.0 thousand hectares of dry land. Due to climate change in recent years, hot and dry weather conditions, low rainfall have a negative impact on the cultivation of grain crops on rainfed lands. Low soil moisture in the autumn is observed in the sparse germination of seeds sown in the fall

in the winter or spring, as well as the thinning of strong and dry cold wheat grasses that occur in some years during the winter months. These unfavorable factors lead to low wheat yields and poor grain quality.

Global climate change, rising air temperatures require the creation of wheat varieties for the soilclimatic conditions of rainfed lands, tolerant to biotic and abiotic stresses, and high grain quality content. The creation of bread wheat varieties with an early ripening, short grain-filling phase (25-30 days) provides an increase in grain yield on dry lands and a stable grain yield even in adverse weather conditions such as heat and drought. The duration of wheat vegetation on dry lands depends not only on the genetics of the variety, but also on soil and climatic conditions, care agrotechnology, sowing time, the time of emergence of seeds in autumn.

The duration of the germination period is important in determining early maturation. In Central Asia, the early ripening of a wheat crop is largely determined by the germination phase. Drought-resistant varieties of wheat accumulate less, late stems are not formed, the leaf surface is small, thin and twisted. The awned (spike with awn) wheat varieties are more drought and heat tolerant on rainfed lands. The generative organs of the wheat are susceptible to drought and heat. Lack of moisture in the soil during the formation of plant reproductive organs and during flowering, dry and high air temperatures during pollination lead to incomplete fertilization, and therefore the number of grains in the spike is reduced.

According to the researchers, the occurrence of high air temperatures during the grain filling period in hot weather with garmsel(dry and hot wind) reduces wheat yield by 30-50% even when the soil is sufficiently moist. Drought tolerant varieties have a shorter ripening period than drought-tolerant varieties. The greatest damage from drought is observed in the heading-ripening phase of wheat. Bread wheat samples belonging to the Central Asian Genetic Center (Uzbekistan and Kazakhstan) were found to be drought-resistant, while wheat varieties belonging to the Minor Asian Genetic Center and the Caucasus were found to be heatresistant. Drought tolerance has been proven by researchers to vary in wheat varieties.

Under drought conditions, changes in the water regime in the wheat crop disrupt the metabolism and lower yields are observed due to the number of grains, the number of grains in the grain and the weight loss of 1000 grains.

MAIN PART

The main direction of wheat selection in the development of drought-resistant varieties in Uzbekistan is the creation of early-maturing varieties, as the period from grain filling to ripening must pass in early varieties before the onset of adverse conditions such as heat and drought. However, in years with good moisture supply, the yield of early varieties was found to be lower than that of medium and late varieties. At the Lalmikor Agricultural Research Institute, research was conducted to create new varieties of bread wheat with high grain quality, resistant to unfavorable environmental conditions and disease-resistant conditions for the rainfed regions of Uzbekistan.

In the experiments conducted in 2020, favorable weather conditions, high rainfall compared to many years, led to high productivity and productivity of bread wheat varieties on dry lands.

RESULTS AND DISCUSSION

According to weather data, the amount of precipitation during the vegetation period of plants in 2020 was 391 mm, which is 29 mm more than the average perennial (362 mm). The relative humidity was also an average of 71%, which can be seen to be favorable in the ripening phases of the wheat vegetation, and the air temperature was also normal (Table 1).

Changes in weather conditions during the growing season of cereals (data from Gallaaral meteorological station in 2020).

TABLE 1

Indicators	Months									Total or average
	X	XI	XII	I	II	III	IV	V	VI	
Precipitation, mm										
Average multi-year, ±	17,1	35,0	55,0	40,4	52,0	65,0	53,6	35,4	8,4	362,0
2019-2020	5,3	32,2	16,3	57,8	61,3	39,5	91,5	87,0	0	391,0
Compared to the average multi-year, ±	-11,8	-2,8	-38,7	+17,4	+9,3	-25,5	+37,9	+51,9	-8,4	+29
Air temperature, °C										
Average multi-year, ±	12,1	5,9	0,3	1,7	0,9	6,8	14,1	19,6	22,5	9,3
2019-2020	13,2	3,7	3,5	1,4	4,6	4,6	9,4	19,6	26,8	9,6
Compared to the average multi-year, ±	+1,1	-2,2	+3,2	-0,3	+3,7	-2,2	-4,7	0	+4,3	+0,3
Relative air humidity, %										
Average multi-year, ±	32	52	69	72	66	60	48	35	23	51
2019/2020	55	78	80	88	78	70	73	67	51	71
Compared to perennials, ±	+23	+26	+11	+16	+12	+10	+25	+32	+28	+20

During the research, the length of the spike, the number of grains in the spike and the weight of the grain in the spike, as well as the 1000 kernel weight were determined in the varieties and lines, high-yielding varieties and new lines were identified. According to him, the standard early-ripening variety Tezpishar has a plant height of 109 cm, the main spike length is 9,6 cm, the

number of spikelets is 17, the number of grains in the spike is 34 and the grain weight is in the spike 1,30 g, 1000 kernel weight 38 g and the total grain yield is 2, 6 t/ha.

The highest yields are observed in the new lines ICA2017 / 23, KP-2016/88, KP-2016/89, SP-2016/303 (IKARDA) and, accordingly, the grain yield are 3,26 t/ha, 2,94 t/ha, 2,93 t/ha and 2,81 t/ha, respectively. In the early-ripening variety, the number of grains in the spike and the grain weight in the spike were 33,9 pieces and 1,3 g, respectively, in the KP-2016/5 line 41,6 pieces and 1,5 g, in the KP-2016/88 line 41,4 pieces and 1,5 g, 45,7 pieces and 1,7 g on the KP-2016/89 line.

Varieties and lines of bread wheat in the RNS nursery, Gallaaral 2020.

TABLE 2

No	Varieties and lines name	Heading days, day, month	Plant height, cm	Spike length, cm	Number of spikelets per spike, pieces	Number of grains per spike, pieces	Grain weight per spike, g	1000 kernel weight, g	Yield, t/ha
1	Tezpishar (st)	01/V	109	9,5	16,8	33,9	1,3	37,6	2,63
2	Bakhmal-97	12/V	122	10,7	16,9	30,1	1,3	43,4	1,93
3	Sanzar-6	5/V	104	10,0	17,6	39,8	1,5	37,6	2,44
4	Istiklol-6	11/V	128	11,7	21,0	37,3	1,5	41,4	2,85
5	Sogdiana	9/V	102	9,7	17,6	37,5	1,5	40,0	2,35
6	Nushkent	3/V	134	10,5	17,3	38,1	1,7	45,2	2,60
7	Kizildon	4/V	103	9,4	17,6	37,0	1,4	38,8	2,50
8	SP-016/303	15/V	133	9,8	19,0	33,4	1,3	38,0	2,81
9	ICA2017/23	12/V	123	8,4	19,5	34,8	1,3	36,4	3,26
10	DNS2013/26	11/V	119	10,9	18,1	34,0	1,4	40,0	2,66
11	KP-2016/5	08/V	93	10,4	19,6	41,6	1,5	37,0	2,60
12	KP-2016/88	15/V	108	9,6	19,9	41,4	1,5	36,1	2,93
13	KP-2016/89	15/V	114	9,4	21,6	45,7	1,7	36,9	2,94
14	KP-2016/58	10/V	125	9,2	18,2	32,2	1,3	40,3	2,62
15	KP-2016/97	14/V	115	10,2	17,2	32,6	1,2	35,5	2,69
16	KP-016/117	05/V	120	8,9	19,7	35,7	1,4	38,1	2,73
17	NSR ₀₅								3,6

The generative organs of the wheat plant are susceptible to drought and heat. According to A.I.Nosatovsky, the lack of moisture in the soil during the formation of plant reproductive organs and during flowering, dry and high air temperatures during pollination lead to incomplete fertilization, and therefore the number of grains in the spike is reduced. According to researchers, the drought-tolerant varieties have a shorter ripening period. The second half of the wheat growing season in Uzbekistan takes place in the context of increasing drought and heat. Under natural conditions, high temperatures slow down the accumulation of dry matter and drastically reduce grain quality. High temperatures affect the reproductive organs of the plant, leading to incomplete fertilization during flowering. When high temperatures occur during the filling period, grain failure is observed, 1000 grains lose weight, and yields are low.

In 2021, the amount of precipitation compared to other years was 133.7 mm, which is 257.3 mm less than in 2020 (391 mm). (Table 3). Extreme drought conditions in 2021 caused wheat varieties to germinate in the spring. Under such conditions, a decrease in the number of seedlings in many winter wheat varieties, a sharp decline in yield was observed due to the fact that the drought continued with high temperatures in the spring.

Changes in weather conditions during the growing season of cereals (data of Gallaaral meteorological station, 2021).

TABLE 3

Indicators	Months									Total or average
	X	XI	XII	I	II	III	IV	V	VI	
Precipitation, mm										
2021 йил	1,1	1,8	1,4	3,2	10,5	95,7	5,7	14,7	0	133,7
Average multi-year, ±	18,0	38,3	54,2	39,7	48,2	65,7	58,2	36,2	8,1	362,0
Compared to the average multi-year, ±	-16,9	-36,5	-52,8	-35,8	-37,7	+30,0	-52,5	-21,5	-8,1	-228,3
Air temperature, °C										
2021 йили	12,3	6,5	-5,5	-4,3	5,3	7,4	14,3	22,0	26,6	11,9
Average multi-year, ±	11,8	5,8	0,5	-0,8	1,2	7,0	13,5	18,7	24,4	9,1
Compared to the average multi-year, ±	+0,5	+0,7	-4,0	-3,5	+4,1	+0,4	+0,8	+3,3	+2,2	+2,8
Relative air humidity, %										

2021 йил	52	68	72	79	71	76	56	49	29	60
Average perennial	59	73	81	83	80	74	67	59	45	63
Compared to the average multi-year, \pm	-7	-5	-9	-4,0	-9,0	+2,0	-11,0	-10,0	-16,0	-3,0

In grain crops, the growth period of the plant is divided into two: 1. Seeds germinate-heading 2. Heading-ripening(maturity). The duration of the ripening period depends on air and soil temperature and humidity conditions. When the air temperature is high, the grain filling period and grain ripening time are shortened. In Central Asia, including the dry lands of Uzbekistan, the early ripening of wheat is determined by the time of vegetation.

A 2021 study found that full germination in the early ripening template variety was detected on May 10, while in other varietal samples and lines, the maturation date was later than in the template variety.

Varieties and lines of bread wheat varieties in the RNS (yield trial) nursery, Gallaaral 2021.

TABLE 4

№	Varieties and lines name	Heading days, day, month	Plant height, cm	Spike length, cm	Number of spikelets per spike, pieces,	Number of grains per spike, pieces	Grain weight per spike, g	1000 kernel weight, g	Yield, t/ha
1.	Tezpishar (st)	10/V	69	8,3	13,0	25,0	0,8	31,6	0,46
2.	Sanzar-6	14/V	55	7,5	15,0	33,0	1,0	30,0	0,29
3.	Bakhmal-97	17/V	78	9,5	17,0	31,5	0,9	27,6	0,34
4.	Istiklol-6	16/V	76	8,8	17,5	37,5	1,2	33,0	0,37
5.	Sogdiana	15/V	60	9,0	16,7	39,0	1,2	31,2	0,47
6.	Nushkent	12/V	84	9,0	15,0	38,3	1,3	35,2	0,35
7.	Kizildon	12/V	65	9,5	16,0	42,5	1,3	29,6	0,36
8.	DNS2013/26	18/V	74	10,0	18,5	36,5	1,2	32,8	0,56
9.	Erytrospermum-40	11/V	70	9,5	16,0	37,0	1,1	30,0	0,54
10.	KP-2016/88	24/V	56	7,3	16,3	33,0	0,7	21,2	0,21
11.	KP -2016/89	24/V	56	8,0	17,0	28,5	0,6	22,4	0,30
12.	KP -2016/58	17/V	74	8,5	16,0	32,0	0,9	27,6	0,31
13.	KP -2016/97	23/V	57	8,5	16,5	34,0	0,7	20,8	0,24
14.	KP-2016/117	14/V	68	8,5	14,5	36,5	0,7	21,5	0,33

15.	KP 2016/303	20/V	72	9,0	15,0	35,5	1,1	30,8	0,35
16.	ICR.2017/23	24/V	64	8,8	17,5	33,0	0,8	24,4	0,23
17.	DNS-2020/2	16/V	63	9,7	16,0	47,3	1,0	21,6	0,24
18.	DNS-2020/4	14/V	62	10	17	55	1,2	21,2	0,42
19.	DNS 2020/6	13/V	74	9	17	40	0,9	24	0,33
20.	KP-2020/38	15/V	77,5	10,5	18	33	1,0	29,6	0,48
21.	KP-2020/126	15/V	66	10	16	53	1,1	21,6	0,28
	NSR ₀₅								0,34

CONCLUSIONS

During the studies, heat resistance and productivity indicators were identified in local bread wheat varieties and new lines. Heat and drought resistant lines were selected. The duration of the germination period depends on the biological characteristics of the variety, in which air temperature and day length play an important role.

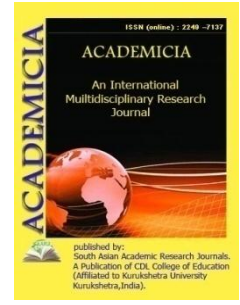
The duration of the germination period is important in determining early maturation. Studies have shown that there is a high correlation between productivity element performance in the spike and productivity. It was also found that favorable weather conditions lead to high productivity in soft wheat lines belonging to the IKARDA center. It was found that dry weather conditions, low rainfall and lack of soil moisture lead to a decrease in wheat yields on dry lands.

Low rainfall in the fall and winter months led to seed germination in the spring months as a result of a lack of moisture in the soil. It was found that this leads to a prolongation of the growing season, the passage of the ripening phases under strong thermal conditions, resulting in low yields without good filling of the grain.

REFERENCES

1. SHARMA A. et al. Correlation and heat susceptibility index analysis for terminal heat tolerance in bread wheat. Journal of Central European Agriculture, 2013, 14 (2), p.57-66.
2. Singh, N. B., Singh, Y. P., Singh, V. K., Javed, Bahar, Singh, V. P. N., Early growth vigour, phenology, seed size, seed hardness as a parameter for assessing terminal heat tolerance in wheat under late sown irrigated condition. Farm Sci. J. (2005) 14 (2): 25-28.
3. Trethowan R.M., M.Reynolds. Drought resistance: Genetic approaches for improving productivity under stress. In: H.T.Buck, J.E.Nisi, N.Salomon (eds.). Wheat Production in Stressed Environments. Proceedings of the 7th International Wheat Conference, 27 Nov.-2 Dec. 2005, Mar del Plata, Argentina. p. 289-300.
4. Maich R., D.Ortega, A.Misgrau and G.Manera. Genetic achievements under rainfed conditions. In: H.T.Buck, J.E.Nisi, N.Salomon (eds.). Wheat Production in Stressed Environments. Proceedings of the 7th International Wheat Conference, 27 November-2 December 2005, Mar del Plata, Argentina. p. 321-330.
5. Todd G.W., Webster D.L. Effects of repeated drought periods on photosynthesis and survival of cereal seedlings. Agron. J. (Medison) 57, 1999, r. 399-404.

6. Dorofeev V.F., Udachin R.A., Semenova L.V. idr .; Pshenitsymira. Pod red. V.F.Dorofeeva; Sost.R.A.Udachin. 2nd ed., Pererab. and dop. -L .; VO Agropromizdat. Leningr. otd-nie. 1987. –560 p.
7. Sinha S.K. Drought Resistance in Crop plants: A critical physiological and biochemical assessment. Drought tolerance in winter cereals. Proceeding of International Workshop 27-31 October. 1985. Capri. Italy. p.349-351.
8. Beknazarov N., Katkova R.O. Creation and dostoinstvsortovpshenitsydlyabogary / Selektisiyaisemenovodstvozernovyx, zernobobovyxikormovyxkultur. - Tashkent, 1983.-S. 46-49.
9. Amanov M.A. Sustainability of wheat to unprofitable factors in Uzbekistan. - Tashkent: Fan, 1978. –91 p.
10. Brezhnev D.D, Dorofeev V.F. Rastitelnyeresursykakgeneticheskayabazaselektsiisortovnaustoychivost. V kn.: Geneticheskieresursyiselektsiyarasteninyinaustoychivost k boleznyam, vreditelyamiabioticheskimfaktoramsredy.-Materialy IX kongressaEukarpia. Under obshcheyredaktseyak. VASXNIL D. D. Brejneva and chl. corr. VASXNIL V.F. Dorofeeva VNIIR im.N.I. Vavilova, -Leningrad, 1981. - P.5-24.
11. Lavronov G.A. Wheat of Uzbekistan. Tashkent, Uzbekistan Publishing House, 1972. - 350 p
12. Nasotovskiy A.I. Pshenitsa. (Biology). M .: Kolos. 1965. –568 p.
13. Xolbazarovich K. K., Sarvarogli M. J., Nikolaevna P. M. Drought and heat tolerance of durum wheat varieties for rainfed conditions of Uzbekistan //ACADEMICIA: An International Multidisciplinary Research Journal. – 2020. – T. 10. – №. 5. – C. 599-603.
14. Pokrovskaya M. N., arshiboev X. Kh., Khaibullaev S. Drought-heat resistance of durum and soft wheat varieties in dry conditions // Modern science: topical issues, achievements and innovations. - 2020 .-- S. 116-119.
15. Zhuraev MA Drought-resistant and heat-resistant varieties of soft wheat in rainfed conditions of Uzbekistan // Fundamental and applied scientific research: topical issues, achievements and innovations. - 2019 .-- S. 75-77.
16. Karshiboev Kh. Kh., Khojakulov T. Kh. Resistance of F2 hybrids of durum wheat to drought and heat on the dry land of Uzbekistan // Knowledge. - 2017. - No. 5-2. - S. 69-72.
17. Dilmurodovich D. S. et al. Selection of high grain yield elements of winter bread wheat lines for rainfed areas //Archive of Conferences. – 2021. – C. 55-62.



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A STUDY ON FACTORS CAUSING CAREER BREAK AND ITS IMPACT ON WOMEN REENTRANTS IN DAKSHIN KANNADA DISTRICT

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ABSTRACT

The research paper investigates the vital factors leading to career breaks in women and the resurge of women wanting to make a comeback to the organizational set up. The study adopts probability sampling with emphasis on stratified sampling technique to identify women reentry into workforce followed by convenience sampling technique under non probability sampling with $n=62$ thereby limiting itself to non-parametric data analysis of Kruskal – Wallis test. The mean rank was highest at 60.00 for outcome of (11) due to cumulative effect of marriage (1) and awaiting better prospects (5) while also (15) due to cumulative effect of child bearing (2), relocation of spouse (4), dependent care (6) and other detrimental factors (7) responsible for career break contributing to a significant difference with 0.05 ($p \leq 0.05$) in managing career work balance among women. Public policy intervention is quint essential in labour markets with the need for organizations to be more agile to support specific needs of women career reentrants.

KEYWORDS: Women, Career, Reentry, Workforce, Public Policy

INTRODUCTION

Women form an integral part of the Indian workforce. The total number of female workers in India is 149.9 million and female workers in rural and urban areas are 121.9 and 28.0 million respectively (source: census, 2011). Out of total 149.9 million female workers, 35.9 million females are working as cultivators and another 61.5 million are agricultural labourers". Of the

remaining female's workers, 8.5 million are in household Industry and 43.7 million are classified as other workers. 11.2 As per census 2011, the Work Participation Rate for women is 25.51 per cent as compared to 25.63 per cent in 2001. The Worker Population Rate (WPR) for women in rural areas is 35.1 per cent as compared to 17.5 per cent in urban areas based on 4th Annual Employment-Unemployment Survey (2013-14) and same is 30.2 per cent in rural area and 14.8 per cent in urban area under 5th Annual Employment-Unemployment Survey (2015-16) under Usual Principal & Subsidiary Status (UPSS) Approach. As per 4th and 5th Annual Employment Unemployment Survey launched by Labour Bureau in December 2013 and April 2015, the overall Female Labour Force Participation Rate under Usual Principal & Subsidiary Status (UPSS) Approach has been decreased from 31.1 per cent to 27.4 per cent. As per the results of Periodic Labour Force Survey (PLFS) conducted by National Sample Survey Office, Ministry of Statistics and programme Implementation during 2017-18, the overall Worker Population Ratio for women in the age group 15 & above was 22% and it was 23.7% in rural areas as compared to 18.2% in urban areas based on usual status (Principal status+ subsidiary status) basis. The overall female Labour Force Participation Rate for the age group 15 & above status (Principal status + subsidiary status) basis was 23.3% which was 24.6% in rural areas as compared to 20.4% in urban areas. The overall unemployment rate for the female was 5.6% and the unemployment rate of female in rural areas was 3.8% and 10.8% in urban areas. [*annual survey report – ministry of labour and employment 2019 – 20.*] However, data on women re- entry into workforce is glaringly unavailable and needs to be investigated. This research paper ponders into re-entry reasons and characteristics of women into workforce.

Research Objectives

- (1) To identify the factors responsible for women re-entering into workforce
- (2) To examine the specific needs of women re- entering into workforce.

LITERATURE REVIEW: -

At times of COVID-19, labour market has remained a concern for policymakers (Borland and Coelli 2020). In a recent study conducted it was found that the societal expectations from Indian women to work was a bare minimum of around 4% which proves the fact that Indian society doesn't have any kind of expectation from women to contribute to the expenses (Rajesh S., 2013). However, women have remained a larger part of workforce and their re-entry to work after a career break requires undaunting attention.

The term re-entry of women into workforce has been a topic of concern ever since 1960's and it was first studied in U.S.A in late 1970's (Geber, 2000). 'Re-entry women' used here is defined as women returning to work after a career break; voluntarily or involuntarily of more than six months, and now desires to once again engage in full-time employment. The women seeking re-entry are with abundance work experience, well qualified and all motivated with wanting to make a "comeback". However, the length of their career break appears to play a key role in the re-entry process. (Gwal, 2016)

The Theoretical Perspectives on Women's careers are kaleidoscope career model of Mainiero and Sullivan (2005) argue that women in early careers focus on challenge, during their mid-career, focus on balance and in the later career look for authenticity. Career scape model of

McKie et al. (2013) proposes that women's career choices are driven by willingness to have greater control on work content, time and need for autonomy.

There are literature support for reasons for women's reentry with prime being financial independence, career identity and work centrality (Singh & Vanka, 2021). However, in our study we choose to split up women re- entry into workforce as internal factors and external factors.

Women reentry into workforce: - Internal factors

Reentry women on life planning have been found to have more career indecision (Slaney, tafford, & Russell, 1981) similar to traditional college students (Slaney, 1986). The effects of career indecision (Slaney & Dickson, 1985; Slaney & Lewis, 1986) have succeeded in producing change in career-undecided women i.e reentry women have been found to be relatively career decided and use a rational career decision-making style (MacKinnon-Slaney et al., 1988; Read et al., 1988) with significantly higher expectations of their careers' providing more future life satisfaction (Read et al., 1988) alongside desirability to have a new career (Sewall, 1984) and new work (Pickering & Galvin-Schaefer, 1988; Read et al., 1988). Hence most reentry women were employed full time, had higher salaries, performed more volunteer work, were more satisfied with their jobs, and placed more emphasis on intrinsic work factors including being autonomous and experiencing a sense of accomplishment (Erdwins and Mellinger 1985). In brief reentry women chose sober jobs like social service, education, and health occupations than management and scientific occupations (Malin et al., 1980).

However, with changing times, when leaving the workforce, women are encouraged to develop a long-range plan for reentry (Greer, 2013; Ronzio, 2012; Zimmerman & Clark, 2016). They aspire for a career re-entry to engage in paid work (Harman & Sealy, 2017), with a compromised yet a better fit paid work in sync with their non-work roles (Hakim, 2000). Hence, women's decision to restart a career after a break with presumptions of the unavailability of a flexible work arrangement, part-time work and lack of training (Panteli, 2006) has been studied as re-entry irrespective of shifts in career or field (McKie et al., 2013) while women who identify strongly with their careers and possess a sense of affiliation with their profession return to the same career after the career break (Herman, 2015) (Stanley, 2018). Overall, most women returnees feel welcomed and included, they tend to have a positive outlook towards their career and feel satisfied with their jobs (Bharathi Ravindran, Rupashree Baral, 2012). But brutally sexism persists in organizations as gendered workplace culture (Herman, 2009) observes sexist behavior or formal discrimination, the interpersonal bias among employers' perceptions of women employees being too emotional, less committed, being incapable of finishing tasks, and not planning to return to work after childbirth are observed (Hebl and Kleck, 2002) (Hoobler et al., 2009) (Koeber et al., 2006) (Koch et al., 2015). Further few studies have examined the desire to work after career break (Pickering & Galvin-Schaefer, 1988; Read et al., 1988) that is the liminal period between staying home and workforce re-entry (Smith, Jarman, & Osborn, 1999; Smith, Flowers, & Larkin, 2009) are usually determined by less committed or incompetent at reentry thereby persuading women to usually pursue alternative careers (Lovejoy and Stone, 2012). Thus organizations need to work on cost efficiency of refreshing a re- entry compared to preparing a 'new recruit' from scratch (Roberts 2002; Quant 2001) that could have prelude tendency that career breaks result in downward mobility in salary and employment status (Gwal, 2016). This take us to focus on the notion that reentry women often underrate their actual abilities (Ekstrom et al., 1981) as they possess excellent retention rates on re- entry (Blankenship et al 2003; Williams et al 2002;

Templeman 2001; Nottingham and Foreman 2000; Alden and Carrozza 1997; Kalnins et al 1994). and that career reentry after a career break (Diekmann et al., 2019) among women professionals' merits attention (Singh & Vanka, 2021).

Reentry women have been found to be more concerned with independent activity (Gough, 1975), with conflicts and emotional distress for beliefs about their roles, beliefs about self, and interpersonal dissatisfaction (Gilbert, Manning, & Ponder, 1980) exhibiting a less internalized locus of control (Erdwins & Mellinger, 1984; Mellinger & Erdwins, 1985). Therefore, reentry women may have problems in self-concept and self-perception (King & Bauer, 1988). Although women in reentry relate themselves to achievement motivation (Farmer & Fyans, 1983) (Erdwins et al., 1982; Pickering & Galvin-Schaefer, 1988) exhibit less fear of success (Freilino & Hummel, 1985) as they have found to exhibit less ambivalent attitudes toward achievement (Freilino & Hummel, 1985). Further women of re-entry have urge for increasing knowledge (Clayton & Smith, 1987; MacKinnon-Slaney et al., 1988; Sewall, 1984), self-actualization, self-improvement, and social and humanitarian motives (Clayton & Smith, 1987) in order to become self-supporting (Clayton & Smith, 1987) with extrinsic job satisfaction (Smart & Pascarella, 1987) that satiates job dissatisfaction, better employment, or changing jobs (Badenhoop & Johansen, 1980; MacKinnon-Slaney, Barber, & Slaney, 1988; Read, Elliott, Escobar, & Slaney, 1988).

To this a step further, re-entry is influenced by age or time of reentry (Healy's, 1999). women returners', have focused on women's choices and career orientations (Doorewaard et al 2004; Houston and Marks 2003) with deep love of the profession, and the enthusiasm (Durand and Randhawa 2002; Stark et al 2001; Pett 2001; Wilcock, 2000). Women returners have a perception of their own skills (Ruth Mason, 2002) as they feel out of touch and fearful of changes in new technology and methods (Hitchcock 2003; Quant 2002; Waibel 2002; Wilcock 2000). Further using career assessment tools, finding a mentor, and focusing on self-care facilitate the re-entry process (Ericksen et al., 2008) requires taking assertiveness training prior to re-entry can also help female professionals (Ericksen et al., 2008). Ronzio (2012) maintains that seeing a career counselor before reentry can help with career transitions, where employers such as consulting firms, have specific programs targeted at re-entrants (Lovejoy & Stone, 2012). This could help solve unrealistic expectations of highly qualified women who often report feeling frustrated and depressed because of their reentry experiences (Lovejoy & Stone, 2012). Thus, women workforce reentry requires some type of intervention (Ericksen et al., 2008; Greer, 2013) as women often fail to maintain professional networks or keep job skills current, and very few create any type of plan for reentry (Greer, 2013). Therefore, Zimmerman and Clark (2016, p.626) argue that "from the day that women opt-out of the workplace, they should be planning for their reentry with a specific focus on maintaining and continuing to develop their skills."

Women re-entry into workforce: - external factors

Family is a strong reason for women to re-enter workforce (Badenhoop & Johansen, 1980). However, a women's vocational role is delayed till 35 years until her family role is established (Betz & Fitzgerald, 1987) and that career versus family values conflict (Kinnier & Townley, 1986) role conflict and emotional distress (Gilbert et al., 1980) leading to a prime non motivational factor for career re-entry (Badenhoop & Johansen, 1980). Further with mounting family difficulties like availability of financial resources (Sewall, 1984) women reentering the workforce has increased the ability to contribute to the family, both financially and experientially

(Clayton & Smith, 1987). Thus, most women reenters are middle class with marriage and children at home, single heads of households, displaced homemakers, or empty-nesters. (Benokraitis, 1987; Christian & Wilson, 1985; Dabrowski, 1983; King & Bauer, 1988; Radloff, 1980). On a personal forefront, reentry women valued freedom and independence over conflicts and intimate relationships (Kinnier & Townley, 1986) which showcased that reentry women and their partners had increased confidence, reduced anxiety, and better relationships with their children and partners (Kelly, 1982). Thereby the vital role of partners (Blossfeld et al., 2001; Hoherz, 2014; Jacob & Kleinert, 2014) as a social support (Höhne, 2007) with emotional and child care support is the most efficient means of assisting women's re-entry into the work force (Brockel, 2018).

External factors such as education and access to childcare would also directly influence women's reentry ability (Nakamura and Ueda, 1999). Children and the time necessary to devote to them are viewed by reentry women as a major obstacle to finishing education (Badenhoop & Johansen, 1980). Read et al. (1988) also found that women with children believe family, as well as finances and limitations of time, are obstacles to their goals with majority time sort in appropriation of the child seen entering school or growing up (MacKinnon-Slaney et al., 1988; Pickering & Galvin-Schaefer, 1988; Sewall, 1984). In two studies (MacKinnon-Slaney et al., 1988; Read et al., 1988) married reentry women were found to be more likely to see themselves as having more family emotional support as compared with separated and divorced women. In these same studies, divorced reentry women placed a significantly higher value on better employment and financial need than did married reentry women. Reentry women with children have also been found to place a higher value on better jobs and income than have women without children (Read et al., 1988). Erickson et al. (2008), focuses specifically on mothers' reentry experiences into the workforce through conceptual framework highlights multiple forces driving women back to work, such as financial, environmental and self-image. Motherhood unseeingly bears a penalty (Abend Roth, van der Lippe, & Maas, 2012; Aisenbrey et al., 2009) with the number and age of children playing a obnoxious role in reentry (Drasch, 2013). In short the transition from staying home with children to workforce reentry can result in personal changes such as decreased self-esteem, lack of confidence, or depression, which may require some type of intervention (Erickson et al., 2008; Greer, 2013) with job demands (Bharathi and Baral, 2012) thus helping assure the well-being of the re-entry of women who appear are caught between being a good employee and a good mother (for exception, see Maheshwari, 2014; Ravindran and Baral, 2013). Therefore, returners should be offered flexible work arrangements and programs for women returners needs to be readily available in practice (Mishra 2016).

Methodology: -The study adopts probability sampling with emphasis on stratified sampling technique to identify women reentry into workforce followed by convenience sampling technique under non probability sampling with n=63 thereby limiting itself to non-parametric data analysis of Kruskal – Wallis test.

Hypothesis: -

H₀: - There is no significant difference among factors hindering women reentrants progress across different types of career breaks.

H₁: - There is significant difference among factors hindering women reentrants progress across different types of career breaks.

Data Analysis and Interpretation using Kruskal -Wallis Test: -**Descriptive Statistics: -**

Factors	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	sig
Outcome	n=6	n=19	n=22	n=11	n=11	n=11	n=8	n=6	n=1	n=2	n=1	n=1	n=1	n=1	n=1	p≤0.05
Lower salary	33.0	37.34	15.75	51.00	29.86	39.00	25.50	47.00	7.50	24.00	24.00	7.50	7.50	7.50	7.50	0.106
Lower position and authority	35.75	34.97	21.50	20.50	35.00	38.00	31.69	36.08	5.00	20.50	20.50	5.00	20.50	20.50	5.00	0.599
Lower job role	31.17	32.84	21.25	12.50	39.86	30.00	29.81	42.08	3.50	12.50	58.00	12.50	12.50	12.50	3.50	0.125
Lower assessment of performance	33.83	32.32	11.00	53.00	35.64	40.00	42.50	28.17	3.00	19.00	19.00	19.00	19.00	19.00	3.00	0.215
managing work-life balance	33.33	26.42	19.50	51.50	43.23	38.50	36.44	24.53	19.50	19.50	60.00	4.00	19.50	4.00	60.00	0.05*
Knowledge outdated	32.33	34.24	23.25	33.5	35.45	33.5	34.19	34.75	2.00	13.00	13.00	33.5	2.00	13.00	33.5	0.576
Lack of support from superiors	28.17	35.89	6.25	59.00	33.41	27.50	35.38	37.33	2.00	10.50	10.50	27.50	10.50	10.50	46.50	0.119
Work culture policies	34.83	31.03	17.00	49.50	35.27	36.00	41.75	31.00	17.00	17.00	17.00	3.00	17.00	3.00	36.00	0.376
Learn new skills	44.83	35.63	28.00	49.50	23.91	28.00	32.00	25.50	6.00	28.00	28.00	28.00	6.00	28.00	49.50	0.332
Talent and expertise not fully utilized	30.67	33.66	21.75	48.5	33.14	31.5	36.06	30.25	12.00	12.00	59.50	31.50	1.00	12.00	31.50	0.494
Job dissatisfaction	30.67	33.82	19.00	45.00	36.77	27.00	35.13	36.33	11.00	11.00	11.00	11.00	11.00	2.00	45.00	0.338

Slow career growth	40.83	26.82	23.50	48.00	37.23	32.00	38.75	39.83	3.00	15.00	15.00	32.00	15.00	15.00	3.00	0.20
Lack of same status and respect	35.83	30.37	7.50	59.00	36.50	30.00	35.06	41.67	12.50	12.50	12.50	30.00	12.50	30.00	2.50	0.17
Lack of challenging task assigned	31.75	30.63	19.75	47.00	35.09	28.50	33.94	41.00	11.00	11.00	59.00	38.50	11.00	28.50	2.00	0.36
Lack of credibility	34.92	29.32	11.50	58.00	34.41	30.00	34.69	37.58	11.50	11.50	58.00	30.00	11.50	30.00	30.00	0.41

Source: - Survey Data SPSS version 23

Note: - the above numerals stand for: 1- marriage, 2 – child bearing, 3- household responsibilities, 4 - relocation of spouse, 5 – awaiting better prospects, 6- dependent care, 7 – any other, 8 – (1&2), 9 – (2&3), 10 – (2&6), 11 – (1&5), 12 – (1&2&3&4), 13 – (5&7), 14 – (2&4&5), 15 – (2&4&6&7)

Inferential statistics: -

The Kruskal – Wallis test relies on mean rank which was highest at 51.00 for outcome of lower salary at reentry due to relocation of spouse (4) , 38.00 for outcome of lower position at reentry due to dependent care (6), 58.00 for outcome of lower job role at reentry(11) due to cumulative effect of marriage (1) and awaiting better prospects (5), 53.00 for outcome of lower assessment performance due to relocation of spouse (4), 35.45 for outcome of knowledge outdated at reentry due to awaiting better career prospects (5), 59.00 for outcome of lack of support from superiors at reentry due to relocation of spouse (4), 49.50 for outcome of ardent work - culture policies at reentry due to relocation of spouse (4), 49.50 for outcome of learning new skills at reentry due to relocation of spouse(4) and (15) due to cumulative effect of child bearing(2), relocation of spouse(4), dependent care(6) and other detrimental factors (7), 59.50 for outcome of talent and expertise not fully utilized at reentry(11) due cumulative effect of marriage(1) and awaiting better prospects (5), 45.00 for outcome of job dissatisfaction at reentry due to relocation of spouse(4) and (15) due to cumulative effect of child bearing (2), relocation of spouse(4), dependent care (6) and other detrimental factors (7), 48.00 for outcome of slow career growth at reentry due to relocation of spouse (4), 59.00 for outcome of lack of same status and respect at reentry due to relocation of spouse(4), 59.00 for outcome of lack of challenging task assigned at reentry (11) due cumulative effect of marriage(1) and awaiting better prospects (5), 58.00 for outcome of lack of credibility at work at reentry due to relocation of spouse (4) and (11) due to cumulative effect of marriage(1) and awaiting better prospects (5).

Overall, the mean rank was highest at 60.00 for outcome of (11) due to cumulative effect of marriage (1) and awaiting better prospects (5); also (15) due to cumulative effect of childbearing (2), relocation of spouse (4), dependent care (6) and other detrimental factors (7), responsible for

career break contributing to a significant difference with 0.05 ($p \leq 0.05$) in managing career work balance. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted.

Scope and limitations: -The current study is one existential part of the pilot study, thereby not covering all aspects in the pilot study undertaken. Further the study is preliminary attempt to understand the nature and work-life aspects of women re-entrants, thus restricting itself to the data collected from Dakshin kannada only. It is a cross sectional study. Future research can be extended to more profound outlook on career breaks and re-entry by ethnic background of women and men. It can also ponder into the frivolous nature of organizations in complying to programs and essentials for women reentrants.

Conclusions: - Women reentering workforce do have varied characteristics and needs which have to be identified and more adequately addressed. Thus, the need to advance the scientific inquiry in the area of reentry women in a more coordinated with stringently controlled research effort is vital. Further labor market structures with employers and government inclusive policies, work practices and cultural traditions play an important role in combining parenthood and employment in post-industrial societies. The labour markets are not only structured by policies, practices, norms, and networks but they also reinforce gender inequality. Thus, labor markets with public policy interventions must reconsider the dearth of research on re-entry women, on which research across sectors is advocated. We hope that the findings of this study will be helpful and kindle scholarly interest in career re-entry of women professionals which is vital to enhance the current understanding of the career restart; more specifically with the aim was to understand the reasons and enablers of re-entry.

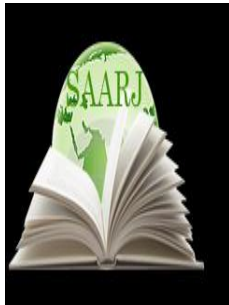
REFERENCES: -

1. Abendroth, A.-K., van der Lippe, T., & Maas, I. (2012). Social support and the workinghours of employed mothers in Europe. *Social Science Research*, 41, 581-597.
2. Aisenbrey, S., Evertsson, M., & Grunow, D. (2009). Is there a career penalty formothers' time out? A comparison of Germany, Sweden and the United States. *Social Forces*, 88, 573-605.
3. Alden, K.R. and Carrozza, M. 1997. The North Carolina AHECself- paced RN refresher program: an evaluation of the first twoyears. *Journal of Continuing Education in Nursing*, 28(1):14- 19
4. Bharathi, R., & Baral, R. (2012 September). Women's careerexit and reentry: A qualitative study, Conference paperpresented at the 13th International Academy of Managementand Business (IAMB) Conference, Bali, Indonesia.
5. Blankenship, J., Winslow, S. and Underwood Smith, A. 2003. Refresher course for inactive RNs facilitates workforce re- entry. *Journal for Nurses in Staff Development*, 19(6):288- 291.
6. Blossfeld, H.-P., Drobnič, S., & Rohwer, G. (2001). Spouses' employment careers in (West) Germany. In H.-P. Blossfeld & S. Drobnič (Eds.), *Spouses' employmentcareers in (West) Germany* (pp. 53-76). Oxford, England: Oxford University Press.

7. Bröckel, M. 2018. "The Role of Partners' Support for Women's Re-Entry into Employment after a Child-Related Career Break in Germany." *Journal of Family Issues* 39 (7): 1739–1769.
8. Drasch, K. (2013). The re-entry of mothers in Germany into employment after family-related interruptions: Empirical evidence and methodological aspects from a life course perspective (IAB-Bibliothek [Dissertationen]: Vol. 343). Bielefeld, Germany: W. Bertelsmann.
9. Diekman, A. B., Clark, E. K., & Belanger, A. L. (2019). Finding common ground: Synthesizing divergent theoretical views to promote women's STEM Pursuits. *Social Issues and Policy Review*, 13(1), 182–210.
10. Doorewaard, H, Hendrickx, J and Verschuren, P (2004) 'Work Orientations of Female Returners' Work, Employment and Society, 18 (1) pp. 7-27.
11. Durand, M. and Randhawa, G. 2002. RNs' views about returning to practice after a career break. *British Journal of Nursing*, 11(7):477- 485.
12. Ericksen, K. S., Jurgens, J. C., Garrett, M. T., & Swedburg, R. B. (2008). Should I stay at home or should I go back to work? Workforce reentry influences on a mother's decision making process. *Journal of Employment Counseling*, 45(4), 156-167.
13. Greer, T. W. (2013). Facilitating successful re-entries in the United States: Training and development for women returners. *New Horizons in Adult Education & Human Resource Development*, 25(3), 41-61.
14. Hakim, C. (2000). Work–lifestyle choices in the 21st century: Preference theory. Oxford University Press.
15. Harman, C., & Sealy, R. (2017). Opt-in or opt-out: Exploring how women construe their ambition at early career stages. *Career Development International*, 22(4), 372–398.
16. Healy, G (1999) 'Structuring Commitments in Interrupted Careers: Career Breaks, Commitment and the Life Cycle in Teaching' *Gender, Work and Organization*, 6 (4) pp.185-201.
17. Herman, C. (2009). It's not the break that's the problem: Women SET professionals and career breaks in European companies. DG for Research: European Communities, Brussels.
18. Herman, C. (2015). Rebooting and rerouting: Women's articulations of frayed careers in science, engineering and technology professions. *Gender, Work & Organization*, 22(4), 324–338
19. Hitchcock, R. 2003. Many happy returners. *Nursing Standard*, 17(34):18.
20. Hoherz, S. (2014). Maternity leave in the context of couples: The impact of both partners' characteristics and employment experiences on mothers' re-entry into the labour market (SOEP Papers on Multidisciplinary Panel Data Research No.647). Berlin, Germany: DIW.
21. Höhne, A. (2007). Soziale Unterstützung in Partnerschaften: Individuelle Beschäftigungschancen und Risiken im ostdeutschen Transformationsprozess unter Berücksichtigung des Partnerschaftskontextes [Social support in partnerships: Individual

- employment opportunities and risks in the East German transition process, taking into account the context of the partnership]. Berlin, Germany: Logos.
22. Jacob, M., & Kleinert, C. (2014). Marriage, gender, and class: The effects of partner resources on unemployment exit in Germany. *Social Forces*, 92, 839-871.
 23. Houston, D M and Marks, G (2003) 'The Role of Planning and Workplace Support in Returning to Work after Maternity Leave' *British Journal of Industrial Relations*, 41 (2) pp. 197-214.
 24. Kalnins, I., Phelps, S. and Glauber, W. 1994. Outcomes of RN refresher courses in a midwestern city. *Journal of Continuing Education in Nursing*, 25(6):268- 271.
 25. Lewis, L. H. (Ed.). (1988). Addressing the needs of returning women. San Francisco, CA: Jossey-Bass
 26. Lovejoy, M., & Stone, P. (2012). Opting back in: The influence of time at home on professional women's career redirection after opting out. *Gender, Work & Organization*, 19(6), 631-653. doi:10.1111/j.1468-0432.2010.00550.x
 27. Maheshwari, M. (2014), "Dynamics of Being a "Good Employee" and a "Good Mother": Dilemmas of Professional Indian Working Women", Indian Institute of Management Udaipur Research Paper Series, No.(2012-2171274).
 28. McKie, L., Biese, I., & Jyrkinen, M. (2013). 'The best time is now!': The temporal and spatial dynamics of women opting in to self-employment. *Gender, Work & Organization*, 20(2), 184–196
 29. Nakamura, J. and Ueda, A. (1999), "On the determinants of career interruption by childbirth among married
 30. women in Japan", *Journal of the Japanese and International Economies*, Vol. 13 No. 1, pp. 73-89.
 31. Nishii, L.H. and Özbilgin, M.F. (2007), "Global diversity management: towards a conceptual framework", *The International Journal of Human Resource Management*, Vol. 18 No. 11, pp. 1883-1894
 32. Panteli, N. 2006. "Returning to IT: Employment and Development after a Career Break in the United Kingdom." *Labour & Industry: a Journal of the Social and Economic Relations of Work* 16 (3): 133–150.
 33. Pett, C. 2001. Helping old dogs learn new tricks: effective teaching and assessment for returning practitioners. *Midwifery Digest*, 11(3):305- 307
 34. Rajeshwari Gwal (2016), Working women- Career breaks and re-entry in a fast changing business environment. —*Metamorphosis*, 15(1) 2016:1-9.
 35. Ravindran, B. and Baral, R. (2013), "Determinants of career exit and professional re-entry of working women in India", *Review of HRM*, Vol. 2, pp. 189-201.
 36. Ronzio, C.R. (2012). Counseling issues for adult women in career transition. *Journal of Employment Counseling*, 19, 74-83.

37. Nottingham, E and Foreman, K. 2000. Creating the right environment for return- to- practice candidates. *Nursing Standard*,14(32):44- 45.
38. Quant, T. 2001. Education for RNs returning to practice. *Nursing Standard*, 15(17):39- 41.
39. Roberts, V. 2002. Responding to Code Bill: workforce in crisis community partnerships returning RNs to the workforce. *Georgia Nursing*, 61(4):26- 27.
40. Smith, J.A., Flowers, P., & Larkin, M. (2009). Interpretative phenomenological analysis: Theory, method and research. Sage
41. Stanley, B. B. (2018). Nurses returning to practice after an extended career break: A narrative study. University of Central Oklahoma.
42. Stark, S., Warne, T. and Street, C. 2001. Practice nursing: an evaluation of a training practice initiative. *RN Education Today*,21(4):287- 296.
43. Templeman, E. 2001. Supporting nurse returners. *Nursing Times*,97(44):36.
44. Waibel, R. 2002. An administrator returns to practice as a perioperative RN. *AORN Journal*, 76(5):862- 865
45. Wilcock, A. 2000. A welcome return. *Nursing Standard*,14(30):18- 20.
46. Williams, A., Brown, A., Crispin, D. and Gibson, D. 2002. Targeting out of the workforce RNs: a promising local recruitment strategy. *Collegian*, 9(1):8- 11.
47. Zimmerman, L.M., & Clark, M.A. (2016). Opting-out and opting-in: A review and agenda for future research. *Career Development International*, 21(6), 603-633.



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IMPROVEMENT OF INNOVATIVE MECHANISMS IN ECONOMIC DEVELOPMENT

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ABSTRACT

This article presents the role of innovation and ways to improve innovation mechanisms in the context of crises occurring during a pandemic. Innovative clusters are defined separately, the author has developed scientific developments and prepared proposals and recommendations for implementation in practice.

KEYWORDS: *Crisis, Innovation, Innovation Mechanism, Clusters, Cooperatives, Concerns, Syndicates, Regional Economies, Innovation Cores And Poles, Transformation.*

INTRODUCTION

At a time when the effects of the crisis continue in the world, in some countries, where the pace of decline continues instead of development, the rapid development of the economy of our country testifies to the correctness of economic policy. All of the above data show the relevance of the topic, which is planned to introduce new approaches to the economy, a system of innovations through the improvement of innovation mechanisms in the economy. In the context of globalization of the economy and the requirements of market relations, there is a fierce competition for investment in the world. If we analyze the investment tendencies of the world's fastest growing economies, we can cite China as one of the first Asian countries and the United States as an overseas country. The pursuit of such high-performance investments can be observed in many developed and developing countries of the world, which are transitioning to a market economy. "Investment" is derived from the English word "investments", which means "capital investment". In the broadest sense, investment is the transfer of funds for a certain period of time to entrepreneurship or other activities in order to earn income or profit. ". According to Swedish economist Klos Eklund, "investment is tomorrow to have more consumption something left to the keun. Part of it is consumer goods that are currently left unused, and the other part is resources aimed at expanding production ". Research in this area is one of the most pressing

issues today. "Investment is a capital investment, which is a set of tangible and intangible funds spent on business and other activities for a certain period of time in order to obtain economic benefits on a risk basis".

Main part

The global financial and economic crisis observed in the world community under the influence of the COVID-19 pandemic is having a significant impact on all sectors of the economy, especially on the supply of products to the world's population. The full satisfaction of the needs of the population in quality and affordable products produced locally depends mainly on the development of the agricultural sector, which in turn requires the introduction of modern and innovative methods in the industry. Modern innovative methods are now manifested in the background of the formation of clusters.

In today's scientific literature, there are scientific developments dedicated to the activities of innovative associations, scientific organizations and enterprises associated with innovation. At the same time, innovation clusters are recognized as one of the main forms of diversified farms. The development of the regional economy consists, first of all, in the rational placement of industrial enterprises and the formation of innovative trends, in particular, innovative clusters, cooperatives, concerns, syndicates, and ensuring their rapid development.

Gradual economic reforms in Uzbekistan are being carried out with a view to achieving a rational sector, production and territorial balance, ensuring economic growth and improving the living standards of the population. The solution of these problems is inextricably linked with the implementation of appropriate investment policy, regulation of investment processes and the formation of an effective system of support. At the current stage of market reforms, the investment policy pursued in Uzbekistan is an important factor in determining the stability, structural and qualitative changes in the economy. In the context of globalization of the economy and the requirements of market relations, there is a fierce competition for investment in the world. Today, Uzbekistan is a country ready for investment. The local policy pursued here, the preservation of peace, the positive situation in macroeconomic indicators - all this serves as a key factor in actively attracting foreign investment. At present, a number of methods have been developed to regulate investment in economically developed countries. They have some experience in the development and implementation of large-scale scientific, technical, social, energy, nature protection and other programs. Also, 2 tasks play a decisive role in the organization of investment in developed countries [8]:

- the use of a system of economic and legal methods in regulating the structure of production and investment processes;
- Development of planning methods at the state and enterprise levels, ie target programs of scientific forecasts, summaries and balance sheets to overcome the negative events and crises in the regulation of investment.

It should be noted that after the introduction of planning in the regulation of investment, France, the Netherlands, Norway and Japan began to develop.

This experience later spread to Sweden, Finland, the United Kingdom, Italy, Belgium, the Federal Republic of Germany, Spain, Portugal, Greece, and Ireland. Due to the different levels of development between the countries, they have formed planning systems to regulate the following

investments. North American system (USA, Canada, Mexico). It has created the conditions for the confrontation of the European Economic Community and the established European common market, as well as had a strong impact on the efficiency of the reproduction process.

RESULTS AND DISCUSSION

Studies by Harvard Business School experts show that the share of innovation clusters in the economy is 32% in the United States, 39% in Sweden, and 44% in other developed countries [1]. In the scientific literature, cluster clustering, agglomeration factor, institutional factors, scientific and technical factors affect the placement of clusters.

In neoclassical theory, clusters are seen as a structure that provides stable interactions between economic agents, ensures economic growth, and leads to a high level of competitiveness. Much research has been done on clusters, the most notable of which are M. Porter's developments. A cluster is a group of companies and organizations that are geographically close and interact with each other. He sees his developments as advantages of geographical location and production, technological proximity. Ketels' research focused on geographical localization. In geographical localization, clusters are interconnected, interacting with each other in terms of dynamic development. According to him, if we ascend at a distance of 10 km from the earth's surface, the clusters are similar and close to each other, but if we analyze them closely, they are radically different from each other [2]. Analyzing the activities of innovative clusters, MP Vainarenko identified the efficiency of cluster activities and developed the concept of "5 I". The author summed up the research of the above scientists and developed a scientific development "3 I".

Such scientific developments have a place in the development of the region's economy. Divided into three major mechanisms, the first mechanism transforms society with the business environment, the second mechanism develops ways to develop the region's economy, while the development of regional development strategies determines the prospects of the region. The third mechanism is the process of cluster consolidation through the development of the economy, integration with information systems. Concentrations of geographical and intersectoral development and business society, market infrastructure will be developed, and these clusters will become large associations.

M. Galushkina believes that the acceleration of cluster activities, in turn, will develop an innovative economy. The competitiveness of the region's economy is largely due to the availability of innovative regions with high efficiency. In our opinion, innovation clusters should be identified as the core of innovative regions and the locomotives of development. Buyers of innovative products will be offered a wide range of new technical and technological products. On the basis of such structural changes, "innovative nuclei" are formed and their distribution is observed, and "innovative poles" begin to appear. Under the influence of strong ties and relationships between them, "innovation clusters" begin to develop.

Under the influence of the cluster approach, the region enters the stage of innovative development, as a result of economic activity, the clusters undergo processes of concentration and cooperation. Specialization and localization processes can be cited as one of the main reasons for the sustainable development of clusters. These processes are formed on the basis of the interrelationships of clusters, and it is necessary to improve the horizontal and vertical development of clusters.

At the same time against the background of active development of clusters is human capital. This is a high level of mobilization of human capital, and as a result of this process, the level of mobilization of human capital is determined. Based on the following results, clusters form highly innovative human capital;

First, the competitiveness of the labor market will develop, highly qualified specialists will be selected from among the workers, there will be competition among highly skilled workers for jobs with good conditions;

Second, there will be an increase in the number of highly skilled workers in the labor market, an increase in the number of highly skilled workers in clusters, and the same process will occur in industries;

Third, research centers will be established within the clusters, which will strengthen the process of specialization, as well as accelerate the process of economic growth.

CONCLUSIONS

In conclusion, it can be said that ways to develop innovations in the development of the economy, as well as to improve innovation mechanisms have been developed. On the basis of these developments, the development of regional economies, innovation clusters as the core of innovative regions and the locomotives of development are presented. On the basis of such structural changes, "innovative nuclei" are formed and their distribution is observed, and "innovative poles" begin to appear. Under the influence of strong ties and relationships between them, "innovation clusters" begin to develop. The application of the North American policy of "fixed-purpose investment - stabilization of the competitiveness of entrepreneurs" in the country as "investment in the development of small business" meets today's requirements. In addition, for the regulation of investment processes in the Republic of Uzbekistan, in our opinion, the Italian type of regional planning provides for the regulation of investment processes in the development of individual sectors of the economy, for example, disparities between regions; It is also expedient to use in the context of Uzbekistan a method aimed at eliminating the disparities between industry and agriculture: the degree of stratification of the population and other cases.

REFERENCES

1. Decree of the President of the Republic of Uzbekistan No. PF-5924: "On measures to further improve and popularize physical culture and sports in the Republic of Uzbekistan" dated January 24, 2020.
2. APPENDIX 1 to the Decree of the President of the Republic of Uzbekistan No. PF-5924 CONCEPT of development of physical culture and sports in the Republic of Uzbekistan till 2025. January 24, 2020
3. Umarmulov, KodirjonMaxamadaminovich, 2018. "A Study on the Dynamics of Foreign Trade and the Issues of Regional Economic Integration in Central Asia," Working Papers 18-5, Korea Institute for International Economic Policy.
4. Umarmulov, K. M. (2018). *A Study on the Dynamics of Foreign Trade and the Issues of Regional Economic Integration in Central Asia* (No. 18-5).

5. Umarkulov, K. M. (2018). A Study on the Dynamics of Foreign Trade and the Issues of Regional Economic Integration in Central Asia. *[KIEP] Working Paper*, 18(05), 0-0.
6. Revetria, R. O. B. E. R. T. O., Maxamadaminovich, U. K., & Mirzaliyeva, G. U. L. N. O. R. A. (2014, January). Production Advantages in Textile and Light Industry and Features of Effective using of them in Uzbekistan. In *Proceedings of the 8th International Conference on Management, Marketing and Finances (MMF'14), Cambridge, MA, USA* (pp. 29-31).
7. Soliyev, I. I., & Ganiev, B. B. (2021). KEY FACTORS INFLUENCING ECONOMIC DEVELOPMENT.
8. Kurbonovich, Tozhiboev K., and Tolliboev S. T. Ogli. "Effective Use of Investment in the Development of the Territory of the Economy." *JournalNX*, 2021, pp. 121-125.
9. Tukhtasinova, D.R. (2019). Theoretical Basis Of Improvement Of Anti-Crisis Management Technology In Enterprises. *Approbation*, (4), 77-79.
10. Tukhtasinova, D.R. (2018). Innovation And Modernization Of The Economy. In *The Role Of Human Capital In Socio-Economic Development* (Pp. 124-127).
11. Muminova, E.A., & Tukhtasinova, D.R. (2016). The problems of financing enterprises in the condition of innovative activity. *Symbol Science*, (12-1).
12. Muminova, Elnorakhon and Tukhtasinova, Dildora (2019) "THE ISSUES OF DEVELOPMENT OF FINANCING OF INVESTMENT PROJECTS BY COMMERCIAL BANKS," *Scientific Bulletin of Namangan State University: Vol. 1 :Iss. 8 , Article 23*. Available at: <https://uzjournals.edu.uz/namdu/vol1/iss8/23>
13. Rakhmonazarov P., Akhunova M. THEORETICAL ASPECTS OF SUSTAINABLE DEVELOPMENT OF REGIONAL ECONOMIC ECOSYSTEMS AND ASSESSMENT METHODS //Scientific Bulletin of Namangan State University. – 2019. – T. 1. – №. 8. – C. 136-143.
14. Akhunova, M. Kh. (2020). Role Of Free Economic Zones In Creating An Investment Climate. In *Mintaka Itisodietini Investmentlashning Of Molyaviy-Xukukiy Va Innovation Zhixatlari* (Pp. 393-398).



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IMMUNIZATION PROBLEMS IN POULTRY FARMS IN SAMARKAND REGION

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ABSTRACT

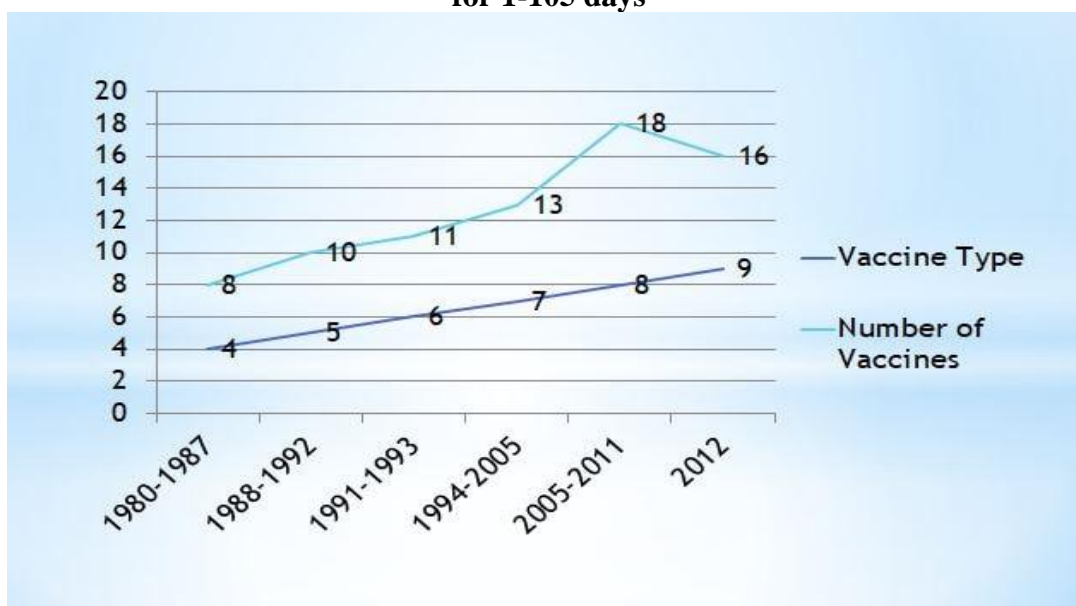
“Samarkand-Parranda” JV analyzed the frequency and effectiveness of scheduled vaccinations from 1980 to 2012 and noted that the type and number of scheduled vaccinations have doubled. JV “Ohalik-Lomannparranda” analyzed the frequency and intensity of vaccinations against Newcastle disease in 1997-1998. An increase in the number and type of vaccinations has been found to cause immunosuppressive syndrome. Immunosuppression was primarily determined by the suppression of postvaccinal immunity generated against Newcastle disease and infectious bronchitis. Immunosuppression has been reported to increase the risk of conditionally pathogenic infections. Immunosuppression has also been found to be influenced by the large population density of poultry farms and the narrow distances between poultry houses and farms. It is recommended to use the immunosuppression phenomenon and give priority to small business to prevent immunosuppressive syndrome.

KEYWORDS: *Immunosuppression, Immunoresponse, Newcastle Disease, Small Private Business.*

INTRODUCTION

Both the media and the scientific literature (4) show that since the second half of the twentieth century, the epizootiological and epidemiological situation in the world has been deteriorating again. This process is reflected in the recurrence of problems such as tuberculosis, brucellosis, salmonellosis, colibacillosis, prevention and therapy, as well as the emergence of anthropozoonotic nosological units such as acquired immunodeficiency syndrome, bovine rabies, avian influenza, swine flu. The fact that there is a state of tension in the immune system of the world's population and pets also plays a role in the emergence of this problem. We came to this conclusion based on the results of our epizootiological observations in the field of industrialized poultry and livestock (Diagram 1). This is because it is known that the virulence of infectious pathogens increases during the passage of an organism with increased susceptibility due to the weakening of the immune system. The table shows that in an industrialized poultry farm, both the type and number of vaccinations of chickens per day to 105 days have doubled in 30 years. Today, chickens are vaccinated against any pathogen every 5-6 days. Such a situation can not but strain the immune system of the chick.

Diagram 1 Dynamics of scheduled vaccinations of chickens in JV "Samarkand-Parranda" for 1-105 days



MATERIALS AND METHODS

The source of our research is the monitoring of the number and intensity of vaccinations with live virus vaccine "La-Sota" against Newcastle disease in 1995-1999 JV "Ohalik-Lomannparranda" and JV "Samarkand-Parranda" in 1980-2012, "Samarkand-Poultry" "Indicators on the effects of immunosuppression in the JV and our subsidiary farms were conducted in 2011-2012. In our research, we used epizootiological, clinical, serological and pathomorphological methods. Opportunities for bacteriological and virological research are being explored.

Results and their analysis

The Samarkand-Parranda JV raises 465,000 chickens and hens. So many chickens are being raised at the Maroqand enterprise, 500 meters away, and this is the situation. In addition, 100 thousand chickens with a diameter of 2 km, 5-6 thousand chickens are raised on 3-4 small farms. Biothermal decontamination of manure is not provided. It can be said that the air entering the ventilation system is rich in virus and bacterial particles. Our subsidiary farm is 1 km away from the settlement, the distance between 3 hens for 2 thousand chickens each is 50-60 m. Due to the fact that the vaccination regime is for 2012, the consequences of immunosuppression were noted in JV "Samarkand-Parranda" and in our subsidiary farms. The incident consisted mainly of costs associated with Newcastle disease. Although biothermal decontamination of manure has begun on our subsidiary farm, it has not been fully implemented. In Samarkand-Parranda JV, the cost of immunized chickens was 6-8%, while in our subsidiary farms it did not exceed 3%.

In 1999, when I was a fifth-year intern at Ohalik-Lomannparranda JV, I noticed that the number of vaccinations against Newcastle disease varied in different chickens. In some hens, revaccination is required every 3-4 months, while in others the immune system fluctuates within a sufficient range even for 10-16 months. The type and number of vaccinations are increasing year by year as we are able to determine the nature of this phenomenon in a timely manner (1,2,3) and not be able to introduce it into production, calling it an immunoreonance phenomenon. It has also been recognized in the scientific literature that vaccination of birds with many types of live vaccines during intensive periods can cause the problem of mixed infections (4). The features of this syndrome, which we are beginning to understand, are expressed in the fact that, first of all, the suppression of post-vaccination immunity is observed in those who have a high frequency of revaccination. First of all, the vaccine against the Newcastle disease pathogen is exposed to immunosuppressive effects. In second place are changes in infectious bronchitis. As with Acquired Immune Deficiency Syndrome, an increase in the incidence of conditionally pathogenic infectious agents has been reported. Salmonellosis in particular plays a leading role here. In particular, the hens are 150-170 days old, which has risen to the top of the egg entry. The Lomann-Brown cross of the Lomann chicken breed shows stronger immunity than the Lomann-classic and Lomann-Sandy crosses. As a result, salmonellosis vaccination has to be included in the plan. In addition, prophylactic antibiotics have to be used in pre-vaccination risk cases. Antibiotics alone are combined with furazolidone in cases where they are not effective enough.

An important role in the emergence of the phenomenon of immunodeficiency syndrome is played by the enlargement and consolidation of industrialized livestock and poultry enterprises and their proximity to residential areas. This condition leads to the opening of natural foci of intestinal infections and even internal leishmaniasis. Biothermal decontamination of manure has not been established in any of the large and small livestock and poultry farms. However, in industrialized countries where livestock and poultry are grown, the distance between not only enterprises but also their workshops is 5-6 km (5-6). In this regard, we believe that the lack of veterinary technology for the complete cleaning of chickens from the canals plays an important role in the development of immunodeficiency syndrome. Because anemia cannot fail to lower the immune system (Table 1).

**TABLE 1 NUMBER OF VACCINATIONS OF CHICKENS IN FARMS 9 AND 10
AGAINST NEWCASTLE PATHOGENS IN 1997-1998 IN JV "OHALIK-
LOMANNPARRANDA"**

№	Row Chicken №	Duration of egg laying	Number of vaccinations
1	9	12	4
2	10	14	1

Current technologies involve filling the hen house with a population of the same age. We have found that this can also contribute to immunosuppression. We found that the number of vaccines could be reduced due to the occurrence of the phenomenon of immunosuppression in a herd formed from populations that differed in age by one month (Table 2).

**TABLE 2 NUMBER OF VACCINATIONS AGAINST NEWCASTLE DISEASE IN HENS
FORMED FROM EQUAL AND DIFFERENT POPULATIONS**

Indicators	Same age shop (n = 8)	Two different age shops (n = 11)
1. Immune duration, days M ± m	176±33,17	239±91,98
2. Number of vaccinations M ± m	1,5±0,17	2,6±0,22

The problem is exacerbated by the lack of formal veterinary service and reporting on smallholders and farms. It is impossible to overcome this without the creation of specialized agrozoovetservis laboratories. Today, specialists from Russia, Ukraine, Turkey and Germany are involved in the use of bacteriological, especially virological, and patmaterials are sent.

CONCLUSIONS

1. The phenomenon of immunological resonance should be tested under production conditions.
2. The vaccination schedule in chickens should be analyzed and corrected.
3. It is necessary to establish laboratories specializing in the provision of agrozoovetservis services to industrialized small livestock and poultry farms.
4. Veterinary legislation should provide for biothermal treatment of manure.

REFERENCES

1. Abdullaev M., Abdullaev Sh., Abdullaev I.T. The role of antiidiotics in the development of post-vaccination immunosuppression against the virus of Newcastle disease in Kur., J. «Problems of biology and medicine» №1 p. 7-11 Samarkand, 1999
2. Abdullaev Sh.M., Ruzikulov R., Abdullaev M., The effect of passive immunity on the formation of active immunity against Newcastle disease in chickens. "Monitoring the spread and prevention of the most dangerous animal diseases", Proceedings of the Scientific Conference, pages 9-11, Samarkand 2001.
3. Bakulov I.A. and dr. The system of epizootologicheskogo monitoring is especially dangerous for exotic and maloizuchennyy infectious diseases of animals., P. 27-29.
4. Gorelov Yu.M., Oslojneniya u jivotnyx, privityx jivymi vaktsinami, «Monitoring rasprostraneniya i predotvrashcheniya osobo opasnyx bolezney jivotnyx», Materialy dokladov nauchnoy konferentsii, s. 48-60, Samarkand 2006g.

5. Djon P. Nichols et al. Agricultural and agribusiness in the USSR, 1993. Faculty of Economics. University of Texas. s. 1-8.
6. Fisini V.I. Poultry farming Rossii-strategy of innovative development »// Moscow-2009. 375s.



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METHODOLOGY OF MONITORING AGRICULTURAL LAND OF BULUNGUR DISTRICT AND CREATION OF ELECTRONIC DIGITAL CARDS FOR CADASTRE OBJECTIVES

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ABSTRACT

The article addresses the issues of maintaining the landscape and ecological balance of the regions, increasing land productivity, improving land cadastre in accordance with modern technologies and rapid monitoring on the basis of GIS (geographic information systems) technologies. The work also provides information on land cadastre indicators in the new century of technologies, ways of their collection, the role of GIS technologies, principles, methods of cadastral mapping and problems related to their improvement and development. In addition, the article includes an inventory of district land resources and the creation of cadastral maps, as well as a qualitative analysis of existing agricultural land.

KEYWORDS: *Landscape, Relief, Ecological Balance, Monitoring, Cadastre, Land Cadastre, GIS, Scale, Plan, Electronic Map, Digital Map, Map Creation Methodology, 3D Model.*

INTRODUCTION

Of particular importance in the world are targeted research on the activities of the economic movement, maintaining the landscape and ecological balance of regions, increasing land productivity, conducting land cadastre in accordance with modern technologies and operational monitoring. In this regard, one of the important issues in the monitoring of agricultural lands is their qualitative analysis and improvement of land cadastre on the basis of GIS (geographic information systems) technologies.

1: 10000 used in agricultural lands in our country; 1: 25000; one of the important issues is the creation of digital electronic cards instead of paper cards with a scale of 1: 50000 and their introduction into production. Therefore, one of the most pressing issues today is the correct

organization of geodetic and cartographic work and the use of modern geographic information system technologies in its implementation.

Therefore, in the efficient and rational use of agricultural land, it is important to monitor their quantity and quality, and at the same time to develop a methodology for creating electronic agricultural maps using GIS programs.

Primary data and their description

Monitoring of agricultural land in the Republic is carried out on the basis of the “Land Code” of the Republic of Uzbekistan, the Regulation “On Land Monitoring” and a number of other documents [1].

3.3 - Further improvement of the reclamation of irrigated lands in accordance with the Decree of the President of the Republic of Uzbekistan Sh.M.Mirziyoev dated February 7, 2017 No PD 4947 “On the strategy of further development of the Republic of Uzbekistan” 3.3 - Modernization and accelerated development of agriculture; development of a network of land reclamation and irrigation facilities; intensive methods in the field of agricultural production; First of all, the introduction of modern water and resource-saving agro-technologies, the use of high-yield agricultural machinery [1]. One of the important tasks is to implement these tasks, i.e. to further improve the reclamation of irrigated lands, rational and efficient use of agricultural land and on this basis to create a scientific basis for cartographic support of the state land cadastre using GIS technology.

The purpose and objectives of the study

The purpose of the study is to improve the methodology for monitoring and creation of electronic digital maps of agricultural lands of Bulungur district for cadastral purposes. For this purpose, the following tasks were identified: Development of a methodology for maintaining the land cadastre system of Bulungur district of Samarkand region using GIS technologies and the development of a methodology for creating electronic digital maps of agricultural lands of Bulungur district using GIS technologies.

The object of research is agricultural lands of Bulungur district of Samarkand region.

The subject of the study is an electronic map based on GIS technologies in the conduct of state land cadastre in Bulungur district of Samarkand region.

Research methods

The study used geographical comparison, cartographic, zoning, historical, photogrammetric, geoinformation and other methods.

The degree to which the problem has been studied. Issues of rational use of agricultural land in the country and the organization and conduct of state land cadastre and the creation of cadastral maps on the basis of modern methods I.A. Giniyatov, T.P. Magazinschikov, A.B. Borisov, A.G. Yunusov, A.I. Ivanov, V.P. Mazalov, A.A. Korolev, S.A. Avezboev, E.Yu. Safarov, I. Musaev, S.N. Volkov, A.R. Bobojonov, J.S. Sattarov, L.T. Tursunov, X.A. Abdullaev, M.M. Muhammadjanov, X.T. Risqieva, Q.R. Rakhmonov, A.Sh. Gafurov, G.A. Tolipov, A.J. Gafirov are covered in scientific research. However, in the above-mentioned works of scientists and researchers, the development and territorial organization of land cadastre, as well as the conduct

of land cadastre in accordance with modern technologies and rapid monitoring have been studied in general.

Also, the scientific works of the above-mentioned scientists have not sufficiently studied the issues related to land cadastre indicators, ways of their collection, the role of GIS technologies, principles, and methods of cadastral mapping and their improvement and development in the new century.

THE MAIN FINDINGS AND RESULTS

It is known that land monitoring is a system of analysis of information collected on the basis of timely detection of quantitative and qualitative changes in the land fund of a particular area, assessment of their productivity and observation of the positive and negative consequences.

Based on the above, we set ourselves the goal of qualitative monitoring of agricultural land in Bulungur district of Samarkand region, ie the analysis of the productivity of existing irrigated land in the district. In our study, generally accepted standard methods were used.

Existing plan-map materials, acts of acceptance of completed works and materials of land survey were used in the monitoring of existing irrigated lands in Bulungur district.

In our research, the monitoring of the land fund of Bulungur district was carried out on the basis of specially organized regular observations, ie photography, inspection, direct measurement, comparison with data from previous years. Based on the results of the inspection, the data were evaluated.

Bulungur district is located in the north-eastern part of Samarkand region, bordered on the south by Urgut district, on the south-west by Taylak district, on the west and north-west by Jambay district, on the north and northeast by Jizzakh region.

Bulungur district belongs to the arid subtropical continental climate zone of the Central Asian province according to climatic conditions. Characteristic features of the climate of this zone are continentality, high soil and air temperatures in summer, uneven distribution of atmospheric precipitation. According to the Samarkand meteorological station, the average annual temperature in the district is + 14.1°C. The hottest month is July with an average temperature of + 25.5 °C, the coldest month is January with an average temperature of -0.3 °C. The average annual rainfall is 328 mm, and its main amount falls mainly in the autumn-winter-spring months. Typical irrigated typical gray, gray-meadow, meadow-meadow, meadow and swamp-meadow soils are distributed in the district [7].

The total land area of Bulungur district is 75197 hectares, including 53728 hectares of agricultural lands (01.01.2020). The district has opportunities to grow vegetables, horticulture, silk and a number of other agricultural products. The area of arable lands in the district is 28,135 hectares, of which 15,637 hectares are irrigated lands. There are also 8357 hectares of perennial trees in the district. Farms in Bulungur district are currently attached to 17 TFMM (Tractor Fleet of Machine Mechanization) [8].

It is known that the main factor in the formation of a database for land cadastre is the inventory of available land resources and the creation of a cadastral map of the area. These two processes are inseparable because they use common source materials, field work is performed by a single executor at the same time, and they are performed in a mutually integral state. The results of the

inventory are presented in the form of cadastral cards and inventory materials (inventory duty cards) describing the activities carried out and their description.

The connection between the spatial data contained in the cadastral inventory maps is made through the identifiers of the land plots. Inventory work is done through certain identification numbers. When compiling cadastral maps, this index is based on cadastral numbers. Such indicators are performed using special identifiers when entering data in the formation of the state land cadastre database.

Cadastral map is a set of measures for the creation of a cadastral map of a district or massif (farm) [4, 6].

The cadastral map is developed to visually reflect the results of land inventory, to determine the spatial location of land plots and their boundaries, areas [2, 3]. This will pave the way for the creation of cadastral duty cards. It is advisable to make cadastral maps and farm plans on the following district cadastral maps at a scale of 1: 10,000, and farm plans at a scale of 1: 1000 and 1: 2000.

Cadastral maps and plans should be developed using digital technology, as they cover a large area. This requires geodetic measurements and remote sensing. In some cases, for small areas, it is necessary to make plans on a scale of 1: 2000, 1: 1000 and especially 1: 500 using tachometric survey [5].

Targeted research has shown that the creation of cadastral maps and plans shows the need to develop special technology for the creation of land cadastral maps, which is not fundamentally different from the methodology of cadastral digital maps made in previous studies. The development of this technology was mainly based on aerospace methods and geodetic field measurements. However, in addition to aerial photography materials, it is necessary to use the results of field studies in the form of vector models of existing cartographic materials and object contours [9, 10.]. In the methodology of creating these cadastral maps, remote sensing materials are used as the main source. This, of course, is done through geodetic photogrammetric processing in GIS technologies. This technology of advancing the work on the creation of cadastral maps reflects the unity of cadastral map and inventory processes. It was based on the use of modern GIS principles and methods. The technology of creating cadastral maps on the basis of remote sensing materials and geodetic data is shown in Figure 1.

In the formation of cadastral maps, land cadastre maps were developed on the basis of the GIS ArcGIS program.

In addition, the created 3D model based on geodetic data was integrated with the created cadastral maps and showed the need to organize cadastral map plans on the basis of 3D models in areas with difficult terrain.

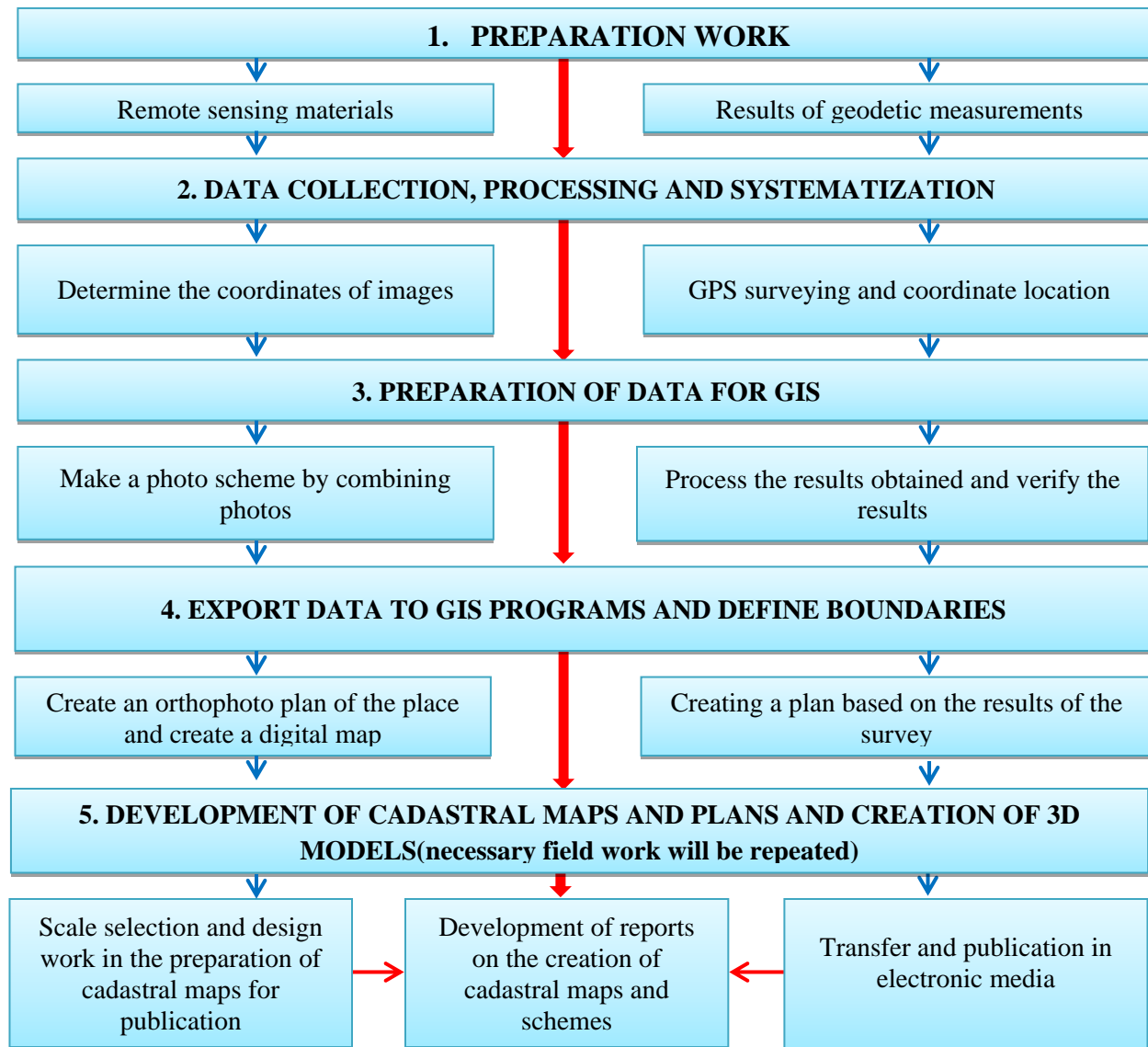


Figure 1. Technology of cadastral mapping on the basis of remote sensing materials and geodetic data.

In our research, along with the inventory of district land resources and the creation of cadastral maps, a qualitative analysis of existing agricultural lands was carried out. At the same time, the quality assessment of 24907.2 hectares of irrigated lands, including existing arable lands, perennial forests, arable lands and irrigated gray lands in the district was analyzed.

Humus plays an important role in the processes, changes and development of soil properties. This is because the organic matter in the soil has the ability to accumulate and retain large amounts of nutrients and moisture due to its ability to absorb a lot of water and its capacity.

The total amount of humus on 8458 hectares of irrigated land in the district is up to 1%, and on 16334 hectares - from 1.1 to 2%. Soils containing more than 2% of humus are 43 hectares in the district, located in the Bulungur massif.

9237 hectares or 37% of irrigated lands in the district are eroded to varying degrees. In particular, 3,810 hectares were weakly eroded, 5,134 hectares were moderately eroded and 293 hectares were severely eroded.

The average score of irrigated agricultural lands in the district is 61.2 points.

It is known that soil evaluation in the country is carried out on the basis of the “Guidelines for the evaluation of irrigated soils of the Republic of Uzbekistan”, taking into account the productivity of agricultural crops there.

Taking into account the natural fertility of soils, the productivity of irrigated lands and their potential for agricultural use, irrigated lands in the district were combined into 10 classes on productivity (on points), 5 agricultural cadastral zones (groups) on soil quality.

There are no lands of the first cadastral group in the district, ie lands of I and II classes, which are not suitable for agricultural use.

Lands of poor quality and worse are class III and IV lands and are included in the second cadastral group. The productivity of these lands is much lower. The area of lands belonging to this group in the district is 142.9 hectares, which is 0.57% of irrigated arable land. In terms of quality, these soils have a score of 21-40, and such soils are found only in the H. Olimjon massif. These lands are part of the stage of active development and cultivation in agriculture. These soils are low-yielding soils with one or two different negative character factors. The soils in this cadastral zone are subject to high humidity and irrigation erosion.

The area of lands included in classes V and VI and belonging to the third cadastral zone in terms of productivity in the district is 9927.7 hectares. In relation to the total irrigated agricultural land area of the district, the area of land belonging to this zone is 39.86%.

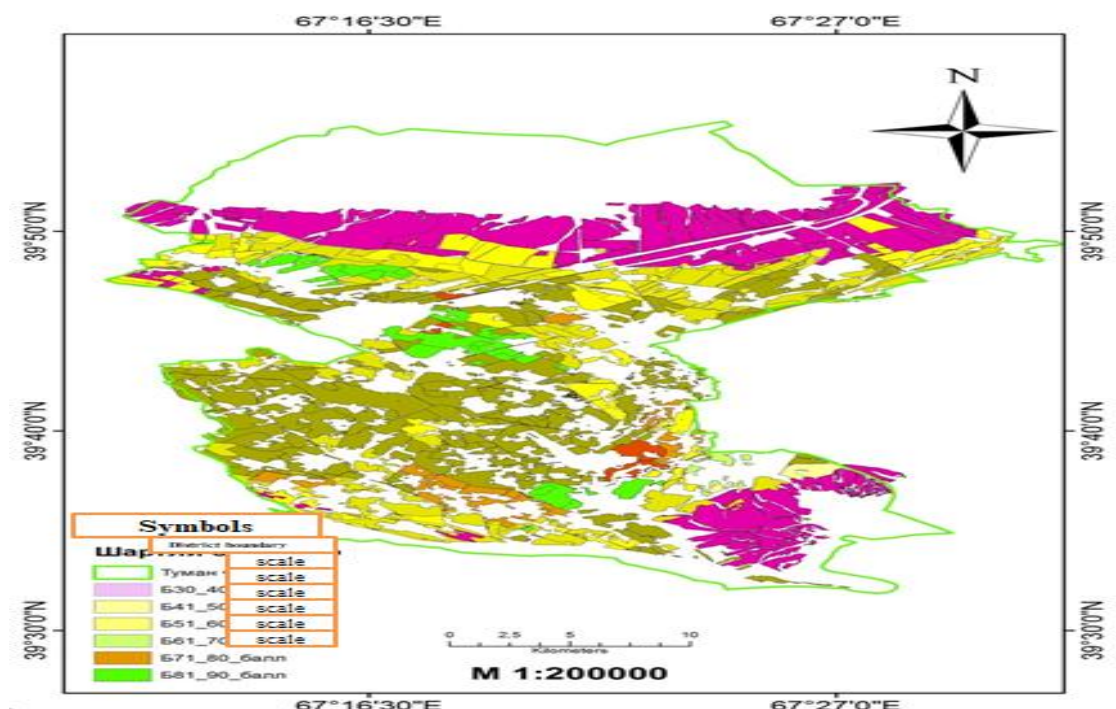


TABLE 1 QUALITY ASSESSMENT OF IRRIGATED AGRICULTURAL LANDS OF BULUNGUR DISTRICT OF SAMARKAND REGION

№	Massifs	Classification of soil by level of fertility										Total	Average score 2018 y
		Bad lands		Low-average soils		Average lands		Яхши ерлар		The best lands			
		Icl ass	IIcl ass	IIIcl ass	IVcl ass	Vcl ass	VIcl ass	VIIcl ass	VIIIcl ass	IXcl ass	Xcl ass		
		Bonitet ball											
		0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100		
1	A.Temur					186,9		153,4				340,3	54,2
2	Uzbekistan						271,0	1215,9				1486,9	62,1
3	A.Maxsumov						280,8	813				1093,8	59,1
4	Ipakyuli							1812,9				1812,9	67,8
5	Kildon							505	250,6			755,6	66,1
6	M.Ulugbek					548,4		1241,9	253,2			2043,5	63,1
7	X.Olimjon				142,9	328,6	727,7	80,3	125,6			1405,1	52,9
8	Mingchinor						369,7	1238,5	41	830,8		2480	69,7
9	Zarbdor					451,2	108,6	885,3	30,9			1476	58,7
10	Zarafshan						235,8	502,2				738	60,2
11	Choyantepa					93,1	204			399,3		696,4	68,5
12	Beshkubi					79,6	107,2	1320				1506,8	60,3
13	Dustlik					619,0	248,6	788,3				1655,9	58,3
14	Bulungur					393,7	978,9	42,1		455,3		1870	62
15	F.Yuldosh						963,9	1034,4	81,1			2079,4	62,8
16	Gubdin					1149,2	982,7					2131,8	48,6
17	A.Navoi					131,	467,	109,	613,1	12,7		1334	63,6

7					3	8	8				,7	
Total				142,9	3981,0	5946,7	11743,0	1395,5	1698,1		24907,2	61,2
By area class			142,9		9927,7		13138,5		1698,1			
Area in%			0,57		39,86		52,75		6,82			

Soils distributed in this zone have a 41-60 quality score and are moderately or less susceptible to irrigation erosion, salinization and other adverse effects. As a result of improper use of these lands, the slopes are washed away. As a result, there is a decrease in humus, which is one of the main elements of soil fertility, and nutrients needed for plants. The soils of this zone are found in Dustlik, Kildon, Choyantepa, A.Temur, Gobdin massifs and a number of other areas of the district.

Classes VII and VIII, which are above average in quality and have good lands, are included in the fourth cadastral zone. The soils of such areas are of good quality and are rated with a 61-80 quality score. The soils of the fourth cadastral zone are 13138.5 hectares, which is 52.75% of the total agricultural area in the district (Table 1). The soils of this region have changed during long-term irrigation and cultivation, and are characterized by their constant yield and positive properties.

The soils of the fourth zone are important for the cultivation of agricultural crops and require proper agro-technical and reclamation measures in these areas. The soils of this zone are distributed in almost all massifs of the district.

The fifth cadastral zone includes soils belonging to classes IX and X, which are very good quality and high lands. The lands included in this zone make up 1698.1 hectares in the district, which is 6.82% of the total irrigated land. On the basis of targeted research and the above data, as well as modern GIS, a 1: 200,000 scale soil map of Bulungur district was created (Figure 1).

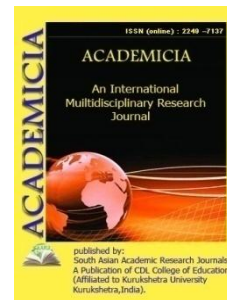
CONCLUSION

The development of methods and technological schemes for the creation of large-scale digital maps is important in the formation of land cadastre. Cadastral maps at a scale of 1: 10,000 on the basis of modern GIS programs play an important role in this. Based on the results of monitoring of agricultural lands in the district, it can be concluded that a number of reclamation and agro-technical measures are needed to increase the productivity of existing lands.

REFERENCES

1. Land Code of the Republic of Uzbekistan, Uzbekistan, 1997.
2. Bobojonov A.R., Rahmonov Q.R., Gofirov A.J. (2008) Textbook on "Land Cadastre". – Tashkent TIMI.
3. Varlamov, A.A. Land cadastre [Text]. A.A. Varlamov, S.A. Galchenko. (2005). 6 Volumes. Vol 6. Geographic and ground information systems. — Moscow: KolosS. – p. 400.
4. Gulyamova L.H., Safarov E.Yu., Abdullaev I.O. (2013) Geoinformation systems and technologies. Study guide. – Tashkent: Universitet.

5. GOST R 52571-2006 Geographic Information Systems. Spatial data compatibility. General requirements. – Moscow. IPK Publishing house of standards, 2006.
6. Kadnichansky S.A. (2005) GIS technologies for creating maps of land resources. – Moscow: GUZ.
7. Data of Samarkand regional department of Uzhydromet main center.
8. Data of the State Scientific Design Institute “UZDAVERLOYIHA”
9. [HTTP://WWW.GISINFO.RU/EDU/EDU.HTM](http://www.gisinfo.ru/edu/edu.htm)
10. [PANORAMA@GISINFO.RU](mailto:panorama@gisinfo.ru)



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COMPARATIVE EFFICIENCY OF THE PREPARATION "NODINORM" IN COMPLEX TREATMENT OF FIBROCYSTIC MASTOPATHY

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ABSTRACT

The pathology of the mammary gland is represented by such diseases as acute and chronic mastitis, fibrocystic mastopathy, gynecomastia, benign and malignant neoplasms, among which the greatest danger is cancer. Among nosological units, fibrocystic mastopathy occupies a special place, which, according to various authors, affects from 50 to 90% of women. Most often, women are sick at the age of 40-50 years. These changes in breast tissue are benign, but patients with mastopathy are at high risk of cancer [3]. A possible solution to the problem of treating patients with combined pathology of the uterus and mammary glands is the use of the domestic drug "Nodinorm" in the complex treatment of the main substance, which is indole-3-carbinol.

KEYWORDS: *Fibrocystic Mastopathy, Benign Tumor, Broccoli, Estrogens, Indole-3-Carbinol, Pharmaceutical Company Naturex, Nodinorm, Pharmaceutical Company Evalar, Indol-Forte.*

INTRODUCTION

Mastopathy is a common non-communicable disease. May occur in women of various ages. The main reasons for the formation are hormonal imbalance, neuroendocrine disorders. The neoplasm of the mammary gland is formed for a long time and may not manifest itself clinically for a long time. For treatment, medical and surgical correction is used [1,11].

Mastopathy is a fibrocystic disease characterized by a violation of the ratio of epithelial and connective tissue components, a wide range of proliferative and regressive changes in breast tissue [12].

This pathology is common in women of reproductive age. Most often, this disease occurs against the background of other gynecological diseases. The danger of mastopathy lies in the fact that this pathology belongs to precancerous diseases, against the background of which breast cancer can form. In the category of patients with mastopathy, the risk of developing malignant neoplasms is 3-5 times higher than in the general population of people [2, 8].

Factors contributing to the onset and development of breast pathology include:

- hereditary factor (presence of benign and malignant neoplasms in maternal relatives);
- neuroendocrine disorders;
- age over 40;
- Artificial termination of pregnancy;
- Obesity;
- prolonged mental stress;
- late first pregnancy;
- absence, short or long period of breastfeeding;
- age of first birth (women who have given birth to two children under 25 have a three times lower risk of developing breast diseases compared with those who had only one child);
- Early menarche and late menopause;

Combination with hyperplastic processes in other organs of the reproductive system;

- Patients with uterine fibroids who are expected to undergo hysterectomy with preservation of the uterine appendages are at an increased risk of the onset and progression of mammary dysplasia in the postoperative period[8].

Women can detect clinical signs of pathology on their own. Symptoms that should alert you:

- Soreness at the site of the neoplasm.
- Lump in the breast tissue.
- Swelling in the affected area.

- Enlargement and hardening of the lymph nodes in the armpits.
- Occurrence of nipple discharge. They are usually transparent serous. Can also be colostrum-like, greenish, yellow, brown[9].

Factors contributing to the onset and development of breast pathology include: hereditary factor (presence of benign and malignant neoplasms in maternal relatives), neuroendocrine disorders, age over 40, artificial termination of pregnancy,

obesity, prolonged mental stress, late first pregnancy, absence, short or long period of breastfeeding, age of first birth (women who have given birth to two children under 25 years of age have three times less risk of developing breast diseases compared with those who had only one child)[6].

Mastopathy is characterized by an increase in clinical symptoms in the premenstrual period. It is also important that the signs of the disease do not disappear after the end of menstruation [12].

Patients suffering from mastopathy should reduce the consumption of tea and coffee, quit smoking, include more vegetables (especially broccoli, as they contain a large amount of indole-3-carbinol) and fruits in the diet [11].

Of particular note is indole-3-Carbinol, contained in broccoli, which increases the efficiency of detoxification systems, which makes it possible to use it as a means of slowing down the aging process [1].

For the treatment of mastopathy, drug therapy is used, including the intake of non-hormonal agents (vitamins, vitamin-mineral complexes, adaptogens, galenic, diuretics, sedatives, hepatoprotectors, potassium preparations, enzymes, non-steroidal anti-inflammatory drugs, iodine preparations, etc.) [11,12] .

One of them is "Nodinorm" - a domestic herbal preparation obtained from plants of the cruciferous family, in particular broccoli, containing highly purified indole-3-carbinol.

The aim of this study was to evaluate the clinical effectiveness of the use of the domestic drug "Nodinorm" from the company "Naturex", containing indole-3-carbinol, for the treatment of diffuse fibrocystic mastopathy (DPCM) in comparison with its foreign counterparts "Indol-Forte" from the company "Evalar", produced in the Russian Federation.

Main part

The study included 45 patients aged 25–45 years, all patients were diagnosed with DPCM during a comprehensive examination of the mammary glands, including examination, palpation, mammography and ultrasound. In this clinical study, the patients were divided into two groups: 30 of them took the domestic drug "Nodinorm" at 200 mg / day, and the remaining 15 patients took "Indol-Forte" from the company "Evalar" also at 200 mg / day, within 3-6 menstrual cycles. In the course of studies conducted among women suffering from benign dysplasia of the mammary glands and taking indole-3-carbinol-containing drugs "Nodinorm" and "Indol-forte", significant improvements in the condition and well-being of patients in both groups were noted.

RESULTS AND DISCUSSION

In the course of the study, the effectiveness of the new multitarget domestic drug Nodinorm for the treatment of patients with cyclic mastalgia (mastodynia) and mastopathy was proved. Considering that the known mechanisms of action of indole-3-carbinol characterize it as a drug with an oncoprotective effect, this result is especially important in terms of preventing breast cancer in patients with cyclic mastalgia. ... The results of studies on the positive effect of indole-3-carbinol and 3,3'-diindolylmethane on clinical markers of increased risk of breast cancer (mastalgia, mastodynia and other manifestations of fibrocystic breast disease) confirm the important role of these molecules as preventive strategies for reducing risk of breast cancer.

After a 3- and 6-month course of treatment with Nodinorm, the following results were obtained during the examination of the patients. Completely completed the study (93.3%) of patients who noted the good tolerance of the drug. 1 patient (DFKM with a predominance of the fibrous component and a mixed form of DFKM) refused to take the drug for a long time and dropped out of the study due to the development of severe dyspeptic symptoms (nausea, diarrhea) during treatment with Nodinorm. Another patient with DPCM with a predominance of the glandular component stopped taking the drug due to the development of an allergic reaction. Such side effects are also possible for Indol-Forte, since these side effects are prescribed in the instructions for this drug.

After 6 months of taking Nodinorm, all 28 patients subjectively noted positive dynamics. At the same time, the disappearance of pain in the mammary glands in general was observed in 76.3% of women, a decrease in pain - in 23.7%. Among the latter, 17.5% noted mild pain in the mammary glands, and only 6.2% of women had moderate pain. Thus, no patient experienced severe pain after 6 months of taking Nodinorm.

The effect of Nodinorm develops gradually, reaching a maximum 6 months after the start of application. In the present study, the maximum clinical effect was achieved in patients with DPCM with a predominance of the cystic component.

CONCLUSION

Based on our comparison, we can say that the pharmacological effects of "Nodinorm" and "Indol-Forte" are practically similar and the domestic drug "Nodinorm" is in no way inferior to the drug "Indol-Forte". Both equally effectively coped with one of the main problems of diffuse fibrocystic mastopathy - mastalgia. It can also be noted that the drug Nodinorm has a very important - oncoprotective - property, this result is especially important in terms of preventing breast cancer, which gives us the opportunity to continue research in the future.

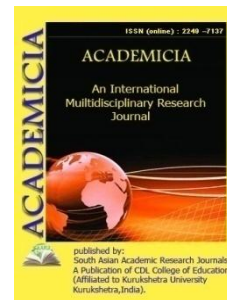
Based on the data obtained, it was concluded that the domestic drug "Nodinorm" can be recommended in the complex treatment of patients with DFKM.

REFERENCES

1. Meliboeva Shohista Sharofiddin Kizi, Musaeva Dilfuza Mahmudovna, Sharipova Elvina Midatovna, Boltaev Mizrob Mavlonovich Botanical Characteristics Of The Medicinal Plant "Broccoli", Pharmacological Properties And Chemical Composition Of The

- Medicinal Plant "Brassica Oleracea" // Bulletin of Science and Education. 2020. No. 24-1 (102).
2. МелибоеваШ. Ш., БолтаевМ. М., ШариповаЭ. М, Выращивание «Brassica Oleracea» НаТерриторииРеспубликиУзбекистан. , central Asian Journal Of Medical And Natural Sciences: 2021: Special issue on COVID-19: Yesterday, Today, and Tomorrow.
 3. Meliboev Sh. Sh., Boltaev M. M., Sharipova M, Comparative Efficiency of the "Nodinorm" preparation in the complex treatment of fibrocystic mastopathy.
 4. , central Asian Journal Of Medical And Natural Sciences: 2021: Special issue on COVID-19: Yesterday, Today, and Tomorrow.
 5. Smetnik A.A., Smetnik V.P., Kiselev V.I. Experience of using indole-3-carbinol in the treatment of breast diseases and prevention of breast cancer. Obstetrics and gynecology. 2017; 2: 106-12.
 6. Licznarska B., Baer-Dubowska W. Indole-3-carbinol and its role in chronic diseases. Adv. Exp. Med. Biol. 2016; 928: 131-54.
 7. Haefele A., Word B., Yongmei X., Hammons GJ, Lyn-Cook BD Indole-3-carbinol (I3C) modulates the expression of DNA methyltransferases 1, 3a and 3b in pancreatic cancer cells: gender influence and novel (C@T) polymorphism in the DNMT 3b promoter region. Int. J. Cancer prevention. 2007; 2: 245-55.
 8. Cohen J.H., Crystal A.R., Stanford J.L. Consumption of fruits and vegetables and the risk of prostate cancer. J. Natl. Cancer Inst. 2000; 92: 61-8.
 9. Anderton MJ, Manson MM, Verschoye RD, Gescher A., Lamb JH, Farmer PB et al. Pharmacokinetics and tissue distribution of indole-3-carbinol and its acid condensation products after oral administration to mice. Clin. Cancer Res. 2004; 10 (15): 5233-41.
 10. Meng Q., Qi M., Chen DZ, Yuan R., Goldberg ID, Rosen EM et al. Suppression of invasion and migration of breast cancer by indole-3-carbinol: associated with upregulation of BRCA1 and E-cadherin / catenin complexes. J. Mol. Med. 2000; 78 (3): 155-65.
 11. Plu-Bureau G., Lê MG, Sitruk-Ware R., Thalabard JC Cyclic mastalgia and breast cancer risk: results from a French cohort study. Cancer Epidemiol. Biomarkers Prev. 2006; 15 (6): 1229-31.
 12. Meng Q., Yuan F., Goldberg ID, Rosen EM, Auborn K., Fan S. ndole-3-carbinol is a negative regulator of estrogen-alpha signaling in human tumor cells. J. Nutr. 2000; 130 (12): 2927-31.
 13. Bradlow H.L., Zeligs M.A. Diindolylmethane (DIM) is spontaneously formed from indole-3-carbinol (I3C) during cell culture experiments. In Vivo. 2010; 24 (4): 387-91.
 14. Manusharova R.A. Treatment of fibrocystic mastopathy / R.A. Manusharova, E.I. Cherkezova // Medical Council. - 2008. - No. 3-4. - S. 20-26.
 15. Sazonova E.O., Vysotsky M.M., Garaeva L.R. The effectiveness of indole-3-carbinol in the treatment of fibrocystic mastopathy in patients after laparoscopic hysterectomy. Endoscopic surgery. 2011; 17 (4): 25-28.

- 16.** Sharipova RG Dustova NK Aslonova M.Zh., Musaeva D.M. Ferlatum - Innovative Approach To Pharmacotherapy Of Iron Deficiency Anemia In Pregnant Women. New Day In medicine 2 (30/2), 303-305.



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DIDACTIC PRINCIPLES OF GUIDING THEORETICAL KNOWLEDGE FROM STEAM SCIENCE INTO PRACTICE

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ABSTRACT

In this article, the didactic principles that help to carry out the practical orientation of theoretical acquired knowledge in the future engineers of the higher educational institution in the process of organizing training on the basis of the STEAM approach are presented, in which one by one touched on the principles of STEAM education.

KEYWORDS: *STEAM Approach, Aspect, Exact Sciences, Engineering, Principles Of Education, Didactic Principles, Fundamental, Methodological Direction, Integration, Active Techniques, Practice.*

INTRODUCTION

We can see that engineering is being taught from developed foreign countries based on the STEAM approach in the education process in America, Germany, Japan, China. The results of the analysis we will try to supplement these aspects with our own approach, taking into account the fact that the implementation of the fall into practice of theoretical knowledge, the reconciliation of new modern techniques and technologies, as well as the formation of an atmosphere of discovery – a meaningful, methodological and spiritual motivational aspect.

LITERATURE REVIEW

When you say the content of Steam: make corrections to the Necessary Steam Science Program, which is compatible with engineers; make adjustments to the practice of practical standards of the educational material; Allocation of the educational material of STEAM hardware on these specialization; contains occupational, theoretical and practical ranks.

Steam's methodological aspect is understood by the use of various methods, methods and forms of education aimed at strengthening the practical knowledge at the time of obtaining theoretical knowledge.

Scientific novelty of the article

As a result of Steam's spiritual motivational aspect, the test of motivation of motivational aspects by combining the natural knowledge of motivated by practicing motivation, the students are understood in the development of their professional activity that students must fully win their professional activity. [1,2,3].

Our opinion is an approach to the Steam approach to each other, while simultaneous approach to the practical knowledge for engineering knowledge is the One who provides practical knowledge to the practical knowledge, the theoretical knowledge derived from the subjects of Steam approach. The specialization and education of the engineering is the basis of the system and structure of the system. Other principles in the education of the university are combined around this principle and organizes integrity, and it provides the main goal of teaching steam subjects - ensuring the formation of training in the professional activities of the future engineer. We believe that the observance of a number of didactic principles, we believe that Steam Science is one of the conditions for practices of education.

Analysis and results

Didactic principles, which helps to implement theoretical diversity of theoretical knowledge in future engineers of the university, made up of:

1. Science of the content of the educational content;
2. Methodological performance of education;
3. Strengthening the fundamentality of Steam Science.
4. Coordination of methodical systems that connects the theory of education, taking into account the psychological features of students:
the logic and mental acceptance of the structure of the content of the context;
Principle of simple to complex;
the connection of clarity with abstraction;
pushing the method of induction in stating the learning material;
5. Activities in education (describing the level of participation of students in educational activities);
6. Independence describes the participation of students in the educational process;
7. Carrying out Interbank Medical Connection;

We will focus on one about the principles of the Steam Education mentioned above.

1. One of the main principles of higher education is scientific institution. Scientific, the full content of various departments of Steam in the university corresponds to the fundamental science departments, ie: the logical firmness of Steam Sciences of content, integration And others are

understood by concepts. All basic concepts should be proved based on the clear definition and practices, based on the rules of judiciary and logic.

2. The Principia for the educational direction of education must be combined with the Principia of Scientific. When called Steam Science Methodology, the doctrine of steam is the doctrine of science methods or their historical development of research techniques. Methodological direction of education is a means of modeling the connection between the material world by modeling the relevant process and objects with a material world through the material engineers It plans to form a view as.

3. Steam Sciences strengthen fundamentality in education. In higher education, these subjects should not be theoretical significance, but no engineering theory cannot be developed without fundamental knowledge and research. "When calling the fundamental educational process, we mean systematic approach to the analysis of the subject technology to the professional pedagogical issue of the subject" [4] [4]. It is the result of a fundamental knowledge that is deeply, well-based task and their ability to use them during practical activities. Adoption of some departments of Steam subjects in the educational process:

- to create a clear idea of the concepts of the basic specific sciences and the meaning of their logical structure and the meaning of practical structure;

- In its specialty, it is achieved through the formation of a skills of steam subjects.

4. Focusing on the practice of teaching methods of teaching, taking into account the spiritual unique features of students, is also one of the important conditions for practices. We believe that one of this is the logical structure of science and condition for harmony to the teaching system of the teaching material.

Only logical conclusions and comments are not easily mastered by students, especially students, and are not ready for axious method. To do this, it is necessary to teach students to provide or reject the assumptions of independent methods and techniques, to formally proof, or reject the assumptions, and in short to the theories of disciplines and engineering depending on the logical practice. Relying on the spiritual aspect of the knowledge of knowledge, then, it is necessary to adhere to the structure of Steam Science Theories. Steam Sciences It is advisable to reduce the topics not dependent on the practice in the program. It is also necessary to submit the departments later. The procedure for submitting various departments of Steam is also related to the principle of complexity from simplicity.

In the field of education, it is necessary to monitor the connection between clarity with absurdly absurdity with accuracy. "At the beginning of the knowledge process, it is necessary to focus less, always maintains applications in the exhibition and focus on determining the students' ability to understand them." [5] [5] Introduction of new concepts should be motivated and less attention should be paid less attention, as this can lead to limiting them.

An important condition for the implementation of the knowledge of students' knowledge of Steam is an important condition - describing activists and independent thinking of their participation in the educational process.

5. When the activity in education is active, the active teaching methods, the problem, the development of the development, the use of a person-oriented education, stratified teaching.

Here is a goal set for the development of students' creative activity, the development of professionalism, research aspirations. In education, the implementation of differentiation and the implementation of individual-oriented education leads to the organization of successful knowledge for students with primary knowledge.

6. Proper planning of independent learning of students is one of the important teachers of the teacher. One of the factors describing the efficiency of modern education is the application of information technology in education. The use of e-manuals and textbooks in the educational process is an important tool in education, which means active and independent education, provides an individual and stratified approach.

7. We also consider the implementation of interdisciplinary interdependence as we should be the condition for us to direct the theoretical knowledge. Teachers of specific disciplines should be imagined that the knowledge gained in mathematics, physics and chemistry should apply to general and specialty subjects, and which specialty should rely on which stealth approach.

We tried to make these steam subjects to each other to each other interdisciplinary binding on a planear model and called Steam Planetar Models.

In the Steam Playetar model, we can see interdisciplinary links (art), Art (art) and Mathematics in Figure 1 in Figure 1 Mathematics, The art, technology and natural sciences are described. Any engineering activity is based on fundamental knowledge and is based on fundamental knowledge.

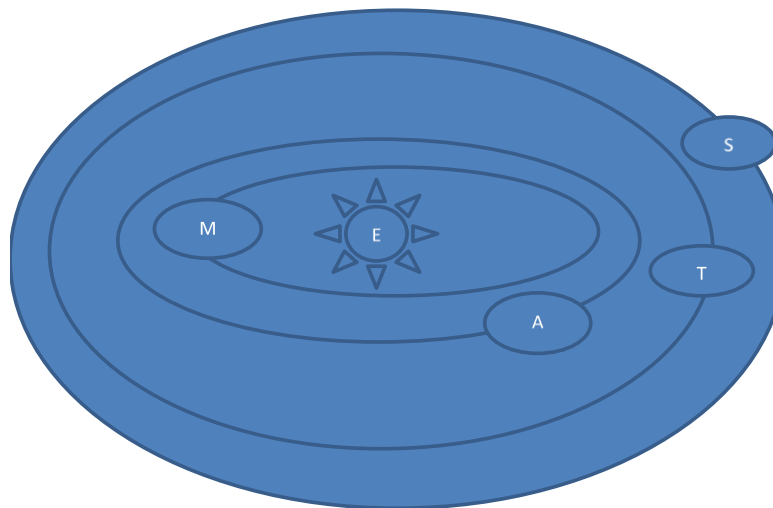


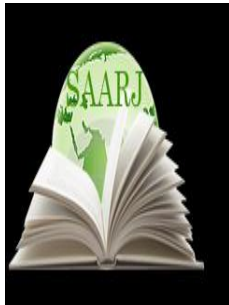
Figure 1. 1.Science (Natural Sciences), 2.Technology (Technology), 2.Et (Art) 4.Egdeau (Mathematics).

CONCLUSION

In place of the conclusion, we must say that the didactic principles that help engineers to carry out the practical orientation of theoretical acquired knowledge through STEAM Science in preparatory higher education organizations, as well as the conditions of the above-mentioned STEAM training principles, allow to apply them in the educational process, to more effectively organize the educational process.

REFERENCES

1. Novojilov, E.D. O metodologii nauchnogo pedagogicheskogo issledovaniya Tekst. / E.D. Novojilov // Teknologicheskaya i ekonomicheskaya podgotovka studentov v pedagogicheskom vuze. M. : MPU, 1998
2. Ovanesov, N.G. Pedagogika matematiki visshey shkoli (podgotovka uchitelya) Tekst. / N.G. Ovanesov. Astraxan : Izd-vo AGU, 2003. - 10 s.
3. Pidkasistiy, P.I. Organizatsiya deyatelnosti uchenika na uroke Tekst. / P. I. Pidkasistiy, G.I. Korotyayev. M. : Znaniye, 1985. - 80 s.
4. Leontyev, A.N. Izbranniye psixologicheskiye proizvedeniya Tekst. / A.N. Leontyev. T. 1, 2. - M. : Pedagogika, 1983.
5. Vigotskiy, J.I.C. Psixologiya Tekst. / J.I.C. Vigotskiy.- M. EKSMO-Press, 2002.- 1008 s
6. Turdiyev Sh., Shadiyev R. On questions of particularities of teaching mathematics in technical higher education institutions (HEI). Austrian Journal of Humanities and Social Sciences № 9–10.Vienna , 2014-.P 141-144.
7. Turdiyev Sh. The role of practical classes and methods to implement them when promoting mathematical problems in technical university //European Journal of Research and Reflection in Educational Sciences.–Great Britain.:2016.-№2. P-36-40.
8. Turdiyev Sh. Forming Innovative Abilities of Students in Engineering and Research. //Eastern European Scientific Journal. 2017. №1 DOI10.12851/EESJ201701.P-163-168.



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THE ESTABLISHMENT OF SMART LIVESTOCK SYSTEMS

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ABSTRACT

This article discusses the need, importance and stages of implementing a smart farm in our country. This article gives information about government support to smart farms (meat and dairy processing farms, livestock processing businesses). In this case, it is recommended to determine the value of financial incentives for entities involved in the system of financial support of the livestock sector. In addition, modern technologies that can be used in the "Smart Farm" and organizational and economic stages of the organization of a Smart Farm are analyzed in the paper.

KEYWORDS: *Livestock, Smart Farm, Digital Technologies, Internet, Modern Technologies.*

INTRODUCTION

Experts predict that by 2050, the world's population would have surpassed 9.6 billion people, possibly requiring 70% more food than is currently needed for food protection. However, due to the degradation of the ecosystem, the increase in energy carriers, and the danger of decreasing soil productivity of agricultural lands, there are significant obstacles to food production (due to misuse and water scarcity).

Today, as a consequence of bio and non-technology research and development, Internet, GPS, and VRT systems, agricultural organization on the basis of new methods, modern tools, and innovative developments, in short, the sustainable development of the agricultural sector in a high-tech intelligent agricultural system security measures are being implemented.

Smart agriculture is a concept that foresees agricultural producers using innovative digital technologies to organize cost-effective activities, increase profitability, minimize the impact of influencing factors, and use resources and time wisely¹.

Smart agriculture encompasses smart farming, smart field, smart garden, smart greenhouse, smart farm (animal husbandry), smart territory, and smart land use, all of which can function independently while also complementing each other. Through smart agriculture, agricultural producers will be able to accurately select the time and amount of resource use through monitoring and evaluation of changes in crop area. Farmers in the livestock sector can better control the biological condition, needs, diet, and physiological condition of specific livestock with the help of intelligent animal husbandry technology, resulting in high productivity.

According to FAO experts, the extensive period of agricultural development in all countries around the world has passed, and the transition to a "smart" period of development is now in demand. As the world's population grows, so does the demand for modern agricultural technologies².

According to Future Market Insights' calculations, the global market value for the introduction of smart agriculture in the world in 2016 was estimated to be around 13 billion US dollars, and by 2026, this figure is expected to reach 40 billion US dollars. The average growth rate of the industry is expected to be about 11.2 percent in the coming years³.

However, this is implemented mainly in developed countries such as the United States, the European Union, Israel and China. The agricultural economy in a large portion of the least developed and developing countries is focused on traditional technologies, and the implementation of new technologies is relatively slow.

Despite the availability of material, technological, and intellectual resources for the long-term growth of the livestock sector in our country, the factors of extensive development are becoming more important. This has led to high resource consumption, low labor productivity and low livestock productivity. Unsatisfactory economic efficiency in the sector, a lack of financial resources, and non-compliance with the construction of appropriate infrastructure all stymie the mobilization of livestock farms' economic potential and the adoption of modern technologies.

In this regard, President of the Republic of Uzbekistan Sh. Mirziyoyev emphasized the importance of "developing a national concept of digital economy," which provides for the use of digital technology to modernize all sectors of the economy⁴.

Decree of the President of the Republic of Uzbekistan dated November 29, 2017 PD-5264 "On the establishment of the Ministry of Innovative Development of the Republic of Uzbekistan" to make proposals on the introduction of modern forms of agricultural production based on the concept of "smart agriculture", which will allow the rational use of land, water and other natural resources in the country, maximize automation of agricultural production in the agricultural sector, significantly increase productivity and improve financial performance, as well as the task

of promoting the introduction of innovative technologies that will ensure food security of the country⁵.

At the same time, the Ministry of Agriculture and other related agencies and ministries are subject to the President of the Republic of Uzbekistan's Decree⁶ PD-5708 "On steps to strengthen the structure of public administration in agriculture" dated April 17, 2019. The mission is to make proposals for projects and funding sources in the field of agricultural digitalization, based on the principle of "smart agriculture."

The need to create a smart farm in the country on the basis of meat and dairy farms can be explained as follows, taking into account the implementation of the above regulations and other conditions. Including:

- low labor productivity due to high manual labor in the livestock sector;
- the ineffectiveness of the prospect of increasing the economic efficiency of production based on traditional methods of management;
- the growing need for new resource-saving advanced technology to be introduced and improved in livestock farms;
- insufficient assessment of the impact of various environmental, bio-physiological, and organizational factors on technological processes that affect production efficiency;
- inadequate ability to ensure that conventional methods are compatible with the quality of dairy and meat products, as well as the quality of animal feed rations;
- the possibility of early detection of animal diseases with the help of modern remote-controlled technological equipment and their use is becoming a necessity;
- the need for daily automated management of livestock storage conditions (possibility of automatic monitoring of the necessary microclimate in storage facilities) in order to maximize the efficient use of livestock genetic potential;
- the implementation of new digital technology in the livestock sector necessitates the automated management of the livestock sector's feed base, the formation of a modern "Electro Pastux" system for driving livestock, and the need to use it to minimize livestock labor costs.

The possibility of introducing digital technologies in the livestock sector is becoming a necessity in connection with the invention of the following technological systems (Figure 1).

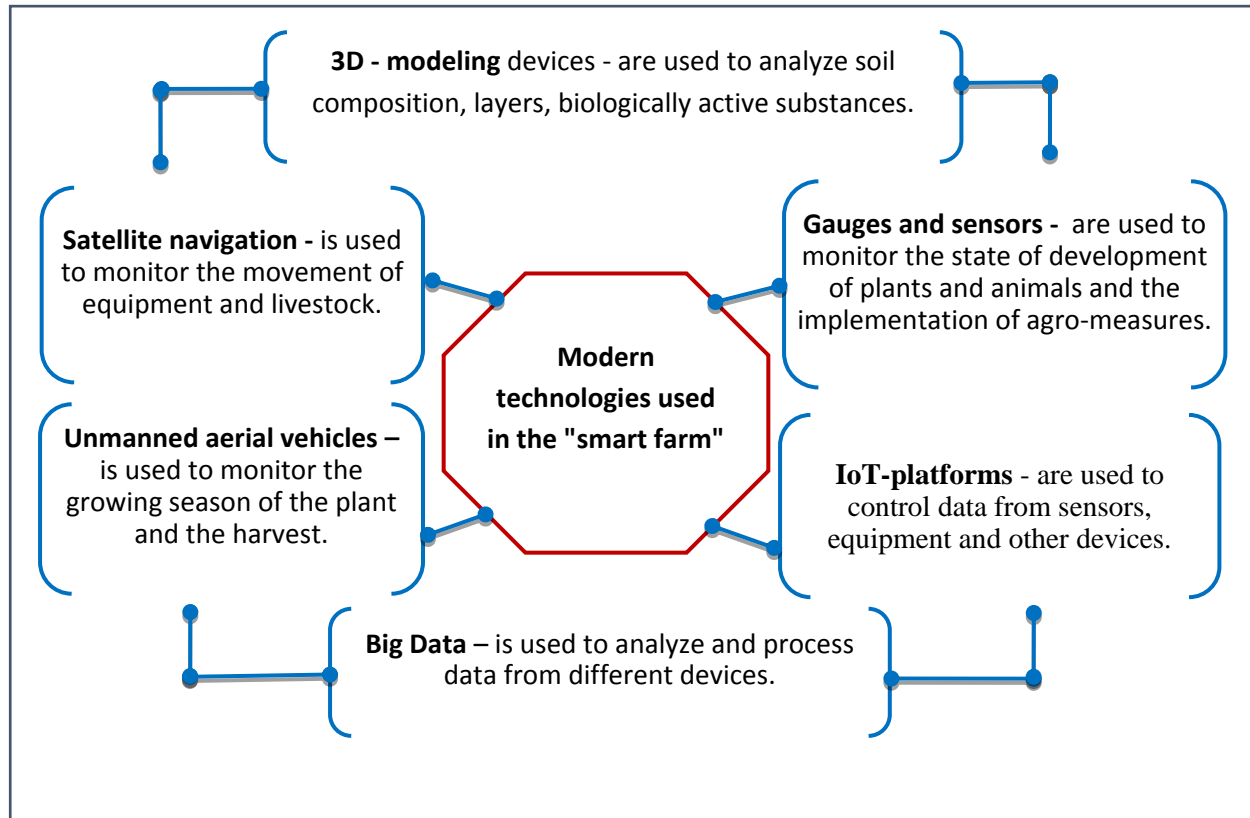


Figure 1. Modern technologies that can be used in the "smart farm"⁷

- 3D-modeling devices - these are used in the analysis and control of soil composition, layers, biologically active substances of arable lands where fodder is grown for livestock;
- satellite navigation - used in the cultivation of feed, machinery for transporting feed and livestock, dairy and meat products, and monitoring the movement of livestock on pastures;
- unmanned aerial vehicles - used for remote monitoring of vegetation, yield and harvesting of fodder crops;
- gauges and sensors - used to monitor the development of plants and animals, physiological and genetic changes, the composition and quality of dairy and meat products, the composition of feed mixtures and the implementation of agricultural measures;
- IoT-platforms - used to control data from digital sensors, equipment and other devices;
- Big Data - used to analyze data from various remote devices, develop short (seasonal), medium and long-term forecasts for business development, make management decisions and monitor.

Given the above, it is necessary to encourage the establishment of smart farms in the country. At the same time, smart livestock farms are the subjects of automated livestock production, most of which require a small amount of human intervention (operator, breeder, veterinarian, etc.)⁷.

Such a farm will rely on digital technology (artificial intelligence, Internet networks, data, and related standards) to ensure production cost-effectiveness, customer activity, and the product's negative impact on human health, among other economic indicators.

As part of the "smart farm" - a system of sensors to identify the physiological state of livestock, which allows you to monitor the number of cattle and automate the process of electronic assessment. Furthermore, the use of sensors and software for assessing and treating livestock's physiological conditions through movement and nutrition allows for automated monitoring of milk quality (protein, fat, dry matter, and so on) in milking equipment.

The automated management of feed planning, herd breeding and veterinary services, milking, animal feeding, microclimate management in barns, and boxes within the automated management framework of "Smart Farm" provides automated workplaces of leading specialists (veterinarians, zootechnicians, and engineers) is coordinated in order to control production on the basis of a digital system.

According to research, feeds prepared using automated biocatalytic technology for enzymatic feed preparation increase feed digestibility by 1.5-2 times as compared to conventional technology, and automated milking modules that track livestock condition increase the incidence of mastitis in cows by 25-30%. Increase the time of economic use of cows up to 4-5 lactation periods by reducing and separating irregular milk in the stream.

However, taking into account the country's agricultural sector's growth patterns and industrial and technological capabilities, the following factors restrict the establishment of smart farms:

Organizational and legal constraints: - the fact that small and large farms produce a substantial portion of meat and milk restricts the need for smart technology and real consumer demand. Individual elements of digital technology, on the other hand, can be used on farms.

- lack of rules for the use of smart technologies in animal husbandry and legal requirements for its harmonization with the legislation;
- the mechanism of operation of the "smart farm" is mainly connected to the Internet, the speed of the Internet in areas where livestock farms are located in the conditions of remote radio communication is lower than international standards;
- the complexity and narrow scope of regulatory documents related to the use of unmanned aerial vehicles and geographic information systems (allowed only for certain areas);
- lack of a system of training specialists for modern areas such as digital economy, smart agriculture, digital technologies in agriculture, insufficient system of their teaching methods and internships;
- a lack of trained personnel operation in the agricultural sector, particularly in the livestock sector (working conditions, distance, wages), because the range of local and foreign HEIs training specialists in IT technologies is not focused on narrow and subsystem orders;
- lack of organizational framework for quality higher education in accordance with the basic approach to the "smart farm", i.e., STEM (Science, Technology, Engineering, Mathematics);

- the necessary equipment and technology for a "smart farm" are entirely reliant on imports, and the necessary infrastructure (scientific institutions, factories, and IT parks) to localize them does not exist.
- the lack of financial resources for the import of devices with high technical and technological capabilities in most livestock farms is a socio-economic limiting factor.
- "Smart farms" necessitate the simultaneous efforts of many experts. The inability of small farms to have adequate working conditions and pay for highly skilled professionals such as zootechnicians, veterinarians, programmers, analysts, and engineers;
- lack of mechanisms for economic incentives for activities related to the creation, production and use of high-performance equipment and technologies for livestock farms;
- the involvement, support, and cooperation of social institutions in the organization and management of the "smart farm" are insufficient, due to a lack of culture associated with the use of smart technologies and the knowledge obtained via them.

Given the foregoing, one of the most pressing tasks facing the livestock sector today is to create "smart farms," develop and enforce financial and economic incentives, and ensure the development of world-class quality meat and milk.

The activities of smart farms, it was noted, necessitate the training of specialists in a variety of fields. These professionals are currently trained in various departmental systems and are not organized. There is a need to organize the activities of their planning and study in this sense.

A smart farm will completely manifest itself as part of the modernization of the livestock network if all systems operate efficiently at the same time. A breakdown of the system would result from a violation of the mixed feed supply needed for a complete ration, or a failure of the power supply or skilled personnel supply to operate the technical equipment that regulates the milk content.

Considering the above, the following logical sequence of steps should be followed when establishing a "smart farm" (Figure 2).

First of all, the stages of establishing a "smart farm" should begin with training and retraining. The reason is that the "smart farm" can import technical and technological equipment, but it will also have to import the appropriate service system. Issues of retraining (internships abroad) on the farm can negatively affect the competitiveness of the product.

And for that, universities dedicated to the training and retraining of trained specialists for the smart farm must open the required areas, open them, and equip them with professional and technological equipment. Simultaneously, particular attention must be paid to the provision of high-quality higher education in line with the new STEM (Science, Technology, Engineering, and Mathematics) approach. Furthermore, frameworks for in-depth analysis of world experience through distance learning and experience sharing in an online system must be created.

The import of technical and technological innovations, as well as attention to their localization, is needed in the second stage. The need for this stage can be explained by the risk of "enclave entrepreneurship" emerging, as well as the emergence of scientific and technological dependency as a result of the importation of equipment and technology needed for a "smart farm."

It is expedient to finance research in this area, encourage authors, expand government grants, encourage the commercialization of research results at "zero value".

In the third stage, all the links required to set up a smart farm need to be organizationally and institutionally adapted. It is advisable to pay attention to the following aspects:

- strict regulation of land-allocation and land-use policies that ensure a complete ration of livestock on a smart farm;
- development and implementation of a system for ensuring continuous resource supply (gas, electricity, water, fuels and lubricants materials, and so on);
- simplification of measures related to the introduction and connection to the high-speed Internet system;
- creating conditions for the security of the database and its free use on the farm;
- - establishing an operational and legal structure for the use of unmanned aerial vehicles (UAVs) and remote communications.

Finally, by promoting the establishment of smart farms, the creation of advocacy support, and the implementation of organizational support systems, it is beneficial to increase interest in the digital management system of farms.

The economic incentives mentioned below should be widely used to encourage the establishment of smart farms. Incentives through the tax system, in particular, are a very powerful method of production.

Since 2008, meat and milk processing businesses have been treated as a single taxpayer, and a value added tax will be implemented on January 1, 2019. We believe that allocating a portion of the value added tax charged by meat and milk processing businesses as one of the center's funding sources is a good idea.

In this regard, the state should promote the activities of organizations that support smart farms (meat and dairy processing farms, livestock processing businesses).

In this case, it is recommended to determine the value of financial incentives (VFI) for entities involved in the system of financial support of the livestock sector as follows.

$$VFI = \frac{(VDP - SOB) * VAT * SI}{100}$$

Here:

VFI - the value of financial incentives for entities involved in support, million soums.

VDP - value of processed meat and dairy products, (million soums);

SOB - value of meat and dairy products purchased from farms, million soums;

VAT - the rate of the value added tax established in the republic, (%);

SI - share of farm incentives, (%).

The economic interests of each business group concerned should be considered when assessing the share of incentives (SI). It is recommended that funds be allocated in the following ratio.

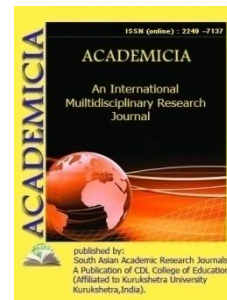
- 50% to the Smart Farm Support Innovation Center;
- 35% of farms that have introduced smart devices;
- processing enterprise can be distributed in the amount of 15 percent.

As a result of this approach, a source of funding for research and development, a financial support system for farms that have implemented smart devices, and incentives for meat and dairy processing companies to buy directly from these farms have all been developed.

In short, the involvement of the private sector in science through the establishment and promotion of smart farms, as a result of material, technical and financial incentives through the increase of the final result of projects, the level of implementation and its commercialization for the private entrepreneur, economic (profit, market segment, capitalization) and for the state, social (food supply, science development and employment) benefits might be achieved.

REFERENCES

1. Uzbekistan will switch to "smart agriculture. <https://www.spot.uz/ru/2017/12/11/smart-agriculture/>
2. V. Rakhmanin - speeches at the session of the St. Petersburg International Economic Forum. <http://radrf.ru/index.php/nashi-publikatsii/9-novosti/627-fao-prizvala-pereklyuchatsya-na-umnoe-selskoe-khozyajstvo>.
3. Ivanov. Agriculture in a smart way. <https://iot.ru/selskoe-khozyaystvo/selskoe-khozyaystvo-po-umnomu>.
4. Address of the President of the Republic of Uzbekistan Shavkat Mirziyoyev to the Oliy Majlis of December 28, 2018. <https://kun.uz/uz/news/2018/12/28>
5. Decree of the President of the Republic of Uzbekistan dated 29.11.2017 PD-5264 "On the establishment of the Ministry of Innovative Development of the Republic of Uzbekistan", <http://lex.uz/docs/3431985>
6. Decree of the President of the Republic of Uzbekistan dated April 17, 2019 PD-5708 "On measures to improve the system of public administration in agriculture." <http://lex.uz/ru/docs/4291908>
7. "Smart" technologies in the agriculture of the Republic of Uzbekistan Concept project, <https://regulation2018.gov.uz/uz/document/3085>



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METHODS OF USING INFORMATION ABOUT THE ART OF MUSIC IN THE TEACHING OF HISTORY OF UZBEKISTAN TO STUDENTS OF 6-7 GRADES OF SECONDARY SCHOOLS

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ABSTRACT

This paper discusses the information used as additional materials in explaining the reality of music to students in the teaching of history lessons in grades 6-7 of general secondary schools and the didactic aspects of educating students in the aesthetic spirit on the basis of this information.

KEYWORDS: Music, Instrument, Musician, Melody, Ensemble, Method, Teaching, Lesson, Genre, Heritage.

INTRODUCTION

Today, the prestige of the science of history in educating the younger generation as a perfect person is growing significantly. The science of history not only forms in students the skills and abilities about our past, but also has a special place in the formation of the younger generation as a patriotic, hardworking, spiritually mature person. Especially in today's globalization, the information conveyed to students through history textbooks is also important in protecting the minds of young people from mass cultural threats.

History not only informs students about the social, political and economic life of our country, but also plays an important role in raising their cultural level. Today, every nation and state wants to be proud of how much it has contributed to human civilization in its past. Furthermore, inculcating in the younger generation the important aspects of human civilization enriched by the spiritual riches of their ancestors not only instills in them a sense of national pride, but is also an important factor in educating the younger generation in the moral and aesthetic spirit. We are convinced once again that the science of history has a special place in the spiritual education of

young people from this point of view. In the criteria of the formation of human civilization, the traditions of urbanization, architecture, religion, art and statehood play an important role.

In this article, we will try to explain the methods and recommendations for the use of music-related resources and materials in explaining topics related to cultural life in the process of teaching history lessons to secondary school students.

We know that music is one of the earliest discoveries of mankind in primitive times. For example, primitive people sent a "signal" to their relatives when something dangerous approached them, or when they called each other somewhere, hitting something and making a noise. The teacher also used certain attributes to explain to the students that in the performance of archaic rituals related to the pursuit of evil spirits, the sound of knocking on something and dancing in front of the fire in the same way as that primitive music. For example, if you can vividly demonstrate the unique sounding situations by hitting a stone, a wood, a wood, this process will be convincingly preserved in the minds of students. As humanity progresses, so do its tools of labor, its clothing, its means of subsistence. This situation can be justified by a lot of information by teaching history to 6th graders in schools [1]. In this class, students can be reminded that our ancestors have a very ancient history in the art of music by showing the statues of women playing the oud in the Ayritom frieze and the drum statue in explaining the culture of Bactria in ancient times. In addition, it is worth noting that the oud and drum instruments were not imported to our country, but these musical instruments were the invention of our ancestors [2]. Explaining Amir Temur's centralized "founder of the state" in the history of Uzbekistan to 7th grade students, Amir Temur was informed by his priest Sayyid Baraka about the presentation of the state flag and drum in the village of Biyo, near Termez. it is possible to note that the drum is not only a musical instrument but also one of the attributes recognized as one of the state symbols, and this information can also be explained by linking this information to the statue of the instrumentalists depicted in the 6th grade Ayritom frieze [3]. Also, when explaining the theme of cultural life in Movoraunnahr and Khorasan in the IX-XIII centuries to 7th grade students, it should be noted that during this period, the art of music in our country was very developed, holidays, weddings, folk festivals and other ceremonies. During this period, musicians made extensive use of oud, tanbur, kobiz, rubab, nay, trumpet, trumpet, neighbor, law, and many other stringed, percussion, and wind instruments. , students' interest in the subject will not only increase, but they will also be eager to play these words. While covering this topic, the teacher has to give information about "Shoshmaqom" formed on the basis of folk melodies. Then, by explaining to students that "Shoshmaqom" is a classic song of the Uzbek and Tajik peoples, it should be noted that the culture, history and traditions of these two peoples are common. He also noted that Shoshmaqom melodies are not the work of one or two musicians, but that this classical melody is a product of folk art, and that this invaluable heritage has come down to us through the traditions of teaching and learning.

MATERIALS AND METHODS

The fact that the great composer of the XX century, academician Yunus Rajabi wrote the note "Shosh maqom" also enriches the students' perception of "Shosh maqom. Also about the students' "Shosh maqom" knowledge and the melodies that formed the basis of Shosh maqom in further expanding their skills were "Rost", "Khusravoniy", "Boda", "Ushak", "Zerafkanda", "Buzruk", "Sipohon", "Navo", "Basta", "Tarona" transition plays an important role [4].

It should be noted that the art of music developed along with the science of poetry and musicology. In addition, it is useful to explain to students that Abu Nasr al-Farabi, known as the "second teacher", wrote a separate pamphlet on music called "The Book of Music" [5]. When informing 7th grade students about the history of our national culture, especially music, it is worth noting that along with "Shosh maqom" there are also Khorezm maqoms, Fergana, Bukhara and Khorezmian ways of performing maqom. In particular, the significant development of the art of maqom during the years of independence, the organization of the festival of maqom in 2018 in Samarkand on the initiative of the President of the Republic of Uzbekistan. It is also possible to enrich the students' perception of this art and increase their interest in the status and its performance [6]. The first renaissance of the Eastern Renaissance in the IX-XII centuries and the second renaissance in the XIV-XIV centuries, the third renaissance put forward by the President of the Republic of Uzbekistan Sh. Mirziyoyev. It is somewhat easier to convey the content and essence to the minds of the students. During the course, it is worth noting that in the XIV-XV centuries in the region were created new melodies and songs, musical instruments and rare works on music theory, many skilled musicians, musicians and hafiz. It is necessary to explain to the students the names of Abduqadir Nayi, Kulmuhammad Sheikh, Hasan Udi, Shahquli Gijjaki, Qasim Robbani, who lived and worked in this period [7]. It is useful to remind students that during this period, along with talented musicians, such thinkers and poets as Ulugbek, Navoi, Jami, Binoi were engaged in the art of music and contributed to its development to a certain extent. The sultan of Movoraunnahr, the great astronomer Mirzo Ulugbek wrote five pamphlets on music, as well as composed melodies "Bulujiy", "Shodiyona", "Akhloqiy", "Tabriziy", "Usuli ravon" and "Usuli otlig". expands.

RESULTS AND DISCUSSION

It should be noted that the nickname of Alisher Navoi, a great representative of classical Uzbek literature, who played an important role in the cultural life of the XIV-XV centuries, is associated with the music "Navo" or "Kuy". It should be noted that Alisher Navoi himself was a skilled musician, and the song "Isfahani" was composed by Alisher Navoi. It should be noted that the great composers of this period, Abdurahmon Jami and Kamoliddin Binoi, created a work on the theory of music, which reached a new stage of development in the organic connection with music and poetry. It should also be noted that the results of the work done during the years of independence to find, study and promote the rich spiritual heritage of our ancestors in the wider public and international arena, in particular, to study and pass on the rich musical heritage of our ancestors. , 2002 Boysun Spring Open Folklore Festival but, the fact that for some reason the festival was suspended but re-organized in 2019 has led to the revival of folklore and folk melodies, songs, lapars, sayings and poems in our country. It is also possible to dwell on the development of the art of baxshi in our country. It provides information about the activities, repertoire of epic schools such as Sherabad, Shakhrisabz, Kamashi, Bulungur, Narpay, Khorezm, the life and work of bakhshi poets, connects them to the Internet and releases video and audio recordings of bakhshi poets. it can be argued that the creator also has a unique voice. At the same time, the students will be able to listen to the melodies "Horse driving", "Kelin oy", "Ghazaloy", "Balkhuvon" and other drums, as well as charnikovuz melodies. It is much easier to embody the real reality in the minds of students by connecting history with the times. Therefore, in 1999 the 1000th anniversary of the epic "Alpomish" was celebrated, in 2000 the honorary title of "People's Bakhshi of Uzbekistan" was established. It should be noted that in 2021, the II

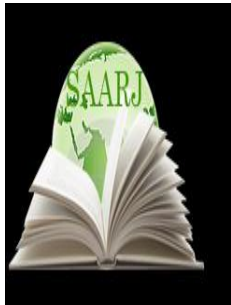
International Festival of Bakhchisarai was held in Nukus, which can further increase the interest of students in this art [8]. It should also be noted that a school of baxshichi was established in Termez, a list of those interested in this art was formed, and he studied at the school of baxshichi.

CONCLUSIONS

In conclusion, it is worth noting that the effectiveness of the lessons will be further enhanced by the use of crossword puzzles, cases, brainstorming, demonstrations, fish skeletons, pyramids in the history lessons for students of grades 6-7.

REFERENCES

1. Sadullaev A, Kostetsky V History, textbook for 6th grade general secondary schools. - Tashkent, 2017, P-186.
2. Tursunov S, Qobilov E, Murtozoev B, Pardaev T. History of Surkhandarya - Tashkent: Sharq, 2004, P-86.
3. Muhammadjonov A, Sultonov F. Textbook of history of Uzbekistan for 7th grades of secondary schools, -Tashkent: "Sharq", 2019. p. 112-113.
4. Musaev N, Azimov H. Cultural Studies, Textbook, - Tashkent, 2011, pp.147-149.
5. Xayrullaev M. From the history of cultural heritage and social, philosophical thought, - Tashkent, 1995, p.43-46.
6. Voice of Uzbekistan newspaper, December 21, 2018.
7. Hamidov H. Problems of history, formation and development of Uzbek spiritual culture (on the example of the history of traditional Uzbek singing) history fan.dok ... diss. Own RFA Institute of History - Tashkent, 1997, p.60-62.
8. New Uzbekistan newspaper. September 18, 2021.



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THE IMPORTANCE OF BIOLOGICAL AND PSYCHOPHYSIOLOGICAL FACTORS IN THE DEVELOPMENT OF EDUCATIONAL AND COGNITIVE ACTIVITIES

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ABSTRACT

In the article, the further development of the educational system, the coordination of educational processes on the basis of an innovative approach, the importance of the activity of student learning and cognition, reading, the specific stage of preparation for labor activity, the calculation of the main activity of students, the development of educational and cognitive activity in students is manifested as a complex psychological phenomenon, to be socially and psychologically prepared for them the emergence of a wide range of opportunities for effective educational and cognitive activity, the activation of educational and cognitive activities of students in the organization of the educational process is carried out under the influence of a number of biological and psychophysiological factors, while parents and teachers should pay attention to the fact that there are, the essence of biological and psychophysiological factors affecting the activity of educational-cognitive activity, as well as the need to acquire modern professional knowledge, the content and important aspects of the organization of independent education, the activation of educational-cognitive activity of students in the educational system today are interpreted.

KEYWORDS: Education, Student, Process, Activity, Teacher, Influence, Necessity, Interest, Activity, Motivation, Quality, Demand, Result, Content, Approach, Essence, Formation.

INTRODUCTION

With new innovative ideas, proposals and initiatives for the development of the educational system, the formation of the necessary skills and knowledge for them to be holders of modern professions, the creation of a system of automation and comprehensive analysis of the management of education when using modern information and communication technologies, the issues of further development of electronic resources and distance education have been. In particular, the development of the methodological system and conditions for the development of educational-cognitive activity and the level of professional training of students of professional education directions plays an important role. Legal-normative and educational-didactic provision of training of pedagogical personnel in accordance with the world requirements is being improved in the higher education system. The development of effective curricula based on innovative approaches to vocational training and the use of new effective didactic opportunities of individual-oriented education in this system will serve as an important factor in achieving educational effectiveness. Today, great attention is paid to the improvement of vocational training of students of vocational education on the basis of technological development of education, the use of innovative approaches, the development of innovative models of competitive, competence training in accordance with the requirements of the labor market. The issue of the development of educational and cognitive activities of students of the directions of vocational education is of great importance in the conditions of the credit-module system of higher education. A number of scientific researches are carried out to improve the evaluation criteria of the level of professional training of graduates of the higher educational institution, improve the electronic system of clarifying the results of educational and cognitive activities. In particular, the development of professional knowledge and skills necessary for the future professional activity of students of vocational education on the basis of innovative, creative potential, acquired pedagogical and psychological knowledge is one of the priority issues. The development of professional training of students by bringing advanced foreign experience into the process of higher education, active acquisition of professional knowledge in the process of training and independent education are considered as urgent tasks to achieve with the help of innovative technologies and methods.

Main part

Further development of the educational system, coordination of educational processes on the basis of innovative approach, activation of educational-cognitive activities of students plays an important role. Study is a specific stage of preparation for labor activity and is the main activity of students. It is aimed at acquiring knowledge, as a result of which the necessary skills and skills are acquired, and the students understand the meaning and purpose of education.

Educational activity is a complex process, carried out in the didactic process from the stage of motivation, that is, after the initiation of internal action on knowledge. Acquisition of knowledge on the basis of stages of knowledge, understanding, analysis and generalization of the content of education indicates the effectiveness of educational-cognitive activity [1]. Exactly the effectiveness of education depends on the correct design of the didactic process by the educator, on the precise setting of the educational goals and the correct Organization of didactic operations in achieving them. In this situation, the correct selection of educational methods and the determination of the types of Education based on them, the harmonization of didactic goals with social goals, the development of educational activities.

In the didactic process, didactic games, problematic education, technologies of cooperation education, modeling education play a key role in the organization of effective educational and cognitive activities. In general, depending on the indicators of the results of achieving the goal of educational-cognitive activity, two groups are divided into:

- 1) effective teaching-learning activities;
- 2) inefficient learning can be divided into cognitive activities.

Effective teaching and cognition activities if we interpret the peculiarities of didactic functions, then in the didactic process on the basis of problematic educational technology, the creative assimilation, interest and need for knowledge of the content of education by students increases. Consequently, one of the main tasks of the new module of education is the formation of the qualification of the student to acquire knowledge on the eve of his labor.

The organization of educational-cognitive activities on the basis of didactic play, problematic, controversial, collaborative technologies, the content of the characteristics of students' cognitive activities, interest in science, the expansion of knowledge. In the educational-cognitive activity, the basis of the content of Education provides the basis for discussion, orientation to find the main ideas and solutions, the formation of creative, independent thinking. Free-thinking classes in educational and cognitive activities formulate the characteristics of students' scientific outlook, need for knowledge, mastering the content of independent education.

The main role in the organization of educational and cognitive activities is played by the correct definition of the toxic range of goals, the correct selection of didactic goals based on the general objectives of the project. So, from the psychological point of view of effective educational and cognitive activities, we can interpret as follows:

- 1) planning of educational and cognitive activities;
- 2) self-control, extensive knowledge, systematization in historical methods;
- 3) master the methods of self-management and find a new one;
- 4) to master the methods of self-control of attention, which governs personal interest.

Educational-cognitive activity is associated with cognition and perception. If these processes do not participate, educational activities may not be manifested.

The organization of didactic process design on an algorithmic basis, that is, the implementation of actual operations, which are carried out in stages in the mastering of educational content by students, is the basis of educational and cognitive activity. Module Program of the educational process in this direction increases the effectiveness of educational-cognitive activity, divide the elements of educational content educational-cognitive activity on the basis of the module lesson and set the objectives of the components associated with it. The effectiveness of educational and cognitive activities, cognitive characteristics in the student's personality are the following criteria.

- 1) active acceptance of the study material;
- 2) to master the methods of mastering the instructional material;
- 3) assignment and assignment of tasks in the mastering of educational content;

4) self-control and evaluation.

The formation of these criteria in the student personality is one of the main issues of educational and cognitive activity. So, based on the final results of the didactic process, we can conclude that any educational process will not be an educational activity either [2]. Consequently, the internal mental and external physical actions that a person performs on the basis of an perceived goal are called activities.

Raising the didactic process to the level of educational and cognitive activity is the main issue of innovative educational technologies. Namely, innovative educational technology is the basis for the organization of effective educational and cognitive activities. In the organization of each didactic process requires careful preparation from the educator, design on the basis of the established pedagogical system and implementation of usual operations on the basis of selected educational technologies, tools and forms. This creates the basis for effective organization of educational activities. The organization of effective educational activities is of social importance. In his contemporaries, the student's worldview is composed, the acquired knowledge, skills, qualifications are transformed into the spirituality of the individual, personality is formed, attitude to society, social system, environmental existence arises, understands the essence of education, respect for it, features of respect are found. Consequently, we see the educational role of education as a priority, however, the content of the sense of respect for education in students is still neglected. It is no secret that as a result of this, negative trends have arisen, such as a careless attitude to the educational process, reading to the name, not understanding the essence of education. Of course, the occurrence of such a negative direction is bilateral, that is, the passive attitude of the student to the educational process, as well as the didactic process by the teacher, is not designed on the basis of pedagogical requirements. Such a professional approach to the didactic process leads to ineffective educational-cognitive activity. Neglect of the results of the educational process creates a ground for the formation of a mood in which students are fed, do not appreciate time. Consequently, the control phase, which is the main component of the didactic process, that is, the realization of the assimilation of students' educational content, has an impact on the results of educational-cognitive activities. This demonstrates the effectiveness of Education, which is the basis of innovative educational technologies.

RESULTS AND DISCUSSIONS

Now the principles of teaching are known, but the law is not known. Therefore, in the direction of determining the laws of teaching and learning and mastering, first of all, the study of a person, his psychological, physiologic and other characteristics continues. The main reason for the non – assimilation of educators is the fact that their literacy (reading, writing) is bad, and the pedagogical reason for this is the lack of fast memory in them. The basis of the technology for the development of students' general educational skills is diagnostics and self-diagnostics.

The more quickly the text is read, the worse it is mastered, but the effect of 50-75% of words in the text on the meaning is less. With the speed of reading, the speed of memorization is different. Remembering is a process that takes place more slowly. In fast reading, the eye stops after both words. In this case, special exercises are performed until you can not stop until the end of the line, that is, you can see at first glance, and then walk upright in the middle of the line and see several lines at once. These are the following: let's not shake the lips, let's not read the words aloud. 250-500 words per minute, in exceptional cases, 700 and more words can be read.

The student's activity will be at more or less levels. Tiradi more than degrees actually decrease the quality of mastering, which is the excitability.

There is no direct immunity between the level of activity and mastering. Low activity, of course, low, while high activity, it can not be noted that it really provides solid knowledge.

Activity for effective reading is diverse, but it can be optimal for everyone. Motivation is of great importance for educational outcomes. Motivation is the sum of various reasons motivating a person to read or perform an action [3]. In students, such a reason is understood, so their assimilation is good. Since the students are older than the students, the motivation in them creates the right attitude towards reading. It will be known from this that the degree of memorization depends on the motivation. Also, to pass the test successfully, only memorization does not give a positive result. Reading, learning and remembering for active use of the acquired knowledge in the future is a positive motivation, and this goal itself is highly effective.

Negative motivation is a complex teaching, but the student's indifference to study negates all our efforts. Motivation factors are the reasons that motivate the student to acquire knowledge. The ability to read consists of many indicators. They change according to age. For example, children, adolescents read faster, keep in mind longer. "The knowledge learned in youth is like a pattern carved into a stone", it is not said in vain. If the motivation in the students is seriously perceived, then with increasing readiness in them, they can study very well.

The student's perception of his / her shortcomings and achievements in the educational process is a serious basis of a positive result [4]. In order to strengthen positive qualities and change their negative qualities, the student must know what is good, what is bad. It is necessary to praise his achievements, and in negative cases to reproach. In its place and the right Praise will help the student to be confident in his own strength. But if the praise is overstated, it causes negative States. Dissatisfaction also has a beneficial effect, especially on the high self-appraiser. But from regular failures the soul of the educator falls, it is necessary to take this into account.

Success in reading, the faster the good deed is stimulated, the more effective the effect [5]. The rebuke also gives the same result. As a result of delaying the rebuke, negative behavior quickly strengthens. This should be avoided. The danger of this is that the appearance of sudden negative behavior is considered to give a "positive" result. Such behavior can create negative skills in the student.

Only by praising or rebuking, it is not possible to strengthen good behavior or eliminate negative behavior. A person simply refuses a behavior that did not give a positive result to him. For example, if a student's immoral behavior is not assessed only by his peers only by laughter, and such students can not grab the attention of others by their undisciplined actions, then the desire for negative actions in them is lost.

If we open up the good qualities of the student and praise him often, then the chances of overcoming the negative qualities in him will increase. By putting a positive quality in a disciplined student in the center of attention of his classmates and group mates, the chances of turning him on the good side increase. Everyone has positive qualities, but it is often acquired negative skills that close it. That is why it is vital for every student to find out the positive aspects that existed before and to develop at the right time.

Learning to read begins with infancy. In Bunda, the interaction of parents and their relationship with children is of serious importance. The first emotional impressions leave a significant mark in the later life of a child. It can be good or bad. When preparing a child for school, parental interaction with the organization of pre-school education is necessary. The organization of preschool education provides assistance to parents in the upbringing of children. The child is brought up mainly in the family. The attitude, readiness of the child to study depends on the environment in the family. Teaching children certain games, setting their constant tasks at home, contemplating a system of age-appropriate requirements will serve to prepare them for school and determine the path to further development.

The educational requirements for a teenager, if they are accepted by the child, will give a result. Therefore, these requirements must be purposeful and have meaning for the child. Otherwise, the child will actively resist. In overcoming difficulties in reading and eliminating many repetitive mistakes, relying on a positive quality in a teenager gives a good result. The more good qualities we find and stimulate in a teenager, the faster we can eliminate the negative qualities in them.

It is necessary for a teenager to be able to share his achievements in school, that is, to be happy together with him, to help him to cope with them if it is difficult. In this situation, parents should have regular contact with the school, even if the teenager is well educated. If a teenager is happy with everything he does, it becomes customary for him to perform tasks and tasks. It is necessary not to prohibit the adolescent's questions about serious matters. This is a matter that determines his future social, biological life. Therefore, it is necessary to answer his questions clearly and satisfactorily.

It is necessary to talk with adolescents on any topic. Free communication with them increases the confidence of the teenager in you. Do not pay attention to the conversation with him under various pretexts. Because over time, your delay can convince others that the teenager has absorbed the wrong thought.

Re-reading is always more complicated than re-reading. In this situation, the following objectives are envisaged in accordance with the need:

- mastering knowledge;
- to teach some skills.

The main basis for re-reading is to make sure that it is necessary. In this it is necessary to seriously enter into the implementation of the intended goals, to believe in the correctness and necessity of the changes that caused the retraining, to have a desire and desire to learn new ones. The need for re-reading is carried out differently under different conditions. For example, studying at home, the beginning of teaching the same in another way at school to a teenager who has learned to count, will also consist in re-reading. Such a situation is a specific challenge for a teenager. Reading to a new way of work, the use of new techniques or reading to a new profession are the main forms of retraining.

The acquisition of knowledge (in education) depends not only on the characteristics of memory, but also on personal abilities, concentration of thought, purpose and diligence [6].

Goal aspiration is one of the necessary conditions, in which the average abilities acquire even more and more robust [7]. The method of cost-effective mastering is different in everyone.

It is known that memory should always be practiced, otherwise it will begin to hurt. Mental and physical abilities for reading can make a huge difference in interaction between adults of equal age. The social, family situation, education, profession, the desire to increase their professional level, lifestyle, opportunities of the person in the Bunda will be important. It is more important than biological age characteristics. Therefore, it is more correct to conditionally divide the age phases.

Each period has its own characteristic of memory, the ability to think, these periods are conditionally defined as follows:

Adolescence is from 18-20 to 25-30 years old.

The middle age is from 25-30 to 45-50 years.

The older age is from 45-50 to 65-70 years.

Old age is higher than 65-70.

2 factors of successful education: interest in learning and preparation for it are well-formed in adults compared to children [8].

In pedagogical practice, the material, objective aspect of the pedagogical process is always present with the addition of mental processes, one can not exist without the other [9]. This applies to any activity, but more relevant especially to the activities of educators, educators and educators.

The pedagogical process can not be carried out without psychological consequences [10]. The ratio of information received and developed by means of 5 intuition members, which forms knowledge in a person, is as follows::

Through the viewing member-83 %;

Through the auditory member – 11 %;

Through the smell cognition member-3,5 %;

By skin sensation-1,5 %;

Through taste knower – 1 %;

Total – 100 %.

The information received with the participation of our members of different senses will be remembered two weeks later in the following quantities:

10 percent of what we read.

20 percent of what we hear.

30 percent of what we see.

50 percent of what we see and hear.

80 percent when we talk.

90 percent when we do practice.

From this it becomes known that the ability of a person to remember depends on what methods he has mastered information and in what ways of intuition members. The most recently learned thing is forgotten sooner. So it is necessary to repeat the last learned more. This should be known, especially by young adults who are studying.

To activate the process of memorization, it is useful to read the material aloud [11]. The sound should be neither too low nor too loud. Reason: in a low voice the student can be distracted from the text, while in a loud voice he can focus on his own voice and move away from the meaning. The acoustic perception of the text in a moderately loud voice and the movement activity of the language help to remember.

So, it is necessary to read aloud, to say words moderately loud (not deliberately hard or in a low voice). Scheme (systematic) memorization will help to draw up a plan of the material read. In this it is necessary to distinguish the Basic Rules, facts. It is necessary to write the main one either in memory or in the system in which it developed itself. Very well helps to distinguish the Basic Rules in different colors. But it is necessary to distinguish the main one correctly, for this it is necessary to learn how to work correctly with the book. Then the material under study is divided into small pieces, the repetition (and not the whole section) gives a good result, saves more time, improves the quality of mastering. Step-by-step study and repetition of the read material not at once will give better results. The teaching science material should be repeated not for one day, but for several days. For example, repeating the task, consisting of 24 exercises, not on 3 day, for 12 days, will certainly give a good result.

It can be concluded that youth forgetfulness is sometimes caused by a slow (passive) fading of memory, and sometimes by an active braking due to an abundance of impressions [12]. It is necessary to control the content, volume of TV shows, which deeply excites young people. Then the imagination of young people can ensure the preservation of their spiritual strength for reading, without spending it on unnecessary things.

Any feature of the psyche requires regular exercise, only then it will be reliable enough [13]. This applies to memory, speech skills, logical thinking, concentration of attention, etc.

Special exercises for memory accumulation exercises:

- the agenda is relatively moderate (stable) - be unchangeable;
- to have a clear time to study and rest during the day;
- to teach the beginning work to the end without distractions, to ensure that the bunda teenager is not distracted by both other young people and adults;
- control over the performance of household tasks;
- strengthening any achievement with timely stimulation;
- more complicated lessons in the morning, the passage of teenage fatigue;
- give rest to the teenager when fatigue is evident.

It is necessary to carefully teach the student to self-control. To do this, the educator, the parent must be calm, give up. This is a serious condition, when they get tired of work and come in an unpleasant mood, it becomes light to press on their feelings if they want to educate the teenager well. Bunda's own behavior, with her behavior, motivates the teenager to be orderly.

CONCLUSION

It is necessary to arm the students with important knowledge in general and specialty areas, to achieve speed in this regard. A thorough mastering of the fundamentals of general and professional disciplines by students allows them to withstand the strong competition in the labor market. The full-fledged formation of students as a specialist depends not only on the teacher and his activities, but also on the development of the student's educational and cognitive activities in the process of training. The development of educational and cognitive activity in students is a complex psychological phenomenon, which manifests its own peculiarities. Their physical, social and psychological readiness for this process creates a wide range of opportunities for them to effectively achieve educational and cognitive activity. Therefore, when organizing the educational process, attention should be paid to this aspect of the issue. In the educational process, the activation of the student's educational and cognitive activities does not take place on its own. This is achieved under the influence of a number of factors. It would be desirable for parents and teachers to pay attention to the fact that there are factors that have a positive impact on the performance of students' learning.

Reliance on psychological factors, both in improving the quality of education and in improving its effectiveness in modern conditions, guarantees a positive result of pedagogical activity [14]. Accordingly, psychological factors play an incomparable role in the development of educational and cognitive activity of students in the higher education system.

REFERENCES

1. Bulatova, Yu.I. Revitalization of educational and cognitive activity of university students / Yu.I. Bulatova // Pedagogy of higher education and vocational education. - 2012. - No. 3 (5). S. 8-13.
2. Godwin, A. Kara "The Counter Narrative: Critical Analysis of Liberal Education in Global Context." New Global Studies 9 (2015): 223-243.
3. Maslow A.G. Motivation and personality. SPb. : Peter. 2016.290 s.
4. Muslimov NA, Rakhimov ZT, Khuzhayev AA Professional pedagogy. Textbook. Tashkent "Voriz" publishing house - 2020. 517 p.
5. Muslimov NA, Rakhimov ZT, Khuzhayev AA, Kadyrov H.Sh. Educational technologies. Textbook. Tashkent "Voriz" publishing house - 2019. 568 p.
6. Podymova L.S. Innovativeness of the subject of education in the context of modernization of higher pedagogical education // Pedagogical education: challenges of the XXI century. - M.: Moscow State Pedagogical University, MANPO, 2015. - pp. 32-37.
7. Rakhimov ZT An innovative approach to the development of students' learning activities. Tashkent State Pedagogical University Scientific Information. Scientific-theoretical journal, issue 3 (19) 2019. Pp. 92-97.
8. Slastenin V.A. and others. Pedagogy Textbook. manual for stud. higher. ped. study. institutions / V. A. Slastenin, I. F. Isaev, E. N. Shiyanov; Ed. V.A. Slastenin. - M. : Publishing Center "Academy", 2013. - P. 576

9. Sklyarova T.V., Bityanova M.R., Beglova T.V. Values in modern school education: the experience of pedagogical design. - Monograph. - Penza, 2017. - 328 p.
10. Finkelstein M.J. The American Academic Profession // A Synthesis of Social Scientific Enquiry Since World War II. – Columbus: Ohio State University Press. – 1984. – p. 109.
11. Frederick P.I. The Lively Lecture – 8 Variations // College Teaching. – Volume: 14. – 1986. – p. 43-50.
12. Foster N. Richard “What is Creativity,” Yale Insights. February 16, 2015. Accessed on October 12, 2016. URL: <http://insights.som.yale.edu/insights/what-is-creativity>
13. Khutorskoy A. V. System-activity approach in teaching: Scientific-methodical manual / A. V. Khutorskoy. - Moscow: Eidos Publishing House; Publishing House of the Institute of Human Education, 2012. - 63 p.
14. Heather Fry, Steve Ketteridge, Stephanie Marshall. A handbook for teaching and learning in higher education: enhancing academic practice / Third edition // <http://biblioteca.ucv.cl>.



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COMPETITION IN THE MARKET OF BANKING SERVICES: THEORY AND PRACTICE

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ABSTRACT

The article discusses one of the priority directions of the strategy of economic development of the Uzbekistan is the activation of the country's financial market and the formation of a global financial center on its territory in the future. At the same time, competition is considered to be the most important factor in expanding and improving business efficiency. Competition encourages constructive action in the market, offering consumers a wider range of products and services at more attractive prices and better quality, which contributes to increasing production efficiency and redistributing financial resources to the most competitive organizations. It is emphasized that competition in the production and sale of goods and services is a fundamental element of the market mechanism for regulating the economy. Banking competition is one of the types of competition in the financial market, in which banks enter into an economic competition for financial assets and customers with all its participants, including non-banking organizations.

KEYWORDS: *Competition, Financial Market, Banking Sector, Banking Services Market, Government Regulation.*

INTRODUCTION

One of the priority directions of the strategy of economic development of the Republic of Uzbekistan is the activation of the country's financial market and the formation in the future on its territory of a world financial center. The most developed sector of the Uzbekistan financial

market at the current stage is the banking services market, which could become the locomotive of the financial market.

Competition is considered to be the most important factor in expanding and improving business efficiency. It encourages constructive actions in the market, forcing them to offer consumers a wider range of products and services at more attractive prices and better quality, which contributes to an increase in production efficiency and the redistribution of financial resources in favor of the most competitive organizations.

The main findings and results

Competition in the production and sale of goods and services is a fundamental element of the market mechanism for regulating the economy. Banking competition is one of the types of competition in the financial market, in which banks enter into an economic competition for financial assets and clients with all its participants, including non-banking organizations. The creation of conditions for the development of competition in the banking market is considered a key factor in the effective implementation of the principle of the unity of the economic space and the free movement of financial services. A retrospective analysis of the nature of interaction between banks in Russia made it possible to identify three stages in the development of interbank competition since the XIX century, to the present day and describe their economic and institutional features.

The beginning of the first stage is associated with the establishment in 1861 of the State Bank and the emergence of various credit organizations: commercial banks, mutual credit societies, city public banks, mortgage credit institutions, credit cooperatives, savings banks, pawnshops. During this period, due to the specialization of their activities, there was practically no competition.

The second stage in the development of the banking system and competition in the banking services market is the Soviet one. It is characterized by a state monopoly on banking. The one-tier banking system was represented by state-owned banks serving enterprises and organizations in industry, agriculture and other sectors of the economy (State Bank), construction and the population (savings bank system). The banking system was organically integrated into the administrative-command model of management, excluding any competition.

The modern third stage in the development of competition in the banking sector of the financial market should be considered the time of the birth of civilized competitive relations. A banking oligopoly was formed in the Republic of Uzbekistan; competition is intensifying in the context of the universalization of banks, as well as the growth of capitalization and centralization of capital.

By historical standards, banks of Uzbekistan are just beginning to compete in the financial market, and this is happening in the context of financial globalization. Domestic credit institutions did not have time to master the methods of competition within the framework of the national financial market, all the more difficult it will be for them to maintain a competitive position in competition with foreign banks.

The following features of competition in the Russian banking services market can be distinguished.

1. Competitors of commercial banks are various institutional structures:

- specialized banks (savings, mortgage, investment banks, serving small and medium-sized businesses, clearing, innovative banks);

- non-bank financial institutions and non-financial organizations (credit unions, pawnshops, leasing companies, clearing houses, financial brokers, investment companies, pension funds, postal organizations, trading houses). However, non-banking organizations do not provide competitive analogs of banking services.

2. Banking markets are markets for a differentiated oligopoly that provide ample opportunities for cooperation and coordination of market policies of various credit institutions, thus, there is both individual and group interbank competition.

3. Competitive space is represented by a number of sectors, in some of which bank act as sellers, placing assets, in others - as buyers, attracting resources.

4. Banking services can interchange each other, but do not have competitive substitutes, in connection with which intersectoral competition is carried out mainly through the flow of capital.

5. A consequence of the legal registration of banking activities as an exclusive type of activity that does not allow for combination with production, trade and insurance activities is the specific nature of interbank competition, differentiated by types of banking services.

6. Competition between banks takes place under conditions of tough (in comparison with other market sectors) regulatory influence from the state (licensing, monitoring, supervision).

Taking into account these distinctive features, as well as the theoretical concepts of scientists on this issue, interbank competition should be understood as a dynamic process of interaction (rivalry and cooperation) of commercial banks in the process of achieving corporate goals related to the expansion of the market for banking services within the framework of certain territorial boundaries or the global economic system.

The analysis of the state of competition in order to establish the dominant position of a credit institution in its banking operations is carried out in accordance with the second regulatory legal act.

The guidelines suggest calculating the following indicators:

- The capacity of the banking market;
- The share of the organization in the given market of services;
- The share of the organization in the total financial resources;
- Market concentration coefficient;
- Index of concentration of the Herfindahl-Hirschman market.

When determining the capacity of the regional market of banking services, one should take into account the volume of services provided by banks registered in the region under consideration (taking into account the volume of financial services of their branches, branches, representative offices, operating cash desks, additional offices, etc., located in this region), and the volume of services provided by branches (branches, representative offices, operational cash desks, additional offices, etc.) of organizations located in another region. To do this, it is necessary to remove from the balance sheet indicators of local banks the indicators of their structural

subdivisions in other regions and not include in the balance indicators of branches of foreign banks registered in this region, indicators of their structural subdivisions (for example, operating offices of branches in another region).

In order to avoid distorting the calculations of the capacity of the banking market and the share of each representative of the banking sector, it is necessary to calculate the “net balances” on the accounts of banking services, which are determined for each bank (branch) separately - by subtracting from the total balance on the accounts of banking services of a bank or a bank branch of the balance of its internal structural subdivisions located outside the territory under consideration.

In the absence of information, it is possible not to adjust the balances on the accounts of banking services, but to additionally analyze the dynamics of competition indicators. A more accurate estimate can be obtained by the average annual indicators of the total balances on the accounts of banking services, calculated using the chronological average.

Banking competition, obeying the general principles of economic rivalry in the market, is specific both in terms of the object (assortment of services and products) and the scale, which are determined by the globalization of the financial market. However, even perfect competition, including in the banking services market, without government intervention in the form of direct management or indirect regulation, over time is transformed into an oligopoly and even a monopoly.

State regulation should be understood as one of the functions of public administration. Its main meaning and content is the establishment and provision by the state of equal rules of behavior (activity) of the subjects of banking relations and their adjustment depending on changing conditions. However, this function of public administration is not limited to this alone. It also includes:

- Comprehensive control over the fulfillment of the requirements contained in the norms of law governing certain relations in the field of interbank competition;
- Coordination and establishment of the general direction of activities of participants in interbank competition;
- Comprehensive protection of their legal interests and rights, normative consolidation of the general principles of creating equal conditions for the functioning of all participants in the banking services market.

To determine the most significant parameters of the financial market, which must be taken into account in the process of regulating interbank competition, on the basis of correlation and regression analysis, paired linear regression equations were constructed that characterize the direct and inverse dependence of indicators of interbank competition in the Samara region on a number of micro - and macroeconomic indicators. The reliability of the regression equation was assessed by the Fisher-Snedekor criterion, the statistical significance of the model parameters - by the Students’ t-test.

The results of the correlation and regression analysis are summarized in table 1.

Thus, the growth of household incomes strengthening of interbank competition in the regional market, and the concentration of banking capital contributes to the weakening of competition.

Inflation rates have a multidirectional impact on interbank competition in the markets for attracting funds and lending to individuals.

TABLE 1 RESULTS OF CORRELATION AND REGRESSION ANALYSIS OF INDICATORS OF INTERBANK COMPETITION

Competition indicator in the regional banking market	Dependency type	Influencing economic factor	Probable ratio of the indicator and the studied economic factors
Market concentration attracting funds from individuals	Straight	Inflation rate in the country	$\hat{y} = 829,15 + 151,15X_8$. A 1% increase in inflation will lead to an increase in market concentration by an average of 151.15 units.
	Reverse	Cash income per capita in the region	$\hat{y} = 4812,69 - 0,14X_3$. An increase in per capita income of the region by 1% will lead to a decrease in market concentration by an average of 0.14 units.
Market leader share raising funds from individuals (branch of Sberbank)	Straight	Inflation rate	$\hat{y} = 26,90 + 1,82X_5$. A 1% increase in inflation will lead to an increase in the share of the considered leader in the market for attracting funds from individuals by 1.82%
		The size of the charter capital of bank of Uzbekistan	$\hat{y} = 5,85 + 0,51X_2$. Growth of the authorized capital by 1 billion rubles. will lead to an increase in the market share of the Bank of Uzbekistan branch by 0.51%
	Reverse	Cash income per capita	$\hat{y} = 75,43 - 0,0018X_{11}$. An increase in per capita income of the region by 1% will lead to a decrease in the share of bank of Uzbekistan in the market by an average of only 0.0018 units.

Competition indicator in the regional banking market	Dependency type	Influencing economic factor	Probable ratio of the indicator and the studied economic factors
Leader's share in the retail lending market (VTB 24 branch)	Straight	The amount of the authorized capital of VTB-24	$\hat{y} = -44,31 + 1,53X_2$. Growth of VTB-24's authorized capital by 1 billion rubles. will lead to an increase in the share of the leader in question in the regional retail lending market by 1.53%

		Net profit of VTB-24	$\hat{y} = 5,95 + 1,32X_1$. Net profit growth of VTB-24 by 1 billion rubles. will lead to an increase in the share of VTB-24 branch in the market by 1.32%
	Reverse	Inflation rate in the country	$\hat{y} = 73,22 - 5,33X_5$. A 1% rise in inflation in the country will lead to a decrease in VTB-24's share in the regional retail lending market by an average of 5.33%

CONCLUSION

In conclusion, the greatest attention in the management of interbank competition within the framework of the antimonopoly policy of the constituent entities of the Republic of Uzbekistan should be paid to the regulation of the process of bank mergers, relying on the equity capital adequacy standards and the Herfindahl-Hirschman index.

REFERENCES

1. Isakov, M. (2020). MI Abdurrahim Ortiqov, Musaxon Isakov. Industrial iqtisodiyot. O 'quv qo 'llanma.-T. TDIU, 2019.
2. Burxanov, A. U., & Kurbonov, X. A. (2018). Ways to Reduce Local Budget Income in the Territories. *Economics and Innovative Technologies*, 2018(1), 13.
3. Palmer, A. (2012). *Introduction to marketing: theory and practice*. Oxford University Press.
4. Rustamov, M., & Rahimova, F. (2019). THE APPLICATION OF INTERNAL AUDIT STANDARDS IN THE ORGANIZATION OF INTERNAL AUDIT IN COMMERCIAL BANKS OF THE REPUBLIC OF UZBEKISTAN. *International Finance and Accounting*, 2019(6), 21.
5. Shekhar, K. C., & Lekshmy, S. (2005). *Banking theory and practice*. Vikas Publishing House.
6. Farmonov, D. B., & Jalilov, A. Z. More Development of Banks' Monetary, Crypto Currency and Blockchain Policy in the Digital Economy. *JournalNX*, 193-197.
7. Ahmad, R., & Buttle, F. (2002). Customer retention management: A reflection of theory and practice. *Marketing intelligence & planning*.
8. Slater, D. (2011). Marketing as a monstrosity: The impossible place between culture and economy. *Inside marketing: Practices, ideologies, devices*, 23-41.
9. Shermukhamedova, S., & Kholikov, K. (2018). PERSPECTIVE COOPERATION BETWEEN UZBEKISTAN AND THE ASIAN DEVELOPMENT BANK (ADB). *International Finance and Accounting*, 2018(3), 37.
10. Lee, C., & Griffith, D. A. (2004). The marketing strategy-performance relationship in an export-driven developing economy: A Korean illustration. *International Marketing Review*.

11. Berdiyev, U. (2020). IMPACTS OF COVID-2019 PANDEMIC ON BOND MARKET IN UZBEKISTAN. *International Finance and Accounting*, 2020(2), 25.
12. Alisher, B., Dostonbek, E., Turgunboy, M., Gulizakhro, T., & Alisher, K. (2021). Issues of Digitization of the Banking and Financial System in the Integration of the Republic of Uzbekistan into the World Economy. *Academic Journal of Digital Economics and Stability*, 10, 76-81.
13. Odilov, A. (2020). Prospects For The Development Of The Capital Market In Uzbekistan. *International Finance and Accounting*, 2020(1), 14.
14. Turobov, S., & Azamatova, G. (2020). The Role Of Households In The Development Of The Digital Economy. *International Finance and Accounting*, 2020(3), 35.
15. Otakhonova, S. (2021). Effective Organization Of Eurobonds Operations. *International Finance and Accounting*, 2021(4), 24.



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CLINICAL CURRENT AND ANTI-VIRAL THERAPY OF ADENOVIRAL KERATOCONJUNCTIVITIS

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ABSTRACT

This study presents the clinical efficacy of the antiviral drug "Virostav" in patients with adenoviral keratoconjunctivitis. On the background of therapy with Virostav, complete recovery with restoration of normal vision was revealed in 69.2% of patients, and partial recovery with subsequent complete restoration of vision in 30.8% of patients. The effectiveness of the drug with complete recovery of patients with adenoviral conjunctivitis was 76.9%. The convenient and ready-to-use drug Virostav has a pronounced therapeutic effect in the complex treatment of patients with both adenoviral keratoconjunctivitis and adenoviral conjunctivitis, this is the basis that the drug Virostav is promising in the treatment of patients with viral eye lesions.

KEYWORDS: Adenoviral Keratoconjunctivitis, Visometry, Interferon, Eye Drops, Virostav, Viral Eye Damage, Antiviral Drug, Biomicroscopy, Clinical Efficacy.

INTRODUCTION

Viral lesions of the organs of vision remain the most important problem in practical ophthalmology due to their wide spread and high frequency of outbreaks. The most common viral agents of eye disease are adenoviruses - adenoviral infections. Among them, the most common are adenoviruses of serotype 8, 11, 19 (epidemic keratoconjunctivitis), adenoviruses of serotype 3, 4, 6, 7 (pharyngoconjunctival fever), as well as enteroviruses [5].

As a rule, viruses often infect the mucous membranes, and viruses in various parts of the eye are especially dangerous. The process most often involves the cornea, as a result of which keratitis

occurs, which in the future is the cause of corneal opacity, persistent decrease in vision, as well as the development of severe complications [2].

Currently, adenoviruses and herpes simplex viruses are the most common causes of corneal damage. According to the world's leading ophthalmologists, 66.8% of all cases of corneal pathology are associated with them, 55.1% - of all ulcerative lesions of the cornea, more than 60% - of blindness. A viral lesion of the eye has its own peculiarity - in most cases it proceeds with a frequent relapse of the disease. Moreover, the course of each subsequent relapse is more severe than the previous one, which requires more intensive and long-term treatment and can contribute to the development of persistent corneal opacity, as well as complicated forms of keratitis - corneal ulcers, its perforation, which requires surgical treatment - corneal transplantation. Such patients lose their ability to work for a long time or become disabled [1, 3].

Treatment of viral eye diseases is a difficult task in practical ophthalmology. Traditionally, antiviral drugs such as acyclovir and others are used for herpes viral lesions of the eyes [6].

Interferons also play an important role in the treatment of viral infections. Interferons as natural antiviral agents have been used for many years to treat viral lesions of the eyes. Due to the action of interferon around the focus of the introduction of the virus, a barrier is formed from cells uninfected with the virus, and therefore the spread of infection is limited. Interferon is also capable of modulating the activity of immunocompetent cells. Human leukocyte interferon has been widely used in the past for the treatment of viral keratoconjunctivitis, but its isolation from donor blood is currently difficult due to the epidemic situation. Recently, recombinant interferons have been used in medicine, including ophthalmology. It is believed that the safety of the spread of blood-borne infections can be fully guaranteed only if the leukocyte interferon prepared on blood cells is replaced with recombinant interferon obtained by genetic engineering [4].

Antiviral therapy for adenovirus infection is associated with certain difficulties, since today there are no drugs in the world that selectively affect the pathogens - adenoviruses. With these infections, drugs of broad antiviral action are usually used - interferons. One of them is the preparation of interferon alpha-2 - Okoferon eye drops. The active substance of Okoferon's drop is interferon alpha-2b of a recombinant person 1,000,000 IU. The drug exhibits immunomodulatory and antiviral activity. In order to avoid possible physicochemical interaction of Okoferon with other ophthalmic agents, it is advisable to apply it 30 minutes before or 30 minutes after instilling other medicines into the eyes [7].

In ophthalmological practice, a drug has recently been widely used - Virostav eye drops, the active agent of which is idoxuridine. Virostav - modern eye drops for the treatment and prevention of viral eye diseases. The main indications for the use of the drug are keratitis and keratoconjunctivitis.

Considering that the mechanism of the antiviral action of Virostav and Okoferon is the same - the drugs act on the basis of interferon alpha-2, we assumed that the use of Virostav in the complex therapy of viral keratoconjunctivitis will allow us to study the clinical efficacy in a comparative aspect.

The aim of the work was to evaluate the clinical efficacy of the antiviral drug Virostav in the complex therapy of viral conjunctivitis in comparison with other antiviral eye drops.

MATERIALS AND METHODS

We observed 23 patients with various forms of clinical course of adenoviral lesions of the eyes: adenoviral conjunctivitis (AVK) - 10 patients: 4 (40.0%) men, 6 (60.0%) women), adenoviral epidemic keratoconjunctivitis (EKC) - 13 patients, including 5 (38.5%) men and 8 (61.5%) women. Patients with adenoviral conjunctivitis made up group I, and patients with epidemic adenoviral keratoconjunctivitis made up group II (Fig. 1).

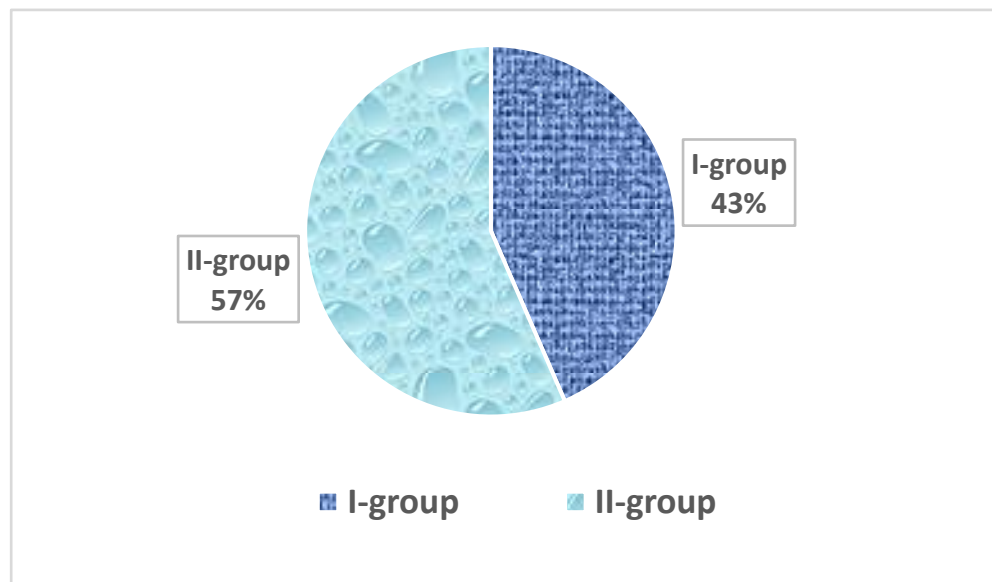


Figure 1. Distribution of examined patients by groups

The age of the examined patients varied from 18 to 55 years in the first group from 18 to 51 years), and in the second - from 19-55 years. The average age of patients in the first group was 35.4 years, and in the second - 37.0 years.

Patients of the first group received traditional therapy with the inclusion of the antiviral drug Okoferon (0.1% solution, 5.0 ml) in the form of eye drops in the treatment regimen. Patients of the second group received Virostav antiviral eye drops (0.1% solution 10.0 ml).

Eye drops Okoferon (0.1%) in patients of the first group were instilled 2 drops into the conjunctival sac of the eye every 2 hours, but not less than 6 times a day. With a decrease in the symptoms of the disease, the volume of instillations was reduced to 1 drop. The course of treatment averaged 7-10 days.

Eye drops Virostav (0.1%) in patients of the second group were instilled in the following sequence - 1 drop into the conjunctival cavity every hour during the day and every 2 hours at night. After sustained improvement, every 2 hours during the day and every 4 hours at night. The treatment was continued for another 3-5 days after complete healing, confirmed by the absence of fluorescein staining of the cornea.

According to indications, patients in both groups received additional treatment depending on the clinical form of the infectious process.

Examination of patients included: collection of anamnesis, results of clinical research, biomicroscopy of the eye, conjunctiva, cornea. General and special methods of ophthalmological

examination were used. Of the generally accepted general research methods, visometry, biomicroscopy and side illumination were used. Of the special research methods, immunological (determination of fluorescent antibodies in conjunctival scrapings), algesimetry (determination of corneal sensitivity) and virological (polymerase chain reaction) methods for determining viral eye lesions (viral conjunctivitis and keratoconjunctivitis) were used.

Statistical processing was performed using a computer program. To assess the statistical significance of differences between comparable mean values, the correctness of the answer was determined by the Student's test (t). The level of significance of this response (P) was determined according to the Student's distribution table (P-coefficient of reliability). Differences were considered significant at $P < 0.05$.

Results of the study

For patients with adenoviral conjunctivitis (group I), acute onset of the disease and bilateral eye damage were most typical. Patients often complained of pain, sensation of a foreign body in the eye, lacrimation. The eyelids of the patients were edematous, the conjunctiva was moderately or significantly hyperemic, the lower transitional fold was thickened, folded, sometimes there were punctate hemorrhages. In half of the patients, regional adenopathy of the parotid lymph nodes was found.

For patients with epidemic adenoviral keratoconjunctivitis (group II), the following clinical picture was characteristic: acute onset, usually both eyes are affected - first one, after 1-5 days - the second. Patients complain of pain, sensation of a foreign body in the eye, lacrimation, regional adenopathy is noted on day 1-2 of the disease. After 5-9 days from the onset of the disease, characteristic point infiltrates appear under the corneal epithelium (Table 1).

TABLE 1 CLINICAL CHARACTERISTICS OF ADENOVIRAL CONJUNCTIVITIS AND EPIDEMIC ADENOVIRAL KERATOCONJUNCTIVITIS IN PATIENTS WITH VIRAL EYE DISEASE

Indicators	The nature of the damage	Adenoviral conjunctivitis %	Epidemic adenoviral keratoconjunctivitis, %	P
Onset of the disease (acute)		100%	100%	$> 0,05$
Eye damage	unilateral	10,0%	7,80%	$> 0,05$
	bilateral	90%	92,3%	$> 0,05$
Eye pain		70,0%	61,5%	$> 0,05$
Sensation of a foreign body in the eye		50,0%	46,1%	$> 0,05$
Photophobia		30,0%	30,8%	$> 0,05$
Lachrymation		40,0%	38,5%	$> 0,05$
The eyelids are swollen		10,0%	15,4%	$> 0,05$
Conjunctival hyperemia	moderate	20,0%	15,4%	$> 0,05$
	significant	10,0%	23,1%	$< 0,05$
Regional adenopathy		50%	46,2%	$> 0,05$
Pinpoint hemorrhages		60,0%	69,2%	$> 0,05$
Point infiltrates under the epithelium		20,0%	30,8%	$> 0,05$
The lower transitional fold is thickened		70,0%	69,2%	$> 0,05$

As can be seen from the table, the clinical picture of adenoviral conjunctivitis and epidemic adenoviral keratoconjunctivitis were very similar, the difference between the clinical parameters was not statistically significant (the exception was significant conjunctival hyperemia in the second group, $P < 0.05$).

In the examined patients of both groups with confirmed viral eye damage, purulent discharge from the conjunctiva was not detected.

Among patients with adenoviral keratoconjunctivitis, conjunctival hemorrhages often appeared (69.2%). In this group, 4 (30.8%) patients had a severe course of the disease with a pronounced allergic inflammatory reaction, severe irritation of the mucous eyes, clearly noticeable edema of the eyelids and conjunctiva, profuse lacrimation and severe photophobia. In patients, the conjunctiva was edematous, loosened, membranes formed on the mucous membrane, the separation of which was accompanied by bleeding. In 15.4% of patients, epitheliopathy was noted on the cornea of the eye. At the first signs of subepithelial punctate keratitis or the formation of films, with epitheliopathy and tear insufficiency, appropriate symptomatic and pathogenetic drugs were added to the treatment.

When carrying out additional therapy for adenoviral conjunctivitis, the time for normalization of the conjunctiva with the disappearance of the phenomena of eye damage was reduced to 6.8 days. The results of treatment in a comparative aspect with a group of patients receiving another drug in the form of eye drops are presented in table. 2.

TABLE 2 RESULTS OF THE TREATMENT OF ADENOVIRAL CONJUNCTIVITIS AND KERATOCONJUNCTIVITIS WITH THE USE OF EYE DROPS OKOFERON AND VIROSTAV

Indicators	Viral eye damage	Okoferon (I-group)	Virostav (II-group)	P
Average duration of therapy, day	adenoviral conjunctivitis	6,8±1,10	7,1±1,32	> 0,05
	epidemic adenoviral keratoconjunctivitis	9,65±1,56	10,1±2,03	> 0,05
Disappearance of hemorrhages, day	adenoviral conjunctivitis	6,5±0,72	6,9±0,89	> 0,05
	epidemic adenoviral keratoconjunctivitis	10,9 ±2,07	11,5±2,21	> 0,05
Disappearance of hyperemia, day	adenoviral conjunctivitis	5,9±0,45	6,3±0,57	> 0,05
	epidemic adenoviral keratoconjunctivitis	6,7±0,69	7,4±0,77	> 0,05
The disappearance of photophobia, day	adenoviral conjunctivitis	8,34±1,24	9,0±1,53	> 0,05
	epidemic adenoviral keratoconjunctivitis	9,64±1,43	10,2±1,55	> 0,05
Complete recovery, %	adenoviral conjunctivitis	80,0%	76,9%	> 0,05
	epidemic adenoviral	70,0%	69,2%	> 0,05

	keratoconjunctivitis			
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As can be seen from the table, in case of epidemic adenoviral keratoconjunctivitis, when prescribing combination therapy with the inclusion of the drug Virostav, the duration of treatment was 10.1 days.

Conjunctival edema disappeared on day 6 in all patients, conjunctival hyperemia disappeared on day 11, and the follicular reaction completely disappeared in all patients on average on day 12 of treatment. It should be noted that as a result of complex treatment, local manifestations of the disease also disappeared.

CONCLUSION

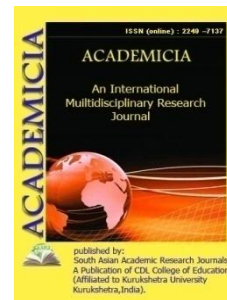
The results of these studies of the clinical efficacy of the drug - Virostav eye drops in comparison with the drug Okoferon in the treatment of adenoviral keratoconjunctivitis showed that the administration of the drug Virostav according to the proposed scheme has no less pronounced therapeutic effect in the complex therapy of adenoviral keratoconjunctivitis. Virostav does not have an irritating effect and is well tolerated by patients. There is a reduction in the duration of treatment, respectively, the number of complications and relapses decreases. The clinical efficacy and safety of patients' therapy was assessed by the reduction or disappearance of clinical symptoms of eye damage. This indicator is naturally associated with a decrease in viral load - viral replication. In the treatment of viral keratoconjunctivitis with the drug "Virostav" in 69.2% of cases, complete recovery was noted and in 30.8% of cases, a relative delay in recovery with subsequent complete recovery was revealed, the effectiveness of the drug in adenoviral conjunctivitis was 76.9% and 33.1%, respectively.

Thus, the results of the study showed that the use of eye drops of the drug "Virostav" revealed a high efficiency of therapy for both adenoviral conjunctivitis and adenoviral keratoconjunctivitis. Virostav, possessing a highly effective therapeutic effect in the complex treatment of adenoviral conjunctivitis and keratoconjunctivitis, is a highly economical drug and very convenient to use as a finished drug.

REFERENCES

1. Hillenkamp J., Reinhard T., Ross R.S. et al. The effects of cidofovir 1% with and without cyclosporin a 1% as a topical treatment of acute adenoviral keratoconjunctivitis: a controlled clinical pilot study // *Ophthalmology*. 2002. Vol. 109. № 5. P. 845–850.
2. Huang J., Kadonosono K., Uchio E. Antiadenoviral effects of ganciclovir in types inducing keratoconjunctivitis by quantitative polymerase chain reaction methods // *Clin. Ophthalmol*. 2014. Vol. 8. P. 315–320.
3. Lenaerts L., De Clercq E., Naesens L. Clinical features and treatment of adenovirus infections // *Rev. Med. Virol*. 2008. Vol. 18. № 6. P. 357–374.
4. Maychuk Yu.F. Modern possibilities of therapy for conjunctivitis // *Proceedings of the 17th Ros. nat. Congress "Man and Medicine"*. – M., 2011. – No 2. – P. 215-225.

5. Nwanegbo E.C., Romanowski E.G., Gordon Y.J. et al. Efficacy of topical immunoglobulins against experimental adenoviral ocular infection // Invest. Ophthalmol. Vis. Sci. 2007. Vol. 48. № 9. P. 4171–4176.
6. Polymorphs and hydrates of acyclovir / K. M. Lutker, R. Quiñones, J. Xu [et al.] // J. Pharm. Sci. 2011. - Vol. 100, № 3. - P. 949-963.
7. Uchio E., Inoue H., Fuchigami A., Kadonosono K. Anti-adenoviral effect of interferon- β and interferon- γ in serotypes that cause acute keratoconjunctivitis // Clin. Experiment. Ophthalmol. 2011. Vol. 39. № 4. P. 358–363.



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PATHOMORPHOLOGICAL CHARACTERISTICS OF THE THYMUS IN SEPSIS IN CHILDREN

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ABSTRACT

The formation and functional development of Gassal's bodies of the thymus normally occurs through 3 stages: construction, self-development and degeneration. Each stage of development of thymic bodies had certain morphological features in the form of cellular, glomerular, amorphous, layered, cystic and calcified formations. The qualitative and quantitative state of Gassal's bodies is of no small importance in assessing the functional activity of the thymus and developing atrophic and degenerative changes in it in sepsis.

KEYWORDS: *Thymus, Reticuloepithelium, Gassal's Little Bodies, Newborn, Sepsis.*

INTRODUCTION

Relevance: Difficulties in diagnosing and treating diseases associated with the pathology of the organs of the immune system in children, the duration and recurrent nature of their course, the impact on their entire subsequent life, put forward an urgent need for deep knowledge and disclosure of the subtle mechanisms of their pathogenesis and morphogenesis. Until now, the morphofunctional state of the immunity organs, in particular the central organ - the thymus, in sepsis in newborns, remains poorly understood. Especially, data on morphological changes in the thymus arising in various infectious diseases remain contradictory [1, p. 194; 2, pp. 36-39; 3, p. 88; 4, pp. 337-352].

THE MAIN FINDINGS AND RESULTS

It is known that the qualitative and quantitative changes in Gassal's little bodies are of no less importance in assessing the functional activity of the thymus and the pathological processes developing in it. For the medulla of the thymus, the most characteristic structures are thymic bodies or Gassal's little bodies. They are concentric clusters of elongated and fusiform cells with large nuclei and a layer of acidophilic cytoplasm [3, p. 88; 5, pp. 44-47; 6, p. 163]. The

exceptional importance of thymic bodies in the homeostasis of the body is evidenced by the fact that they quickly respond to exogenous and endogenous pathological signals, which leads to an imbalance of the entire system of differentiation and proliferation of T-lymphocytes, and, consequently, the entire immune system [3, p. 88; 7, p. 600].

Considering the above, the study of the features of the morphological and morphometric parameters of thymic bodies in normal conditions and in sepsis in children makes it possible to reveal their morphological and functional significance in the immune response during the development of a systemic vascular inflammatory process in the form of sepsis.

In this work, the **goal** was to identify the morphological and morphometric features of the thymic bodies of the thymus in health and sepsis in children.

MATERIAL AND RESEARCH METHODS

The object of the study was the thymus of 23 newborn children who died in the neonatal period from sepsis. As a control, the thymus of 16 newborns with a body weight of more than 3000 g, born at term and died from craniocerebral birth trauma, was investigated. During the autopsy, the thymus was isolated, weighed, and the thymus weight coefficient (TWC) was determined. For histological examination, pieces of thymus were fixed in 4% formalin solution in phosphate buffer and, after dehydration in alcohols, embedded in paraffin. Sections with a thickness of 5-8 μm were stained with hematoxylin and eosin, according to Van Gieson, and the PIC reaction was performed. To unify the accounting of morphological changes in the thymus in newborns and various pathologies, an algorithm for assessing morphological signs has been developed.

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In some cases, heavy-like fields of the reticuloepithelium can be found, forming associations of thymic bodies, consisting of small cells that do not exhibit form-forming and functional activity, which once again emphasizes the connection between the specialization of the cells of Gassal's bodies and the shape of the latter.

The homogeneity and uniformity of functioning bodies, their small size and moderate number is a reliable sign of the normal activity of the thymus gland in the absence of changes in it on the part of the lymphoid tissue. On the other hand, the homogeneity of the structure of thymic bodies may indicate desynchronization of their development.

The functional activity of Gassal's bodies is primarily evidenced by the appearance of nuclear-free cells and the homogeneity of the amorphous substance (Fig. 1). As already noted, one of the signs of vigorous activity is the concentric structure of the bodies. However, this state was not

limited to the presence of only such structures. Very often it was possible to detect Gassal's little bodies in the form of microcysts (Fig. 2), the lumens of which are either filled with an amorphous mass or empty, but their outer layer consists of cells predominantly with preserved nuclei. This layer was like a capsule.

The content of the cystic cavities differed in nature, but in most cases, SHIK-positive substances were detected in it, the presence of which increased with the aging of Gassal's bodies.

Already at the stage of functional activity of Gassal's bodies, calcium salts can be deposited in them, which lead to partial or complete calcification of the cell-free masses (Fig. 3), but with the relative safety of the outer cell layer.

The final stage of histogenesis of thymic bodies is the phase of their degenerative changes. At the same time, even at this stage of development, it is far from always possible to draw a clear boundary between it and the previous stages. The degenerative nature of the changes in Gassal's bodies is evidenced by a noticeable increase in non-nuclear cells, up to the complete disappearance of cells with preserved nuclei, which is preceded by an increase in their cytoplasm from the side of the boundaries between individual cellular elements and the formation of an amorphous mass (Fig. 4). In this case, the process is not limited only to the center of the thymic bodies, but also captures their outer layer. In this phase, attention is drawn to the variety of morphological forms of Gassal's bodies, which concerns, first of all, their structure and size, and, to a lesser extent, their shape. The latter usually has rounded or oval outlines, especially when the thymic bodies are enlarged. To a lesser extent, this applies to small bodies. And this has its own explanation, which serves as an indirect confirmation of the secretory ability of these structures. By a generally accepted law, the accumulation of contents in the lumens of hollow organs or structures leads to their uniform expansion. With a further increase in the content and this is possible only when it is produced by the cells of Gassal's bodies, the shape of the structures takes on a rounded shape. Difficulty in acquiring a rounded shape may be associated with an increase in the viscosity of the contents or an uneven deposition of calcium salts.

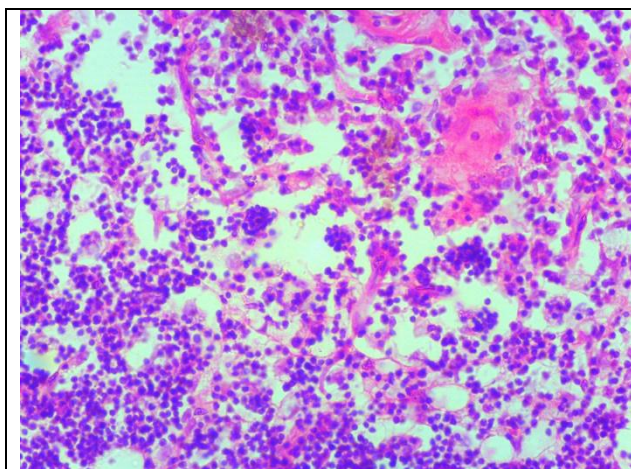


Fig 1. Formation of Gassal from pulling reticular cells. Ok: G-E. X: 10x20

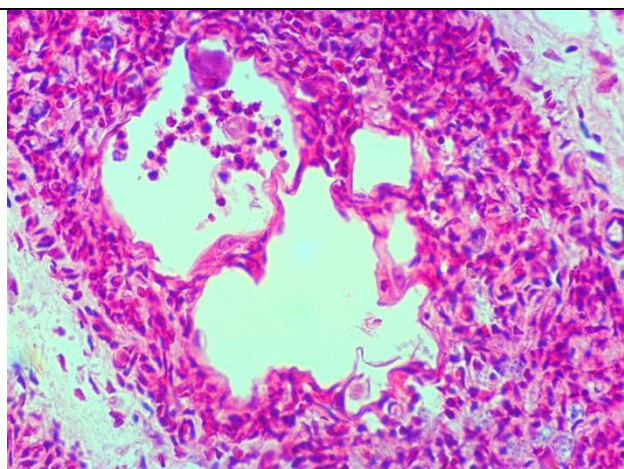


Fig 2. Formation of cysts. Ok: G-E. X: 10x20

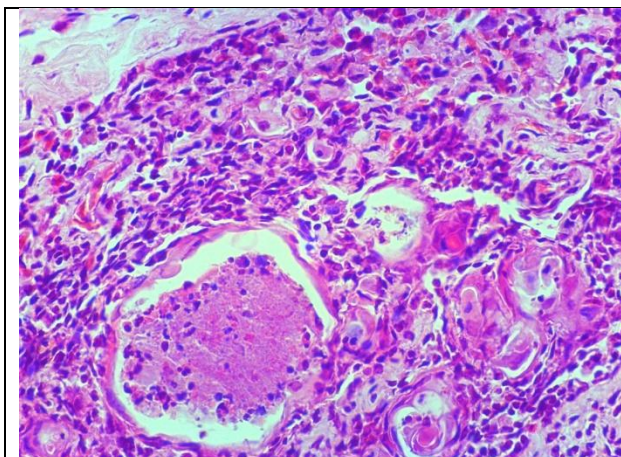


Fig 3. Filling the amorphous mass of Gassal's little body. Ok: G-E. X: 10x20

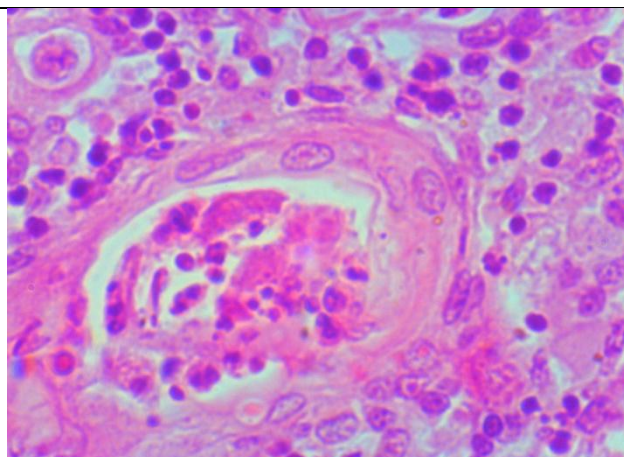


Fig 4. Dead cells and calcifications in the lumen of Gassal. Ok: G-E. X: 10x40

Thus, analyzing the morphological signs of the formation and degenerative changes of thymic bodies, it can be assumed that their active activity is largely related to the size, structure and nature of the structural composition. Taking into account all these parameters made it possible to systematize Gassal's bodies and identify their types, taking into account the phase of development; it was identified 3 stages and the nature of the structure of Gassal's bodies in the norm: 1) the stage of construction; 2) the stage of their own development and 3) the stage of degeneration. Each stage of development of thymic bodies had certain morphological features in the form of cellular, glomerular, amorphous, layered, cystic and calcified formations.

The results of studying the qualitative and quantitative characteristics of thymic bodies in sepsis showed that, along with the violation of qualitative signs, the number of thymic bodies in the stages of construction and self-development was significantly reduced, and degenerative forms were significantly increased. The size of the bodies reaches 175 microns, there are many cystic forms. The main number of bodies in the stage of degeneration is characterized by various types of structure, calcified bodies appear. The bodies lose their functional activity, the disappearance of nuclear cells is often observed, the lumen of the cysts is filled with an amorphous mass. These degenerative changes in thymic bodies are accompanied by marked delimatization of the cortical layer. In this case, stromal reticuloepithelial cells become bare and dysplastic rearrangements develop in them.

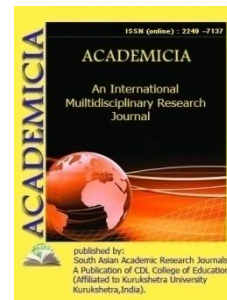
CONCLUSION

Thus, it can be noted that the qualitative and quantitative state of Gassal's bodies is of no small importance in assessing the functional activity of the thymus and developing atrophic and degenerative changes in it during sepsis.

REFERENCES

1. Kemileva Z. (1984) Thymus gland. I Ontogenetic and phylogenetic development of the thymus gland.– Moscow.“Medicine”. – p. 194. (Кемилева З. Вилочковая железа. I Онтогенетическое и филогенетическое развитие вилочковой железы. Москва «Медицина» 1984, 194 с.)

2. Krayushkin A.I. and other. (2000) Anatomical variants of the rabbit thymus shape during prenatal and postnatal ontogenesis. - Morphology. Volume 118, No. 15, - pp. 36-39. (Краюшкин А.И. и др. Анатомические варианты формы тимуса кролика в период пренатального и постнатального онтогенеза. – Морфология. 2000, Том 118, № 15, - с.36-39.)
3. Ovchenkov V.S., Kulpina E.V. (1998) Formation and age-related changes in thymus bodies in humans. Morphology.– Tashkent. 113, No. 3. – p. 88. (Овченков В.С., Кульпина Е.В. Формирование и возрастные изменения телец тимуса у человека // Морфология 1998, Т. 113, № 3, С. 88.)
4. Samsygina G.A., Yatsyk G.V. (2005) Sepsis of newborns. In kN. “Guide to Pediatrics. Neonatology”. - Moscow: Dynasty, - pp. 337-352. (Самсыгина Г.А., Яцык Г.В. Сепсис новорожденных. В кН. «Руководство по педиатрии. Неонатология» М.: 2005, Династия, - с. 337-352.)
5. Sobotyuk N.V. and other. (2000) Immune status of full-term and premature newborns from mothers with unfavorable pregnancy in ontogenesis. – Morphology. Volume 118. No. 15. – pp. 44-47. (Соботюк Н.В. и др. Иммунный статус доношенных и недоношенных новорожденных от матерей с неблагоприятно протекающей беременностью в онтогенезе. – Морфология, 2000, Том 118. № 15, с. 44-47.)
6. Tuaeva Z.S., Totoeva N.M. (1993) Histostructure of the human thymus gland. Morphology. – Tashkent. 105, Volume 9-10. - p. 163. (Туяева З.С., Тотоева Н.М. Гистоструктура вилочковой железы человека. Морфология, 1993, Т. 105, в. 9-10, С. 163.)
7. Shabalov I.P. (2007) Neonatology. – Tashkent. 2. М.: - p. 600. (Шабалов И.П. Неонатология. Т. 2. М.: 2007, - 600 с.)



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USE OF MULTIMEDIA TOOLS IN THE DEVELOPMENT OF SPEECH COMPETENCE

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ABSTRACT

This article reveals the importance and methodology of using video materials in the development of students' speaking competence. Guidelines for achieving the specified qualification requirements are provided and the benefits are explained. Opinions of scholars and educators on the development of speech competence in native language classes are analyzed.

KEYWORDS: Verbal Competence, Knowledge, Skills, Competencies, Video Material, Multimedia Tools, Skill Requirements, Comprehension, Assessment, Oral Presentation.

INTRODUCTION

Although the state educational standards define two types of mother tongue teaching: speech and linguistic competencies, the current curriculum focuses on the formation of linguistic competencies in the field of modern Uzbek literary language: memorization of grammatical rules, theoretical knowledge. The draft National Program for 2020 focuses on the correct and effective use of language in different situations, i.e. the formation of practical skills. This aspect contributes to the development of speech competence, the formation of comprehension skills, oral and written speaking skills. "Within the framework of grammar knowledge, skills and competencies are formed as a specific direction in terms of meaning and content, which allows to improve the speech culture of language units" [2].

THE MAIN FINDINGS AND RESULTS

The use of multimedia tools in the development of speech competencies is relevant. When working on a person's speech, it is necessary to regularly use modern information and telecommunications tools that expand the opportunities for the effective development of information competence. It is recommended to use mobile devices (phones, tablets and other gadgets) to develop the skills of searching, analyzing scientific information from various sources

and working with the media in accordance with information security. In addition, it is a necessary tool to help develop oral skills, written speech skills, reading and comprehension skills, and listening comprehension skills. For example, we used a small experiment when we covered the topic of “Simple and Conjunctive” in the 9th grade mother tongue curriculum. First of all, what should a student in 9th grade know in terms of simple and compound sentences? What qualification requirements should be worked on to develop speaking and linguistic competence when explaining the topic of simple and compound sentences? Based on the initially defined curriculum, we have identified the following speaking and linguistic competency qualification requirements for a 9th grade student that are to be achieved through our proposed method.

Verbal competence

(Oral, written, comprehension (reading and comprehension), listening comprehension)

Qualification required code	Oral speech
9.SC.OS.1	To be able to speak fluently in formal and informal situations, following the rules of the Uzbek language;
9. SC.OS.2	To be able to prepare thoughts and ideas in the form of a presentation without deviating from the topic;
9. SC.OS.3	Be able to prepare and speak on a specific topic;
9. SC.OS.4	Verbal representation of graphic drawings and diagrams get;
9. SC.OS.5	Understand the content of language tools in the performance of poems and works, the effective use of tone, pitch, pause;
9. SC.OS.6	Consistent expression of ideas on the basis of the given text, pictures, audio and video materials;
9.HK.O SC.OS H.7	Appropriate use of arguments and quotations in speech, adherence to the norms of public speaking.

	Listening comprehension
9.SC.LC.1	To be able to hear and understand different forms of speech and debate; be able to answer questions about the monologue and conversation heard, to react to it;
9. SC.LC.2	Be able to identify the details mentioned on the general topic of live speech and audio material;
9. SC.LC.3	Be able to express the information given in audio or video material in different styles in written, graphic and pictorial form;
9. SC.LC.4	Understand the methodological tools in speech tone (irony, pitching, sarcasm, irony, exaggeration, boasting, humor);
9. SC.LC.5	To draw conclusions based on what has been heard and to substantiate the conclusion with evidence;
9.HK.A SC.LC TT.6	Understand the spirit (pathos) of the listened speech and be able to react to it.

Linguistic competence

Qualification required code	Written literacy
9.LC.SP.1	Know the spelling rules and be able to apply them correctly in written speech;

Qualification required code	Syntax
9. LC.S.1	Distinguish between parts of speech and the means of connecting them, the use of punctuation between its parts;
9. LC.S.2	Distinguish between conjunctions that are connected, followed, and without a conjunction, being able to use them correctly in speech;
9. LC.S.3	To know about quotations and assimilations, to use them in speech, to use punctuation marks correctly;
9.LC.S.4	Know and be able to differentiate specific aspects of speech styles.

The experiment showed the effectiveness of both working on the child's speech and providing theoretical information on the basis of a single video material. First, a video on "Startup created in the garage: innovation laboratory" was shown (kun.uz). When choosing the video, taking into account the age, interests, psychology of the student, attention was paid to the educational aspects that serve to expand the worldview. And another important aspect is that the issue of time allotted to the video should not be overlooked. The volume of video materials should last from 10 seconds to 3 minutes. As they watch the video, students record key words and phrases in their notebooks.

RESULTS AND DISCUSSIONS

Assignment 1. Repeat the content of the video.

Consistent, meaningful, expressive, fluent, expressive narration is required on the basis of sequence, following the norms of literary pronunciation. The student is also taught to behave freely, to pay attention to the body, hand movements when speaking, to draw the attention of his peers, in short, the art of public speaking. The arguments presented in the text can be enriched by the reader, i.e. it is allowed to fill in the ideas and make additions. "A child's speech is a reliable means of communication only if it is understandable to others. This depends on the consistent, fluent and complete expression of the idea in speech, the choice of clear words, the purity and accuracy of pronunciation. Under favorable conditions, to some extent, these features are formed by teaching the child on the basis of a clear plan, the use of various methodological methods" [1]. The teacher carefully monitors each student's speech, focusing on the shortcomings in it. Whenever possible, mistakes and shortcomings in the student's speech, ability to control others through their speech, behavior in public, etc. are discussed with the participation of their peers (classmates, groupmates). "It is well known that listening exercises develop listening comprehension skills and, at the same time, prepare students for the development of listening comprehension skills" [3]. The ability to understand what they see and hear, to think on the basis of it, and to draw conclusions is also formed. In Task 1, we used the descriptive monologue type of monologue speech. By changing the direction of the task, descriptive monologue speech, discussion monologue speeches can also be used. It is also recommended to use interactive methods and techniques, such as "Microphone", "Press Conference" for Task 1.

Assignment 2. Identify compound sentences.

A paper version of the text in the video will be distributed. Students divide the sentences in the text into simple and compound sentences. Emphasis is placed on identifying cuts in sentences and the means of connecting compound sentences. In Task 2, verbal competence is directed towards linguistic competence.

Handout

Amazon, the world's largest online store, has captured the hearts of children around the world with its animated products - Disney, Google, a search engine used by millions of people a day, and Lotus Engineering, which is innovating nanotechnology. Do you know what binds them? They all started in a simple garage and have had great success. Amazon, Disney and Google are world-renowned, but Lotus Engineering is still at the beginning of its journey, but has managed to implement useful projects.

Lotus Engineering is the name of our laboratory in Tashkent, not in any part of Europe. It's not just a simple laboratory. There, innovations will be created and applied to society using the power of nanotechnology, a direction that is still new not only for Uzbekistan but for the whole world. Interestingly, it is located in a simple garage, which once served as a car repair shop.

Amir Obidov, Lotus Engineering Project Manager, is a Doctor of Advanced Materials Science and Engineering, Professor. He studied for a master's and doctoral degree in South Korea, and the young scientist, who returned to Uzbekistan to defend his dissertation, began to think about continuing his career in a new way.

Simple sentences	Compound sentences	Means of connecting simple sentences in compound sentences

Assignment 3. Turn simple sentences in the text into compound sentences.

Students complete the task using connectors, connecting function tools, and tone. On one side of the screen, the text is displayed, and on the other side, the means of connecting simple sentences are displayed.

The reader takes a creative approach to the topic when turning simple sentences into compound sentences: inventing a continuation of a simple sentence requires the development of speech in it, the growth of vocabulary.

Evaluation

Important aspects of multimedia assessment:

1. The teacher will be able to assess 30 (32, 28) students in a class at a time.
2. Computer is a "tolerant" tool. Allows the reader to correct mistakes and shortcomings and come to a final substantiated conclusion.
3. The student will have an objective opinion; there will be no protest mood.

We used the Bingo exercise to assess students' knowledge of the topic. The student finds the sentences in the fourth column that match the content of the sentences in the second column and

writes the number in the third column. The correct answers will be entered into the computer's memory, so the computer will not accept his answer until the reader finds the correct answer. However, in assessing the student, the number of attempts earned and the time spent are taken into account.

№		№	
1	Amazon, Disney and Google are world famous		applied to society
2	They all started in a simple garage		although Lotus Engineering is still in its infancy, it has managed to implement useful projects
3	It will create innovations using the power of nanotechnology, a direction that is still new to the world		achieved great success

Homework was also given on the basis of this video material. Each group of students independently finds the meaning of the words and phrases they have written using internet search engines and electronic dictionaries.

Group 1: Disney, startup, engineering, and master's...

Group 2: Google, PhD, Nanotechnology, Amazon...

Group 3: nanopowder, innovation, materials science, project...

In this way, the student develops the skills of effective use of Internet resources, search and retrieval of sources and materials, enrichment of independent knowledge, self-study.

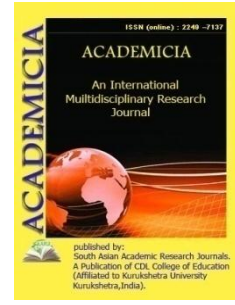
CONCLUSION

Thus, parts 9.SC.OS.1, 9.SC.OS.3, 9.SC.OS.6, 9.SC.OS.7; 9.SC.LC.1, 9.SC.LC.2, 9.SC.LC.3, 9.SC.LC.5, 9.SC.LC.6 of our speech competence qualification requirements developed on the basis of the established program, 9.LC.SC.1, 9. LC.S.1, 9.LC.S.2 parts of our linguistic competence qualification requirements is fulfilled. Along with the elements of verbal competence, the child also develops the skills of working with the media, understanding, sorting information, reacting to it, summarizing and proving.

REFERENCES

1. Babaeva D. (2018) Theory and methods of speech development. (Textbook). – Tashkent: “Barkamolfayz media”. –p. 432.
2. Mavlonova K. (2019) Improving the methodology of teaching the native language by integrating the subject of literature with the subject of literature through the literary text. Diss. PhD. – Tashkent. – p. 157. (Мавлонова К. Она тили фанини адабиёт фани билан бадий матн орқали интеграциялаб ўқитиш методикасини такомиллаштириш. Дисс. PhD. – Тошкент:, 2019. – 157 б.)
3. Salisheva Z. (2019) Improving the methodology of developing students' monologue speech in Uzbek language classes (in Russian groups): Diss. PhD. – Tashkent:. – p. 179. (Салишева З. Ўзбек тили машғулотида талабалар монологик нутқини ривожлантириш методикасини такомиллаштириш (рус гуруҳларида): Дисс. PhD. – Тошкент:, 2019. – 179 б.)

4. L.V. Shevkoplyas. (2017) Formation of English-speaking competence in listening to future teachers in the process of independent work. Candidate of Pedagogical Sciences. Diss. – Tashkent. (Шевкопляс Л.В. Формирование англоязычной компетенции в аудировании будущих учителей в процессе самостоятельной работы. Канд. пед. наук. ... дисс. – Тошкент, 2017.)
5. Gulyamov A and others. (2012) Methods of teaching the native language. – Tashkent: “Science and technology”. –p. 380.
6. t.me/kunuzofficial
7. Ismatullayeva, N. R. (2021). On the Introduction of E-Learning Portfolio in the Educational Process. *Current Research Journal of Pedagogics* (2767-3278), 2(09), 35-37.



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A STUDY OF VERBAL LEARNING DISABILITY AMONG PRIMARY SCHOOL STUDENTS

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ABSTRACT

Learning disabilities are the problems that affect the brain's ability to receive process, analyze or store information. These problems can make it difficult for a child to learn as quickly as someone who is not affected by learning disabilities. The children with verbal learning disabilities have difficulty with words, both spoken and written. The present study has been conducted for initial or firsthand identification of verbal learning disabilities among primary school students. The main purpose of this study is early detection of cases with learning disabilities and recommends such cases for further intensive diagnosis and assessment to experts and qualified professionals. According to need and nature of the study descriptive survey method was employed. In the present study data was collected through verbal learning disability checklist developed and standardized by Dr. Vishal Sood. 80 primary school students from four schools (Two Govt. & Two Private) of Yamuna Nagar district of Haryana were selected by purposive sampling technique. Parents and teachers of these students were filled the checklist of verbal learning disabilities.

KEYWORDS: *Disabilities, Diagnosis, Descriptive*

INTRODUCTION

VERBAL LEARNING DISABILITY

Learning disability refers to learning problems which manifest in an imperfect ability to listen, think, speak, read, write or do mathematical calculations which are not primarily due to visual, hearing impairment motor handicap, mental retardation environmental or economic disadvantages, but due to a disorder in the psychological process involved in understanding or in using language. Kirk (1962) has defined: "learning disability refers to a delayed development in

one or more of the process of speech, language, reading, spelling, writing or arithmetic resulting from a possible cerebral dysfunction and emotional or behavioral disturbance and not from mental retardation, sensory deprivation, cultural or instructional factors.”

TYPES OF VERBAL LEARNING DISABILITIES

Reading disabilities:

A reading disability is a condition in which an individual displays difficulty in reading resulting primarily from neurological factors. National institute of Neurological Disorders and stroke defines reading disability or dyslexia as, “Dyslexia is a brain based type of learning disability that specifically impairs the individual’s ability to read. A specific learning disability that affects reading and related language-based processing skills. The severity can differ in each individual but can affect reading fluency, decoding, reading comprehension, recall, writing, spelling, and sometimes speech and can exist along with other related disorders. Dyslexia is sometimes referred to as a Language-Based Learning Disability.

Speech and Language Comprehension Disabilities:

Dyspraxia is a deficiency in the ability to speech and language comprehension. It can be one of the earliest types of disabilities to identify. This is because some of the symptoms are noted due to a lack of social integration, failure to reach developmental hallmarks and the palpable lack of expression in young children. This can cause regression in essential verbal expression skills and lead to low academic achievement. A speech and language disability is a deficiency in either expressive or receptive processing of language. A speech disability is characterized by difficulty in articulation of words. Examples include stuttering or problems producing particular sounds. A language disability is a specific impairment in understanding and sharing thoughts and ideas, a disorder that involves the processing of linguistic information.

Writing Disabilities:

Dysgraphia is a deficiency in the ability to write, primarily in the terms of handwriting, but perhaps also in terms of coherence. A specific learning disability that affects a person’s handwriting ability and fine motor skills. Problems may include illegible handwriting, inconsistent spacing, poor spatial planning on paper, poor spelling, and difficulty composing writing as well as thinking and writing at the same time. It occurs regardless of the ability to read and is not due to intellectual impairment.

Mathematical Disabilities:

Dyscalculia is a specific learning disability involving innate difficulty in learning or comprehending simple mathematical, arithmetical operation. A specific learning disability that affects a person’s ability to understand numbers and learn math facts. Individuals with this type of LD may also have poor comprehension of math symbols, may struggle with memorizing and organizing numbers, have difficulty telling time, or have trouble with counting. It is akin to dyslexia and includes difficulty in understanding numbers, learning how to manipulate numbers, learning mathematical facts and a number of other related symptoms.

JUSTIFICATION OF THE STUDY

Learning disability refers to learning problems in primary students like understanding, reading, speaking, remembering new things many more. Due to these disabilities the person may have difficulties in their social task. A child with these problems cannot try harder, improve their problems, could not pay full attention in their work. Learning disability is a problem that affects the brain of the child. We all human beings are born equal in this world. All are equal but some disorders arise itself.

Education plays an important role in human life. All have the right to educate. People suffering from these disabilities must not think that they don't have the right to educate. They cannot be a success person they must try their best if are guided proper. Students suffering from disabilities such as mental retardation, learning disabilities, physical handicap, backward child, juvenile delinquent can be improved if supported in best way, they need help to learn how to do these but verbal learning disabilities is a common problem at primary stage. They face the problems such as speaking, reading, spelling, writing, figuring out words, communicating, working etc. but one cannot tell properly by looking at a person that he is facing learning disabilities.

This study was conducted to gain an understanding of the learning problems of children with a learning disability which has implication on different interventional programs for children with learning disability in school and home settings.

OBJECTIVES OF THE STUDY

1. To study the concept of verbal learning disabilities.
2. To study the dimension of verbal learning disabilities.
3. To study the difference of verbal learning disabilities among primary school student in relation to their gender.
4. To study the difference of verbal learning disabilities among primary school student in relation to their residential background.
5. To study the difference of verbal learning disabilities among primary school student in relation to types of school.

HYPOTHESES OF THE STUDY

1. There exists no significant difference in the verbal learning disabilities of primary school students in relation to their gender.
2. There exists no significant difference in the verbal learning disabilities of primary school students in relation to their residential background.
3. There exists no significant difference in the verbal learning disabilities of primary school students in relation to their type of school.

RESEARCH METHODS USED

Keeping in view the nature of the present study, descriptive survey method was used to collect the data.

POPULATION & SAMPLE

The entire students studying in different primary schools were considered as populations from these population 80 students were selected by purposive sampling technique. Four schools (Two Govt. & Two Private) of district Yamuna Nagar were selected for the sample. Parents and teachers of these students were filled the checklist of verbal learning disabilities.

TOOL USED

Keeping in view the nature and need of the study, Verbal Learning Disability Check List developed and standardized by Dr. Vishal Sood was used.

STATISTICAL TECHNIQUES USED

1. In order to identify verbal learning disabilities among primary school students, *Percentage Method* was followed.
2. 't'-test was applied to find out significance of difference between different groups.

DELIMITATIONS OF THE STUDY

1. The present study was delimited only to 80 primary school students.
2. The present study was delimited only to 40 government school students affiliated to board of school education Bhiwani, Haryana and 40 students from public school affiliated to C.B.S.E.
3. The present study was delimited only to district Yamuna Nagar.

ANALYSIS OF DATA

TABLE 4.1 RESULTS RELATED TO OVERVIEW OF DATA ON VERBAL LEARNING DISABILITY

Percentage of Students of Verbal Learning Disabilities

Level Of Verbal Learning Disabilities	Scores	Number Of Students	Percentage Of Students
Extremely High Verbal Learning Disabilities	158 and above	00	--
High Verbal Learning Disabilities	139-157	04	5%
Above average Verbal Learning Disabilities	119-138	24	30%
Average Verbal Learning Disabilities	92-118	11	14%
Below Average Verbal Learning Disabilities	72-91	27	33%
Some Verbal Learning Disabilities	52-71	14	18%
Normal Child	Below 52	00	--

Total number of students= 80

Table 4.1 shows that 5% students have very high verbal learning disabilities, 30% students have average verbal learning disabilities, 14% students have average verbal learning disabilities, 33%

students have below average verbal learning disabilities and 18% students have some verbal learning disabilities.

TABLE-4.2 RESULTS RELATED TO SIGNIFICANCE DIFFERENCE IN THE MEAN SCORES OF VERBAL LEARNING DISABILITIES OF PRIMARY SCHOOL STUDENTS IN RELATION TO THEIR GENDER

Dimensions of Verbal Learning Disabilities	Gender	N	Mean	SD	t-ratio
Reading Disabilities	Male	50	28.86	8.02	0.88
	Female	30	28.60	8.01	
Speech and Language Comprehension Disabilities	Male	50	25.32	7.70	0.96
	Female	30	25.40	7.29	
Writing Disabilities	Male	50	21.96	5.99	0.72
	Female	30	21.46	6.05	
Mathematics Disabilities	Male	50	24.24	7.11	0.49
	Female	30	23.10	5.95	
Total (Verbal Learning Disabilities)	Male	50	100.38	26.72	0.77
	Female	30	98.63	24.58	

N= 80, Df= 78

Table Value= 1.99 at 0.05 level of significance

Table Value= 2.64 at 0.01 level of significance

Table 4.2 indicates that obtained 't' values for all dimensions of verbal learning disabilities viz. Reading Disabilities, Speech and Language Comprehension Disabilities, Writing Disabilities and Mathematics Disabilities are less than the table value i.e. 1.99 at 0.05 level of significance. Hence, there exists no significant difference between the male and female higher primary school students with regard to said all the dimensions of verbal learning disabilities.

It is also observed that the calculated 't' value (0.77) of the verbal learning disabilities (total) is less than the table value (1.99) at 0.05 level significance with df/78. So, there is no significant difference in the mean scores of verbal learning disabilities of higher primary school students in relation to their gender.

So, the hypothesis 1 which is stated earlier that *there exists no significant difference in the verbal learning disabilities of primary school students in relation to their gender* is accepted.

TABLE-4.3 RESULTS RELATED TO SIGNIFICANCE DIFFERENCE IN THE MEAN SCORES OF VERBAL LEARNING DISABILITIES OF PRIMARY SCHOOL STUDENTS IN RELATION TO THEIR RESIDENTIAL BACKGROUND

Dimensions of Verbal Learning Disabilities	Residential Background	N	Mean	SD	t-ratio
Reading Disabilities	Urban	45	29.28	8.45	0.50
	Rural	35	28.08	7.36	
Speech and Language Comprehension Disabilities	Urban	45	25.57	7.64	0.76
	Rural	35	25.05	7.42	
Writing Disabilities	Urban	45	22.06	6.08	0.62

	Rural	35	21.40	5.91	
Mathematics Disabilities	Urban	45	24.04	6.66	0.75
	Rural	35	23.57	6.79	
Total (Verbal Learning Disabilities)	Urban	45	100.97	26.33	0.62
	Rural	35	98.11	24.38	

N= 80, Df= 78

Table Value= 1.99 at 0.05 level of significance

Table Value= 2.64 at 0.01 level of significance

Table 4.3 indicates that obtained 't' values for all dimensions of verbal learning disabilities viz. Reading Disabilities, Speech and Language Comprehension Disabilities, Writing Disabilities and Mathematics Disabilities are less than the table value i.e. 1.99 at 0.05 level of significance. Hence, there exists no significant difference between the urban and rural higher primary school students with regard to said all the dimensions of verbal learning disabilities.

It is also observed that the calculated 't' value (0.62) of the verbal learning disabilities (total) is less than the table value (1.99) at 0.05 level significance with df/78. So, there is no significant difference in the mean scores of verbal learning disabilities of higher primary school students in relation to their residential background.

So, the hypothesis 2 which is stated earlier that *there exists no significant difference in the verbal learning disabilities of primary school students in relation to their residential background* is accepted.

TABLE-4.4 RESULTS RELATED TO SIGNIFICANCE DIFFERENCE IN THE MEAN SCORES OF VERBAL LEARNING DISABILITIES OF PRIMARY SCHOOL STUDENTS IN RELATION TO THEIR TYPE OF SCHOOL

Dimensions of Verbal Learning Disabilities	Type of School	N	Mean	SD	t-ratio
Reading Disabilities	Govt.	40	28.90	7.56	0.87
	Private	40	28.62	8.44	
Speech and Language Comprehension Disabilities	Govt.	40	25.40	7.60	0.95
	Private	40	25.30	7.50	
Writing Disabilities	Govt.	40	21.87	6.23	0.88
	Private	40	21.67	5.80	
Mathematics Disabilities	Govt.	40	24.47	7.40	0.39
	Private	40	23.20	5.89	
Total(Verbal Learning Disabilities)	Govt.	40	100.65	26.91	0.75
	Private	40	98.80	24.93	

N= 80, Df= 78

Table Value= 1.99 at 0.05 level of significance

Table Value= 2.64 at 0.01 level of significance

Table 4.4 indicates that obtained 't' values for all dimensions of verbal learning disabilities viz. Reading Disabilities, Speech and Language Comprehension Disabilities, Writing Disabilities and Mathematics Disabilities are less than the table value i.e. 1.99 at 0.05 level of significance.

Hence, there exists no significant difference between the govt. and private higher primary school students with regard to said all the dimensions of verbal learning disabilities.

It is also observed that the calculated 't' value (0.75) of the verbal learning disabilities (total) is less than the table value (1.99) at 0.05 level significance with df/78. So, there is no significant difference in the mean scores of verbal learning disabilities of higher primary school students in relation to their type of school.

So, the hypothesis 3 which is stated earlier that *there exists no significant difference in the verbal learning disabilities of primary school students in relation to their type of school* is accepted.

MAIN FINDINGS

1. It was found that out of total 80 primary school students, 04 students i.e. 5% students have found high verbal learning disabilities, 24 students i.e. 30% students have found above average verbal learning disabilities, 11 students i.e. 14% students have found average verbal learning disabilities, 27 students i.e. 33% students have found below average verbal learning disabilities and 14 students i.e. 18% students have found some verbal learning disabilities.
2. No significant difference of verbal learning disabilities was found among male and female primary school students. Hence the gender doesn't influence the verbal learning disabilities of primary school students.
3. No significant difference of verbal learning disabilities was found among urban and rural primary school students. Hence the residential background of primary school students doesn't influence their verbal learning disabilities.
4. No significant difference of verbal learning disabilities was found among Government and Private primary school students. Hence the type of school doesn't influence the verbal learning disabilities of primary secondary school students.

EDUCATIONAL IMPLICATIONS

The most outstanding characteristics of any research are that it must contribute something new in to the development of an area concerned. So, the investigator has to reveal the educational implication of the study undertaken. Finding of present study have an ample of educational implications for teachers, parents, students and administrations.

On the basis of findings of the present study, it will help the educational planners, administrators, lecturers and professors of colleges of education as well as degree colleges and also for parents in the following ways:

1. School should organize special programs should be organized to assess the verbal learning disabilities at primary level.
2. Students with extremely high & high verbal learning disabilities should be referred to Neuro psychologist.
3. Students with above average verbal learning disabilities should be referred to psychologist/ psycho- therapist and speech therapist.
4. Students with average/ moderate verbal learning disabilities should be referred to counselor.

5. Students with below average and some verbal learning disabilities need parental and teachers' attention. So school and family should create healthy environment for the students.
6. A resource person/expert should be appointed in the institution for identification of persons with disability and to provide them remedial teaching.
7. The teacher should use the interesting and effective teaching methods and strategies to make teaching-learning process effective.
8. Teacher should use the special equipment or instruments while teaching the disabled children.
9. The teacher should provide eco-friendly environment in the classroom.
10. The present study is helpful to know about the verbal learning-disabled students, teachers can treat them in a better way.
11. The difference of gender and residential background among the students must be ignored while teaching them.
12. Seminars, workshops and conferences should be organized in the institution for the development of self-confidence among the pupils, teachers.

REFERENCES

- Agrawal, Rashmi and Rao , B.V.L.N.(2007). Education for disabled children, New Delhi: Shipra publications.
- Aggarwal, J.C.(1998). Basic Ideas in Educational Psychology. Delhi; Shipra Publications.
- Alley, G. and Deshler, D, (1979). Teaching the learning Disabled Adolescents, Denver: love..
- Assouline , S. G., Nicpon, M. F. & Whiteman, C. (2010, Spring). Cognitive and Psychosocial Characteristics of Gifted Students With Written Language Disability. The Gifted Child Quarterly, 54(2), 102-115. Retrieved February 14, 2017.
- Carrier, James. 1986. Learning Disability: Social Class and the Construction of Inequality in American Education. New York, NY: Greenwood Press.
- Chauhan, S.S (1996). Advanced Education Psychology. New Delhi; Vikash Publishing House.
- Dudley-Marling, Curt (2004). The Social Construction of Learning Disabilities. Journal of Learning Disabilities. **37** (6): 482-489.
- Dyson, L. (2010, Winter). Unanticipated effects of children with learning disabilities on their families. Learning Disability Quarterly, 33(1), 43-55. University Press.
- Gearheart, B.E. (1973). Learning Disabilities, Educational Strategies. St. Louis : C.V. Mosby.
- Goel, Sushil Kumar (2011). Hand Book of Learning Disabilities. Agra : Harprasad Institute of Behavioural Studies.
- G.M. McArthur; J.H. Hogben; V.T. Edwards; et al. (2000). Specific reading disability and specific language impairment.". Journal of Child Psychology and Psychiatry. 41 (7):869- 874.
- Lerner, J.W. (1976). Children with learning Disabilities. Boston: Houghton Mifflin.

Lerner, J.W. (1985). *Learning Disabilities Theories, Diagnosis and Teaching Strategies*. Boston; Houghton Mifflin.

Lerner, Janet W. (2000). *Learning disabilities: theories, diagnosis, and teaching strategies*. Boston: Houghton Mifflin. ISBN 0-395-96114-9.

Mangal, S.K. (2009). *Educating Exceptional Children: An Introduction to Special Education*, New Delhi Prentice Hall of India Pvt. Ltd.

M.F. Joanisse; F.R. Manis; P. Keating; M.S. Seidenberg (2000). Language Deficits in Dyslexic Children: Speech Perception, Phonology, and Morphology.. *Journal of Experimental Child Psychology*. 77 (1): 30-60.

Panda, K.C.(1997) *Education of Exceptional Children*. New Delhi. Vikas Publication House Pvt. Ltd.

Patton, J. M. (1998). The Disproportionate Representation of African Americans in Special Education: Looking Behind the Curtain for Understanding and Solutions. *The Journal of Special Education*. 32 (1):25–31.

Shamir, A., Korat, O. & Fellah, R. (2012, January). Promoting vocabulary, phonological awareness and concept about print among children at risk for learning disability: can e-books help? *Reading and Writing*, 25(1), 45-69.

Sood, Vishal(2005). *Verbal Learning Disability checklist*. National psychological corporation. Agra.

Thompson, S.B.N. "Dementia and memory: a guide for students and health professionals." Aldershot: Ashgate 2006.

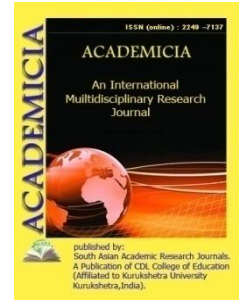
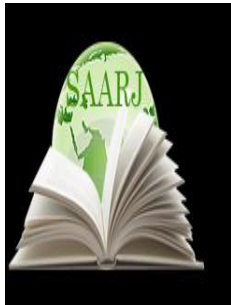
Thompson, S.B.N. (2000). The Central Executive System in people with Down's syndrome and dementia. *Clinical Gerontologist*. 21 (3): 3–32.

Thompson, S.B.N. (2000). Investigation into Down's syndrome and dementia. *Journal of the Association of Practitioners in Learning Disability*. 17 (3): 10–14.

Thompson, S.B.N. (1999). Examining dementia in Down's syndrome (DS): decline in social abilities in DS compared with other learning disabilities. *Clinical Gerontologist*. 20 (3): 23–44.

Walia, J.S. (2004) *Foundations of Educational Psychology*. Jalandhar City, (Punjab). Ahim Paul Publisher.

Wallace, G. and McGoughlin, J.A. (1979). *Learning Disabilities: Concepts and Characteristics* Columbus. OH: Merrill.



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USE OF PRECEDENT NAMES IN UZBEK ART JOURNALISM

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ABSTRACT

Today's image of human improvement, the preservation of personality in our time, which is quickly picking up common, widespread highlights on the premise of the principles of globalization, the significance of national values, and the true esteem of national and cultural heritage is completely understood by every nation nowadays. In many cases, people address a specific sentence, situation, or individual to the general public with a variety of gestures in order to precise and supposition, increment its adequacy, or draw the recipient's attention to the same event. This process of language specifically reflects the mental image of the nation. The hypothesis of intertextuality and precedent units was also shaped on the basis of such views. The great intrigued of linguists in precedent units, particularly precedent nouns, is clarified by the linguocultural forms that take place as a result of the interaction of different languages. As a result, there is a growing body of investigation on precedent units. An analysis of precedent units in Uzbek art journalism, in particular the study of precedent names, and their role in text creation; one of the important tasks of Uzbek linguistics today is to determine which famous nouns are popular for the representatives of the Uzbek linguocultural society.

KEYWORDS: *Intertextuality, Precedent Unit, Precedent Name, National Precedent Name, Universal Precedent Name, Anthroponym, Standard.*

INTRODUCTION

It is no embellishment to say that one of the foremost imperative errands of the media is to make the message interesting to today's recipient, who lives in a constant flow of data, and not to lose interest in him directly. The author's fashion of communication plays an imperative part here. The fact that the reader acknowledges the author's own "news" when perusing the text, as well as the effectiveness of such "discoveries" within the reader's authority, is the subject of research for a number of areas of linguistics. There are two inclinations within the process of displaying information for journalistic and artistic functional methods of language: in the first method, the author himself makes "novelty" and emphasizes this novelty, attempting to express his "I" in the context of the text; in the second method it alludes to the usual methods of expression, using existing templates.

THE MAIN FINDINGS AND RESULTS

A person studying the language and culture of another country tries to get acquainted with the cultural environment by comparing it with the units of his native country, mother tongue or world culture. This is one of the reasons why the study of precedent units in the field of linguistics.

As seen, intertextuality started to take shape as a partitioned phenomenon in science, it became clear that it was based on other phenomena, units, and their properties that were not considered in linguistics. This phenomenon opened up new aspects within the linguistic literature and began to be studied extensively and in detail. At its core, the phenomenon of "precedent" was introduced into science. Y.N. Karaulov, who first introduced the term "precedent unit" to science, defined precedent units as "a very personal character of a certain person, that is, well acquainted with him and covering a wide range of him, including his past and contemporaries" the recipient is, and finally, very important in the cognitive and emotional relationships that are repeatedly referred to in the discourse of this native speaker" [Karaulov; 1987, 267] as a unit. In many cases, people address a particular sentence, situation, or individual to the general public with a variety of gestures in order to express an idea, increase its effectiveness, or draw the recipient's attention to the same event. This process of language directly reflects the mental image of the nation. The theory of intertextuality and precedent units was also formed on the basis of such views. N. Karaulov first includes in the precedent texts the names of works of art, names of characters, famous quotations and cultural symbols of oral nature. The scientist actually referred to the phenomenon under the term "text". I.V. Zakharenko, V.V. Krasnikh, D.B. Gudkov and D.B. Bagayeva talk about this phenomenon in their co-authored articles; Karaulov's definition of the "precedent text" states that the understanding of this phenomenon is close to scientific truth, that the scientist uses the concept of "text" in a broad sense, and that the term lists common features for all units. They also argue that precedent phenomena are a key (nuclear) element of the cognitive base that embodies a set of knowledge and perceptions that apply to all representatives of a particular language [Zakharenko, Krasnikh, Gudkov, Bagayeva; 1997, 82]. The concept of "precedent text" is taken after by "precedent sentence" by V.G. Kostomarov and N.D. Burvikova (1994), "pragmoreflex" by Y.P. Prokhorov (1996), "precedent name" by D.B. Gudkov (1996), "precedent phenomenon" by V.V. Krasnikh and others, and the concepts of "precedent situation" (1997) entered the science of linguistics [Gudkov; 2020, 24]. In spite of the fact that hundreds of other scientific studies have emerged from these studies, the exact definition of the phenomenon of precedent has not however been definitively set up, and

researchers contrast on this point. In subsequent logical research and writing V.V. Krasnix, D.B. Gudkov, I.V. Zakharenko, and D.B. Bagayeva indicate scientific sees on precedent units [Arbuzova; 2007, 8]. Moreover, based on the investigation of hypothetical sources, V.L. Latisheva notes that this marvel is translated differently by researchers, called by different names. According to him, in the work related to this phenomenon, researchers are studying the phenomenon at what level and to what extent, “precedent text”, “precedent sentence”, “logoepistema”, “precedent textual reminiscence”, “textual reminiscence”; they used various terms such as “lacuna”, “basic axiom of linguistic memory”, “intertext”. On the basis of these terms it is possible to understand the close phenomena and to summarize all of them on the basis of the above-mentioned definition of Y.Karaulov [Janayeva; 2008, 11]. Y. Nakhimova also noted that this phenomenon, its units are studied in grammatical, structural-semantic, methodological, rhetorical, psycholinguistic, sociolinguistic, onomastic, lingvoculturological, cognitive-discursive and other aspects, and in these works the intertext, phenomenon (precedent name, precedent-cultural sign, precedent concept), historical (social, political) or artistic (theatrical) metaphor; text reminiscence, logoepistema, vertical context element; antonomasia and allusion (as a type of rhetorical trop and figure), referring to terms such as the famous noun (onim) used to denote a cognate noun [Nakhimova; 2011, 9-10].

Precedent units are graded according to the level of awareness. According to D.B. Gudkov, these units are *auto-precedents*, *social-precedents*, *national precedent units* and *universal precedent units*. The researcher clarifies the phenomenon of autopreredence by the reflection of the individual and the universe in his mind. Certain occasions connect an individual's emotions, memory, and imagination with affiliated lines that are familiar only to him or her. Socio-precedents, on the other hand, are recognizable to members of a particular social group or class and are considered to belong to the collective cognitive level. At the same time, the scholar acknowledges that devout writings (all religious precedent events) are well known to members of the religion to which they belong (in any case of nationality, race, age, social origin). Or a similar division may be different for members of the professional community. National precedent units, on the other hand, are familiar to most members of a particular linguistic and cultural community and are part of that society's cognitive base. Universal precedent units, on the other hand, are perfect units familiar to any modern, conscious being [Gudkov; 2020, 26]. They are not limited by social boundaries such as nation, religion, and race.

The precedent unit is a steady model system that is familiar to individuals of a particular linguo-cultural community, popular among them, and serves to express similar events related to the life and history of the community. Precedent units permeate the ideology of a linguocultural society, its mental image, its way of understanding existence. Their bodies are constantly changing. These units come to life again and again in the talk, they serve as a benchmark for a specific culture and become a image of an event or situation [Janayeva; 2008, 5]. Precedent units are also energetic and changeable, adjusting to social, verifiable, and etymological contexts. The sources of precedent names are also always upgraded. Today, in expansion to traditional point of reference title sources (devout sources - the Book of scriptures, Qur'an, hadith, antiquated culture, fables, history, art, fiction, and logical literature, etc.), relatively new sources can be cited, such as media texts in different forms. Mass media, Internet resources (Internet journalism, advertising slogans, TV programs and their names, newspaper and magazine columns, etc.) today are the emergence of new precedent names, their widespread popularity, and the rapid

replacement of obsolete precedent units with new ones. One of the main sources of precedent names in modern conditions is the media. In the past, it took many years for precedent names to become popular, but today the process is very short. The foundation of precedent names of any language includes national and international names, but it reflects the specific worldview, national identity and beliefs of the nation.

Interest in precedent names is explained by the linguocultural processes that take place as a result of the interaction of different languages. A.V. Tereshchenko clarifies this situation as follows: “Communication of languages having a place to different linguistic and cultural societies is viable only when the social barrier, as well as the cultural barrier, is overcome” [Tereshchenko; 2016, 76]. Y.B. Ushakova characterizes the diverse semantization of precedent names in different dialects by the fact that the precedent names *Julius Caesar*, *Quasimodo*, *D’Artanyan* shape different affiliations between representatives of Russian and other languages [Ushakova; 2014].

In the distant past of any nation, the names of famous people, legendary folk heroes, notable places, famous historical events are preserved in the linguistic memory of this linguocultural community in connection with various associations. This may be the reason why precedent names are sometimes used as a benchmark. I.V. Zimin also pointed out that the famous horses became the standard among the stable comparative units of many nations [Zimin; 2004, 110-111].

The word “precedent” is derived from the Latin word “*praecedens*”, which means “leading”, “before”. The word is interpreted in Russian in the “Explanatory Dictionary of the Russian language” originally published in 1935-1940, and edited by D.N. Ushakov [<https://dic.academic.ru/contens.nsf/ushakov/>]. The Russian Dictionary, published by the Institute of Linguistic Research of the Russian Academy of Sciences, defines the word as follows: “1. an event that happened in the past and serves as a model or basis for similar situations. 2. A model decision of a court or other public authority to resolve similar issues in the legal system of some capitalist states. *Court precedent*”. [Precedent // Dictionary of Russian Language. 4 Volumes. 1987, p. 387]. In addition, the word is used in a number of narrow field dictionaries (dictionary of foreign words in Russian, historical dictionary of Russian Galicianism, large encyclopedic dictionary, encyclopedia of sociology, large encyclopedic dictionary, financial dictionary, dictionary of business terms, dictionary of synonyms, etc.). This word is used as a legal term in the Uzbek language in the “Encyclopedia of Laws of Uzbekistan” and is defined as follows: application of the earlier decision” [Encyclopedia of Laws of Uzbekistan; 2009, 370]. In the field of Uzbek linguistics, the term first appears as a linguistic phenomenon within the scientific articles of D. Khudoiberganova. Nowadays, there is a developing intrigue in studying the phenomenon of recidivism and its units. As said above, the first scientific views on precedent units in Uzbek linguistics are watched in the research of D. Khudoiberganova. In his scientific views, the researcher investigates not only universal precedent names but also the peculiarities of the Uzbek mentality in the creation of texts. As D. Khudoiberganova noted in her doctoral dissertation “Anthropocentric interpretation of scholarly texts in Uzbek language”, “precedent units appear as a means of transmitting social codes from generation to generation. At the same time, the study of texts containing analogies, text-metaphors, precedent units, standards, speech labels is the most important source in creating a scientific interpretation of the linguistic landscape of the world specific to a particular ethnic

group”[Khudoiberganova; 2015, 58]. In her doctoral dissertation, linguist D. Khudoiberganova notes that precedent names have a special place among precedent units, noting that such names are used in a work of art for various pragmatic purposes. The scientist also proves by examples that another important function of precedent names is “participation in the creation of the text as a subject of microtext”.

At the same time, in D. Khudoiberganova's pamphlet “Language, Thought, Culture” there are two important features of precedent names: the first - popularity, that is, a strong place in the linguistic memory of language owners; the second is symbolism, that is, being an example of a certain set of qualities [Khudoiberganova; 2020, 40]; cite national, Eastern, and Western linguistic names that are widely used in Uzbek linguistics today, as well as universal names [Khudoiberganova; 2020, 41].

Based on the above ideas of the scientist, it is clear that precedent names may not always reflect both highlights, that is, a few moments are characterized only by the quality of popularity, and some minutes pass through the level of popularity and become known in the minds of certain mentalities; it able to moreover see that it gets to be a unit that communicates a special and unrepeatable etymological scene - a benchmark.

D. Andaniyazova's views on prevalent onomastic units in Uzbek literary texts are also critical for research on precedent units. In his work, the researcher depicts in detail the linguopoetic highlights of point of reference onims in Uzbek exposition and verse, their capacities in the scholarly content, denotative and connotative (in turn, connotative use is divided into two - metaphorical and metonymic), cites their valuable ideas about their being an allusive name, etc. [Andaniyazova; 2016]. In particular, D. Andaniyazova's monograph “Linguopoetic study of onomastic units” notes the characteristics of point of reference units: 1) existence in the memory of language owners; 2) popularity; 3) a connection to a popular text or situation; 4) acquisition of symbolic meaning [Andaniyazova; 2016, 45].

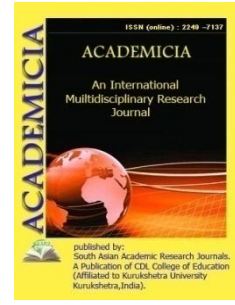
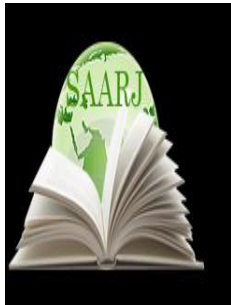
CONCLUSION

To conclude, the study of precedent names has become an object of study in Uzbek linguistics today. There are many aspects of the Uzbek language that need to be considered within the study of precedent names and precedent units in general. Focusing on the problem of investigation of the phenomenon of precedent and its units will help to decide their put in the cognitive base of members of the Uzbek linguocultural society.

REFERENCES

1. Arbuzova V.Yu. (2007) Precedent in the Russian language as a linguistic and cultural phenomenon (based on the material of scientific episodes) Avtoref. Dis. Candidate of Philological Sciences. – Yelets: Lipetsk state pedagogical University. – p. 24
2. Encyclopedia of Law of Uzbekistan. Responsible for publication is R.A. Muhitdinov et al; Editor-in-Chief N. Toychiyev. – Tashkent. Adolat. 2009. – p. 704.
3. Andaniyazova D. (2016) Linguopoetic study of onomastic units. - Tashkent: “Turon zamin ziyo”. – p. 20.
4. D.B. Gudkov. (2020) Use case name and precedent problems. Ed. 2nd, stereotype. – Moscow: Lenand. – p. 152.

5. Dzhanayeva V.V. (2008) Linguo-cognitive foundations of communication: foreign cultural precedent phenomena. Abstract of thesis. Diss. Candidate of Philological Sciences. - Vladikavkaz: Kabardino-Balkarian state university named after H.M. Berbekova. – p. 22.
6. Zakharenko I.V., Krasnykh V.V., Gudkov D.B., Bagaeva D.V. A precedent name and a precedent utterance as symbols of precedent phenomena. Language, consciousness, communication: Sat. articles. Ed. V.V. Krasnykh, A.I. Izotov. (1997) – Moscow: “Philology”. Issue. 1.- p. 192.
7. Zimin V.I. (2004) On the national and cultural characteristics of stable comparisons. Cultural layers in phraseological units and in discursive practices. – Moscow. Languages of Slavic culture. – pp. 110-111.
8. Yuldoshev M. (2019) Linguopoetics of the literary text: Monograph. – Tashkent. NMIU “Uzbekistan”. – p. 107.
9. Karaulov Yu.N. (1987) Russian language and linguistic personality. Yu.N. Karaulov. – Moscow: Nauka. – p. 216.
10. Nakhimova E.A. (2011) Precedent onyms in modern Russian mass communication: theory and methods of cognitive-discursive research monograph. EA Nakhimova GOU VPO “Ural state pedagogical university”. – Ekaterinburg. – p. 276.
11. Tereshchenko A.V. (2016) Precedent names in modern Russian and English languages: status, semantics, features of functioning. Bulletin of TSPU (TSPU Bulletin). – p. 76.
12. Khudayberganova D. S. (2015) Anthropocentric interpretation of literary texts in Uzbek language: Doctor of Philological Sciences. Diss. – Tashkent. Academy of Sciences of Uzbekistan: TAI. – p. 58.
13. Xudayberganova D. (2020) Language, Thought, Culture: Scientific pamphlet. D. Khudoyberganova. – Tashkent: Nodirabegim. – p. 120. (Худайберганова Д. Тил. Тафаккур. Маданият: Илмий рисола. Д. Худойберганова. – Тошкент: Нодирабегим, 2020. – 120 б.)
14. <https://dic.academic.ru/contens.nsf/ushakov/>



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DIVERGENT ASSIGNMENTS USED IN INTEGRATED TRAINING

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ABSTRACT

The article quotes methods and processes on how to develop and improve divergent thinking through the integration of the subjects taught in the article. The uniformity of thinking prevents the right perception of the situation and prevent other people from accepting their thoughts and makes personal communication difficult. In contrasting of convergent thinking, different thinking from each other is different thinking of many answers to the same question. Modern didactics offer a number of approaches to the integration of academic subjects, but still not created universally recognized content, forms and tools of the process. As long as it applies to any assignment, the problem, which is belonging to the problem, we can find a few solutions to the Allebat.

KEYWORDS: *Development Of Divergent Thinking, Text, Title, Analysis, Fatty Speech, Integration, Problem.*

INTRODUCTION

Under modern conditions, insecurity is not given enough attention to the teaching of disciplines. Even subjects such as physics and electrical engineering, chemistry and materials science are taught without the systematic connection in secondary special, professional education curricula. Measures to eliminate the problem are being limited to meetings of training of these subjects on the time of the relevant curricula or measures to partially harmonize the content of sciences. To resolve it, the necessary conditions for the integration of the subject disciplines, which ensure the knowledge of students, are required to develop the necessary conditions, form, content and tools of the subject.

Modern didactics offer a number of approaches to the integration of academic subjects, but still not created universally recognized content, forms and tools of the process. Many pedagogical

scientists act in the study of integration processes in education, depending on the integration of fundamental sciences.

This situation is originally explained by the fact that the integration was initially implemented in fundamental networks and later spread to the field of pedagogy. It should be noted that academic subjects are different from scientific sciences. Only this difference is not in the content, but in the form of the absorption shape, size and explanation depth.

The didactic essence of the integration of Educational Sciences is determined by the need to develop the order and legislation of pedagogical activities that allow to determine the conceptual structure and techniques of the formation of new knowledge in various educational sciences. Integration of Educational Sciences is an inalienable continuation of mutual synthesis of science fields and scientific knowledge.

The main purpose of the educational and educational disciplines is to synthesis of subjective new knowledge, the main task of integration processes - the development of pedagogical technologies ahead of the synthesis of subjective new scientific knowledge.

Purpose. The purpose, tasks, and content of education carried out at different levels of education are always determined by the present and future needs of society. Regarding global and national changes in scientific, technical, socio-cultural changes, one of the priorities of higher education is intellectually and physically developed with high levels of spiritual and moral culture, Preparation of a future specialist who has professional growth and personal development.

In recent years, students' ability to develop flexible, effective thinking skills, to make decisions under the restrictions given, is the ability to seek alternative, non-standard ideas, and the restrictions given, called divergent, there is more and more non-linear, different opinions.

Often, due to primary school teachers, linear (convergent) thinking, the correct solution to any problems has learned to use a single solution together with them to develop the mind of schoolchildren. It is possible to explain to the Conscious of the clear meditation of such thinking. The uniformity of thinking prevents the right perception of the situation and prevent other people from accepting their thoughts and makes personal communication difficult. In contrasting of convergent thinking, different thinking from each other is different thinking of many answers to the same question. Similarly, such thinking type included as divergent thinking by scientists and researchers.

Scientific novelty of the article. For many years, the problem of forming divergent thinking has been repeated several times in psychological and pedagogical literature. Specialists conducted mental psychological research, and they were engaged in the study of various thinking and the characteristics of the factors of its development.

Divergent thinking can be called a special thinking occupied by creative people. Diverish thinking is manifested in creativity and different abilities. Creating a new non-standardist, creativity - the basis of any creature.

Dividner is a type of thinking that involves the problem, which involves all the creative capabilities of a person, but meant to solve the right solution.

Many teachers rarely imagine what the students's creativity is. They mainly convey the concepts, increasing their experience and other methods to accurately fulfill professional tasks.

Research of a number of scientists shows that divergent thinking is a speed (the number of things to the time unit), elegance (circulation of flexibility), uniqueness (non-standard, non-traditional ideas) And it is a way of thinking aimed at the formation of criteria for accuracy (fullness, accuracy) of ideas. Therefore, creativity, interest, the desire to manifest the person, the other presentation of the material, are facilitated with different criteria for assessment of the results.

Among the primary school students the concept of thinking is mainly meaningful. That is, the formation of the educational task must first be done in the form of objective and game actions that ensure the emotional basis of arbitrary concepts, not in the form of oral disputes.

The primary school teacher is in need of divergent thinking in designing its professional pedagogical activities, extraction of courses and classes, and analysis of pedagogical activity. Teachers need to understand the essence of different approaches in upbringing and education.

Results and practical applications. The primary school teacher must embody the following features for divergent thinking and quality of this thinking to achieve high quality efficiency:

- to be reflected in their own eyes or on the mind and to correct the correcting deficiencies in their activities;
- Captify critical evaluation of various events in the formogene activity;
- to identify their direction and other solutions in the state of uncertainty in the solution of the camels;
- to be able to organize the knowledge and skills of the magnificent nature independently;
- Donal conditions in the event of the registration and introduction of new training issues;
- Creating alternative options when solving the absorption, and can be considered for a solution in them;
- to be able to merge and change methods in solving possible;
- Prompt methods and technologies.

As a result, various thinking helps to reveal the meaning of the educational process to primary school teachers and choose the form, according to the content of lessons, as well as their network.

Ensuring the beauty, charm, consistency, consistency and elegance of primary education, showing the beauty, charm, consistency and elegance of the lessons, showing the beauty, charm, consistency and elegance of primary education, showing the beauty, consistency of primary education, and the teacher's skill depends on the knowledge and component approach.

By dealing with issues and problems, students are developing, independence, positive qualities such as freedom, pursuit, hardship, and as a result, the child is personally brought up. They get acquainted with the life, production practice of their city, producer, people's work.

In modern teaching, the main task of the teacher is to help the reader to independently master knowledge, not to provide readiness. To do this, students need to organize the educational process to complete their ability and opportunities and to use all their efforts to learn all their efforts. In this case, we use ways to find solutions and solutions to tasks in the subjects taught in primary school.

Below we will provide examples from the introduction of primary education in the Integration of Primary Education in the example of primary education.

Read the text and find a title to it.

In the desert, various animals were in herd. They were very difficult to thirsty without finding water. They wanted to dig a well. The lion first started working. He is quickly tired. The second is the elephant's work. He was also tired quickly. The turn came to the giraffe, wolf and fox. Soon, they were also exhausted. The end of the work was entered into the work. He had danged with his thin hoofs, and finally made water. All animals were happy.

By reading this text, students themselves can think of several headers with them. At the same time, each reader explains the purpose of the title he has set forthcoming this title, the reader develops the students' abilities.

Students can text the text as follows and explain it.

1. Initially, the first student tells the concept and knowledge: "We can communicate to text, water obi life, because we can understand that all animals in the desert are difficult to suffer from infirmity. If there watered the animals would not have difficulty".

In this case, we will be able to explain deeper to students based on the content of the water that all living souls in nature, the source of life in nature, and the source of natural science.

2. Then the second reader reads his understanding and writing: With this we can say that we are saving, the Savior".

Based on the title of the second reader and the comments mentioned, we can consider text in the context of the science. We can shape positive qualities of friendship, and the concept of salvation from the concept of friendship, and doing a goodness of salvation here.

3. And we can say "Texten to the text and work with wisdom. King Sher of the water lion, the most huge animal verb and all other animals were unable to do. Although it is small and weak, he can express his opinion, using his mind and hoofs".

From the mentioned points and the title, we can say that our student contributed to enriching the contents of the technology. The reason is that teaching students are taught in the field of technology, mental tasks, such as the rules of tasks, and safety of the case, and the correct use of tools. In the text, the text shows that in the mining of the water, using its mind and digging the land with thin hoofs and producing water.

This means that we can learn when the causes of these three titles were analyzed when we are analyzed on the content of three subjects in primary education and improve and develop existing. All students in the class understand that any assignment, the problem and the integration of the question on the integration of sciences.

After doing such exercises, assignments, and questions, will command students to conclude. Students concluded that very many questions, problems, and several solutions can be found in a variety of ways.

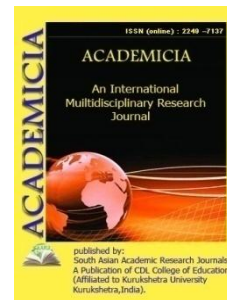
This, in turn, shows that we can improve the quality of education, improve the quality of education and develop the skills of students to observe obstruction.

CONCLUSIONS AND SUGGESTIONS

As long as it applies to any assignment, the problem, which is belonging to the problem, we can find a few solutions to the Allebat. In finding a few solutions to the problem, students can observe thought, observation, observation, and increase their knowledge and develop. From this we can come to conclus, we need to use divergent thinking in the educational process. We need to focus on independent thinking in the teaching, divorcing of ideas.

REFERENCES:

1. Matchonov S., Shojalilov A., G'ulomova X., Sariyev Sh., Dolimov Z. O'qish kitobi. 4-sinf uchun darslik. – Toshkent: Yangiyo'l poligraf servis, 2020.-160 bet.
2. G'afforova T., Nurullayeva Sh., Haydarova O. Boshlang'ich sinflar uchun ona tili va o'qishdan didaktik materiallar. – Toshkent: Ilm ziyo, 2004.–78 b.
3. 3.Yo'ldoshev J.T.Turli xil fikrlash boshlang'ich sinf o'qituvchisining faoliyatida. Aktualniye vizovi sovremennoy nauki. LXI Mejdunarodnaya nauchnaya konferensiya. Vipusk 7(61). 26-27 iyulya 2021 g.
4. Umarova M., Hamroqulova X., Tojiboyeva R.. O'qish kitobi. 3-sinf uchun darslik. – Toshkent ,O'qituvchi 2019.-283 bet.
5. Ismatullayeva, N. R. (2021). On the Introduction of E-Learning Portfolio in the Educational Process. *Current Research Journal of Pedagogics* (2767-3278), 2(09), 35-37.



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IMPROVING THE QUALITY OF SECONDARY FIBER RAW MATERIALS STUDYING A PROCESS

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ABSTRACT

The article presents the results of improving the quality of waste paper by converting the printing ink in the MS-3 waste paper mass into a soluble state. The necessary conditions for the solubility of printing ink in the waste paper mass have been recommended.

KEYWORDS: *Waste Paper, Paper, Alkali, Degree Of Polymerization.*

INTRODUCTION

According to the report "Pulp and Paper Market Size, Share & COVID-19 Impact Analysis... and Regional Forecast, 2020-2027" provided by Fortune Business Insights, the pulp and paper market will grow by an average of 0.8% per year by 2027 reaching a volume of 368,1 billion USD. The authors of the report divide the market into three sectors, namely newsprint, printing and packaging paper, among which packaging paper has the largest share (52.9%) [1].

To produce one ton of paper, 24 trees need to be cut down. During the year, one tree produces enough oxygen for 4 people [2]. In this regard, annual plants, non-wood perennials, the rational use of fibrous waste from the main production is of particular importance.

Secondary resources in our republic - from annual plants such as cotton wool [3], cotton stalks [4], straw [5]; non-woody plants, including tapinambur [6], amaranda remnants [7], and licorice

root waste [8] have the potential to be used in the paper industry to obtain a fibrous semi-finished product.

The pulp and paper industry is the sixth largest industry in terms of water consumption, consuming 163 m³ of water per 1 ton of product, the bulk of which falls on the production of fibrous semi-finished products.

One of the main directions of reducing water consumption is the efficient use of waste paper (waste paper, recycled paper, secondary raw materials).

In the paper industry, recycling of waste paper can reduce water consumption by 40%, solid waste by 39% and air pollution by 73% [2].

Worldwide, newsprint is made from 68% of secondary raw materials. At the same time, 68% of all paper produced worldwide is a packaging paper, and its composition consists of 50% recycled paper, i.e. waste paper. However, waste paper is almost never used in the production of printing and writing paper. Even in the US, only 6% of waste paper is used for this purpose. This means that almost 90% of the primary fiber in the production of printing and writing paper, i.e. cellulose from wood, is used. And that in turn signifies that the forest will be cut down again. MS-1, MS-2 or MS-3 sort waste paper can be used in the production of printed paper. Although there is no problem in using MS-1 and MS-2 waste paper, the presence of printing ink in MS-3 waste paper limits its use for the above purposes. In particular, the problem of maximum separation of dye on the fiber surface during the processing of waste paper, its removal from the cellulose suspension, decolorization of dyed fiber and raising the whiteness of secondary fiber is currently being studied in all developed countries [10].

LITERATURE REVIEW

When the composition of paper waste generated in different enterprises was studied by NMR analysis, a researcher, it was found that a certain amount of polycyclic aromatic compounds, heavy metal, dioxin and furan compounds were present [11]. An analysis of the literature revealed that it was a multi-component system used in the preparation of typographic ink. Printing ink is supposed not to penetrate deep into the paper and to dry quickly. For this purpose, typographic inks are prepared mainly on the basis of typographic drying oils. The composition of the paint may vary depending on the purpose for which it is used. For example, when printing a newspaper, liquid paint is used, taking into account the rapid drying of the paint, and when printing books, some darker colors are used. In the preparation of all types of printing paints, wood resin and soap are added to the oil. In the literature, the composition of typographic dye is given as follows: typographic oil - 50 kg, wood resin - 10 kg, black dry - 12 kg, soap - 1 kg, color pigments 250 g. It is an olive oil that acts as a curtain. To remove the printing ink from the waste paper mass, it is first necessary to break down the component that forms the film. This means that the olive oil in the paint is an oily-waxy substance, and by converting it to a soluble state, the waste paper mass can be removed from the printing ink. When reusing all types of packaging materials, it is important to remove the dye while maintaining the physical and mechanical properties of the fibrous material. Studies have suggested 3.5% maleic anhydride and 15.8% specific polymer as the optimal content for dye extraction [12]. Another alternative method of extracting printing ink from waste paper is currently proposed by G. Tofani. To do this, to remove the dye from the paper sediment formed during the flotation cleaning process, it

is fired at 5750C and bleached with sodium ditionite, the cost-effectiveness of reuse in paper production as a filler from the resulting ash is currently being studied [13].

A number of scientists have recommended the use of biotechnology to extract laser printer ink and printing ink from the waste paper mass. Experiments have shown that cellulose from *Aspergillus oryzae* MDU-4 for the removal of ink from newsprint, and lacquer isoenzymes from *Ganoderma lucidum* MDU-7 and 2 mM HOBt for cleaning laser printer ink have shown good results. Twin-80 has also shown the best results among the enzymes studied to break down toxic toner used in laser printers and remove it from the waste paper mass [14].

The method and efficiency of extraction of non-fibrous waste from waste paper is selected depending on the shape, size, quantity, composition and surface properties of the waste as follows:

- Treatment: waste size and their shape;
- sorting: waste size, their shape and viscosity;
- Washing: waste size and their shape;
- Flotation: waste size and their surface properties.

The size of the waste as printing ink is in the range of 1-100 μm , and their density is 1.2 - 1.6 g / cm^3 [15]. Extraction of wastes with a density of about 1 g / cm^3 from the waste paper, ie adhesives, waxes, paraffins and latexes, is a more difficult and complex process than cleaning from other wastes. In terms of waste size, the removal of waste, including glue and paint particles, which is the same as the length and diameter of the waste paper fiber, requires separate processes. [16].

Methodical part

The study examined MS-3 waste paper - paper waste consisting of books, magazines and archival papers as an object. The efficiency of the printing dye extraction process from waste paper is evaluated by the degree of polymerization of cellulose [17] and the capillary values of paper castings [18].

Main part

Previous studies in this area have shown that the removal of printing ink from MS-3 waste paper is mainly based on the bleaching of the waste paper, in which a printing ink is removed from a waste paper under the influence of oxidants and reductants [19]. In the study, the printing ink was extracted from the waste paper mass, but the capillary capacity of the paper samples prepared on its basis had low values. This is due to the fact that in addition to the coloring pigment in the printing ink there are various auxiliaries, including oil-wax substances - olives, the presence of which in the waste paper mass, adversely affects the printing properties of the formed paper.

In the study, the waste paper was treated in an alkaline environment in order to make the printing ink soluble. In this case, in the first stage of the process, the paper-waste paper first swells, then absorbs the alkali, and in the next stage, a chemical reaction takes place between the abrasive alkali and the oily substance. At high temperatures, in an alkaline environment, the waste paper swells excessively, and the average size of its pores increases several times, facilitating the

diffusion of fatty substances in the printing ink. Under the influence of alkali, waxy substances hydrolyze to form sodium salts of fatty acids:



An extraction efficiency of a printing ink is evaluated by a degree of polymerization of castings and capillary properties of paper products made from it. For this purpose, MS-3 waste paper was treated at different concentrations of alkali at a temperature of 90°C for 50-60 minutes. The results of the studies are presented in

TABLE 1 INFLUENCE OF ALKALI CONCENTRATION ON WASTE PAPER QUALITY INDICATORS

#	Concentration of NaOH ,%	Polymerization level	A capillarity properties of paper castings, mm
1	1,0	850	4
2	1,5	820	6
3	2,0	800	7
4	2,5	740	9
5	3,0	710	10

Commentary: $t = 90^{\circ}\text{C}$; $\tau = 50\text{min}$

From the data given in the table, with an increase in alkali concentration, a slight decrease in the degree of polymerization of cellulose is observed, and as well as an increase in capillary properties. Repeated recycling of paper will result in lower quality of the collected paper, which will again increase the demand for primary fiber. It is also known that the quality of the paper decreases dramatically when the dye is removed [20].

Since an increase in the alkali concentration of more than 2% led to a sharp decrease in the degree of polymerization of the cellulose, its amount of 2% was accepted as the acceptable concentration. The increase in the capillary capacity of the samples can be explained by the fact that the film-forming agent in the printing ink is destroyed by alkali. The capillary rise of the liquid in the samples occurred as a result of the transfer of oligo-oily-waxy substances from the paper to the solution with increasing alkali concentration.

Although the decomposition of typographic dye was achieved with increasing alkali concentration, a sharp decrease in the degree of polymerization of cellulose was also observed. This is due to the rupture of hydrogen bonds in the cellulose macromolecule under the influence of alkali at high temperatures. Therefore, in order to reduce the alkali processing temperature, the effect of temperature on the process was studied, while maintaining the alkali concentration of 2%.

The results are shown in Figures 1 and 2.

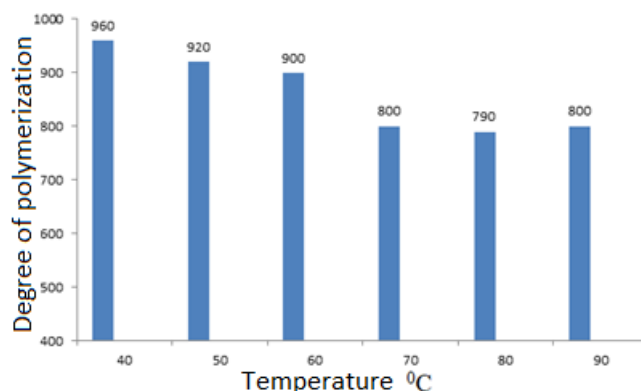
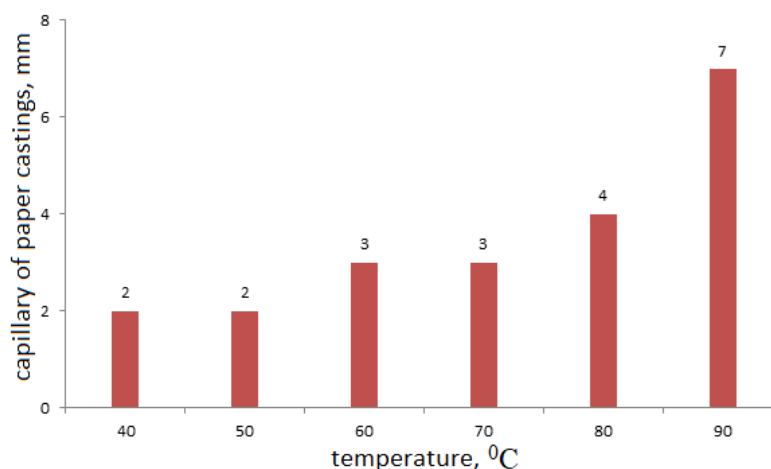


Figure 1. The effect of temperature on the degree of polymerization of waste paper



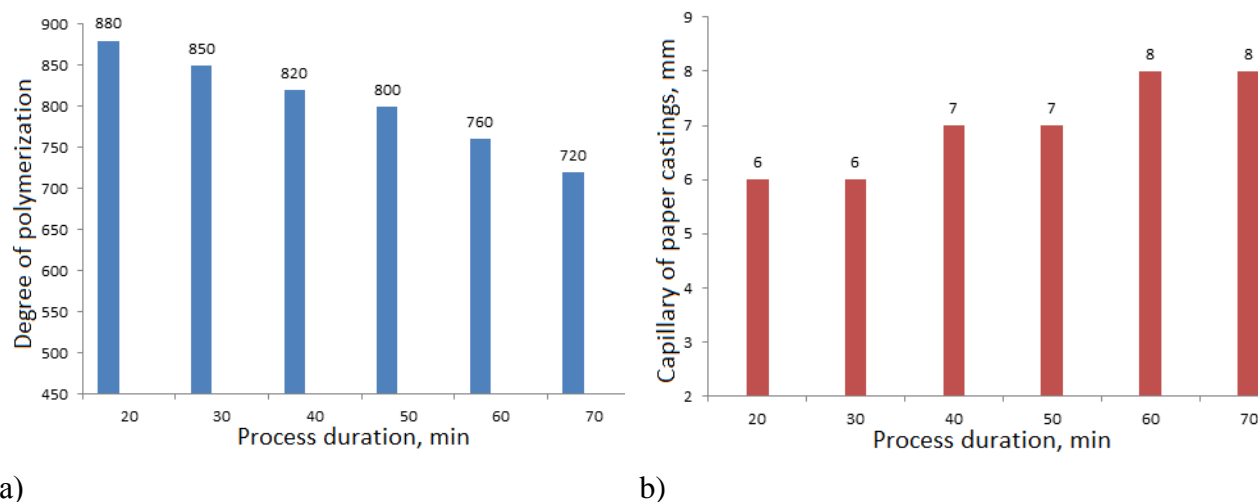
Commentary: $C_{\text{NaOH}} = 2.0\%$; $\tau = 50$ min

Figure 2. The effect of temperature on the quality of waste paper

The results given in the diagrams show that the polymerization rate of cellulose has a high value at low alkaline treatment temperatures, but the capillary rise of the liquid in the samples is observed only when the process is carried out at a temperature of 90°C.

Hence, the hydrolysis of oily-waxy substances under the influence of alkali at high temperatures has been confirmed, a temperature of 90°C was accepted as the optimum temperature. Next, the effect of process duration on the efficiency of typographic dye extraction from waste paper mass was studied. The results are shown in Figure 3.

When analyzing the graphical data, it was found that an increase in the process duration of more than 50 min leads to a further decrease in the degree of polymerization, but the capillary is almost unchanged. Due to the fact that the amount of printing ink in the paper samples did not change, the system was in equilibrium for 50 minutes during the transition of alkali-oil-waxy substances to the solution under alkaline conditions.



Commentary: $C_{NaOH} = 2.0\%$; $90^{\circ}C$

Figure 3. The effect of process duration on waste paper quality indicators:

a) effect on the degree of polymerization; b) effect on paper capillary capacity.

CONCLUSION

The results (Table 1) show that as a result of alkaline treatment of the waste paper mass, the degree of whiteness and capillary content of the castings decreases with increasing alkali concentration in the system by more than 2.5%. This may be due to the formation of a hydrophobic layer on the casting surface as a result of the hydrolysis of drying oil and other oils in the printing ink under the influence of alkali, as well as the re-absorption of the pigment in the solution into the fiber. Wastes are also divided into separate classes in terms of wetting, i.e., hydrophilic, hydrophobic, and wastes that are wetted in a neutral environment. The method of removing the waste from the waste paper mass and the appropriate chemical and auxiliary reagents are selected according to the wetting environment of the waste. In addition to the above, wastes known to adhere to metal parts of equipment at high temperatures are also known as paraffin, wax, and latex.

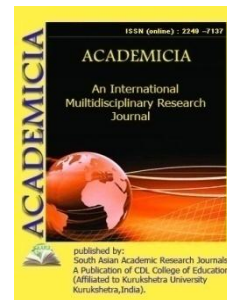
REFERENCES

1. E. Kirichenko. The global pulp and paper market will reach \$ 368.1 billion by 2027. LesPromInform. No. 6 (152), 2020-C99.
 - a. 2. <https://www.waste.ru/modules/section/item.php?itemid=476>. Recycled paper: problems and solutions. Industry portal. Waste.ru
2. Galimova Z.K, BabakhanovaKh.A, Nabiev D.S. Characteristics and printing properties of paper based on cotton and liquorice cellulose // Bulletin of young scientists of St. Petersburg State University of Technology and Design. Issue No. 1 –S.94-97
3. Shatalov A. A., Pereira E. the production of cellulose from cane. Quoted from RZhKh, 2002, No. 1, abstract 02.18-19F17
4. Barbash B.A., Trembus I.V., Gapon O.S. Container kareon and writing paper from straw fibrous semi-finished products // Packing. -2009. -No 6. -c. 18-20.

5. Murodov M.M., Egamberdiev E.A., Rahmonberdiev G.R. "Tapinamburysimligifayz baraka vamjizanavlaripoyalaridan cellulose olishzharayoniniyrganish". Composition materialarilmiy-tekhniviywaamaliyzhurnali. Tashkent, 2012
6. Matrasulova DF, Karimov B.B. "Exploring the possibility of obtaining cellulose from amaranth (Amaranthus)". International seminar "Technology textiles - 2018", TITLP Tashkent, pp. 118-119.
7. Abdumazhidov A.A., Mamadiyorov B.N., Mirataev A.A. "Yizilmiyaidizichiqindisidanolinganyarimcellulozaniogartirish". Republic of Ilmiyanzhumani, AzFAPolymerlarKimyoshi VA Physics Institute. Toshkent, November 10, 2017
8. Neil Seldman. Working Partner Update: Conservatree, Inc. <https://ilsr.org/working-partner-update-conservatree-inc/3> MAR 2018
9. Noskova O.A. "Waste paper massasisifatiniyahshilashda flotation usulinallash" 2012, p. 222-224.
10. R. Abdullah, C. Fauziah Ishak, W. Rasidah Kadir, R. Abu Bakar. Characterization and Feasibility Assessment of Recycled Paper Mill Sludges for Land Application in Relation to the Environment. nt. J. Environ. Res. Public Health 2015,12 (8), 9314-9329;
a. <https://doi.org/10.3390/ijerph120809314>
11. A. Elloumi, M. Makhlof, A. Elleuchi, Ch. Bradai. Deinking Sludge: A New Biofiller for HDPE Composites. <https://doi.org/10.1080/03602559.2015.1132432>
12. Tofani, G., de Nys, J., Cornet, I. et al. Alternative Filler Recovery from Paper Waste Stream. Waste Biomass Valor 12, 503-514 (2021). <https://doi.org/10.1007/s12649-020-01011-7>
13. Sonu Saini, PreetiChutani, Prabhat Kumar, Krishna Kant Sharma. Development of an eco-friendly deinking process for the production of bioethanol using diverse hazardous paper
14. wastes. Volume 146, February 2020, Pages 2362-2373. <https://doi.org/10.1016/j.renene.2019.08.087>
15. S. S. Puzyrev Resource-saving technology of waste paper processing. General provisions. LesPromInform No. 3 (34), 2006-C.104-108. <https://lesprominform.ru/jarticles.html?id=1494>.
16. Vanchakov M.V., Kuleshov A.V., Konovalova G.N. Technology and equipment for processing waste paper: a tutorial. 2nd ed., Rev. and add. –SPbGTURP. SPb., 2011. S1. -99 p. : ill. 44.978-5-91646-033-9
17. YunusovKh.E., Mirataev A.A. "Kofozishlabchikarishningnazariasoslari" fanidan laboratory of mashulotlarinibazharishuchunusubiykursatma.
18. KhasanovaS.Kh., Nabiev N.D. "Kozningassosiyturlari va hossalari" fanidan laboratory mashulotlariuchunusubiykursatma.
19. A.A. Abdumazhidov, H. S. Shorakhmedova, A. A. Mirataev, I. A. Nabieva. PROBLEMS OF USING PAPER IN THE COMPOSITION OF RAW MATERIALS Ministry of Science and Higher Education of the Russian Federation Federal State Budgetary Educational Institution

of Higher Education "St. Petersburg State University of Industrial Technologies and Design", "Innovative Directions in the Development of Science of Polymeric Fibrous and Composite Materials", International Scientific Conference St. Petersburg 2020

- 20.** Janne T. Keränen, Ilpo Ervast. Amounts of non-fibrous components in recovered paper. Resources, Conservation and Recycling. Volume 92, November 2014, Pages 151-157. <https://doi.org/10.1016/j.resconrec.2014.09.010>



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EFFECTS OF MINERAL AGRO ORES ON WINTER WHEAT GROWTH AND DEVELOPMENT

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ABSTRACT

The topic corresponds to the priorities of scientific research, as it is currently actual in the republic's agriculture, after finishing the research, past crops, which increase soil productivity and winter wheat yield, will be determined in the conditions of the Republic of Karakalpakstan at the first time. Carrying out agro-ameliorative measures for reduction of soil salinity, increase of soil fertility and productivity and quality of crops, development of efficiency of past crops and mineral agro-ores in increase of winter wheat yield, application of organic and siderate fertilizers to the soil - is the way to solve the problems.

KEYWORDS: Winter Wheat, Soil, Fertility, Mineral Agro-Ores, Celadon Green, Past, Yield.

INTRODUCTION

Due to the biological properties of winter wheat, it must be resistant to the effects of winter frosts. However, despite the fact that the climate of our country is sharply continental (summer is hot and cold), in autumn, winter and spring the weather changes very quickly and due to improper application of certain agro-technological processes, it can not grow or develop. Therefore, the protection of winter wheat from the negative effects of winter frosts should begin with the sowing of seeds. In order to protect the crop from the negative effects of winter frosts, it is advisable to select fast-ripening varieties resistant to winter frosts, sow them at the right time and feed them properly. Winter wheat has a relative degree of frost resistance, and when agro-technological processes are used incorrectly, they can also die from the cold.

In order to eliminate the disadvantages of growing winter wheat and other crops, a computerized diagnostic program of feeding on the actual condition of farmland has been developed. Under this program, each farm will be provided with an agrochemical passport for feeding winter wheat and cotton. If it is followed we can not only reach to the planned yield but also increase soil productivity.

Grain yield produced from imported varieties such as Krasnodarskaya-99, Grom, Moskvich, Tanya, Starshina, Pamyat, Pervica, Nota, as well as from winter wheat varieties created under local conditions, such as Chillaki, Andijan-1, Andijan-2, Andijan-4, Bobur, Asr, Durdona, Matonat, Yaksart, Khazrati, Bashir, Omad in the main areas. The organization of the sowing season for this year's harvest in a cohesive way, the correct selection of varieties, ensured the achievement of high yields in the soil and climatic conditions of each region of the Republic. Timely implementation of advanced agro-technical measures has allowed to increase grain production, further improve its quality and consumer properties. The key to success was also the introduction of modern technologies in agriculture, the achievements of advanced farming techniques, the timely implementation of measures to fully establish the seed system. .

Methods of the research

Soil and climatic conditions of Khojayli district of the Central region of the Republic of Karakalpakstan, winter wheat, past crops were studied at the farm "Urazboy-ota". In our experiment, the varieties of winter wheat "Kroshka", mung bean "Durdona", soybean "Arzuv", sesame "Black Prince" are planted according to the sowing norms set in the recommendations.

Scientific research work is being carried out on the theme the selection of promising winter soft and hard wheat varieties, recommended for new plantings, creating scientific basis of agrotechnical elements of their local production taking into account the soil and climatic conditions of the country. Scientific research work is being carried out on yield of winter soft, hard wheat varieties are selected for each region based on the results of development and research of agronomic elements of cultivation of promising varieties with high grain quality indicators and their optimal sowing times and the implementation of fertilization standards.

Results of the research

After winter wheat, 12-21 quintals of root mass and plant residues remain in the soil, which has a positive effect on the increase of humus content, improvement of water and physical properties. After winter wheat, the field is empty in early July. Intermediate crops can then be planted to make better use of the land, or reclamation can be carried out with the application of organic fertilizers.¹

There are 3080-3180 thousand plants of winter wheat per 1 hectare . In order for winter wheat to overwinter well, it needs to have a thick snow cover during the winter months. The winter months in Karakalpakstan will be dry and cold without snow. Therefore, wintering of winter wheat is very important.

When determining the height of the plant stem and spike biometric parameters, the following was found. Before harvesting, the plant height is 78-7-83.1 cm, the length of the spike is 9.1-9.0 cm, the number of spikes is 19.2-18.9, the number of grains in the spike is 41.2-40.7 grains, grain weight was 1.68-1.70 g, 1000 grains weighed 38.8-37.0 g.

When mung bean was sown for grain before winter wheat intermediate crop (mung bean) + 20 t / ha of manure + 1.0 t / ha of celadon green (var. 8-10), then winter wheat, it provided a yield of 50.0-51.5 q / ha. This indicates that it was 10.0–11.5 q / ha higher than the control variant (var.1) in which winter wheat was sown after winter wheat.

When we determined the yield of winter wheat by variants, we found the following.

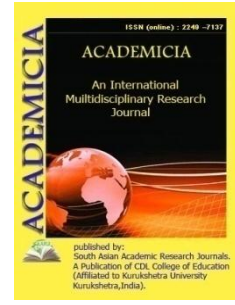
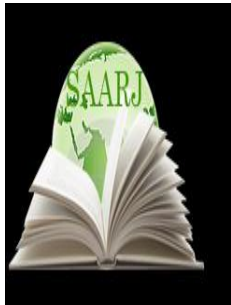
The average yield of the variants was 39.5-51.5 q / ha. The lowest rate is observed in variant 1, i.e. when winter wheat was sown after winter wheat (39.5 q / ha). In 2-4 variants when mung bean, sesame and soybean sown for grain before winter wheat it was 41.5-43.0 q / ha, in 5-7 variants when mung bean, sesame and soybean sown for grain before winter wheat, then 10 t / ha manure + 1.0 t / ha celadon green was used, it was 44.0-47.5 q / ha and in 8-10 variants when after harvesting mung bean, sesame, soybean, intermediate crop (mung bean) + 20 t / ha of manure + 1.0t / ha of celadon green was used it was 50.5-51.5 q / ha.

CONCLUSION

To scientifically substantiate the duration of sowing of past crops, the efficiency of crop structure in the system of crop rotation of local mineral agro-ores, organic fertilizers in order to obtain high yields of winter wheat and increase soil fertility in saline soil conditions of the Republic of Karakalpakstan is achieved.

REFERENCES:

1. Ismailov U.E., Sadikov E., Saipnazarov G. Short ration crop rotation in the conditions of Karakalpakstan. Nukus. 2015.
2. Ismailov U.E. The technology of using local mineral agro-ores in cotton. Scientific report on the project KXA-7-007-2015. Nukus. 2017.
3. Ismailova A. Influence of local agro-ores on cotton. Nukus. Miraziz-Nukus. 2018. p-68.
4. L.Mirzaev, D.Gafurov, D.Haydarova, "The effect of different standards of mineral fertilizers applied on winter wheat on the growth and yield of secondary crops" // Journal of Agriculture of Uzbekistan. Agroilim 2018. -№3 (53). p-29.
5. O.Botirov, I.Adashev, "The impact of winter wheat sowing methods on grain yield" // Journal of Agriculture of Uzbekistan. Agroilim 2018. - №4 (54). p-20-21.



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FIELD CONDITIONS FOR PLANTING RE-CROPS WITH MINIMUM TILLING

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ABSTRACT

The article presents the results of a study of the physico-mechanical properties of the soil in the fields after harvesting crops. The advantages and peculiarities of the method of land cultivation, the Strip-Till technology, as well as search for the possibility of using it for the cultivation of re-crops in permanent furrows and in row spacing ridges. The data obtained as a result of experimental studies to determine soil moisture and hardness, as well as the quality of soil tilling by the recommended working bodies, are presented.

KEYWORDS: *Physico-Mechanical, Experimental, Moisture*

1. INTRODUCTION

Total work on further improvement of the system of crop placement based on soil and climatic conditions of the regions of The Republic, increasing the efficiency of land and water resources, sustainable enrichment of the domestic market, maintenance and cultivation of agricultural products to expand processing and export Great attention is paid to the timely and quality conduct of the complex [1].

It is known that the main and pre-sowing tillage is the most energy-intensive process in agricultural production, accounting for 40-50% of the total energy spent on the cultivation of agricultural crops in the country. Therefore, reducing energy consumption in the main and pre-sowing tillage of lands saves a large amount of fuel and lubricants in agricultural production, reduces labor costs and other costs, and increases the durability of machines and their working

bodies. The result is a reduction in the cost of the product grown. One of the main ways to ensure energy efficiency in the cultivation of lands in the conditions of the republic is the use of combined aggregates [2].

Combined aggregates perform several technological operations on soil preparation and sowing in one pass. As a result, the negative impact of tractor motors on the soil is reduced, the quality and productivity of work is increased, the time of tillage is reduced and moisture is retained in it, and fuel and other costs are reduced. Combined aggregates used in tillage are based on the sequential installation of machines or working bodies that perform various technological processes in tillage, the use of which mainly leads to a reduction in the number of field passes of machine-tractor units.

Nowadays, after harvesting the grain crops, the land is plowed, prepared for sowing and then sown separately for the sowing of secondary crops. Most importantly, a lot of time is spent on pre-sowing preparation. As the soil moisture is low, it is necessary to irrigate the field before plowing. Then you have to wait 4-5 days until the soil matures, and only then begin to prepare the soil.

2. MATERIALS AND METHODS

Based on the scientific research, it is possible to perform several operations (land preparation, planting, etc.) in one pass by creating combined aggregates.

Minimal tillage with a combined unit, ie all technological processes of primary and pre-sowing tillage, without tillage and road tillage, and in one pass from the field, in order to prevent its over-compaction and structural damage and reduce labor, energy and fuel consumption. The development and widespread introduction of machines and aggregates [3,4,5,6,7] is a topical issue.

Field agrophony, physical and mechanical properties of the soil are of great importance in substantiating the parameters of such aggregates. With this in mind, the physical and mechanical properties of the soil in the fields where wheat was harvested, ie soil hardness according to the profile of the field (TST-Agro cluster in Lower Chirchik district of Tashkent region, Bobur femoral farm in Kamashi district of Kashkadarya region). In this case, soil hardness was measured at seven points along the slope profile (Figure 1).

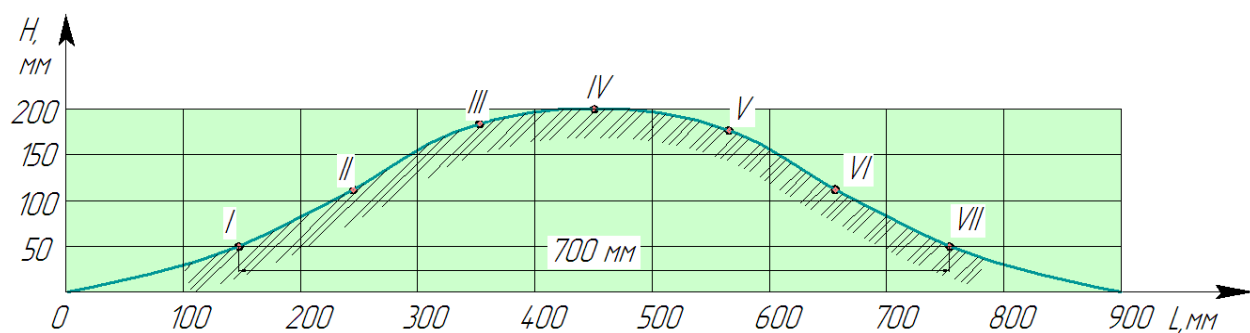


Figure-1. Furrow profiles.

Based on the results obtained, we create histograms on the profiles of the field of wheat sown in the open field and the field of wheat sown between rows of cotton (Figures 2,3,4,5).

3. RESULTS AND DISCUSSION

Based on the results obtained, we can conclude that in the wheat field planted between rows of cotton, the soil hardness of the egat profile is relatively less than in the open wheat field. As a result, a wheat field planted between rows of cotton is preferred for replanting.

Also, the results of research on energy-resource-water-saving technology of cultivation of agricultural crops in cotton and fallow lands and minimal tillage with a combined aggregate [8,9,10] bulk weight (density) and studied at depths of 0 to 10 cm, 10 to 20 cm, and 20 to 30 cm before processing (Table 1). The result showed that the volume weight value at the top of the egat profile was low.

The results obtained are given in the table 1.

TABLE 1

Points marked on the furrow profile	A field of wheat planted in the open	A field of wheat planted between rows of cotton	A field of wheat planted in the open	A field of wheat planted between rows of cotton	A field of wheat planted in the open	A field of wheat planted between rows of cotton	A field of wheat planted in the open	A field of wheat planted between rows of cotton
	10 cm	15 cm	15 cm	20 cm	20 cm	25 cm	25 cm	25 cm
	Hardness indicators, MPa							
1	1,88	3,61	2,20	3,86	2,23	3,86	2,43	3,86
2	3,15	2,27	3,19	2,44	3,19	2,52	3,19	2,61
3	3,29	2,84	3,29	3,06	2,23	3,86	3,29	3,06
4	2,20	1,00	2,57	1,36	2,85	1,78	2,98	2,14
5	1,84	2,76	2,21	2,97	2,41	3,19	2,41	3,19
6	2,47	2,80	2,49	3,03	2,56	3,03	2,71	3,03
7	2,56	2,45	2,79	2,70	3,04	3,08	3,04	3,08

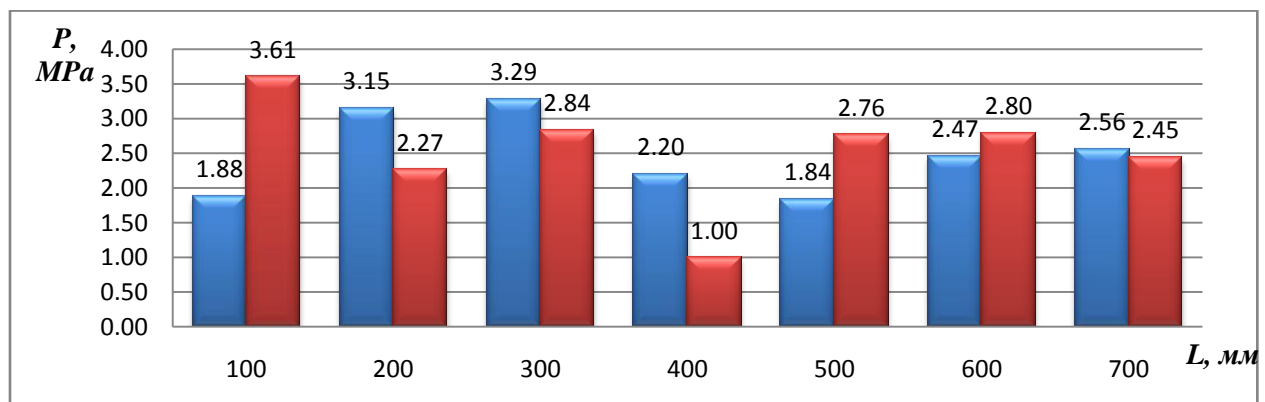


Figure 2. Up to a depth of 10 cm on the profile of furrow hardness indicators

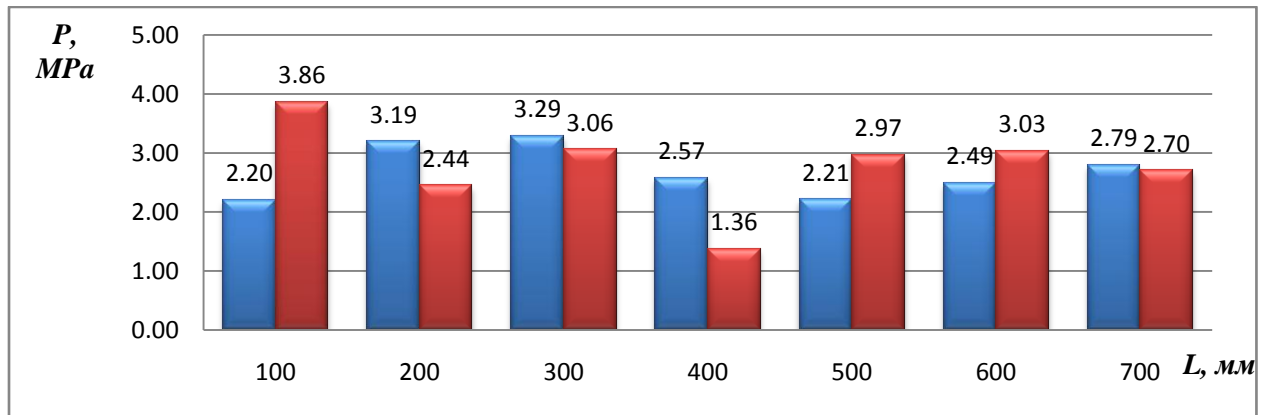


Figure-3. Up to a depth of 15 cm along the profile of the furrow hardness indicators

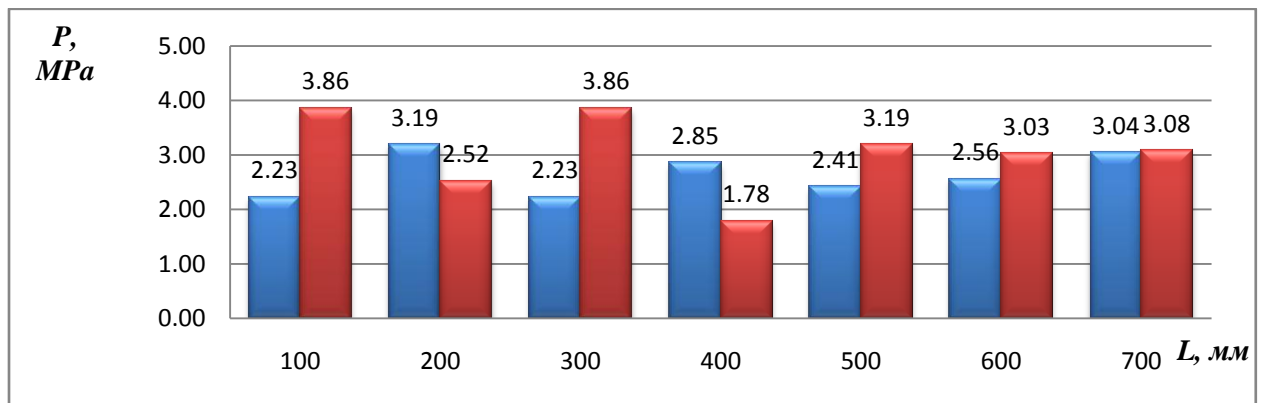


Figure-4. Up to a depth of 20 cm along the profile of the furrow hardness indicators

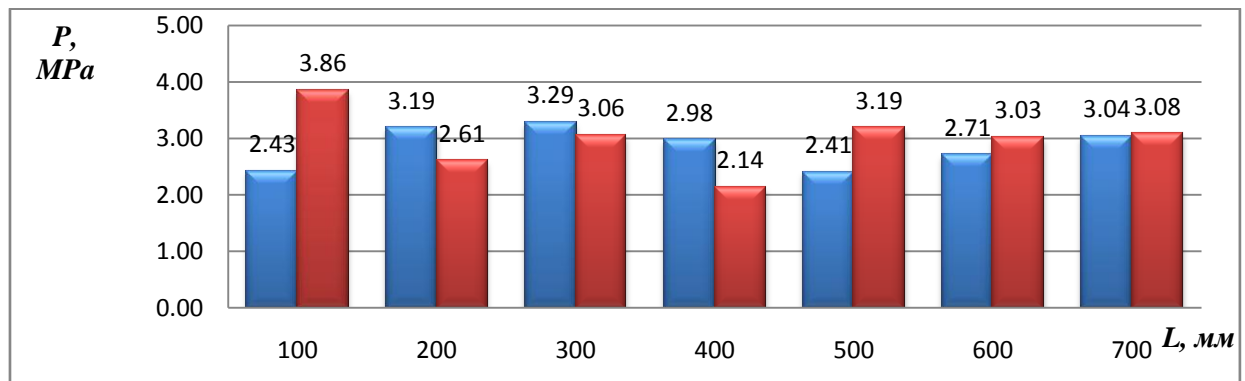


Figure-5. Up to a depth of 25 cm along the profile of the furrow hardness indicators

TABLE 2 VOLUMETRIC WEIGHT (G/CM³) OF FIELD SOIL FREED FROM WHEAT BEFORE PLANTING AND PROCESSING.

Horizontal, cm	Indicators	Sample location		
		Marza	Side of furrow	Rut
0-10	M _{av.} , g/cm ³	1,07	1,02	1,11
	σ, g/cm ³	0,03	0,02	0,04
	V, %	2,8	2,0	3,6
10-20	M _{av.} , g/cm ³	1,13	1,15	1,19
	σ, g/cm ³	0,08	0,05	0,03
	V, %	6,6	4,3	2,5
20-30	M _{av.} , g/cm ³	1,17	1,20	1,21
	σ, g/cm ³	0,03	0,03	0,02
	V, %	2,8	2,8	2,0

Soil moisture and hardness were also banned at depths of 0 to 10 cm, 10 to 20 cm, and 20 to 30 cm (Table 3). According to the experimental results, the soil moisture in the upper part of the slope profile (0-10 cm) was 5.4-6.1%. This indicator is not sufficient for seed germination. At the bottom of the Egat profile we can see that the soil moisture is 11.7-12.5%. Soil hardness was 3.8-4.02 MPa at the top of the egat profile and 5.32-5.45 MPa at the bottom.

TABLE 3 SOIL MOISTURE AND HARDNESS AT THE EXPERIMENTAL SITE

Horizontal, cm	Sample location		
	Marza	Side of furrow	Rut
0-10	5,4/3,80	6,0/3,93	6,1/4,02
10-20	9,8/5,10	10,2/5,14	10,5/5,19
20-30	11,7/5,32	12,2/5,39	12,5/5,45

Note. In the figure-soil moisture is at%

in the denominator - soil hardness is atMPa

4. CONCLUSION

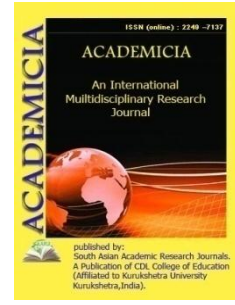
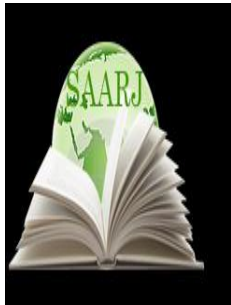
To determine the mass of straw in the experimental plot, 1m² of straw residue was collected from each suitable site. Calculations showed that the mass of straw on the experimental plot was 4.2 t / ha and the coefficient of variation was 15.6%.

In addition, research on resource-efficient agrotechnologies of perennial tillage [11] shows that the impact of resource-efficient agrotechnologies on the agrophysical and agrochemical properties of the soil, changes in its mechanical composition, evaporation of soil moisture and water permeability properties require the development of new tillage aggregates in the cultivation of secondary crops.

The above scientific research also shows that the planting of secondary crops requires the development of energy-saving aggregates for field preparation.

REFERENCES

1. Resolution of the President of the Republic of Uzbekistan No. PP-3281 "On measures for the rational placement of agricultural crops and the forecast volumes of agricultural production in 2018".
2. Tukhtakoziev A. Ways to reduce energy consumption in land allocation [Ways to reduce energy consumption in land reclamation]. Republican scientific-practical conference "Improvement of the use of high-efficiency agricultural machinery". –Tashkent, 2017. - 93-98 B.
3. General concepts of integrated development of agricultural mechanization and electrification processes in Uzbekistan until 2020. – Toshkent: Fan, 2011.
4. Sokolova L. S. Minimalnaya obrabotka pochvi [Minimum tillage] // Voprosy sotsialno-orientirovannogo modelirovaniya tekhnologicheskikh protsessov. Sovremennye issledovaniya sotsialnykh problem. - 2012. - No. 7.
5. Karaxanov A., Tolibaev A. E. Resource-saving technology of re-crop cultivation through minimal tillage]. // Materialy mejdunarodnoy nauchno-prakticheskoy konferentsii. –Tashkent, 2006. –UzNIIX. –S.73-76.
6. Aliboev B., Alimova F., Atadjanova M., Primkulov B. Estimation the tightness of precision elements of agricultural tractors' hydrodistributors // Journal of Advanced Research in Dynamical and Control Systems, 2020, Vol.12, 07-Special Issue, 2258-2264, DOI: 10.5373/JARDCS/V12SP7/20202352.
7. Alimova F., Bayat A., Saidova M., Primkulov B., Atadjanova M. Substantiation Of Parameters And Operating Modes Of The Pneumatic Sowing Apparatus For Cluster Sowing Of Cotton Seeds // Solid State Technology, 2020, Vol.63, Issue:6, 11876-11886.
8. Alimova F. A.¹, Primkulov B. Sh.², Investigations of Technological Process Work of the Energy-Saving Combination Aggregate For Re-Sowing The Seeds, International Journal of Advanced Science and Technology, Vol. 29, No. 9s, (2020), pp. 5770-5779.
9. Karaxanov A., Tolibaev A. E. Universalnaya pnevmomexanicheskaya sevalka [Universal pneumatic seed drill] // Respublikanskaya nauchno-tehnicheskaya konferentsiya s uchastiem zarubezhnykh uchennykh. - Tashkent, 2004. –P.79-81
10. Report on research work on the KHA-3-010 project Development of energy-resource water-saving technology for cultivating crops on permanent ridges and ridges and a combined unit for their implementation. – Gulbaxor, 2013g. – 63 s.
11. Khasanova FM, Karabaev IT The effect of soil agrotechnology on crop yields [Influence of tillage agrotechnology on crop yields]. Monograph. - Tashkent: Navruz. - 2018.– 124 p.



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INFLUENCE OF THE HEATING TEMPERATURE ON THE PROPERTIES OF STEEL

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ABSTRACT

The article analyzes the methods of heat treatment of iron-carbon alloys. In particular, the modes of heat treatment of steel grade 45 and 40X were studied. The essence of unconventional modes is that by means of preliminary high-temperature HT, a high level of defectiveness of the crystal structure of steel is achieved. Thus, it has been shown that with significant heating of steel, extreme temperatures are observed at which, after cooling, structures with an increased (after normalization) dislocation density or with a high level (after quenching) are formed.

KEYWORDS: *Austenitic Steel, Iron, Steel 40X, Melting, Low-Carbon Martensitic Steels*

INTRODUCTION

An important problem of modern mechanical engineering and repair enterprises is to reduce the cost of metal and energy resources. Since the main parts of machines are made of carbon and low-alloy steels, the service life of which is mainly determined by mechanical properties, they are hardened by heat treatment (TO) - quenching and tempering. The accepted standard modes of maintenance of metal products, as a rule, provide high mechanical properties, but in some cases this turns out to be insufficient. In particular, this concerns the toughness of metals [1], which ensures high product reliability.

In recent years, in order to exclude large grains in blanks, considerable attention has been paid to structural heredity [2]. Dependence of the mechanical properties of low-carbon martensitic steels on the structural heredity during HT [3]. In articles [4] heredity is considered during phase transformations.

MATERIALS AND METHODS

Based on the studies carried out, it was established that all unconventional modes of steel HT are based on the fundamental laws of phase transformations [5]. The essence of unconventional

modes is that by means of preliminary high-temperature HT, a high level of defectiveness of the crystal structure of steel is achieved. This allows, upon repeated heating, depending on the completeness of repeated structural transformations, to significantly refine the steel grain [4]. However, in the studies carried out, there were unresolved theoretical and practical issues related to phase transformations of steels:

- the effect of the heating time on the temperature and the value of the extremum of the dislocation density after $\gamma - \alpha$ - transformation upon cooling in air and after annealing of steel upon cooling together with the furnace.

In this work, not only the mechanism of $\alpha - \gamma - \alpha$ - transformations is considered, but also it is noted that with high heating there is an extreme temperature at which atoms of refractory impurity phases pass into a solid solution (austenite). In this case, upon cooling ($\gamma - \alpha$ transformation), the dislocation density in the α - phase increases. During repeated phase recrystallization, some of these dislocations are retained, which significantly increases the performance of steel products.

Investigated samples of steels 45 and 40X industrial smelting. Armco iron samples were used as a reference material. Steel grades are regulated by STSD 3541-79. The chemical composition of the investigated heats is shown in Table 1.

TABLE 1 CHEMICAL COMPOSITION OF STEEL SAMPLES FOR RESEARCH

№	Steel grades	Element content, % wt.						
		<i>C</i>	<i>Mn</i>	<i>Si</i>	<i>S</i>	<i>P</i>	<i>Cr</i>	<i>Ti</i>
1.	Армко-Fe	0,04	0,04	0,03	0,02	0,015	-	-
2.	45	0,42	0,65	0,26	0,02	0,02	-	-
3.	40X	0,41	0,74	0,35	0,025	0,022	0,92	-

The samples were thermally treated at different temperatures: the initial temperature for each steel was chosen from the calculation above the critical point of heating temperatures $Ac_3 + 30 \div 50$ °C, and then at temperatures of about 900, 1000, 1100, 1150, and 1200 °C. The holding time at each of the above temperatures was different: 5 minutes, 20 minutes, 2 hours, and 5 hours. Depending on the holding time, heating was carried out in a salt bath or in an oven. The samples were cooled in air, in water or oil, as well as while cooling together with the oven. Thus, the thermal prehistory of steel was created. The repeated phase recrystallization was always carried out with heating to $Ac_3 + 30 \div 50$ °C for each steel.

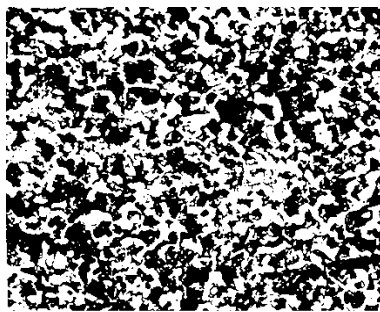
Analyzes were carried out: metallographic - on microscopes MIM-8M [6]; X-ray diffraction - on the DRON-2.0 installation. The state of the fine structure of steel (dislocation density), the amount of retained austenite, the period of the crystal lattice, and the amount of carbon in the phases of hardened steel were determined [7].

Metallographic and X-ray studies showed an intensive growth of austenite grain with an increase in the heating temperature, and the dislocation density was very low, although an extreme temperature is clearly observed for steels 45 and 40X, when the dislocation density is increased (Table 2), and the austenite grain grows (Fig. 1).

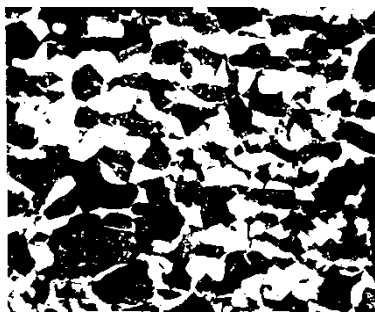
TABLE 2 THE AMOUNT OF AUSTENITIC STEEL GRAIN DEPENDS ON THE HEATING TEMPERATURE

Heating temperature, °C	Steel grades					
	45			40X		
	d_{av} , mm	N ball	ρ , 10^8 cm^{-2}	d_{av} , mm	N ball	ρ , 10^8 cm^{-2}
850	0,017	9	эталон	-	-	-
870-880	-	-	-	0,0193	8	etalon
1000	0,106	3	1,7	0,021	8	1,73
1100	0,168	2	3,5	0,032	7	5,57
1200	0,214	1	1,5	0,102	3	1,75
1260	-	-	1,5	0,107	3	4,37

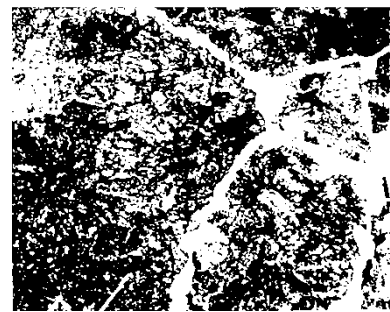
Note: d_{av} – average grain diameter; N – ball number according to STSD 8639-92



870 °C



1100 °C



1260 °C

Fig. 1. Microstructure of steel 40X after annealing at heating temperatures: 870, 1100, 1260 °C($\times 100$).

The difference in the density of dislocations between the maximum and minimum in percentage terms is significant, but in absolute terms it is very small: $\Delta\rho \approx 1,64$ or $3,84 \cdot 10^8 \text{ cm}^{-2}$. Naturally after the repeated phase of crystallization and crimping, when the density of dislocations grows by three orders of magnitude up to 10^{11} cm^{-2} under the influence of the low density.

With an increase in the heating temperature, a certain growth of austenite grain is observed. However, in all cases, there is an extreme heating temperature of 1100 °C with an austenitization time of 20 min, when, after cooling, the maximum level of dislocation density can be recorded (Table 3). From the tabular data, a relatively large increase in ρ is seen, but the absolute difference is not large.

When normalizing large-sized parts, the holding time in the austenitic region during the heating process can be calculated in hours. In this case, the effect of the influence of extreme temperature on the state of the fine structure of steel has not been determined [8].

Studies have shown that with an increase in the holding time during heating of the steel after the $\gamma - \alpha$ transformation, the density of dislocations of the α - phase decreases, and the peak of the maximum shifts to lower heating temperatures (Fig. 2).

TABLE 3 DISLOCATION DENSITY OF STEELS AFTER NORMALIZATION AT DIFFERENT HEATING TEMPERATURES (AUSTENITIZATION 20 MIN)

Normalization temperature T , °C	Armco-iron		Steel 45		Steel 40X	
	$\rho, 10^9 \text{ cm}^{-2}$	ρ/ρ_{900}	$\rho, 10^9 \text{ cm}^{-2}$	ρ/ρ_{850}	$\rho, 10^{10} \text{ cm}^{-2}$	ρ/ρ_{870}
$A_{c3} + 30 \div 50$	—	—	1,0	—	1,13	—
900	0,37	—	—	—	1,13	1,0
1000	0,88	2,38	1,73	1,73	2,31	2,0
1100	1,40	3,78	4,5	4,5	4,54	4,0
1200	0,73	1,97	2,99	2,99	1,26	1,08

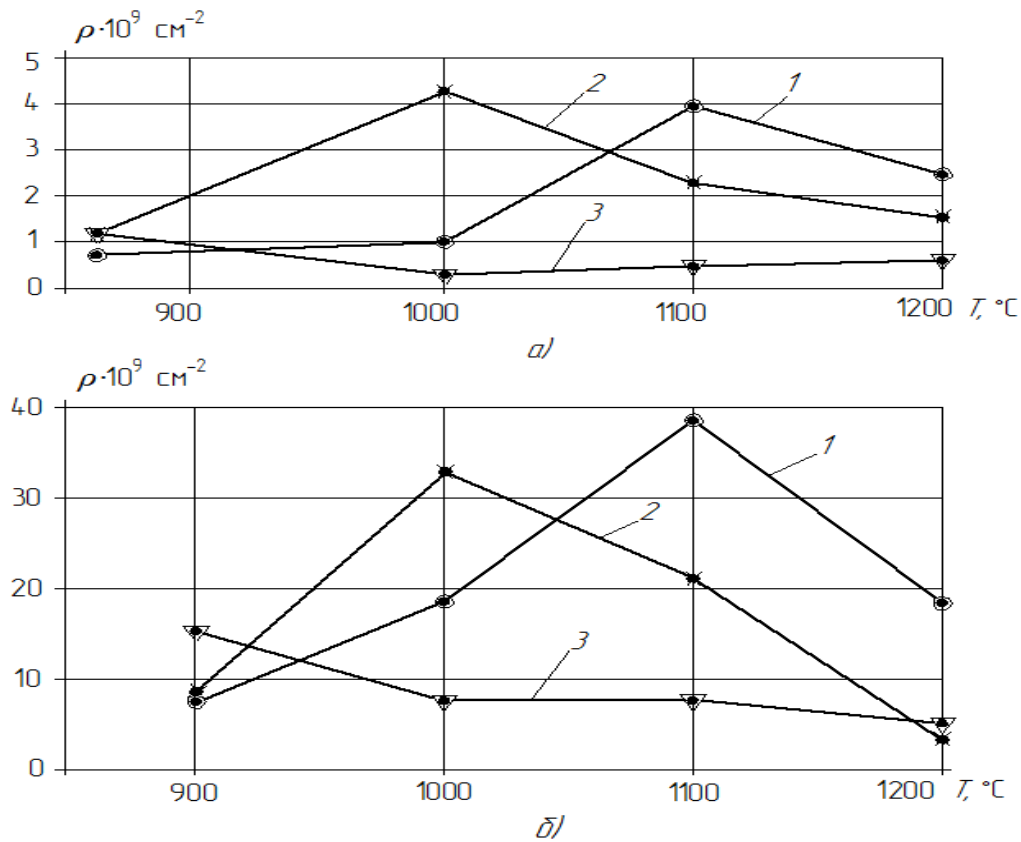


Fig. 2. Influence of temperature T of heating and holding time 20 min (1), 2 h (2), 5 h (3) on the density ρ of dislocations of normalized steels 40 (a) and 40X (b)

Quenched steel samples are the most convenient for studying the structure parameters, since their main structure is martensite and a certain amount of retained austenite. Of particular importance is the density of dislocations in steels quenched from a temperature (1100 °C) of heating in comparison with quenching in an environment from the usually accepted temperatures (above the heating temperatures of $A_{c3} + 30 \div 50$ °C). This difference is large at low carbon content, for example, 288% for armco iron. For samples made of steels 45 and 40X, it is 37 and 69%, respectively. It is possible to assume that the effect of the growth of the density of dislocations in the hardened and low-tempered steel in the case of the hardening with an extreme temperature (1100 °C) at the speed of In this case, in the process of quenching cooling and at low tempering,

a redistribution of carbon atoms between phases was observed: carbon atoms pass into dislocations and into residual austenite.

The influence of the holding time on the dislocation density at different heating temperatures after quenching cooling is shown in Fig. 3. The nature of the change in the density of dislocations with an increase in the holding time is similar to the change in density during normalization. The same results were obtained in the study of steel 40X.

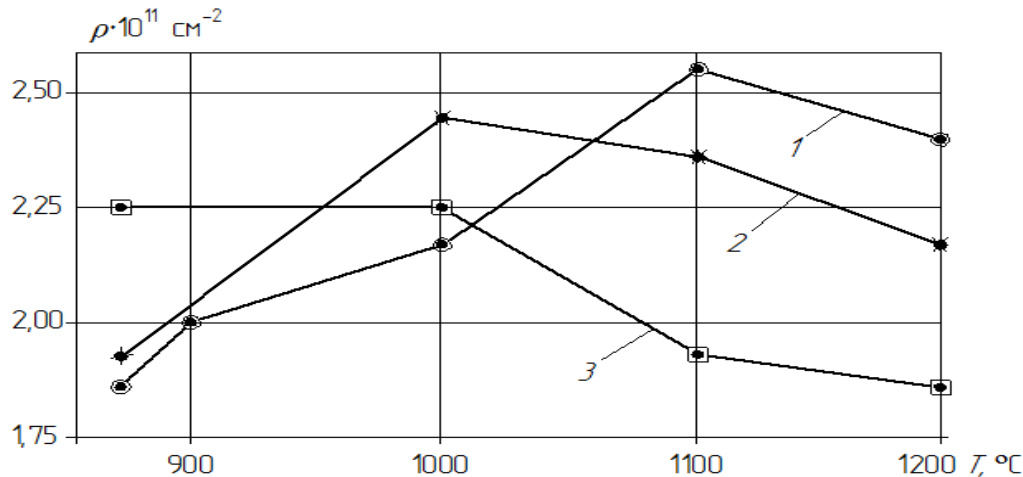


Fig. 3. Influence of temperature T and holding time 20 min (1), 2 h (2), 5 h (3) on the density ρ of dislocations in hardened steel 45: tempering at heating 200 °C

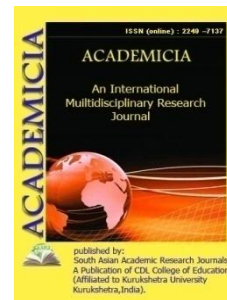
CONCLUSION

Thus, it has been shown that with significant heating of steel, extreme temperatures are observed at which, after cooling, structures with an increased (after normalization) dislocation density or with a high level (after quenching) are formed. The extrema of the dislocation density occur at temperatures of 1100, 1000, and 900 °C with holding times of 20÷30 min, 2 h, and 5 h, respectively. The increase in the dislocation density depends on the content of carbon and alloying elements in steels.

REFERENCES

1. Podrezov N.N., Podrezova I.S. Vliyaniye strukturnoy nasledstvennosti na prochnost reaktornoy Cr–Ni–Mo–V stali // Globalnaya yadernaya bezopasnost. Volgondsk: 2017. № 4. S. 91–96.
2. Yugay S.S., Kleyner L.M., Shotsev A.A., Mitrokhovich I.N. Strukturnaya nasledstvennost v nizkouglerodistix martensitnix stalyax // Metallovedeniye i termicheskaya obrabotka metallov. 2004. № 12. S. 24–29.
3. Yugai S.S., Kleiner L.M., Shatsov A.A. and Mitrokhovich N.N. Structural heredity in low-carbon martensitic steels // Metall Sciens and teat treatment. 2004. V. 46. N. 11–12. P. 539–542.
4. Dyuchenko S.S. Heredity in phase transformation: mechanism of the phenomenon and effect on the properties // Metall Science and heat treatment. 2000. V. 42. N. 3–4. P. 122–126.

5. Sadovski V.D. Correction of the Course – Grained Structure During Thermal Treatment of Steel // Heat Treatment and technology of surface coatings. Proceedings of the 7th International Congress on Heat treatment of Materials. V. 1. December 11–14. 1990. Moscow. P. 10–14.
6. Batayev V.A., Batayev A.A., Alximov A.P. Metodi strukturnogo analiza materialov i kontrolya kachestva detaley. M.: Nauka, 2007. 224 s.
7. Gorelik S.S., Skakov Yu.A., Rastorguyev L.N. Rentgenograficheskiy i elektronno-opticheskiy analiz. M.: MISIS, 1994. 328 s.
8. Berdiyev D.M., Yusupov A.A. Nestandartniye rejimi termicheskoy obrabotki i ix vliyaniye na iznosostoykost stalnix izdeliy // Vestnik mashinostroyeniya, Moskva.: 2021. №9. S. 50-54.
9. Berdiyev D.M., Yusupov A.A. Povisheniye iznosostoykosti stalnix izdeliy metodom nestandartnix rejimov termicheskoy obrabotki // Lityo i metallurgiya, Minsk. 2021. №2. S. 100-104.
10. . - 2018.– 124 p.



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DETERMINATION OF IODINE CONTENT IN SOME MEDICINAL PLANTS THROUGH POTENTIOMETRIC AND IODOMETRIC TITRATION

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ABSTRACT

The article provides information on the determination of the iodine content of in species of Diospyros kaki (PCh) persimmon chocolate, Diospyros kaki (KH) Korolyok-Hyakume persimmons, the extracts of Cucurbita pepo L – pumpkin fruits and Exocarpium Citri L-lemon peel, which are grown in the conditions of Andijan region, through potentiometric and iodometric titration methods.

KEYWORDS: *Persimmon, The Extracts Of Lemon Peel And Pumpkin Fruit, Potentiometric And Iodometric Titration, Electromotive Force – EF, Increase Of Potential After Equivalence Point, Starch Indicator Solution, Titration Graph, Approximate Titration, Exact Titration.*

INTRODUCTION

Although synthetic drugs containing iodine are used in thyroid disease, they can adversely affect certain systems in the human body, such as the gastrointestinal tract in patients with pathology of the gastrointestinal tract. As a result, iodine deficiency, which leads to thyroid dysfunction due to poor absorption of iodine in the body, is not eliminated [1; p. 19-23].

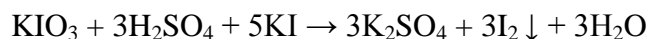
Given the side effects of synthetic drugs on the human body, we recommend that patients with thyroid disease use drugs made from various medicinal plants or iodine-containing food supplements. Such medicinal food supplements are used in practice in the treatment of thyroid disease and are highly effective [1; p. 19-23].

Iodine medicinal food additives are prepared from iodine-containing medicinal plants, or enriched with natural biodiesel, depending on the beneficial properties of the plant for the human body. In order to prepare medicinal food compounds containing iodine, the amount of iodine in

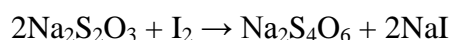
medicinal plants is first checked. Potentiometric and iodometric titration methods can be used to determine the amount of iodine in solutions of these plant extracts [2; p. 24-26].

The potentiometric analysis includes methods for determining the concentration of ions in a solution based on the measurement of the potential difference (electromotive force - EF) between the electrodes immersed in the test solution.

Their oxidometric capacity was used for the potentiometric determination of iodine in the analyzed solutions. Since the iodine ion is electroactive in an aqueous solution under given conditions, the oxidation-reduction pair is formed by titrant in order to determine the endpoint, ie 1 drop of 0,1 N KI solution is added to the solution to form $\text{IO}_3^- / \text{I}^-$ pair.



In doing so, I_2 falls into precipitate. The solubility of the resulting precipitate is small (0.28 g / l).

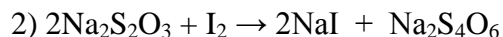
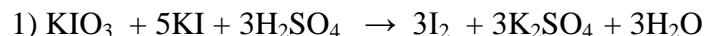


When the titration of I_2 in the solution was completed, the last added 1 drop of $\text{Na}_2\text{S}_2\text{O}_3$ led to an increase in the electrode potential. The rise of the potential after the equivalence point can be explained using the formula [3; p. 10-20].

$$E = 1,33 + \frac{0,059}{6} \lg \frac{[\text{IO}_3^-][\text{H}^+]^{14}}{[\text{I}^-]^2}$$

To assess the accuracy of the results of potentiometric determinations, we also directly determined the amount of iodine in persimmons, pumpkins and lemon peel by iodometric titration.

The method is based on the interaction of potassium iodate with potassium iodide in an acidic environment (1) and titration of the released iodine with sodium thiosulfate (2) [3; p. 10-20].



The amount of iodine in mg in the solutions obtained for analysis was calculated according to the following formula:

$$X = \frac{N_t * V_t * E_a * V_{er}}{1000 V_{ek}}$$

Here, N_t – titrant normality;

V_t – total volume of titrant consumed, ml;

E_a – equivalent molar mass of iodine compound in the test solution;

V_{er} – the mass of the sample to be tested, mg;

V_{ek} – the volume of titrant solution consumed at equivalent point, ml.

EXPERIMENTAL PART

Samples of Diospyros kaki (PCh) palm chocolate, Diospyros kaki (KH) Korolyok-Hiakume palm varieties, Cucurbita pepo L - pumpkin fruits and Exocarpium Citri L-lemon peel solution of lemon peel grown in the Andijan region as the object of analysis for the research work.

2 grams of persimmons, lemons and pumpkins weighing to the nearest 0,01 g were placed in three separate porcelain crucibles, each containing 3 ml of 20% potassium carbonate and 2 ml of distilled water, moistened, the crucible lids closed and left at room temperature for 16 h. The crucibles were then placed in a sand bath with the lid open and heated to 150–250 °C until the smoke stopped. The muffles were then placed in the muffle furnace with the lid closed and kept at 250 °C for 30 min. The temperature in the crucible samples was gradually raised to 500–550 °C until complete combustion. The firing process was continued until a white residue remained in the crucibles. A solution of 2 N sulfuric acid was added to the obtained white ash until pH = 2, and distilled water was added to them so that the volume of the solution was 100 ml. Due to the slight turbidity in the resulting solutions, the solutions were centrifuged for 10 min and separated from the precipitate [4; p. 30-33].

Potentiometric determination of iodine. Iodine in solutions of palm, lemon, and pumpkin samples prepared for analysis was separated from 50 ml of the solutions obtained for potentiometric testing. Potentiometric titration of I-ions in the obtained solutions determined the amount of iodine in the solution. I-130 ionometer was used before potentiometric determination of iodine was initiated. Initially, the filtrate from the palm sample was separated from 10 ml using a 10 ml graduated pipette and placed in a 50 ml titration beaker. To the solution was added 1 ml of 2 n H₂SO₄ solution, stirred by adding 10 ml of 0,1 N KI solution, then cover the container with a stopper and place in a dark place for 10 minutes. Add 0,01 N Na₂S₂O₃ from the burette to the mixture, stirring until the colour turns light yellow to the orange test solution. Approximately 2 ml of starch indicator solution was added to detect free iodine in the test solution. As a result, the mixture turned brown and the titration was continued with 0,01 N Na₂S₂O₃ solution until the final colour of the solution disappeared. The Pt indicator and silver chloride comparison electrodes, as well as the steel piece sterile coated completely with polyethylene, were washed and dissolved in distilled water. The solution in the beaker was placed in an MM-3M magnetic mixer with electrodes and a magnetic stirrer rod. A constant rotation speed of the magnetic stirrer was set to keep the solution stirring continuously during the titration. The main attention was paid to the fact that the solution does not scatter and no gaps are formed around the electrode. The titration process was continued until the brownish colour of the solution disappeared [4; p. 30-33].

In this process, the ionomer potential was measured and the titration was performed by adding titrant fractions every 40-60 seconds from a standard solution of Na₂S₂O₃ in a micro burette with a volume of 25 ml. Since the amount of iodine in the test filtrate was very low, the titration was carried out by adding the titrant fractions dropwise.

40-60 seconds after the addition of each fraction (drop) of titrant, the ionomer index was expected to remain constant, and these potential values were recorded in the titration protocol. The titrant volume up to the drop corresponding to the largest potential-jump was taken as the volume corresponding to the equivalence point. The amount of iodine was calculated based on

the results of 6-7 repetitive experiments conducted in parallel. After each titration, the used vessels and electrodes were washed with distilled water.

The volume of sodium thiosulfate corresponding to the potential jump in the initial titration was approximated, and in subsequent parallel titrations, the titrant was added dropwise in the jump area. In the approximate titration, 1 ml of titrant was added [4; p. 30-33].

The point of slow jump of the potential corresponds to the equivalent point. To find the volume of titrant used for titration, the volume of titrant added during the drop titration was added to the volume of titrant (e.g., 4 ml) that went to the potential jump in the approximate titration. To find the volume of titrant used for droplet titration, the number of drops was multiplied by the volume of one drop.

To find the volume of one drop, the number of drops in 1 or 2 ml of solution was determined and the corresponding volume was divided by the number of drops.

Potentiometric titration of iodine in solutions of lemon and pumpkin fruits was carried out in the same way.

The iodometric titration method was used to estimate the potentiometrically determined amount of iodine in persimmon, lemon, and pumpkin fruit extracts.

Dissolve 10 ml of the test sample obtained for analysis in a conical flask with a volume of 250 ml in 100 ml of distilled water to the measured volume. As the resulting solution was turbid, it was filtered. To the resulting solution was added 1 ml of 2 N H_2SO_4 solution, stirred by adding 5 ml of 10% KI solution, cover the container with a stopper and leave in a dark place for 10 minutes. Because before titration, an additional process under the influence of light in the reaction mixture, oxidation of iodide ions to iodine can occur [5; p. 102-105].

$\text{Na}_2\text{S}_2\text{O}_3$ with 0,01 N from the burette was added to the test solution, stirring until the orange solution turned light yellow. When approximately 2 ml of starch indicator solution was added to the test solution, the mixture turned brownish blue. The titration was continued until the final colour of the solution disappeared.

Given the decrease in the accuracy of the analysis when using a completely uncooled starch solution, the solution was titrated while cooled. An iodine starch complex is formed which reacts very slowly when the indicator solution is added too early, which leads to high results of the analysis.

The reaction was carried out at a moderate room temperature of 25 °C so that the indicator solution did not lose its sensitivity when heated due to the increased volatility of iodine [5; p. 102-105].

RESULTS AND THEIR DISCUSSION

A potentiometric titration method was used to determine the amount of iodine in solutions made from dates, lemon peel and pumpkin fruits. The results of the exact and approximate titrations are presented in Table 1.

As can be seen from the results in the table, the abrupt jump in EF corresponded to a titrant area of approximately 5 ml in the approximate titration and 7 ml in the exact titration. After adding 4

ml of titrant in the approximate titration and 6 ml in the exact titration, we started dripping titration to find the exact equivalent point.

In the potentiometric titration process, the titrant consumption at the equivalence point was 5 ml and the total titrant consumption was 14 ml when titrated with sodium thiosulfate with the addition of 15 ml of distilled water to 10 ml of the persimmon extract solution.

The following equation for the amount of iodine in persimmon extract was determined on the basis of the following formula, taking into account that the iodine content of the persimmon solution tested for normality of the titrant used in the experiment was 0,01 n and the equivalent of potassium iodate was 214

$$\chi = \frac{N_{Na_2S_2O_3} V_{Na_2S_2O_3} \vartheta_{KIO_3} V_{er}}{1000 V_{ek}} = \frac{0,01 \cdot 14 \cdot 214 \cdot 10}{1000 \cdot 5} = 0,0599 \text{ mg} = 59,9 \text{ mkg was obtained.}$$

To carry out potentiometric titration with the addition of 15 ml of distilled water to a volume of 10 ml of a solution of lemon peel extract, 15 ml of a 0,0001 N solution of sodium thiosulfate obtained as a titrant was used.

The volume of titrant consumed at the equivalent point was 6 ml, and if we determine the amount of iodine in it, $\chi = \frac{N_{Na_2S_2O_3} V_{Na_2S_2O_3} \vartheta_{KIO_3} V_{er}}{1000 V_{ek}} = \frac{0,0001 \cdot 15 \cdot 214 \cdot 10}{1000 \cdot 6} = 0,00053 \text{ mg} = 0,53 \text{ mkg was obtained.}$

TABLE 1 RESULTS OF POTENTIOMETRIC TITRATION

<i>Persimmon extracts</i>						<i>Lemon peel extract</i>						<i>Pumpkin extract</i>					
Approximate titration			Exact titration			Approximate titration			Exact titration			Approximate titration			Exact titration		
Added titrant volume, ml	Measured EY _u K values, mV	The difference in EF values	The volume of titrant added, (drops) ml	Measured EY _u K values, mV	The difference in EF values	Added titrant volume, ml	Measured EY _u K values, mV	The difference in EF values	The volume of titrant added, (drops) ml	Measured EY _u K values, mV	The difference in EF values	Added titrant volume, ml	Measured EY _u K values, mV	The difference in EF values	The volume of titrant added, (drops) ml	Measured EY _u K values, mV	The difference in EF values
1	400	-	1	400	-	1	400	-	1	400	-	1	400	-	1	400	-
2	400	-	2	400	-	2	400	-	2	400	-	2	400	-	2	400	-
3	398	0,02	3	398	0,02	3	398	0,02	3	398	0,02	3	398	0,02	3	398	0,02
4	394	0,04	4	396	0,02	4	394	0,04	4	396	0,02	4	284	1,14	4	396	0,02
5	22	1,7	5	39	0,0	5	28	1,1	5	39	0,0	5	258	0,2	5	28	1,1

	0	4		0	6		0	4		0	6			6		0	6
6	20 0	0,2 0	6	38 0	0,1 0	6	26 0	0,2 0	6	27 4	1,1 6	6	234	0,2 4	6	25 4	0,2 6
7	18 4	0,1 6	7	25 8	1,2 2	7	24 4	0,1 6	7	25 8	0,1 6	7	212	0,2 2	7	23 0	0,2 4
8	17 0	0,1 4	8	24 6	0,1 2	8	23 0	0,1 4	8	24 6	0,1 2	8	192	0,2 0	8	20 8	0,2 2
9	15 8	0,1 2	9	23 6	0,1 0	9	22 0	0,1 0	9	23 6	0,1 0	9	174	0,1 8	9	18 8	0,2 0
10	14 8	0,1 0	1	22 8	0,0 8	1	21 2	0,0 8	1	22 8	0,0 8	1	158	0,1 6	1	17 0	0,1 8
11	14 0	0,0 8	1	22 2	0,0 6	1	20 6	0,0 6	1	22 2	0,0 6	1	144	0,1 4	1	15 4	0,1 6
12	13 4	0,0 6	1	21 8	0,0 4	1	20 2	0,0 4	1	21 8	0,0 4	1	132	0,1 2	1	14 0	0,1 4
13	13 4	-	1	21 6	0,0 2	1	20 3	0,0 2	1	21 6	0,0 2	1	122	0,1 0	1	12 8	0,1 2
			1	21 4	-	1	20 4	-	1	21 4	0,0 2	1	114	0,0 8	1	11 8	0,1 0
									1	21 5	-	1	108	0,0 6	1	11 0	0,0 8
												1	104	0,0 4	1	10 4	0,0 6
												1	102	0,0 2	1	10 0	0,0 4
												1	102	-	1	98	0,0 2
												1	102	-	1	98	-
															2	98	-

When 15 ml of distilled water was added to 10 ml of pumpkin extract solution, 20 ml of 0,0001 N titrant solution was used for potentiometric titration. Taking into account that the volume of titrant consumed at the equivalent point is 5 ml, the amount of iodine in the solution was determined to be

$$\chi = \frac{N_{Na_2S_2O_3} V_{Na_2S_2O_3} \vartheta_{KJO_3} V_{er}}{1000 V_{ek}} = \frac{0,0001 \cdot 20 \cdot 214 \cdot 10}{1000 \cdot 5} = 0,00085 \text{ mg} = 0,85 \text{ mkg}$$

was obtained.

16 ml of titrant ($Na_2S_2O_3$) was used to determine the iodine content by iodometric titration by taking 10 ml of a solution obtained by burning a mixture of palm fruit extract and potassium carbonate for analysis. The volume of titrant consumed at the equivalence point was 6 ml. Based on these data, the results of the analysis were calculated using the following formula.

$$\chi = \frac{N_t * V_t * E_a * m}{1000 V_{ek}} = \frac{0,01 * 16 * 214 * 10}{1000 * 6} = 0,057 \text{ mg} = 57 \text{ mkg}$$

Based on the values entered in the titration account, titration curves were constructed.

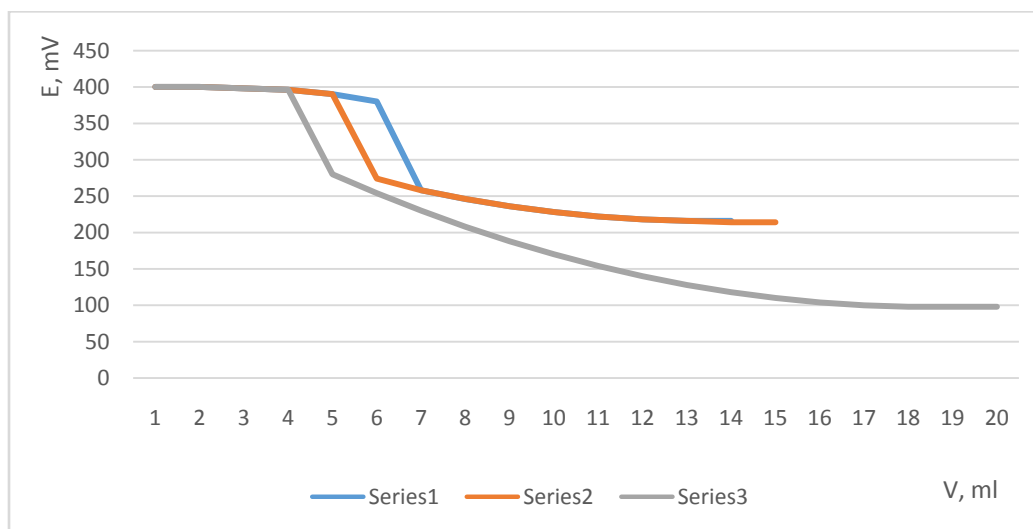


Figure 1. Graph of potentiometric titration of iodine content in persimmon, lemon peel and pumpkin fruit solutions.

When the iodine content of lemon peel extract of the same mass was determined by iodometric titration, the volume of titrant consumed at the equivalence point was 12 ml, and the total volume of titrant consumed was 28 ml. As a result of titration, the amount of iodine in the sample was found to be

$$\chi = \frac{0,0001 * 28 * 214 * 10}{1000 * 12} = 0,00049 \text{ mg} = 0,49 \text{ mkg} .$$

In the same order, 18 ml of titrant was used for pumpkin fruit extract. The volume of titrant consumed at the equivalence point was 5 ml. The amount of iodine as a result of titration was found to be

$$\chi = \frac{0,0001 * 18 * 214 * 10}{1000 * 5} = 0,00077 \text{ mg} = 0,77 \text{ mkg} .$$

The results of potentiometric determination of iodine content in solutions of persimmons, lemons and pumpkins are given in Table 2.

TABLE 2 RESULTS OF POTENTIOMETRIC AND IODOMETRIC DETERMINATION OF IODINE IONS IN PERSIMMON, LEMON PEEL AND PUMPKIN FRUIT SOLUTIONS

№	Objects to be analyzed	Theoretical amount mkg	The results of the analysis, relative to 100 g of sample (χ , mkg)	
			Potentiometric titration	Iodometric titration
1	Persimmon	60	59,9	57
2	Lemon	0,6	0,53	0,49
3	Pumpkin	1,0	0,85	0,77

If we compare the results of potentiometric and iodometric titration, we can see that the results of potentiometric titration are closer to the theoretical data.

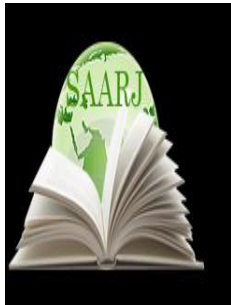
CONCLUSIONS

The following conclusions were drawn from the experiments to determine the content of iodine in the aqueous extracts of persimmons, lemon peel and pumpkin fruits obtained as the object of study and the analysis of the results obtained in them:

1. Diospyros kaki (PCh) persimmon chocolate, Diospyros kaki (KH) Korolyok-Hyakume persimmon species, Cucurbita pepo L - pumpkin fruits and Exocarpium Citri L-lemon peel sample grown in the Andijan region as the object of analysis for the research work.
2. Aqueous extracts of the obtained samples were isolated, and analytical solutions at concentrations of 10%, 25%, 50%, 75% and 100% were prepared using bidistillate water from the initially concentrated solutions to be tested, and analytical methods were selected to study the chemical composition of these solutions.
3. Potentiometric titration was performed to determine the amount of iodine in the extracts of persimmon, pumpkin and lemon peel. The iodometric titration method was used to assess the level of accuracy of the results obtained in potentiometric titration.
4. When the content of iodine in persimmon, lemon peel and pumpkin fruits was analyzed by potentiometric and iodometric titration methods, it was found that iodine exists 59,9 mkg in 100 g in the content of persimmon, 0,53 mkg in lemon peel, 0,85 mkg in pumpkin.

REFERENCES

1. Askarov I.R., Khodzhikulov A.S. Drugs used in the treatment of iodine deficiency and their chemical composition. Ferghana State University Journal of Scientific News 2019 y. Number 4. 19-23 p.
2. Khojiqulov A.S. A natural food supplement made on the basis of persimmons. // Tabobat (+) plus (journal). Tashkent-2020 y. № 2 volume, 24-26 p.
3. Kocherov V. I., Alyamovskaya I. S., Darienko N. E., Saraeva S. Yu. Instrumental methods of analysis // Ekaterinburg. Urench State University, 2015. p.10-20.
4. Turaev Kh.Kh., Umbarov I.A. Potentiometric studies of the oxidation of iodine ions from sodium nitrite // Universum: technical sciences: electron. scientific. zhurn. 2017. No. 12 (45) p. 30-33
5. Ermolenko V.P., Kharchenko O.O., Moisenko I.E. Modern aspects of iodine control in food. Comparative analysis of methods. Odessa scientific Harkovsky Academy of Technology. 2010, p.102-105



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TRADITIONS AND SKILLS IN ENGLISH, RUSSIAN AND UZBEK STORYTELLING

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ABSTRACT

The article examines the principles of literary influence and poetic renewal in the development of world literature. There is illustrated the role of Anton Pavlovich Chekhov's works in world storytelling. The influence of the author's work on the works of the English writer Catherine Mansfield and the well-known writer of the Uzbek nation Abdulla Kakhar is studied on the example of their storytelling, the stages of development are studied. The system of ideological and artistic growth in stories is scientifically proven.

KEYWORDS: *National Mentality, Literary Influence, Artistic Renewal, Innovation, Logo, Contrast, Ideological Commonality, Socio-Psychological Determinism, Creative School.*

INTRODUCTION

As we know, there are many nations and people in the world. Every nation has its traditions, mentality and worldview. If we want to get acquainted with the worldview or mentality of a nation, we must refer to the literature created by the writers of that nation. Because writers write their works accordingly to their nations' worldview. Therefore, the literature of every nation has its uniqueness. However, we can find proportionality in the works created by representatives of different nationalities. Let us approach the works of the English writer Catherine Mansfield, the Russian writer A. Chekhov and the Uzbek writer Abdulla Kakharin this perspective.

Main part

Catherine Mansfield is a New Zealand writer who had made a huge contribution to the development of the story genre in her time. While working in this genre, she studied the traditions of different folk writers, perfected and continued them. The literary influence of Chekhov's work on Catherine Mansfield deserves special mention: "It is important that

Mansfield paid attention to the shortness of this story, which can be written long according to the tradition of English literature. Anyway, the works of this event were very close and valuable to her, it didn't happen without Chekhov's literary influence". [Л. Володарская, 1989, 13].

Catherine Mansfield was called "English Chekhov" by her contemporaries. In some of her stories, Chekhov's literary influence is evident. The proportionality in the writer's work can be seen differently. This can sometimes be seen in terms of the theme, sometimes in terms of the idea and the essence of the work. For instance, her story is named "The Little Governess", begins with a young girl going alone on a night train from England to Germany for working as a nurse. Moreover, this story also skillfully expresses the girl's worries, thoughts and feelings about going alone, without relatives. An old man accompanies the lady, who is walking in such fear and anxiety. At first, the lady is afraid of him and looks at him with suspicion. Later, because of her childish innocence, she began to respect the old man as if he were her grandfather, and unfortunately she trusted him. When she arrives in Munich, the old man takes the girl around the city and takes her home to carry out his nefarious plan. The girl ran away from the old man's house, but the young girl's confidence was broken. She realizes that she has made a big mistake by trusting the old man. The story is a convincing and appealing portrayal of the horrors of life, the ugliness of human morality, the shattering of a young girl's childish innocence.

In the play, the writer contrasted the innocence, purity, and sincerity of life with the opposite of lies and deception. This contrast plays an essential role in achieving the literary goal of the writer. In life, light and shadow are intertwined. As long as there is a shadow, we feel the light, its value, its superiority.

The author's goal of depicting the two poles of life - the positive and the negative - in the opposite way, is reflected in the same place. She would like to teach the reader the value of life and the need to spend one's life in the pursuit of good. Because the good in the face of evil, the light in the face of darkness (horror) is more clearly reflected in the imagination of the reader. Catherine Mansfield doesn't conclude the story, she doesn't talk about what "horror" is. It is up to the reader to decide.

Chekhov's story "Српак" is radically different from the above story in its plot and course of events. But these two works also have proportional aspects. This is reflected in the common meaning and ideas of the creators. Chekhov's story "Српак" also expresses the horrors of life, the shortcomings in human morality through the image of the protagonist Dmitry Petrovich Silin. The fear in this play serves to express how cowardly the protagonist is. Furthermore, dishonesty and betrayal are committed against the protagonist by close people, such as his friend and wife. But Silin behaves as if he expects the same thing to happen throughout the play. Because he tells his friend how much he is afraid of living, of people, that his wife doesn't love him, that life itself is horrible. His friend abuses his trust by using Dmitry Silin's weakness and betrays him with his wife. At the end of the story, it is clear that Dmitry Silin understands everything, as can be seen from the last words he said to his friend: "A misunderstanding is likely written in my destiny. If you understand something, then... congratulations to you. My eyes are dark" [А.П. Чехов, 1992, 357].

The tragic side of the protagonist of the story is that it depicts how weak, blind, reluctant the hero is in the face of life's difficulties, to turn a blind eye to the problems he encounters, to give up. And the extent to which people are capable of meanness is reflected. When Chekhov wrote this

story, it was, definitely, based on the mentality of his people. The balance between “Српак” and “The Little Governess” is that in both, the protagonists' trust is shattered. They were afraid of it.

Uzbek writer AbdullaKakhar also called one of his stories "Dahshat(Horror) “ AbdullaKakhar also writes about fear in “Dahshat”. But he takes a completely different approach to the subject. M. Sultonova studied the works of A. Kakhar a lot, according to her scientific research which was investigated in the mid-1960s, she mentioned that “When the author worked on the theme of the past in "Dahshat", the main goal was to reveal the oppression of the past, the violation of human rights; to inspire a deep hatred for the writer's classes and thus a greater appreciation of our free time" [D.Quronov, 2007, 35].

He illustrated the plight of women in the past with the story of the protagonist Unsin. Unsin was the youngest, eighth wife of Olimbekdodhoh, and she was ready to do anything to get rid of her fate, and she agreed with the dodhoh:

Unsin had to go to the cemetery at night and make tea. Only then does the plaintiff promise to let her go home. It's scary to go to the cemetery at night, but Unsin prefers this horror to live in dependence and captivity.

Well-known literary scholar Ozod Sharafiddinov said that Abdulla Kakhar wrote the story based on a popular legend. According to the legend, a young man had to go to the cemetery and stab the grave. But he stabs the hem of his robe, and he got scared and right away died.

The author was able to write a very impressive and meaningful story based on this legend. The most impressive feature of the story is that the protagonist is not afraid to sacrifice her life for freedom. Yes, she will perish physically, but she will be free spiritually.

Comparing the story “Dahshat”(horror) with Chekhov's “Српак”, Chekhov expresses that the protagonist did not fight fear, weakness and unwillingness in the face of life's hardships, on the contrary, Unsin had great courage and she was able to overcome fear, he even skillfully described her willingness to sacrifice her life.

Here are some thoughts of G. T. Garipova, Candidate of Philological Sciences, on "Dahshat" and "Српак ":“Chekhov used the following order of socio-psychological determinism: "grievance - misunderstanding - fear –dependance ."

“A. Kakhar, in contrast to A. Chekhov, created a slightly different system of philosophical and socio-psychological determinism: "dependance- the fear of captivity - the fear of death - death."A. Kakhar’s protagonist was able to overcome fear, physically she died, however she could achieve freedom spiritually” [Г. Гарипова,2012, 40].

CONCLUSION

Every writer can write a story for a different purpose. For example, some writers write to teach their readers to learn from the actions of the heroes in their work, to be able to behave like them in life, while others, on the contrary, draw conclusions from the mistakes of their protagonists, not to repeat their shortcomings in their lives.

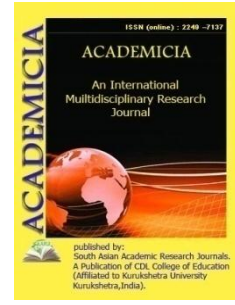
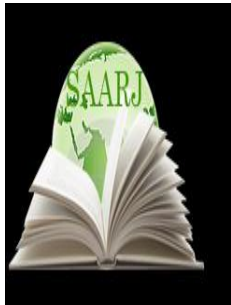
Catherine Mansfield and A. Chekhov wrote the above-mentioned stories with the aim that readers would read them, draw conclusions from the mistakes of the protagonists and not repeat

them in their lives. On the other hand, AbdullaKakhar created “Dahshat” to illustrate the heroine's devotion and actually, he would like to teach us that we should learn from her.

In conclusion, all three writers were able to write their shortstories skillfully and effectively. For this reason, surely we can say that these stories are still loved and read by literary lovers today.

REFERENCES

1. L. Volodarskaya. Katherine Mansfield and her stories. Cm .: Katherine Mansfield. Stories. Translation from English. Moscow. Book. 1989, p. 13
2. A.P. Chekhov. Fear. Cm .: A.P. Chekhov. Stories. Moskva, 1992, p. 357
3. Dilmurod Quronov. Inspired. See Jahonadabiyoti magazine. 2007, № 5, 35-p.
4. G.T. Garipova. Comparative analysis of the stories of A. Chekhov "Fear" and A. Kahkhara "Fear". Cm .: Journal "Teaching Language and Literature", 2012, No. 8, p. 40.
5. Abdullah Qahhor: an individualist. (Collection of articles based on archival manuscripts and memoirs). - T .: Tamaddun, 2013. - 160 p.
6. Borev Yu. The art of interpretation and evaluation. - M., 1981. - S. 51-56.
7. Brunettière F. Evolution of genres in the history of literature. - P., 1890.
8. Karim Bahodir. Psychology. - Tashkent: Publishing House named after Ghafur Ghulam, 2016. - 364 p.
9. Caudwell K. Illusion and reality. - M .: Progress, 1969 .-- 364 p.
10. Sainte-Beuve. On the threshold of modernity. - Paris, 2002 - P.221-256.
11. Шарафиддинов О. Talent and faith. - Tashkent: Sharq, 2000. - 208 p.
12. Шарафиддинов О. Creativity. - T .: Sharq, 2004. - 637 p.



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CORONAVIRUS PANDEMIC AND WESTERN BALKANS

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ABSTRACT

The article shows the current economic situation in the Western Balkans, gives an assessment of the economic development of the countries at the present time, the development prospects. The “shadow” component that emerged in the 1990s plays a major role in the country's economic life. The unemployment rate in Albania is relatively low for the region. The role of SMEs in economies remains relatively small. In the countries of the third group there is a high level of social protection for society, but the social dialogue between entrepreneurs and their employees is poorly developed. Despite these improvements, per capita income levels are expected to remain 6.5% below pre-pandemic projections through 2022. Tourism-dependent economies, particularly Albania and Montenegro, will continue to struggle with restrictions on international travel.

KEYWORDS: *Western Balkans, Pandemic, Integration, Macroeconomic Indicators*

INTRODUCTION

The Balkan sub-region of Southeastern Europe (SEE) is a permanently complex ethno-confessional and territorial conflict area with a high value of an external factor that can exacerbate “frozen” conflicts at any time. This factor is in the interest of actors like the EU (in an institutional function), the USA, Germany, Great Britain (to a lesser extent a number of other European countries - Italy, Greece, Austria, CEE countries, France), China, Turkey, a Range of Middle Eastern countries (Saudi Arabia, United Arab Emirates, Qatar, Kuwait).

METHODOLOGY

In terms of socio-economic development, the countries of the Western Balkans are inferior to the EU members. According to the UN typology, the states in the region are still countries with transition economies. The process of creating market relationships is still ongoing. One of the

most important prerequisites for joining the EU is the completion of the socio-economic transformation process and the development of a market economy. Four of the five Western Balkans began these processes under very similar conditions, since all but Albania were part of a common state.

DISCUSSION

To date, three types of economic models are being followed that are emerging in the countries of the region.

The first group of countries includes North Macedonia, where the privatization of state property took place earlier than in the other countries examined. Through market-oriented reforms, the government has helped to significantly increase the share of small and medium-sized enterprises (SMEs) in the economy. It is characterized by a high level of protection of the sphere of work and legislation by the state.

Although the picture is ambiguous, the socio-economic model of North Macedonia can be expected to evolve towards building a continental European form, sometimes referred to as the socio-market economy. The weaknesses of the Macedonian model are high levels of corruption and organized crime.

Albania belongs to the second group of countries. It has made rapid progress in privatization, which makes the private sector's share of the Albanian economy the highest of all Western Balkan countries. The "shadow" component that emerged in the 1990s plays a major role in the country's economic life. The unemployment rate in Albania is relatively low for the region. This is because the majority of the population who could not find employment at home emigrated: According to various estimates (Albanian Statistical Agency, World Bank), 1.08 to 1.44 million 37 to 50 left Albania between 1990 and 2010 alone % of the total population of the country. The level of social protection in society is low.

Despite a number of institutional features that are not characteristic of industrialized countries, it can be argued that Albania is on the way to building a liberal market economy with its own peculiarities. Contrary to the classical model, the role of the country's financial sector, including the stock market, is insignificant, very high levels of informal relationships persist in society, public administration is ineffective, and organized crime is thriving.

The third group of countries includes Bosnia and Herzegovina, Serbia and Montenegro. Privatization processes were the slowest in this group of countries and therefore private entrepreneurship is lowest in the Western Balkans. A characteristic feature of all countries in this group is a high level of informal economy and crime. The role of SMEs in economies remains relatively small. In the countries of the third group there is a high level of social protection for society, but the social dialogue between entrepreneurs and their employees is poorly developed. The level of social benefits to the population as well as expenditure on health and education are at a low level. With regard to the "level of carelessness", this country category shows many similarities with the Mediterranean model. Although the differences between the classical Mediterranean model and the group analyzed are so great that they could be ascribed to a particular variety - the Balkan model.

RESULTS

In 2001-2019, the countries in the region managed to slightly narrow the income gap (by 14%) with the EU, but the gap is still very large. In 2019, GDP per capita in PPP for the Western Balkans was only 39% of the EU-27 level. The highest GDP per capita is in Montenegro - 23 thousand US dollars, the lowest in Albania - 11.8 thousand US dollars.

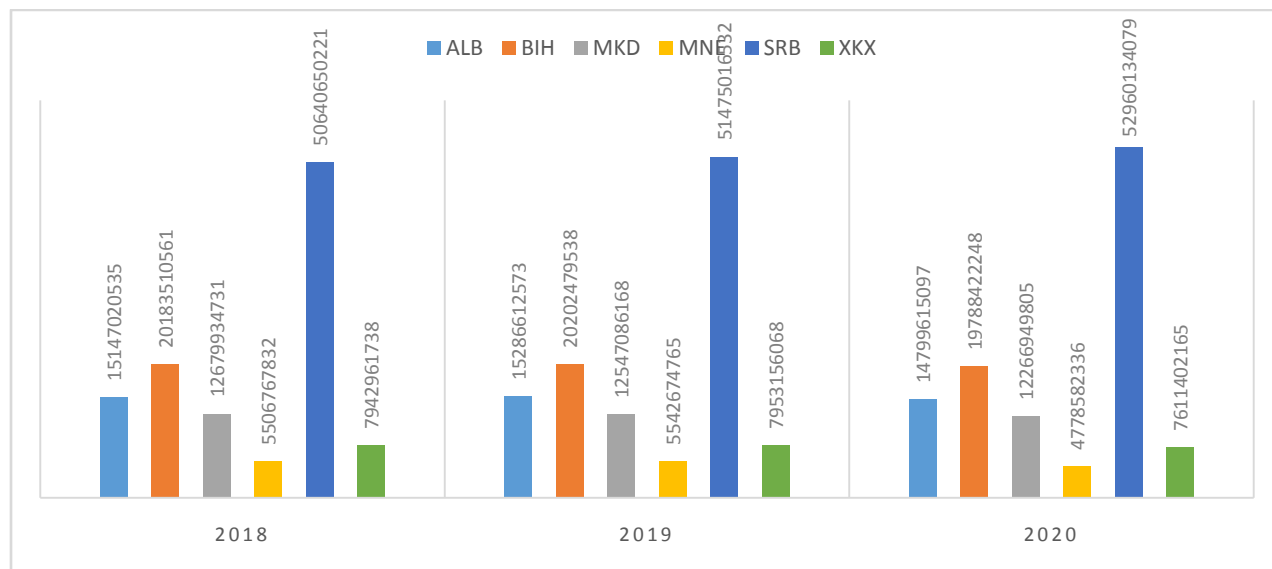


Figure 1. GDP USD¹

The structure of foreign trade between countries in the region is similar. The majority of exports are industrial goods - more than 60%, while the share of high-tech products does not exceed 5%. The exception is Montenegro, where more than 50% of exports are fuel and mining products. In other countries, the combined share of these positions is around 12%. Another important export product of the Western Balkans is agricultural products - more than 15% in the export structure. In the structure of imports of the countries of the region, industrial goods dominate - 64%.

The most important trading partner of all countries in the region is the EU, which supplies over 70% of the export volume of the Western Balkans. Regional trade plays an important role, with the countries of the region accounting for at least 15%. Russia is only one of the five largest export destinations in Serbia (approx. 5% of Serbian exports). The main importer into the countries of the region is also the EU - it accounts for more than 60% of the regional imports. In terms of regional imports, China ranks second with 7.7%, and Turkey ranks third (7.7%). Russia is one of the five most important import partners for three countries in the region: Serbia (7.9%), Bosnia and Herzegovina (4.7%) and Albania (2%) 3.

All countries in the region have trade deficits financed by foreign capital inflows and migrant remittances. The latter play an important role in the economies of the Western Balkans. Due to the high double-digit unemployment rate, the region is an exporter of labor. Remittances from migrants from the Western Balkans are the main source of capital inflow into the economy and even exceed the volume of foreign direct investment (FDI) attracted (with the exception of Albania).

Foreign capital plays an important role in the socio-economic development of the Western Balkans. In 2019, the region received \$ 6.9 billion in FDI, which is 0.4% of the global level. Serbia is the largest capital importer among the countries in the region. They account for over 60% of the inflows of foreign direct investment into the region. Albania is in second place by a large margin - just under 20%.

According to UNCTAD data, in 2019 Serbia became the second among the transition countries to have managed to attract the most foreign direct investment - 4.3 billion US dollars. The main industries that received FDI were: construction (28%), transport (16%), wholesale and retail (8%), information and communication technologies (5%). Serbia continued to develop export-oriented projects in the automobile cluster, which was the subject of foreign capital investment. Most foreign direct investment came from the EU in 2019. China has started to play an increasing role by investing in infrastructure and energy projects. The countries of the region have accumulated FDI of US \$ 73.5 billion (0.2% of the world volume), of which 60% in Serbia, 12% in Albania and Bosnia and Herzegovina. Due to the end of the privatization process of state property and the small size of the national economies, the volume of foreign capital inflow into the real economic sectors is insignificant.

Amid the COVID-19 pandemic, which plunged the global economy into one of the deepest recessions in 100 years, emerging and developing countries in the Europe and Central Asia (ECA) region experienced an economic downturn of 2% in 2020. According to forecasts, the pace of economic recovery in 2021 will be 3.6% slower than previously expected due to the new wave of coronavirus infections. Governments play an equally important role in shaping labor markets in this region: 86 million people work in the public sector, or 25% of the total workforce, well above the global average of 16%.

In the Western Balkans in particular, the proportion of people with higher education in the public sector is more than twice the average for the population as a whole.

The economies of the Western Balkans were hit by one of the worst coronavirus outbreaks in the ECA region in early 2021, with daily peak increases well above the regional average. Similar to Central Europe, the three economies of the Western Balkans (Bosnia and Herzegovina, Montenegro and North Macedonia) are among the top 10 EMDE countries with the highest COVID-19 deaths per capita, further adding to the burden on health systems. In most Western Balkans economies, widespread vaccine rollouts are not expected until the second quarter of 2021 (later than originally expected) as countries wait for vaccines to be delivered through the World Health Organization's COVAX mechanism. The supply of vaccines is hampered by delays in production and imports.

An exception is Serbia, where vaccination started at the end of December and 24 doses per 100 inhabitants were administered until mid-March, which is well above the average for the region and the world.

Economic growth in the Western Balkans is expected to accelerate to 4.4% in 2021 and then slow to 3.7% in 2022, provided that consumer and business confidence rebounds as the COVID-19 pandemic takes control and levels of political instability decreases. Despite these improvements, per capita income levels are expected to remain 6.5% below pre-pandemic projections through 2022. Tourism-dependent economies, particularly Albania and Montenegro, will continue to struggle with restrictions on international travel. Rising fiscal obligations in the

countries of the sub-region have reduced the scope for fiscal support and contributed to the development of macroeconomic imbalances. At the same time, state budget tensions will mount as additional spending will be required to counter the negative economic effects of the COVID-19 outbreak.

Despite these challenges, economic growth and productivity gains in Albania and North Macedonia will be supported in the medium term by accelerated structural reforms in the run-up to EU accession - provided that accession negotiations are not postponed again. The sub-region is also expected to benefit from the recently adopted EU Economic Support and Investment Plan, which calls for funds to be mobilized

Support the development of sustainable connectivity, the development of human capital, the improvement of competitiveness and inclusive growth, the transition to a green economy and digitization.

The COVID-19 crisis underscores the critical importance of investing in digital skills and technology to ensure continuity of the learning process, as well as the need to devote resources to modernizing information and communication infrastructure to enable distance learning for learners, especially children social classes, support vulnerable households. Die Einbeziehung der Ziele der grünen Wirtschaft in das Konjunkturpaket nach der Pandemie wird die Widerstandsfähigkeit gegenüber zukünftigen Schocks erhöhen und die Risiken verringern. Maßnahmen zur Förderung der Einführung grüner Technologien, einschließlich Bemühungen zur Verbesserung der Energieeffizienz durch Nachrüstung von Gebäuden, können hohe steuerliche Multiplikatoren haben, da sie arbeitsintensiv sind und zu Produktivitätssteigerungen beitragen.

In the long term, measures to create an environmentally friendly physical infrastructure, energy modernization, investments in education and training will be effective,

Investing in natural capital, green research and development and in low and middle income countries, spending on rural support (Hepburn et al. 2020). Improving energy efficiency, nature conservation, use of clean energy sources, sustainable development of the transport sector are also among the priority areas for investments that promote green development.

Bridging the gap between current spending and the level required to achieve the Sustainable Development Goals can contribute to sustainable growth in per capita income. Prioritizing investments in high-yield green infrastructure projects and promoting the widespread introduction of environmentally friendly technologies can support higher growth in the long term and at the same time help curb climate change.

Strengthening resilience to the risks of climate change, including the increasing frequency of severe cyclones and droughts, rising sea levels and falling crop yields, is crucial.

For the ECA region, especially since the region has many agricultural exporters and a large part of the population lives on the coast (World Bank 2019a). It is expected that in the coming decades more than 80% of the agricultural area will be exhausted due to lower rainfall (European Environment Agency 2019). Spending on investments in sustainable infrastructure can be offset through targeted rapid job creation measures, including the introduction of drought management technologies, landscape and water catchment management, ecosystem restoration and sustainable forest management.

Bridging the gap between current spending and the levels required to achieve the Sustainable Development Goals can contribute to sustainable growth in per capita income. Prioritizing investments in high-yield green infrastructure projects and promoting the widespread adoption of environmentally friendly technologies can support higher growth in the long term while helping to mitigate climate change.

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For many emerging and developing countries, investments in renewable energies can help improve energy security and at the same time reduce dependence on imported electricity. These investments could also ease the burden on energy subsidy budgets, which are quite high in the ECA countries and averaged more than 3% of GDP in 2019. The tax incentives provided so far in the G20 countries in response to the pandemic are intended to support both carbon-intensive and environmentally friendly activities. In the G20 countries, including the ECA region, support for the electricity sector has focused on CO₂-intensive activities. In the absence of reforms in energy consumption and tariff policies, the transition to low-carbon energy is likely to result in lower household revenues.

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The recession in the Western Balkans region is being driven by a sharp drop in domestic and foreign demand during the pandemic. Traffic restrictions and social distancing measures have a particularly profound impact on the tourism and service industries, with the latter accounting for up to 50 percent of employment in the region (75 percent in Montenegro). Supply-side disruptions and falling demand are affecting many manufacturing industries; Investments are severely affected by liquidity bottlenecks and a high degree of uncertainty.

The main risk for the Western Balkans arises from the fact that the onset of the economic crisis will be difficult to cope with due to the ongoing pandemic in connection with a deep recession in the European Union.

All six governments in the region have announced fiscal and social measures to support communities and businesses in this emergency; its implementation is allocated between 1 and 6.7 percent of GDP. Countries that entered the crisis with larger fiscal and external reserves are better placed to fund larger aid programs.

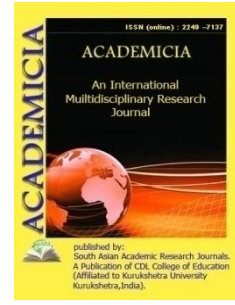
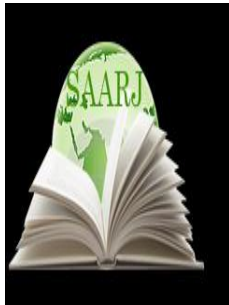
In the Western Balkans, the proportion of those who are dependent on self-employment, part-time employment and income from informal activities is higher. These categories are vulnerable to crises, but more difficult to support with traditional mechanisms.

Socio-economic models of the countries of the Western Balkans were formed in the 1990s - 2000s. According to a scenario similar to the Eastern Europe scenario, which led to a high degree of dependence of the national economies on the global economic and external economic

situation. This underlines the importance of the almost undisputed European election for the states in the region.

SOURCES

1. Vladislav Vorotnikov Andrzej Gabarta The states of the Western Balkans in the era of transformations: European choice and Russian interests. Modern Europe, 2021, no. 1, p. 62-73. DOI: <http://dx.doi.org/10.15211/soveurope120216273>
2. Stella Arzumanyan, Zokhida Adilova, Nargiza Khujanazarova, Shakhlo Davirova, Aziza Karimova. Analysis of the transition to an innovative economy in developed countries (on the example of Israel). International Journal of Advanced Science and Technology, Elsevier, Scopus 29 2020/5 pp. 1804-1813
3. Weltbank, 2021. "Daten, Digitalisierung und Governance." Wirtschaftsbericht der Region Europa und Zentralasien, Frühjahr 2021. Weltbank, Washington DC. Doi: 10.1596/978-1-4648-1698-7.
4. <https://www.welt.de/wirtschaft/article169232212/Die-neuen-Gastarbeiter-kommen-aus-dem-Westbalkan.html>
5. Altmaier: „Verlängerung der Handelserleichterungen für Länder des Westbalkans ist klares Signal der Solidarität“
6. The World Bank, World Development Indicators. <http://data.worldbank.org/indicator>
7. <https://www.imf.org/en/Countries>



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THE IMPORTANCE OF PERSONAL VALUES OF ELEMENTARY SCHOOL STUDENTS IN LEARNING

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ABSTRACT

Educational activities enable an elementary school student not only to develop a high level of cognitive processes, but also to develop personal qualities. In addition, the student's success in school will become an absolutely positive basis for his or her subsequent mental development and personality formation. This article is also devoted to a complete coverage of this very topic.

KEYWORDS: *Junior Schoolchild, Education, Value, Cognitive Processes, Learning Activities.*

INTRODUCTION

The changes taking place in society have a great influence on the formation of the human qualities of students, who are the object and subject of the educational process. Given this, in our country, special attention is paid to ensuring that students grow up as versatile people in the educational process. In particular, the Concept of "Continuous Spiritual Education" of the Republic of Uzbekistan provides for a change in the prevailing views in society. In particular, there is an opinion in the public mind that "the fruits of a child's upbringing are visible later, when he finishes school and grows up." One cannot agree with this opinion. Because no matter how old a child is in life, implicit behavior appropriate for that age is expected. If the expectation is justified, praise is given, if not justified, criticism is expressed.

Independence raised issues related to human dignity, its interests and the needs of human dignity. Human dignity also manifests itself in his social characteristics, his activities in society, his relationship to others and the environment, his maturity, his possession of social characteristics and his ability to express them in a spiritual way. Philosopher K. Nazarov said: "The process of becoming a person, realizing one's own value and the value of others takes a lot of time. In general, in the third millennium all over the world there is a growing need for the application in practice of the universal criteria of the philosophy of appreciation. Unfortunately, when humanity, from the early days of its existence on the planet, prioritized dignity and value, the

modern landscape of the Earth would be completely different, and humanity would not be faced with universal problems such as environmental storms, the threat of war and spiritual decline. " [4]

Of course, the spirituality and behavior of an elementary school student cannot suddenly become good or bad. The behavior of a child of any age reflects the level of strength or weakness at that age. Every day a child unknowingly either pleases or grieves the parents or teacher. Otherwise, adults would not rate children as "polite child", "correct your behavior", "loving girl", "naughty child", "stubborn child", "fearless child". This proves that the level of parenting of a child manifests itself every day in online relationships, in behavior, and not later.

Value orientations are a complex structure in which 3 main components can be distinguished: cognitive, emotional and behavioral. Cognitive is an element of knowledge, emotional is an emotional component that arises as a result of assessment; behavior is associated with the implementation of value orientations in human behavior.

In the success of the educational process in primary grades, the internal needs of the student, motives, acquisition of knowledge, knowledge and skills, attitude to values are of particular importance.

The problems of motivation and value of peers in activity and behavior was the subject of research by famous psychologists V.G.Aseev, L.A.Blokhina, A.N.Leontieva, V.N.Myasishche, A.N.Piyanzin, S.L.Rubinstein. In their study, a number of mechanisms for the formation of values in students were considered.

From play activity to the transition to educational-play activity, more noticeable personal updates are formed, associated with the development of awareness in this activity. Younger school age is the age of intensive intellectual development. Intelligence ensures the development of all other mental processes during this period, the intellectualization of mental processes, their understanding and arbitrariness. During this period, educational activity makes high demands on all aspects of the psyche of students, and as a result, the content of the students' value system is improving.

Two factors influence the formation of the value system of primary schoolchildren: objective and subjective. Objective factors include the material and technical base of an educational institution, the state of the surrounding world, and subjective factors include the psychophysiological characteristics of children, the specifics of their motives and characteristics. Subjective factors develop in direct connection with the individual characteristics, interests, orientation of the student's personality. [8]

Pedagogical observations show that positive attitudes towards reading decline slightly towards the end of the primary school period. Interest in learning activities increases in grades 1–2 and decreases in grades 3–4. With a decrease in interest in educational activities, the teacher's narration of the finished material and the institution of memorization of students prevail, the activities of students are imitative in nature. Students in grades 3-4 usually do not like to retell what they read, copy exercises written on the blackboard, memorize rules and verses, and instead like to independently solve examples and problems, observe natural phenomena, draw and sculpt things from plasticine and clay. In other words, younger students are more interested in work that has the potential for initiative and independence. V.A. Sukhomlinsky believes that one of the

reasons for the decline in interest in reading at early school age is a high low assessment by the teacher, which leads to a decrease in the child's interest in reading and a decrease in self-confidence.

Psychologist N.I.Murachkovsky found that the origin of inadequacy is influenced by two different categories of personality traits:

- First, the peculiarities of the student's thinking;
- Secondly, the attitude towards learning, which is reflected in the orientation of the student's personality, is the "inner position of the student". [5]

Based on the analysis of the described situation, the formation of a system of values among younger students will largely depend on the values of primary school teachers. It is the teacher, as a person and a specialist, who introduces children to the world of social relations, culture, connects them with spiritual riches and new achievements created by mankind. Valuable goals of the teacher's activity are reflected in the results of students' educational activities. This is another aspect of the problem under study. An empirical experimental study of the value system of a primary school teacher makes it possible to form a clear idea of the modern primary school teacher, to determine the values of the highest and lowest significance.

V.A. Yadov considers independent values in pedagogical activity as the basis of human consciousness as a hierarchical structure consisting of thoughts and feelings capable of expanding their vital interests around themselves. Therefore, the development of the teacher's personal and professional values is considered as an indicator of pedagogical activity that affects the teacher's self-esteem, the satisfaction of his higher social needs, such as self-development and self-expression. In addition, values in the work of a teacher are viewed as factors of social maturity, civic responsibility, professional ideals and humanity.

E.A.Rudenko writes that the highest value in upbringing is the personality of the child. In order for this value to be absorbed into the consciousness of the teacher, his system of values, it is necessary to coordinate the teacher himself, his way of thinking and behavior. This is not connected with the improvement of qualifications and competencies, the introduction of the most modern technical means and a new experimental program into the educational process, but with the emergence of new thinking.

Indeed, the vocabulary of primary school students is of particular importance in the organization of educational activities and the application of the personal-value approach in the development of literacy. On the eve of entering school, the child's vocabulary increases to the point that he can express himself. A 6-year-old normally developing child uses 3-7,000 words in his speech. Their school educational activities play a particularly large role in the development of children's speech. Before going to school, the child uses his or her speech only as a means of communication and cognition, without thinking about how he or she speaks. However, at school, the language spoken by the child remains the subject of instruction and study.

As a result of studying the grammar of his native language, a child at school learns to consciously structure his speech in accordance with the rules of grammar. In the process of studying grammar, the phonetic side of the child's speech is determined, the morphological side of speech is clarified, the structure of the syntax is significantly improved. [10] These qualities, characteristic of certain aspects of speech, develop not only as a result of reading grammar, but

also under the influence of other subjects taught in school. In the process of studying and solving all the subjects taught at school, the student's vocabulary is enriched.

Researcher G. Mamatova in the methodological manual "Methods of forming literary ideas in younger schoolchildren" not only acquaints schoolchildren with literary ideas, but also focuses on the study of the language of fiction. In his opinion, the study of the language of a work of art means enriching the speech of students with literary terms, visual aids, elements of the literary language. [3]

Educational activities provide an opportunity for a student of elementary grades not only to develop a high level of cognitive processes, but also to develop personal qualities. At the primary school age, the formation of the child's personality continues. A student's success in school will be an absolutely positive foundation for his or her subsequent mental development and personality formation. As a result, it can be seen that the child spontaneously begins to understand his or her place in the family, the class in which he or she is studying, and in other communities.

The transition to a new type of activity creates a new attitude of the student to his main activity. A sense of duty begins to grow in him. He understands that reading is compulsory and it is his duty to follow the established rules and requirements. Feeling like a real reader, he needs to read well. [9]

The moral consciousness of primary school students undergoes significant changes when reading grades 1-4, moral qualities, knowledge, imagination are significantly enriched, the child begins to understand himself. If he does not know his inherent good and bad qualities, the motives for learning will change as follows: the interest of elementary school students will turn from an interest in a specific fact to an interest in laws and principles. Psychological research in recent years has shown that there may be interest in ways of acquiring knowledge, moving to the middle grades of primary school. Motives for self-study also arise during primary school, but they appear in the simplest form - interest in additional sources of knowledge and from time to time reading additional books. When social motives move into first grade, it shifts from a nondifferential general understanding to a deeper understanding of the reasons for reading and learning, "to an awareness of the content of reading for oneself and to socialization. social motives. Situational social motives at this age are the need to seek support from a teacher.

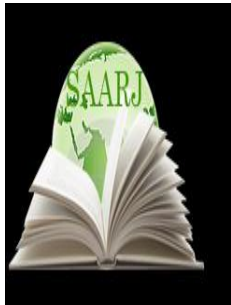
Learning activities provide an opportunity for children of primary school age to meet certain educational needs, as well as take a place among their peers. It is in this place or position that the child seeks to learn well. Children at this age constantly compare their own successes with the successes of other peers. It is extremely important for them to always be the first. [7] Motivation to participate in competitions among children in primary school is a natural psychological need that gives them strong emotional stress. These features actually begin to show in kindergarten and are most evident in primary school as well as adolescence.

Primary school students evaluate themselves based on what adults think and evaluate. The student's self-esteem will also depend on his or her success in various activities. Self-esteem among elementary school students can be different - high, adequate, appropriate or low. Traits such as confidence, openness, susceptibility to external influences, obedience, which are present in children of this age, provide a good opportunity to shape them as individuals. The transition from government to self-government during the small school period is extremely important.

Revealing hidden talents in children in the educational process, showing them their activities from an early age, creating opportunities for the development of their creative abilities is the key to the development of competitive personnel who will show high potential, social activity, intelligence and intelligence into the future. This corresponds to one of the priorities of our state - the upbringing of a comprehensively developed person. [6]

LITERATURE:

1. Bototova Zh.A., Kostrikova Yu.V., Radchenko E.A., Rakhmanova M.N. Value orientations of primary school teachers // International Journal of Applied and Fundamental Research. - 2016. - No. 1-2. - S. 260-263.
2. Zdravomyslov A.G. Needs, interests, values. M., 1998.S. 81.
3. Mamatova G. Methods of formation of literary ideas among younger schoolchildren. - T.: Istiklol, 2010. -55 p.
4. Nazarov K. Fundamentals of Philosophy. - T., Publishing house and printing house "Uzbekistan". 2005. -- 384 p.
5. Shabbazova Dilfuza Ruzikulovna. "Features of the development of creative activity of primary school students" Bulletin of Science and Education, no. 10-2 (88), 2020, pp. 88-91.
6. Shabbazova Dilfuza Ruzikulovna. "Individual Factors Of Formation" Conference "Of Students Of Primary Classes" Eurasian Union of Scientists, no. 4-8 (73), 2020, pp. 46-49.
7. Ruzikulovna, S. D. (2021). Primary Education Teacher And Student Teaching Activities And System Of Personal Values.
8. H.M.Djumayeva, (2020). Model Of Preventing Of Students From Internal Threats And Its Main Components. European Journal of Research and Reflection in Educational Sciences Vol, 8(12), 94-99.
9. Salomov, A.A., & Khurramov, R.S. (2019). Theoretical Aspects Of Logical Thinking Development At The Lessons Of Mathematics At Elementary School. Internauka, (41-1), 12-14.
10. Yakibova Dilorom Sharifovna. "Formation of creativity of thinking of primary school students in technology lessons" Bulletin of Science and Education, no. 9-1 (87), 2020, pp. 63-65.



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THEORETICAL BASES OF PROFESSIONAL DEVELOPMENT OF FUTURE PEDAGOGICAL PERSONNEL

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ABSTRACT

This paper discusses issues related to the study of the complex process of professional competence of future teachers in the educational process, the use of the laws of pedagogical communication technologies on the basis of a systematic approach

KEYWORDS: Education, Economics, Future Pedagogue, Professionalism, Professional Competence, National Model, Mentality, Pedagogical Technologies, Efficiency, Mobility, Flexibility

INTRODUCTION

Today, in the context of the interconnected development of social, economic and political relations as a system, it is becoming increasingly clear that the human factor, its intelligence, knowledge, skills, abilities and values are the main coordinating factor and tool.

A new type of person, a perfect person is formed by educators-specialists who carry out new labor activities. This huge and responsible task is enshrined in the Law of the Republic of Uzbekistan "On Education" and the "National Training Program". Its implementation in practice requires an innovative approach from the educational institutions that train teachers - to ensure the professional competence of future teachers in the educational process, using a systematic approach. In today's market economy, the main requirements for teachers are:

- high level of qualification and professionalism;
- have the knowledge, skills, abilities and basic qualities necessary for a professional career;
- professional mobility, flexibility;
- ability to adapt quickly to changing life situations;

- Qualities of a competitive specialist
- the ability to think independently and critically, the ability to detect contradictions in real life and find ways to overcome them, the ability to use modern technology, the ability to apply the acquired knowledge, creative new ideas ability to give, creative thinking, ability to use information correctly, ability to work in a team, etc.

In order to achieve these goals, educational institutions must, first of all, improve the professional qualities of their specialists. The quality of knowledge of competent teachers must meet the following requirements:

- completeness - the amount of knowledge about the object, process, event to be studied;
- depth - comprehension and interconnection of knowledge from different disciplines;
- Systematization - the organization of the sequence of knowledge, step-by-step mastering;
- Reality, specificity - the ability to apply knowledge to the elements in specific situations;
- generality - the ability to express real knowledge in a general way, using concepts.

The following indicators of knowledge play an important role in professional training: efficiency, mobility, flexibility, comprehension. These characteristics are one of the foundations that form the functional competence of each professional. Necessary components for this profession are included in the training program of the Republic and among the main qualities of the national model. It takes time to consider the content of today's continuing education, the basics of organization, its management as a subject of a new paradigm-social renewal, a force that creates a new social way of life.

In the current context, the spiritualization of the educational process, as a method and mechanism for the realization of the intellectual and spiritual potential of the learner, performs its function, fulfills its function, understands and comprehends students, works on itself, encourages them to look for ways to develop their capabilities independently.

The professional competence of the future teacher consists of the following qualities:

1. Social qualities;
2. Features of adaptation to the conditions of the labor market;
3. Necessary features of the profession.

These qualities can ensure that every educator is competitive in the job market. The following changes may occur in educational institutions in the training of competitive teachers: First, if the educational process is not organized on the basis of cultural and intellectual development, the student will find answers to the questions that are necessary for him, aimed at crying out the vital necessity. He answered the following questions: - Why is the activity carried out? What methods and ways is it used? How is it achieved?

Second, does the student acquire such knowledge in the process of learning, which helps the student to find answers to the following questions: what is it?, what does it do?, how can it do it? and so on. Third, the student develops the skills he or she needs to do effectively. Fourth, the student will have communication and teamwork skills. Fifth, the student will have the ability to

anticipate and predict. Sixth, the student develops an active life position and high motivation to work.

These personal qualities, attributes, knowledge, skills ensure the professional suitability of the future pedagogical staff, which are based on the following psychological processes and situations:

- Contemplation (ability to perform thinking operations)
- Emotional-volitional qualities - emotions, volitional acts, ways of their expression;
- People, in relation to people, work, self;
- Knowledge, evidence, laws;
- Experience universal, professional, new, local;
- Traditions, norms.

Activities in pedagogical colleges and universities are part of the educational service for the state, society and the individual as a whole. This is a long process. According to the Russian researcher V. Markova, educational services differ from the process of production of goods (objects) by the following qualities, signs: durability, durability of production and consumption, inconvenience to storage, etc. This means that the results of the educational service are not felt, are not captured, can not be transferred from one place to another, can not be preserved.

The following pedagogical technologies are used to develop the professional competence of future teachers:

- Explanatory educational technologies;
- Person-oriented educational technologies;
- Developing educational technologies.

At present, the use of the laws of pedagogical communication technologies in the development of pedagogical competence can give the planned result. Pedagogical communication is organized and directed by the teacher. Pedagogical communication is a creative process. It is held in the following stages:

1. Planning, design of communication with students by the teacher;
2. It takes into account the individual qualities of students, the choice of optimal methods;
3. Communicative attack - in which students are quickly involved in the learning process and the modeled communication is further clarified;
4. At this stage, manages the measures to strengthen the psychological connection with students, implements educational goals in practice.

From modern technologies to developmental professional competencies of educators, developmental educational technologies give effective results. This technology allows future professional educators to develop the following socially important qualities, to develop general and professional, professional erudition; development of creative abilities; demand and systemic

growth. This technology will equip future professionals with methods of correcting the personal professional institutions of students.

The technology that optimally develops professional competence in the system of new pedagogical technologies is the technology of targeted intensive training of specialists. The production of this technology, closely related to practice, performs its function together and is based on the following principles:

- the ability to independently develop in their field what is needed in a quality, world-class, accessible way, and to conduct research on what is needed;
- the ability of a modern specialist to create and use automated information bank, knowledge bank and other information resources;
- A modern specialist must be able to fully understand the whole technological process, from the beginning to the end of the product, to have the knowledge and skills to automate this process as much as possible.

The following rules should be followed in the training of a specialist with such professional competence:

- complex of training (education - practice together with upbringing);
- Carry out real course work and graduate work related to individual or group practice;
- use of modular legislation in the employment of a group of graduates;
- involvement of university teachers, specialists, production staff in the management of students;

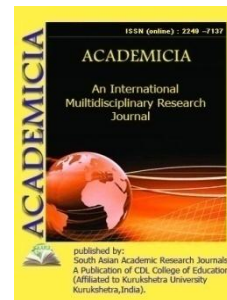
Flexibility, mobility of the training system, operative social and economic changes of special courses, programs, plans, methodologies, non-contradictory changes, updates on the basis of requirements;

- Focus on computerization, programming of the training system, the development of independent knowledge, skills and abilities;
- Continuous training;

Differentiation of specialists depending on the quality of training. Based on the above, a comprehensive approach, the analyzed new laws of education in the development of professional competence of future professionals optimally perform their function as a system. Improving the professional competence of a specialist is a modern requirement, and this psychological, social structure develops on the basis of targeted education. Today's education is such a sphere of social activity that it should create the necessary conditions for the development of a new type of person. Modern education is the development of individual knowledge and learning activities of students, upbringing and self-education, as a synthesis of socialization. Its goal is to create the conditions for the development of a new-minded, independent and democratic person, a highly professional person, a citizen, a citizen of his country.

REFERENCES

1. Law of the Republic of Uzbekistan "On Education" No. ZRU-637 of September 23, 2020
2. Lomakina T., Sergieva M. Pedagogical technologies in professional educational institutions. Moscow 2007
3. Sotsial'no-pedagogicheskix osnovy napravlenosti obrazovatel'nogo protsessa na formiravanie lichnosti. –T .: 2011god.
4. X'ell L, Zegler D. Theory of personality. SPB: Peter. 1998 god



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APPROACHES TO LEXICAL CONNOTATIONS

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ABSTRACT

This article deals with the research of lexical connotation in English and Uzbek languages. The article also discusses logical-philosophical concept of connotation, semantic connotations, connotations with an emotional basis. A more extended definition of connotation is presented in the Great Russian Encyclopedia, published in 30 volumes, edited by A.M. Prokhorov, which complements the previous definition: the connotation includes semantic and stylistic elements, in a certain way associated with the main meaning and superimposed on it. In particular, they talked about the difference between concrete and abstract words. Specific words were determined not only by what qualities they possess, but also by whether the carrier of these qualities also possesses the same qualities.

KEYWORDS: Denotative, Connotation, Pragmatic Features, Semiotics.

INTRODUCTION

There are many approaches to the definition of lexical connotation, the concept of connotation is vague, this term is interpreted ambiguously, has many synonyms. An attempt to define connotation from the standpoint of one or two or three aspects is incomplete. Each direction individually is not able to fully comprehend the essence of the connotation.

In our opinion, the lack of terminological unity in the definition of a given concept is due to its complexity and multidimensionality, it presupposes the structuring of this phenomenon, therefore, in the structure of the lexical meaning of a word, several types of it are distinguished: 1) denotative meaning: the object denoted by the word (in a broad sense) in linguistics is called a denotation, therefore denotative meaning is a meaning that characterizes the correlation of a word with a designated subject (situation); 2) the significant meaning, which is the main one for lexicologists, which is often called simply the meaning; 3) emotive (or connotative) meaning is a meaning associated with an emotionally expressive and evaluative reflection of objects and

phenomena of the external world, which is known to all native speakers, although it is not recorded in dictionaries (compare the connotations of the word pig in English language - "commonly used **to insult a person as dirty, fat, greedy, gluttonous,**" or the word hare "**sensitive and artistic**"); 4) structural meaning is a correlative meaning indicating the relation of a word to other words of the language.

DISCUSSION

The meaning of the word includes, in addition to the denominational, the connotative aspect. The term "connotation" is used in different areas of philological knowledge and covers various aspects of the word: "additional or marginal semantic components", "emotional and expressive", "modal" and "evaluative", "pragmatic features" , "Semantic associations" and "stylistic nuances", etc.

The word "connotation", having appeared in about 1200 from Lat. con - notare "together - to designate" and having arisen in scholastic logic, was used in philosophical and theological discussions about the meaning of words, in philosophy about the language of the 14th century, the term connotation began to be used quite specifically with the goal of distinguishing words in image and action , depending on what they indicate. In particular, they talked about the difference between concrete and abstract words. Specific words were determined not only by what qualities they possess, but also by whether the carrier of these qualities also possesses the same qualities. In structural semantics, the concept has undergone significant expansion and change. The semantic scope of the concept of connotation was further expanded in semiotics, which led to different uses of this term: the concept gradually spread to sign systems of thought, such as image, matter, and sound.

In the linguistics of the 19th century, the term "connotation" began to denote all the emotively colored elements of the content of expressions, correlated with the pragmatic aspect of speech.

Nevertheless, despite the long history of using this term, its definition in linguistics is still ambiguous. The term "connotation" entered linguistics in the 17th century through the Port-Royal grammar to denote properties as opposed to substances. The Russian Encyclopedic Dictionary edited by A.M. Prokhorov and The Big Encyclopedic Dictionary give the following definition of connotation: Connotation (Middle Ages. note, designate), in linguistics, additionally, the concomitant meaning of a linguistic unit or category.

A more extended definition of connotation is presented in the Great Russian Encyclopedia, published in 30 volumes, edited by A.M. Prokhorov, which complements the previous definition: the connotation includes semantic and stylistic elements, in a certain way associated with the main meaning and superimposed on it. The connotation serves to express the expressive-emotional and evaluative shades of the statement. For example, the word "winter", denoting Despair and Hope. References to winter in literature may refer to **death, old age, pain, loneliness, despair or an end**. The season provides the setting for painful messages, as well as messages of renewal, rebirth and hope, according to Annie Fitch in an article on the Poetry Foundation

The logical-philosophical concept of connotation goes back to J. Mill and his works in the 19th century, where connotation is based on the opposition of connotation and denotation. Connotation according to J.S. Mill is the signs communicated by a word, his ideas about

connotation correspond to modern ideas about the essential features of a concept and is based on a three-part understanding of a sign (sign-object, referent and signified): denotation - the extensional meaning of the sign, connotation - its intentional meaning. In 1934 K. Buhler continued J.S. Milla's arguments by developing in his works in the book "Theory of language".

This can be formulated in a different way, namely, that words of a certain class open around them one or several vacancies, which must be filled with words of certain other classes. In reporting "The city is built of marble", we may be giving completely different information, and this is due to the very meaning of the complex connotative name "built of marble". The word "white" denotes all white objects - snow, paper, sea foam, etc. - and includes, or co-means (connotes), the attribute of whiteness.

L. Yelmslev presented the arguments that to describe the semantic content of a word to the designated objects (expansion) and signs (design) of the designated objects also include judgements and assessment, connected in a single linguistic community.

In 1962 T. Pavel for the first time expresses the idea of research with the help of connotations of the semantic structure of metaphor, in which the denotative meaning is replaced by the contextual, figurative, connotative. Since that time, in linguistics, the view of connotation as an integral part of the language system, which cannot be limited only by stylistic framework, has been increasingly strengthened. Referring to the opinion of L. Yelmslev, R. Barth defined connotation as a stimulator of the meaning of a symbolic, evaluative or feeling-dependent image.

Connotations, despite the fact that they are conditioned by culture, are arranged strictly according to the rules, moreover, they are not limited to individual signs, and are closely related in a row with each other by signs, as in a single text. A connotation is a content for which a denotative system serves as an expression, and this content itself can be determined as a result of "subtracting" the denotation from the text, and "a connotative system is the expression plan of which is itself a sign system". Connotation according to R. Barth varies between expressive, stylistic variants and emotional-expressive coloring of the object of denotation and the content of the word.

For the first time the socio-cultural component was introduced into connotation by Bloomfield, who singled out purely semantic connotations related directly to the sphere of consciousness and connotations with an emotional basis. In the connotations of group L. Bloomfield saw a certain level of speech, conditioned by social, regional and cultural factors. To this group, he attributed the connotations that arise in borrowed words. The inclusion of extralinguistic factors in the concept of connotation caused some linguists to try to attribute connotation not to the field of linguistics studies, but to the sphere of pragmatics and semiotics.

S. Bullon, in turn, also considers and uses connotation in relation to all socio-cultural associations arising from native speakers in connection with a particular word, and which a native speaker may not know about, since these associations are related to culture and cannot be conveyed by traditional dictionary definition or one-word lexical equivalent in translation. As one of the examples, S. Bullon analyzes the associations associated with the word "шампанское" champagne. This expensive wine is in Great Britain a social marker of belonging to the upper strata of society, and is also associated with weddings and other special occasions.

V.N. Telia considers the connotation as a special macrocomponent of meaning (halo), since the ability to signal the value attitude of the speaking subject to the world, and thereby the ability of the utterance containing the given name, to produce a pragmatic effect and constitutes the specificity of the connotation, including the way of expression estimates. The main function of connotation is the function of influence, directly and inextricably linked with the pragmatics of speech. A.N. Leontiev considers connotation in connection with the peculiarities of speech perception and refers the definition of connotation to psycholinguistics.

D.N. Shmelev, following K.A. Dolinin, examines the connotation from a stylistic point of view. He considers the core of the word not some separate meaning of the word, but those semantic elements that are common to all meanings of the word. In the research of D.N. Shmelev, expressive elements of language appear: 1) those that characterize the emotional state of the speaker or his attitude to the subject of the message (or are aimed at emotionally influencing the interlocutor); 2) those that characterize the speaker himself from a linguistic point of view.

N.G.Komlev does not endow connotation with explicit content, connotation is a semantic modification of meaning, which includes a set of semantic layers, feelings, ideas about a sign, a logical concept or some properties and qualities of objects, for the designations of which the given word-meaning is used. Otherwise, the connotation is the sum of the components included in the semantic structure of the sign, and is not formally contained in the word-sign.

CONCLUSION

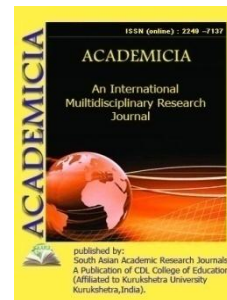
Thus, there are many approaches to the definition of connotation, the concept of connotation is indistinct and vague, this term is interpreted ambiguously, has many synonyms. Researchers consider stylistic, emotional, cultural, pragmatic, associative and other aspects of connotation; it appears before us as a kind of "heap-small", and not as a structured whole. From our point of view, this is because the attempt to define connotation from the standpoint of one or two or three aspects is incomplete. Each direction individually is not able to fully comprehend the essence of the connotation. In our opinion, the lack of terminological unity in the definition of this concept is due to its complexity and multidimensionality, it presupposes the structuring of this phenomenon, therefore, to give a definition of connotation is to describe its structural elements.

REFERENCE:

1. Haydarov, AnvarAskarovich and Navruzova, NiginaHamidovna (2021) "Stylistic Features Of Intonation," Scientific reports of Bukhara State University: Vol. 5 : Iss. 1, Article 2. DOI: 10.52297/2181-1466/2021/5/1/2 <https://uzjournals.edu.uz/buxdu/vol5/iss1/2>
2. AnvarHaydarov. (2020). Methodological features of graphic tools. Middle European Scientific Bulletin, 5. <https://doi.org/10.47494/mesb.2020.5.73>
3. Khudoyberdievna, SaidovaZulfizar. "English phraseology and its integration with terminology." *Academicia: An International Multidisciplinary Research Journal* 11.2 (2021): 1618-1622. <https://www.indianjournals.com/ijor.aspx?target=ijor:aca&volume=11&issue=2&article=265>.

4. Ruziyeva Nafisa Zarifovna. "The Significance Of Using Euphemisms In Different Fields Of Society."E-Conference Globe.Vol. 3.No. 1. 2021. <https://papers.econferenceglobe.com/index.php/ecg/article/download/341/339>
5. 5.Kobilova A.B. Features of the use of the periphrases of the Uzbek and English languages in journalistic texts. International Journal of Psychological Rehabilitation, Vol.24, Issue 07, 2020.Pages: 8162-8168. <https://www.psychosocial.com/article/PR270794/18979/>
6. Khaydarov, AnvarAskarovich (2020) "Expression Of Connotative Meaning In Onomatopoeia," Scientific reports of Bukhara State University: Vol.4: Iss. 5 , Article 5.DOI: 10.52297/2181-1466/2020/4/5/5 <https://uzjournals.edu.uz/buxdu/vol4/iss5/5>
7. Haydarov, A. A. (2019). Methodological Features Of Imitation Words. Theoretical & Applied Science, (10), 688-690. <https://www.elibrary.ru/item.asp?id=41328966> 9.Akramov, I. (2021).ОСОБЫЕ ЗНАКИ, СВОЙСТВА И ХАРАКТЕРИСТИКИ АФОРИЗМОВ. ЦЕНТР НАУЧНЫХ ПУБЛИКАЦИЙ (buxdu.Uz), 5(5).извлечено от http://journal.buxdu.uz/index.php/journals_buxdu/article/view/2386.
8. Usmonova, Z. H. (2017). The artistic character of Stephen King's novels and their influence on Uzbek science fiction. Міжнароднийнауковий журнал Інтернаука, (1 (1)), 170-172.[http://www.irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE_FILE_DOWNLOAD=1&Image_file_name=PDF/mnj_2017_1\(1\)__48.pf](http://www.irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE_FILE_DOWNLOAD=1&Image_file_name=PDF/mnj_2017_1(1)__48.pf)
9. Khudoyberdievna, S. Z. (2021). Structural Grammar Analysis Of Phraseologism Of Mental Processes And Personal Characteristics. *Web of Scientist: International Scientific Research Journal*, 2(10), 137-143. <https://wos.academiascience.org/index.php/wos/article/view/401>
- 10.10.Zarifovna, R. N. (2021). SEMANTIC AND STRUCTURAL ANALYSIS OF EUPHEMISMS (ON THE EXAMPLE OF ENGLISH AND UZBEK LANGUAGES). *Web of Scientist: International Scientific Research Journal*, 2(10), 144-147. <https://wos.academiascience.org/index.php/wos/article/view/402>
11. Saidovna, V. F. (2021). Tourism Discourse And Its Terminology. *International Journal of Progressive Sciences and Technologies*, 25(2), 08-10. <https://ijpsat.es/index.php/ijpsat/article/view/2871>
12. Ibragimovna, G. M., Saidovna, V. F., &Suleymanovna, K. N. (2020). A short humoristic text for the training of students with specialized of tourism. *International Journal of Psychosocial Rehabilitation*, 24(2), 509-519. <https://www.elibrary.ru/item.asp?id=43256915>
- 13.13.Ruzieva, N. X.,&Yuldasheva, F. E. (2017). The use of mingles in the communicative way of teaching. Міжнароднийнауковий журнал Інтернаука, (1 (1)), 138-139. <https://www.inter-nauka.com/uploads/public/14846000251146.pdf>
14. Rasulov, Z.I. (2010). The principle of contextual analysis of elliptic sentences (based on the material of the English language). *Bulletin of the Chelyabinsk State University*, (21), 91-94. <https://cyberleninka.ru/article/n/printsip-kontekstualnogo-analiza-ellipticheskikh-predlozheniy-na-materiale-angliyskogo-yazyka/viewer>.

-
- 15.** Djumayeva, NozimaDjurabayevna. "Magic Musical Instruments In English And Uzbek Folklore." Language and culture. 2018.
[https://scholar.google.com/scholar?hl=ru&as_sdt=0%2C5&q=MAGIC+MUSICAL+INSTRUMENTS+IN+ENGLISH+AND+UZBEK+FOLKLORE&btnG=](https://scholar.google.com/scholar?hl=ru&as_sdt=0%2C5&q=MAGIC+MUSICAL+INSTRUMENTS+IN+ENGLISH+AND+UZBEK+FOLKLORE&btnG=www.elibrary.ru)
(<https://www.elibrary.ru/item.asp?id=35192565>)
- 16.** RuzievaNafisaZarifovna. "Neologisms in English language."Academy 5 (32) (2018).<https://cyberleninka.ru/article/n/neologisms-in-english-language>



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**PUBLICATION OF TRANSLATED WORKS IN THE MAGAZINE
"EDUCATION AND TEACHER" (BASED ON NUMBERS FROM 1925-
1927)**

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ABSTRACT

The translated works published in the journal of "Education and Teachers" between 1925 and 1927 are examined in this article. The intellectual value of the translated texts is explored, as well as their role in current writing. There is a brief overview of translators' and authors' work. The art of translating has progressed over time. Translation has been proved to be the most essential mode of interethnic communication. Not only was the literature and art of other countries studied through translated works, but also their way of life, history, economy, and daily life. More than that, I really can't do it. All I could do was translate some of the blessed man's poems into Russian through prose. That's a big deal"6. Apparently, Cholpon is a proponent of innovation in literature.

KEYWORDS: *Translated Works, Period, Turkestan, Education, Literature, Art, Source, Foreign Literature, Magazine.*

INTRODUCTION

The book is one of the most important discoveries in human history. Of course, life would be unimaginable without literature. Today, a book encompasses a wide range of newspapers, periodicals, and other media in addition to books. In a nutshell, they encourage individuals to open their eyes, learn about the world, understand themselves, grow spiritually, and discover the truth. Only through books do we learn about our country's ancient past and the tremendous scientific and cultural treasures of our forefathers.

The magazine "Education and Teacher", published between 1925 and 1933 and housed in the Republic's libraries' Rare Publications Collection, is one of our spiritual treasures. The journal is a great source for the study of our country's early and mid-twentieth-century history, literature, and the oppressed lives of our people during the Soviet colonial period as a literary and historical source. This publication depicts the country's most affluent period of intellectuals and modern literature representatives.

Education and Teacher is a natural follow-up to "Maorif," a magazine that ran from 1918 to 1919.¹ Despite the fact that it claims to be a monthly political, educational, literary, scientific, and scientific publication, literary materials predominate. The publication's name also suggests that it is a scientific and methodological journal for educators. The columns in the journal are as follows: "Official section", "General section", "Education", "Society", "Explore the country", "Literature", "Dictionary and terms", "Science and technology", "Criticism and literature", "Western literature", "Literary reviews", "Biography", "Language and terminology", "Fine arts", "Education news", "Political enlightenment", "Economics", "Agriculture", "Professional movement", "Children's literature", "Local news", "Questions and answers", "Messages", "Responses and advice from the office", "Announcements". It is known from this index that the sections "Literature", "Western literature", "Literary reviews", "Children's literature" cover the whole literature, while the sections "Criticism and literature", "Biography" are partially given literary articles.

In the sections "Western Literature" and "Literature," the journal "Education and Teacher" publishes current poetry, stories on diverse topics, critical pieces, and translated works on a regular basis. There are examples from fraternal peoples and foreign literature. In the 4th issue of 1925, in the translation of A.Niyazi, the article "Examples of lessons from the history of Turkish literature" translated from Azerbaijani (The similarities in form and meaning in the works of Fuzuli and Navoi are also about their differences), in issue 5-6 of 1925, Mahmud Suboy's story "Life and Death" from Russian, in issue 7-8, 1925, an analysis of the stories of Robindranath Thokur in Cholpon's article "Great Indian", R. Tokhur's story "Subha" translated by Cholpon; issue 9-10, 1925, issues 11-12, 1925, Turgenev's short stories "Bosaga", "Tilanchi" translated by Makhmud Suboy, Lermontov's poem "Debate", translated by Erkin in the same issue, in issues 1-2-3 of 1926, Gogol's story "Shinel" translated by S.A. Siddikui, in the 3rd issue of 1926, Arthur Arnu's story "Paris Commune" translated by Makhmud Suboy, in issues 3-4-5 of 1926, Kubikuf's critical article "Great writers of Russia" translated by Kh. Nuri, in the 4th issue of this year, Farichi's story "Galila" translated by M.Suboy, In the 5th issue of this year, the story "Stipan Razin" translated by M. Suboy, in the 9th issue of 1926, Lunacharsky's "Days of February", "At the time of change" translated by M. Suboy, in the 10th-11th issue of 1926, Bayish translated the story of Y.Zart "Mirob", The story "Xun-chi-fu" from Chinese life, translated by Z.Usmani in 3-4 issues of 1927, in the issue 7-8, 1927, the story "Duoxon" based on the Russian translation by M. Suboy, in the same issue M. Gorky's works "Interests" translated by Y. Omon.

Artists such as Makhmud Suboy, Cholpon, Erkin, Kh. Nuri were active in the field of literature in translating samples of foreign literature into our native language. Especially in Cholpon's translation of R.Thokur's story "Suba"², Lermontov's poem "Debate", translated by Erkin³, the story "Stipan Razin" translated by M. Suboy⁴ and the protagonists of the "Xun-chi-fu" stories

from Chinese life translated by Z.Osmani did not leave the readers indifferent with their textual will, worldview and patience in the trials of difficult times⁵.

The first research on Robindranath Thokur was conducted by Abdulkhamid Cholpon and Abdurauf Fitrat in the early twentieth century. His eight-volume work (1958-1965) was later published in Uzbek. Robindranath Thokur's novels and short stories by Sharif Talib, Odil Rakhimi, Tokhtasin Jalolov, Amina Rajabova, Kodir Mirmukhamedov, S. Khudaiberganov, S. Abdukakhorov, A. Isroilov, poems by Mirtemir, Maksud Shaykhzoda, Shukhrat, Shukrullo, Jumaniyaz Jabborov. It is known that it was translated by artists such as Erkin Vakhidov and Yusuf Shomansur and presented to students.

In particular, Cholpon's research on Thokur's work is important in the development of twentieth-century literature. Cholpon had a great respect for the work of this Indian writer. In an article dedicated to him, The "Great Indian" writes: "I will tell about my pathless: Navoi, Lutfi, Boykaro, Mashrab, Umarchan, Fuzuli, Furkat, Mukimi: same, same, same! The mind is something else - looking for something new; Botu, Gayrati, Altai, Elbek, Jolkinboy: It's just fun! They are false lights for me, but for my tomorrow! I don't read Avloni, Tavallo, Siddiqi and Hakimzoda, I don't read them: they are the ones who put me in this situation!... It was in this situation that the great man came to me. After that, I really bled! Although my hands were shaking, my heart was pounding, and I was not strong enough, I wanted to introduce to my people that "golden bridge between east and west. More than that, I really can't do it. All I could do was translate some of the blessed man's poems into Russian through prose. That's a big deal"⁶. Apparently, Cholpon is a proponent of innovation in literature. The poet was inspired by the works of modern intellectuals and tried to acquaint students with the works of foreign writers. In Cholpon's issue 11-12, 1925, he published an article entitled "Tagur and Tagurology". The article notes that Thokur read the first information about his Nobel Prize victory in 1913 in the magazine "Shura" and brings to the readers' attention a translation of Thokur's poem "Hey, passenger girl"⁷.

In Suba's story, "In Chandipur, Bonikatno had three daughters, the youngest of whom was Subashini (sweetheart)". In short, he was called Suba. She was a beautiful girl, but she couldn't talk. The girl's sisters have already got married. Father understood his daughter well and was kind to her, but the mother considered her an insult to herself. The girl was sitting under a Tamar tree on the banks of the Bengal River, talking to a mute nature like her. Khussain's son Pratap also used to come here to fish. Suba helped him catch fish and cook from the vegetables he brought. Both get used to each other. Unable to bear their neighbours' gossip about Suba, Bonikatno and his wife take their daughter Suba to their home in Calicutta. At their last meeting, Pratap said: "Your parents have found you a husband. You're going to Calicutta. You wouldn't forget me", -said and was upset from Suba. Despite her weeping, they made her marry to Calicutta. Because of Suba's dumbness in the husband's house, no one talks to him. After some time her husband brought a new wife.

Robindranath Thokur's story "Suba" describes the tragic fate of women. His stories such as "Account", "Mokhamaya", "Notebook", "Judge", "Sister" are also on this topic. A similar theme of women has been mentioned in Uzbek literature by many writers⁸. In particular, Cholpon's story "Tulip in the Snow" describes the fate of Sharofatkhan, who is only seventeen years old. In addition, Zebi, the characters of Cholpon in the novel "Night and Day", the baker girl, in the stories "Baker Girl", Unsin in Abdullah Qahhor's story "Horror" are similar to Thokur's

characters Uma, Subashini, Khiroda and Shoshikola. Problems such as early marriage, wedding customs, mother-in-law relationships, and illiteracy are still relevant today.

Robindranath Thokur's stories deal with many of the social, moral, and Indian traditions of the Indian people. If they openly express their hatred of the evils of human nature, such as hypocrisy, cowardice, cruelty, greed, immoral customs in society, violence, injustice, the age-old divisions among the people, feelings of sympathy, pity, kindness to ordinary, simple, honest people, their worries and problems.

Lermontov's poem "Debate", translated by Erkin, describes the debate between the two mountains, Kazbek and Elburs. The old man looked at Elburs Kazbek and said, "People are coming and climbing on you and building a house. Do you know what they mean? You must not build a house for them, they must not strike your valleys with axes, they must not stab you in the chest in search of gold, they must not build roads, they must not let caravans pass through them. You know, they're cunning, especially the people of the East. " In response, Kazbek said: "Do not be afraid of the East, because for 900 years it has been quiet, a drunken Gurju pouring alcohol on his clothes, Tekhran leaning on his pillow with the pleasure of a colony, the god-burned (hot) land Jerusalem is silent, the Nile River in the distance, pyramid stones were mined. They are counting the stars, reminiscing and enjoying the quiet times of their ancestors. The old East is over, it can't be compared to me." Elburs, on the other hand, told him he was very proud. Suddenly there was a commotion, a commotion in the Urals, an explosion of the Dun River, and an army of white crowns. Fire broke out and drums began to attack the East. Kazbek was upset and looked to the east. He put his cap on his head and kept calm forever.

The Caucasus Mountains are a mountain range at the crossroads of Europe and Asia. The most famous peaks - Mount Elbrus (5642 m) and Mount Kazbek⁹ (5033 m) are covered with permafrost and glaciers. The highest mountain in the Caucasus is Elbrus. Mount Elbrus, with two crater peaks, was formed millions of years ago. Mount Kazbek is located on the border of the Kazbegi district of Georgia and the Republic of North Ossetia in Russia. There are many stories and legends about these two inseparable friends - Elbrus and Kazbek - in the folklore of Russia and other countries. In one of them they were always on the battlefield and in a merry feast, that Elbrus was strong and wise, and that Kazbek was a handsome young man, that no one could defeat them and allow them to attack their prey, but the enemies found a way to do so, telling the curious and young Kazbek that his friend Elbrus had slandered him and was laughing at him. Then the confident Kazbek began to distance himself from his loyal friend¹⁰ and their relationship has been torn apart, and in the second it is said that Elbrus and Kazbek were father and son, and everyone envies their greatness and grandeur, that they were in love with a girl named Mashuni, Elbrus sent his son Kazbek to war and forced him to marry Mashuni, curious Kazbek killed his father, then stabbed himself in the chest with a guilty conscience, Mashuni is said to have suffered greatly from these events.

Of course, this theme is not left out of Lermantov's view, and the poem "Debate" is created. In the play, the language of the Kazbek Mountains shows that the eastern countries have been in turmoil for many years, lagging behind in development, spending time in drunkenness instead of moving forward, and even the mighty Nile, where the pyramid stones were mined, is silent, peace and prosperity, novelty and that no one is fighting for progress, that the east is old, that the war is still going on, is illuminated with a peculiar sad passion. In the poem, the poet, who always lives with the pain of the people, is clearly expressed.

As a poet, prose writer and artist, Lermontov made a significant contribution to the development of Russian culture and literature. In his works, he sang the ideas of freedom and patriotism. In this sense, Lermantov's works have always fascinated Uzbek translators.

Among the translated works in the magazine "Education and Teacher", the story "Stipan Razin" translated by M. Suboy attracts the reader with its interest and relevance. Translator Makhmud Suboy has appeared in almost all issues of the magazine with excellent translations. Without this creator, the translation in the magazine would be meaningless. In the 6th issue of the magazine in 1927, the editors gave a biography of this artist under the title "The true friend of our magazine", noting that the editor of the magazine was pleased with the translator and concluded: "Makhmud Suboy is a real fan who has been actively working since the founding of our magazine"¹¹.

For some reason, very little is known about this artist. Makhmud Suboy co-authored with the representatives of Jadid literature and contributed to the development of our literature with his translated works and scientific articles. Because he studied in Turkey, his articles imitate the works of Turkish artists. He used the nickname "Semurg" in his articles. He was not among the victims of repression. If he had, his life and work would have been studied.¹²

In Russia, the situation of peasants and the urban population deteriorated en masse as a result of the increase in taxes caused by the wars with Poland (1654-1657) and Sweden (1656-1658). As a result, the story of "Stepan Razin" describes the tragic situation and uprising of Russian peasants during the reign of the Ramonovs in Russia in 1670-1671. The peasant uprising is led by Stepan Razin. Razin defeated the king's army and captured the cities of Astarkhan, Saratov and Samara. Land title deeds will be destroyed. Razin's army was defeated near the city of Simbirsk and he fled to Don. He is captured by his friends and handed over to the government. Hundreds of thousands of peasants will be executed to quell the rebellion and take revenge. In public, Razin was first punished and then beheaded.

Makhmud Suboy does not specify the author of the story. "Russia has played a significant role in the history of the revolution, and since then it has been part of folk literature and music. There is a lot in Russian folklore about this event and Razin. We moved one of them here."¹³ he said.

The protagonist of the story is Razin Stepan Timofievich (1630-1671), leader of the Peasants' War against landlords and serfdom in Russia, Don Cossack. He was betrayed by the Cossack chieftain (aksakal) to the tsarist government. He was executed in Moscow¹⁴. Stepan Razin's uprising shows the causes and consequences of the disintegration of Russian society at that time, and the need for reform in Russia.

Among the translated works, the story of "Xun-chi-fu" from Chinese life, translated by Z.Osmaniy, has a special relevance. He can't help but feel sad for Xun-chi-fu, the old Chinese man and his complicated life as he reads the account. We are confident that such individuals exist.

The story is about the miserable life of an old Chinese man named Xun-chi-fu. From morning till night, Xun-chi-fu pulls a chariot of wild Europeans for a loaf of bread and half a bowl of soup. After his beloved son Li was executed by European tyrants, the old Hong-chi-fu has to be put in a chariot. As a gesture of sadness for his son who was slain at the time, he places a circular white object on top of his cap. He gave his son to an Englishman named Mr. Astik from an early age. He was a tyrant who caused a lot of problems for Lee. Lee cried out at first that he won't work

here, but when his father ignored him, Lee eventually became a silent child. His mother passed away one day. His father rushed to Astik's residence and informed him of the situation. Astik beat Hun-chi-fun in spite of pleas that he entered his house without allowance. Lee used an ax to hit his master Astik in the head and cut off one of his ears, unable to withstand his father's harsh beating. Astik then accused Lee of cannibalism, tortured him to death, intervened with the government, and had him murdered by executioners. Astik gets into his automobile one day while standing next to a European club. It's raining, and walking is difficult. Astik pushes him with his cane and beats him when he is tired and wants to relax for a while. Hun then became enraged and proceeds to walk down the street to the river. Then he went upstairs and down to the river with his cart. The cart swiftly plunges into the river, and Astik is knocked unconscious. Astik has fully left China.

Imperial powers (the United Kingdom, Germany, Austria-Hungary, France, Japan, the United States, Russia, and Italy) intervened in China and captured Beijing in August 1900. The "Final Protocol" between foreign countries and China was signed on September 7, 1901, transforming the Sin Empire into a semi-colonial state.¹⁵ The Chinese people had many problems during this time, which lasted until 1912. The narrative of "Xun-chi-fu" exemplifies this point.

Ziyo Osmani, the story's translator, co-edited at the "Bukhara Akhbori" newspaper with A. Fitrat, Cholpon, and Said Akhrori, which was a tribune of the Jadids and fought for national independence and bourgeois-democratic changes in the country, and was repressed on charges of nationalism between 1920 and 1923¹⁶. Ziyo Osmani, a thoughtful son of his day, was engaged in the press with his translated works like "The New Uzbek Alphabet Was Welcome"¹⁷ (No. 6, 1926, p. 39). The author, whose name is unknown, does not appear to be uninterested in the author's work.

In the late XIX and early XX centuries, the socio-political, spiritual, and enlightenment literary developments in Uzbekistan were crucial times in the history of Uzbek literature. The country's and people's biggest tragedy - the loss of their freedom as a nation and a state - had a tremendous effect on the intelligentsia's psyche, yet true artists' spirits were not broken during this period of depression. There was a growing interest in the literature and art of brotherly and foreign countries as fresh, timeless works appeared around the world. The art of translating has progressed over time. Translation has been proved to be the most essential mode of interethnic communication. Not only was the literature and art of other countries studied through translated works, but also their way of life, history, economy, and daily life. There has been an increase in interethnic friendship. Of course, the publication "Education and Teacher" plays an important role. The "Western Literary" and "Literature" sections of this magazine published works and articles translated from Russian, English, Chinese, Turkish, Azerbaijani, Tatar, and Tajik languages, which played a vital role in the development of Uzbek literature in the 1920s and 1930s. The above-mentioned and examined translated works are clear evidence of our point of view. In general, this publication is one of the most important sources for early twentieth-century Uzbek periodicals, history, literature, education, and culture.

REFERENCES

1. F.Nuriddinova "Jewels of Turan". Tashkent. A classic word. 2019. P.219
2. <https://uz.wikipedia.org/wiki/Xitoy> "The history of China"

3. <https://uz.drunkentengu.com>
4. <https://pro-fishman.ru>
5. <https://qomus.info>> cat-b>
6. // Education and Teacher, December 1925, Issue. 9-10, pp. 79-86.
7. // Education and Teacher, January 1925, Issue. 11-12, pp. 85-89
8. // Education and the Teacher, July, 1926, Issue. 5, pp. 29-30
9. // Education and the Teacher, March-April 1927, Issue. 3-4, pp. 25-28
10. // Education and Teacher, October, Issue 7-8, 1925
11. // Education and the Teacher, July, Issue 6, 1927, p.27.
12. // Education and Teacher, July, Issue 5, 1926, pp. 29-30
13. O'z.ME. Tashkent. State Scientific Publishing House, Issue 10. 2005. p 431.
14. From an interview with Professor Naim Karimov on this topic.
15. [Uz.wikipedia.org/wiki/Kavkaz tog'lari](https://uz.wikipedia.org/wiki/Kavkaz_tog%27lari)
16. Z.O.Kenjayeov. "Science and Education" Scientific Journal October 2020 / Volume 1 Issue 7.



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‘LISTEN TO ME PLEASE!’ –A CLARION CALL OF NATURE FOR RESCUE: AN ECOCRITICAL STUDY ON DR. INDIRA GOSWAMI’S THE MAN FROM CHINNAMASTA

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ABSTRACT

From time immemorial the affinity between man and nature was inextricable. Man and nature protected and nurtured each other to safeguard and nourish mankind. The ecological and the cultural dominance the Whites had over the third world countries are referred to as ‘Eco – colonization’ of the natural world. The Man From Chinnamasta explores the issues of ecological malpractice and questions mankind on the issues related to rituals and devotion at the detriment of ecology. It also reveals the Whiteman’s dominance over nature and the resources. The study focuses on the concept of the ‘Other’, the cruel strategies the whites employed to ‘other’ man power, poor peasants, ecology and the natural resources alike. The protagonist, the Jatadhari, holds a pragmatic opinion on the subject of sacrifice and offering. From an ecological perspective, the novel lends occasion to explore the bond that nature and this hermit shared. The clarion call to save ecology gives birth to a new canon which discards the centuries-old practice of butchering animals. His perspective towards offering acts as a catalyst that welcomes new modifications. The Jatadhari is bestowed with the sense of living in harmony with our ecosystem. The environmental crisis happening around us is a result of man’s detachment from the natural world. The present study employs an Ecocritical approach that strives hard to bind the scholars and critics, to show the significance of nature to the human world. It is an investigation of the relationship between each other.

KEYWORDS: Anthropocene, Voice, The ‘Other’ Ecocriticism, Green Studies, Eco Colonisation, Postcolonialism

INTRODUCTION

In the prehistoric period, the affinity between man and nature was inextricable. Man protected and nurtured nature so that nature might guard and nourish the human race. But with the arrival of new philosophies and expeditions, both man and nature took their own path. With the advent of colonization, the ecological resources were exhausted for gain. European civilization grew more and more anthropocentric and bolstered their egotism believing that they were not only the best of God's creation but are the monarchs of the whole world. The present study aims to emphasize on the environmental crisis and global issues arising from the exploitation of the natural world from a post-colonial perspective.

The voyages of Columbus and Vasco da Gama emphasize the merging of commercial and financial interests, (religious) ideology and belief, military force and political cunning. "... already during his first voyage, we may discern in Columbus the germs of the idea for violently subduing the native populations to grab their riches: the horrific genocide of the "Indians" is quick to follow". (Prasad 4)

It can be concluded thus that the means by which the colonists became supreme were through expansion of territory, coercive violence, and ruthless exploitation be it the colony, man-power or natural resources. The work *The Beginnings: Ecology and Eco-Criticism* discuss the relationship that living and the non-living beings owe to their environment. The ecological and the cultural dominance the Whites had over the third world countries are referred to as 'Eco – colonization' of the natural world. As a result, ecocriticism arrives with the promise of offering a unique combination of literary and natural scientific discourses.

In Dr. Indira Goswami's novel, *The Man from Chinnamasta* the interconnection between nature and culture is analysed. Ecocriticism believes in 'constructedness' which includes the idea that "everything is socially and linguistically constructed" (Barry 243). The "outdoor environment" overlaps and gradually moves from nature to culture." (Barry 243) Religious and cultural obligations should maintain this interconnectedness. Goswami tries to bring both nature and culture face to face to eliminate hindrances that try to distort this connection. Ecocriticism mainly concentrates on how literature interacts with and participates in the entire ecosphere.

Thomas K. Dean in his paper "What is eco-criticism" asserts that, the ecological crisis are a result of humanity's cessation from the "natural world, brought about not only by increasing technology but also by particularization; that is, a mentality of specialization that fails to recognize the interconnectedness of all things." (Dean 5)

The Man from Chinnamasta deals with the issue of animal sacrifice. The novel was written in the yesteryears where white imperialists ruled Assam with their headquarters in Gauhati, the capital of Assam. The study focuses on the concept of the 'Other', the cruel strategies the whites employed to 'other' man power, poor peasants, ecology and the natural resources alike. However, the present study focuses only on ecological 'Othering'.

The independence movement was fast gaining ground. The white men were growing cautious. Volunteers were prepared to lay down their lives for the motherland. Mahatma Gandhi had launched a war of emotions where moral issues took the place of bullets. (TMC 146)

Assam was populated with white sahibs enjoying the pleasure of hunting birds and rehearsing their shooting skills. Plummeted cartridges, stray bullets fallen here and there, trees with holes

made from pleasure shooting and hunting was a common sight. "The path was littered with empty cartridges. They were clear indications that more and more white men were coming here for rifle practice"... "Another aimed his rifle at a grapefruit..." (TMC 46) Herons and cranes falling by the target of the White shooters during the rifle practice was not something amusing to the local people living there, "... Just then a large crane fell from the sky at the jatadhari's feet. It had been hit by a stray bullet. The students shouted, "We *must* ask the White men to move their shooting range. Gently the Jatadhari lifted the dying crane and cradled it to his chest ..." (TMC 53) John Simon's visit to Assam created excitement among the people. "The Gandhi topi was becoming popular around that time" (TMC 144). The cry for *Swaraj* was at its crest. The novel is sandwiched between the demand for Swaraj, the growing capitalist consumerism and banning of animal sacrifice. However, the present study deals only with Ecocritical perspectives in this novel.

"The Orient is an integral part of European *material* civilization and culture." (Ashcroft 24) Taking 'Culture' as its stance, the study extends to support the ecological crisis prevailing at rampant based on cultural and religious background. An illustrious account of the mighty river Brahmaputra is delineated whose tide rises and falls with the sharp tenor of the novel. The breath taking imagery of the mighty sea 'draped dappled white' (TMC 64) acts as a spectator, at times roaring with tumult or at times tranquil and sedate. Dr. Goswami's deliberate use of the botanical terminologies for plants, flowers, birds, reptiles, creepers, and trees makes it an authentic ecological survey which not only studies the theme but also teaches the reader new terms of the flora and fauna of Assam.

Hunting had been a popular sport among the whites. Shakespeare's evergreen quote best fits with the white's mentality: "Like flies are to wanton boys, are we th' gods/ they kill us for their sport". (Shakespeare 136) Seeing the severed marks on the trees Dorothy exclaims, "What are these marks on the trees? ...Targets for the white man's shooting sessions. Here are the empty cartridges ... The wood apple tree has been wounded!" (TMC 172) Many officers along with the officials "of the East Bengal Company and the government of Assam were hunting here". (TMC 28) The frequent visitation of the Sahibs from "the Steamer Company cycled up at dawn for target practice' and eventually 'Many trees had been felled". (TMC 28) While practicing, "the bullets often missed their targets and hit the nests of tokoras or barhoitokas. Sometimes they got a flapping dhanesh. On occasion a bird dropped from the sky, landing in the midst of the jatadhari's congregation". (TMC 29) Apart from these, the flora and fauna of the land are not left untold.

Dr. Goswami's frequent reference to moss, vines, flowers, creepers and varieties of grass makes it a real display of assorted species of shrubbery. "... tender sprigs of durba grass, blood red hibiscus flower, Sandalwood ". (TMC 6) Images of the "chirping bulbuls, the chattering monkeys and the first flickers of dawn in the eastern sky" (TMC 7) fill her pages. She describes the monsoons with brevity as,

... the trees had closed in. the sculpted crowns of the bheleu trees were heavy with green blossoms. Gulmohar and moroi were in full bloom. The stalks of the bhatghila, were pregnant with seeds – like eggs in a lizard's belly shown up by the sun. the round gandhosoroi leaves shone like coins stamped with the queen's seal. (TMC 135)

The most important character, the humble hermit Jatadhari becomes the redeemer and liberator of animals. Nature trusted him as her savior. His matted dreadlocks were a safe haven for snakes and reptiles. “A strange poisonous snake twisted happily around his matted locks”. (TMC 30) Intricately coupled with postcolonial issues and religious sacraments the present research studies the same novel with an ecocritical perspective. The step taken by the hermit is a noble attempt to preserve the ecosystem which is ‘Othered’ at various levels. Here orthodoxy and religious practices ‘others’ the ecosystem.

Unlike the fanatic hermits, the Jatadhari though a passionate devotee of Ma Chinnamasta is aware of the flimsy line that demarcates devotion from fanaticism. Keeping himself within the yardsticks of religious taboos, the Jatadhari holds a pragmatic opinion on the subject of sacrifice and offering. The novel narrates an incident where a woman came with her child “fearful that some inauspicious star would cast its evil spell on her son who had played football with the skull”, (TMC 25) The Jatadhari consoles the troubled mother by giving a logical solution, “... there is nothing to fear. What proof have you that it was a skull from a sacrifice that was accepted by the goddess?” (TMC 27) His interpretation is reasonable and justifiable. He adds saying that the days of ancient writings and beliefs have changed and it is ridiculous to follow them blindly.

Can anyone today stand for a whole day and night before the Mother, holding an oil lamp in the severed head of a sacrificed buffalo? The sacred bowls in which blood and lotus flowers were offered to the mother have all disappeared. (TMC 26)

Deep ecology has stressed on the link between listening to the nonhuman world and reversing the environmentally destructive practices modern society pursues. There is a need to establish communication between human subjects and the natural world. Gary Synder in her work *The Practice of the Wild* rightly opines that leading an ethical life with our surroundings will reduce contentions. (Synder 22)

Pertinent to the above concept the deep ecologist in Goswami strikingly narrates the bond that nature and this hermit inextricably shared. Nature is projected as confiding in the ascetic’s idealistic belief and devotion. They cry out for redemption from this cruel practice forever. His pragmatic perspective itself is a call for ‘change’. The narration speeds vigorously with the surging flow of the river Brahmaputra.

On seeing the trees wounded with bullets the Jatadhari exclaims with grief, “The wood apple tree has been wounded”. (TMC 172) In the words of Gary Synder in her work *The Practice of the Wild*, “The world is not only watching, it is listening too”. (Synder 22) The greatest flaw in human nature is to neglect mother-nature and its boundless service to mankind. The attitude they have towards nature and “... its treatment is literally sickening, unethical, and a source of boundless bad luck for this society”. (Synder 22) In relevance to the above context, as Christopher Manes in “Nature and Silence” from *The Ecocriticism Reader* opines that — “In addition to human language, there is also the language of birds, the wind, earthworms, wolves, and waterfalls-a world of autonomous speakers whose intents (especially for hunter-gatherer peoples) one ignores at one’s peril” (Manes15), similarly the novel records various narrations where nature seems weeping at times with the poor animals that are kept ready to be hacked. River Brahmaputra is witnessed roaring with surging waves hitting the shore. When Bidhibala’s

buffalo was made ready to be butchered, “The Brahmaputra roared ...Without warning a large owl hooted in the mango tree.” (TMC 103)

The Jatadhari brings a new canon which discards the centuries-old practice of butchering animals. His perspective towards offering acts as a catalyst that welcomes new modifications. The main subject of the novel lies in the process in which animal sacrifice was banned in the Kamakhya temple. The ascetic devices a movement, fixes the “date, time and the auspicious moment ...” shouting “Ma ... Ma ... Ma! Cast off your blood stained robes ... adorn yourself in garments of flower ...” (TMC 53) A memorandum against animal sacrifice being submitted to the high priest creates a raucous situation in the vicinity. A strong union of students from Cotton college, Tol ... all assembled to fight tooth and nail against this practice.

W.M. Adams in the work *Green Development Environment and Sustainability in the Third World* in *Countercurrents in Sustainable Development* talks about the “impacts of environmental degradation that are socially and spatially differentiated: they may end up affecting the global environment, but first, they damage small parts of it”. (185) The Jatadhari is bestowed with the sense of living in harmony with our ecosystem. Both the creator and its creation lie in one accord which cannot be divided. God being the absolute creator of this cosmos will be hurt seeing His own creation in the form of animals being mercilessly butchered. With ample quotes from the ancient scriptures, University journals and government documents the Jatadhari gives an enlightening insight into this thought: “Listen. O faithful, just as our mothers want us to live and be happy- so does the Goddess Kamakhya want her children to live and be happy”. (TMC 151) The Jatadhari claims:

The mother has never said that she would reduce the earth’s abundance to ashes if she were not offered blood’ ... Everyone joined in,

A House of flowers. The finest offering!” ...

He continues:

... The status of flowers is higher than blood. The sacred texts state that the goddess is satiated for a hundred years with the blood of a single buffalo. The same writings also claim that an offering of one Karabi flower can earn the devotee the virtues of the most arduous Yagna, the Ashwamedha or horse sacrifice. (TMC 128 – 129)

The devotees chorused:

Throw out the blood. Worship the goddess with flowers. Ma ... Ma ... Ma! (TMC 129) The disciple’s joined them: “you can earn greater blessings by offering flowers than by offering blood”. (TMC 130)

The subject in this novel is not about hindering one’s devotion in worshipping the goddess. It is only the gruesome practice of shedding animal blood that is put to question. Extending various alternatives, the students from Tol including youths and scholars explain to the priests about, “the scriptures offer alternatives to sacrifice. We can also please the Mother with honey, milk, and yogurt. It doesn’t say anywhere that the rituals cannot be performed without blood”. Despite the tremendous effort, the opposition was headstrong. “O Ma Durga! O Ma Durga! We cannot change what has been practiced for thousands of years”. (TMC 57) and threatened the students about the Mother’s wrath.

Deep Ecologist Lawrence Buell in *The Environmental Imagination* says that “human behavior is not an empty vessel whose only input will be that provided by culture, but is strongly influenced by genetic orientations that underlie and modify, or are modified by cultural influences” (Buell 3). Religious rituals are an inextricable part of the culture. Animal Sacrifice is a religious act offered by the devotee to Ma Chinnamasta. As Lawrence Buell opines, human behavior is dependent on cultural modifications as only such changes will lead to the harmonious existence of the society; likewise, the Jatadhari’s deep ecologicistic zeal tries to create harmony with nature by discarding all hindrances that intimidate or cause threat to the ecosystem.

The term “Gift Economy” used by Gary Snyder in work *The Best Buddhist Writing* pronounces the words of Gandhi who says that, “For greed, all of the nature is insufficient”. (Synder 39) It is high time that something should be rendered back to nature for all her benefits bestowed on mankind. According to her, a gift economy is that which “saves the world instead of depleting and devouring it”. In this context, the role of a writer is of paramount importance: “Art takes nothing from the world: it is a gift and an exchange. It leaves the world nourished”. (Synder39) Dr. Goswami’s acute sensitivity and empathy for mother-nature are a “Gift Economy” in its real sense. She tries to ‘save’ the depleting cosmos from perdition by reconciling both the human and the non-human world. Like a crusader, she comes to nature’s rescue with her compelling narrative and infinite vision.

As the collection of signatures grew higher, the Jatadhari who was ‘Othered’ by the other priests for accomplishing this mission along with his followers were taken into custody. Stones were pelted at the doors and windows leading to injury. Few students were admitted to the hospital. The procession commences with the Jatadhari at the lead demonstrating, “... respectful of all creatures... Man is God’s creation. Man has many things to learn from animals. Only when men and animals live in harmony will the world become a paradise.” (TMC 180)

God is personified in nature and also resides in them. The wood apple tree that has been wounded appears to him as, “the embodiment of Shiva’s matted tresses ... And the three leaves of the wood apple tree are the three Vedas – Rig, Yajur and Sama.” (TMC 172) Nature itself manifests its cooperation in this protest. Snakes and birds ‘encourage’ the hermit not to give up the quest. As the procession progresses, “a venomous serpent riding in his dreadlocks (TMC 181) had rested in his matted locks. Wild birds had perched on his arms”. (TMC 181) It appeared as though nature too had come with the same petition imploring humanity to be more loving and sensible to sustain Mother earth. Being ‘othered’ for this noble purpose, Chinnamasta Jatadhari was yet steadfast in his command crying “carry on”... “Move along, move along” (TMC 182) reverberating across the nook and corner of the shrine. It would be worth adding the opinion of Gary Synder who in *The Practice of the Wild* asserts that, “It would be a mistake to think that human beings got “smarter” ... and invented the first language. Language and culture emerge from our biological-social natural existence...” (Synder 18)

The adamant tantric demanded blood from the ascetic’s flesh ordering him to exactly make the incision, “from below the navel or from the back. Blood from the arms or the stomach is also acceptable”. (TMC 185) They insisted hard to cut a part of “your own body” and offer a lotus leaf cup filled with your blood ... a razor, a machete, a sharp knife – you can use any of these. Remember, that the larger the blade, the more auspicious it is” (TMC 185) randomly shouting ‘Now prove it’ (TMC 185).

The sacrificial altar “was drenched in the blood of young men”. (TMC 186) The novel ends with a heavy downpour which, “carried away the raw blood with all the other rubbish and swept it into the bosom of the Brahmaputra. In the light of day, no one could see a trace of blood. Not a single wipe bloodstain remained”. (TMC 186) Dr. Goswami tries to explain the tremendous effort and unity one needs to bring a change in the socio-cultural practices. Nevertheless, after the blood drained from the hermit’s body the novel emphasizes that “Not a single bloodstain remained”. (TMC 186) The hermit’s jeopardized attempt to ban animal sacrifice signifies the dawn of modernity and transition. Therefore, while Goswami exposes the cruel and evil side of the colonialists, she also portrays how certain positive elements percolated even in such an atmosphere of indignity, injustice, and unconcern.

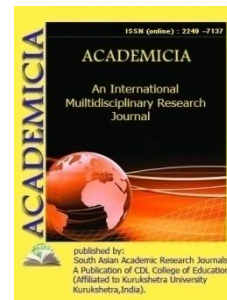
The phenomenon of ‘Change’ can be brought by removing, breaking, and discarding the old and existing ones. ‘Breaking the rule’ being Goswami’s hallmark, she faces tremendous opposition in the issue of animal Sacrifice in this novel. As Greg Garrard in his seminal work *Ecocriticism* estimates about the responsibility of ecocritics that “they must nevertheless transgress disciplinary boundaries and develop their own ‘ecological literacy’ as far as possible” (Garrard 5), Goswami too breaks (deconstructs) certain sensitive boundaries for the greater welfare of the ecosystem.

Ecocriticism explores and critiques the relationship between the humans and the ecology which is severed due to eco colonization. “natural” world has intrinsic value: that we should care for it not simply because this may be of benefit to us” (Adams 49) As man has been continually failing in fulfilling his moral obligation towards the natural environment, the harmony between mankind and nature is disturbed. The fundamental concept of ecology is that everything is interrelated. It is this unified concept that the ecocritics and environmentalists survey. They assert that nature exists as “an entity which affects us, and which can affect, perhaps fatally, if we mistreat it”. (Barry 243)

REFERENCES

1. Adams, William Mark.(2008)Green Development Environment and Sustainability in the Third World in Countercurrents in Sustainable Development. London & New York. 3rd ed., Routledge.
2. Ashcroft, et.al., (1995) The Postcolonial Studies Reader. New York. London. 2nd ed. Routledge.
3. Barry, Peter. (2010) Beginning Theory: An Introduction to Literary and Cultural Theory. New Delhi. 3rded. Viva Books Pvt. Ltd.
4. Buell, Lawrence. (1995) The Environmental Imagination: Thoreau, Nature Writing and the Formation of American Culture. Cambridge.
5. Dean, K. Thomas. (1994) “What is Ecocriticism”. Defining Ecocritical Theory and Practice. Sixteen Position Papers from the 1994 Western Literature Association Meeting Salt Lake. pp 1-18.
<http://www.asle.org/wp-content/uploads/ASLE_Primer_DefiningEcocrit.pdf>
6. Garrard, Greg. (2004)Ecocriticism. London and New York. Taylor & Francis Group. Routledge.

7. Goswami, Indira. (2006) *The Man from Chinnamasta*. New Delhi. Translated by Prashant Goswami. Katha Books.
8. Manes, Christopher. (1996) "Nature and Silence", *The Ecocriticism Reader: Landmarks in Literary Ecology*. Edited by Cheryll Glotfelty, Harold Fromm. Athens & London. The University of Georgia Press.
9. Prasad, Anshuman, (2003) *Postcolonial Theory and Organizational Analysis: A Critical Engagement*. Edited by Anshuman Prasad. New York. Palgrave Macmillan.
10. Shakespeare, William. (2007) *King Lear*. New Delhi. Atlantic Publishers and Distributors (P)Ltd.
11. Synder, Gary. (2007) *The Practice of the Wild*. Berkley. Counterpoint. 1990. ---. *The Best Buddhist Writing 2007*, editors. Edited by Melvin Mcleod, and Shambala Sun. Boston & London. Shambhala Publications, Inc.



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VERBALIZATION OF THE CONCEPT OF FRIENDSHIP IN ENGLISH AND UZBEK

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ABSTRACT

This research examines the semantic and linguocultural characteristics of various English and Uzbek proverbs regarding friendship. The equivalents of some proverbs in a target language are offered for understanding them in the other language in order to discover numerous essential new translation methods and compare and contrast their peculiarities in the English and Uzbek languages. The findings and examples presented in this study can assist in identifying certain differences in the meanings of English and Uzbek proverbs about friendship, as well as learning about their linguocultural uniqueness.

KEYWORDS: Proverb, Verbalization, Friendship In English And Uzbek, Linguoculturology, Cultureme, Pragmatics, Synonymy, Antonymy, Equivalent, Context.

INTRODUCTION

Linguoculturology is one of the most important elements of linguistic research; it deals with a variety of concerns relating to a nation's language spirit and cultural variance, as well as many national-cultural conceptions and conversational structure theories. This branch looks at how a language reflects a country's spirit. It is linked to various fields of study such as philosophy, logics, sociology, anthropology, and semantics, and it encompasses national-cultural knowledge via voice communication.

The focus of this article is on the contrastive examination of proverbs that fall into the third category of this classification. It is self-evident that the emergence and formation of proverbs, as well as their acceptance into real dialogues by the nation, takes a significant amount of time. The languages of English and Uzbek are said to have a long history. The Uzbek language has a rich history as well. True, it was only lately that this language was given the label "Uzbek language," although it has existed since the X-XI century. A large number of proverbs, sayings, and aphorisms are considered to constitute a significant part of Uzbek culture. The main sources can

be divided into the following categories: religious characters and borrowed translations (mainly from the Arab, Tadjik, Persian and Russian languages). Furthermore, some proverbs are derived from sayings made by the media (TV, radio, or social media), film and song phrases, and even commercial slogans in all languages, including English and Uzbek. They do, however, require some time to develop or construct new proverbs.

Concepts and methods

With the use of examples concerning friendship, this article tries to examine the linguo-cultural characteristics of proverbs in these two languages. The concept of "friendship" is an abstract term that is valuable in human life and falls into the same category as "family," "health," "wealth," and "labor." Because of the culturemes that exist in the content of a target language, translating proverbs word-for-word is insufficient to represent the meaning of a proverb in other languages. It may lead to a misunderstanding of a proverb's essential meaning.

To explore the peculiarities of proverbs regarding friendship in different languages, the approach of discovering analogues of proverbs in English and Uzbek was utilized. - Like birds of a feather, they flock together. O'xshatmasdanuchratmaso'xshatmasdanuchratmaso'xshat (They do not meet who do not look like each other). In the English proverb, bird behavior is compared to human friendship, however in the Uzbek proverb, a short sentence form with an unknown subject is employed. It is acknowledged that practically all proverbs belonging to the Uzbek nation have a sentence form with an elliptical subject. In addition, according to the interesting fact that both proverbs, which are given above have Arabic origin (XVI century).

In a language, there are many synonym words and phrases, and proverbs might be interchangeable.

Their meanings are sometimes similar, and they might be used interchangeably in some situations. However, despite their lexical similarity, many synonym proverbs cannot be considered absolute synonyms. Because their expressiveness in their meanings varies to some extent, they are used in different cases and situations – and thus have different pragmatic and sociolinguistic characteristics: some are mostly used in formal (official) situations, while others are frequently used in informal (oral) conversations. Despite the fact that the proverbs listed above have various synonyms, they cannot be substituted in a context because the semantic or stylistic balance would be disrupted. A man is known by the company he keeps. – Do'stingkimliginiayt, seningkimligingniaytaman (Tell me your friend, I shall tell who you are).

According to these proverbs, a man's attributes are defined by the type of friends he has. These two proverbs appear to be semantically identical, but their pragmatic aspects differ: the English proverb is typically employed in more official and literary forms, whilst the Uzbek proverb is typically used in informal speech.. There is no better looking-glass than an old friend. / The eye of a friend is a good mirror. –Do'stachitibgapirar, dushmankuldirib (A friend tells bitter truth, an enemy sweet lie).

According to these proverbs, a true friend gives you the truth even if you don't like it, and they should warn you about your faults or bad character, but adversaries deceive you with beautiful words in order to be liked or find your flaw. The lexeme mirror (= looking-glass) is used in both of these English proverbs. The artistic trick of oxymoron is used in the Uzbek translation of these proverbs (friend – enemy, bitter – sweet). A friend in court is better than a penny in purse. –

Boylikboylikemas, birlikboylik (Wealth is not wealth, solidarity is wealth). The main meaning of these proverbs represents that friendship is more valuable or necessary than money, it is real wealth. The existence of the cultureme "penny" proves that it belongs to the English nation.

Compare and analysis

In the English culture, friendship is compared to money, and it is said that friends are better than pennies; in the Uzbek society, friendship is equated to genuine wealth. It is beneficial to have friends in both heaven and hell. – *ishingosonbitadi, do'stingyoningdabo'lsa*. (You fix your difficulty quickly while your friend is with you.) Because of the culturemes "heaven" and "hell," which are both religious words and semantic opposites, the English proverb has a powerful expressiveness and impressiveness (antonyms). The occurrence of these words exemplifies the proverb's linguocultural and pragmatic idiosyncrasies. The proverb in Uzbek has more simple structure and literal meaning in comparison with the English one that owns figurative meaning. Be a friend to thyself and others will befriend thee. – *O'zigaboqmagan, o'zgagayoqmas* (If one does not pay attention to himself (his character or behaviour), others do not like him).

To summarize, proverbs have become an important component of the English and Uzbek languages. They differ from one another in terms of semantics, structure, style, and even pragmatics. Many flaws in a nation's culture are addressed in Proverbs. The purpose of proverbs is to characterize, identify, and reflect the culture of the language in which they are found. National concepts, items, attitudes, traditions, well-known forebears, and even place names — cultural points – can all be found in a language's paremiologic fund. Proverbs in English and Uzbek connected with the theme of "friendship" represent a nation's attitude, culture, and customs, and play a significant role in the language of the country. In both languages, proverbs about friends are various, besides synonymous or antonymous proverbs can be found among them. Friendship proverbs can be found in both languages, and they include both synonymous and antonymous proverbs. However, because they are chosen according to a context, their synonymic and antonymic relationships are not considered absolute, and their meanings may be slightly altered as a result. As a result, using a proverb in the right context makes a speech clear and fluent. Because, as previously said, proverbs are frequently employed in speeches and are chosen based on time, place, circumstance, and other pragmatic aspects. Furthermore, society and social processes have a direct impact on proverb usage, semantic expressiveness, and other characteristics.

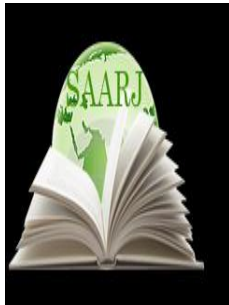
CONCLUSION

The process of translating proverbs from one language to another necessitates more than a componential or structural approach; it is vital to convey the target proverb's fundamental meaning precisely in the translation. The paper's principal finding is that there are significant semantic, structural, and stylistic parallels between English and Uzbek proverbs about friendship, as well as many variances. However, there is no similarity between the linguocultural features of these proverbs in these languages. Because, according to the genetic classification of global languages, they are not relative languages. Furthermore, every nation has its own culture, tradition, and, of course, culturemes that represent aspects of that culture in the language of that nation. These culturemes supply proverbs with unique semantic and linguocultural characteristics. In light of the foregoing, it's worth noting that proverbs contain social behaviors that can be seen in a real or hypothetical society. Furthermore, because a language develops from

day to day, the number of proverbs in it changes as well; certain proverbs may fade away, and people may begin to employ new proverbs in their talks.

LIST OF REFERENCES:

1. Gotthardt H.H., Varga M.A. (eds.) Introduction to Paremiology: A Comprehensive Guide to Proverb Studies. Berlin: De Gruyter, 2014. P. 2-10.
2. Yusupov U.K. Contrastive Linguistics of the English and Uzbek languages. Tashkent: Akademnashr, 2013. P. 27-28.
3. Cruse D.A. Lexical Semantics. Cambridge: Cambridge University Press, 1986. P. 25-38.
4. Semantic and linguocultural features of English and Uzbek proverbs with concept of friendship. <https://cyberleninka.ru/article/n/semantic-and-linguocultural-features-of-english-and-uzbek-proverbs-with-concept-of-friendship>



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THE ROLE OF VENTURE CAPITAL IN THE INNOVATIVE DEVELOPMENT OF A TRANSFORMED ECONOMY

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ABSTRACT

The article examines the research of a number of scientists on the role of venture capital and innovation in the innovative development of a transforming economy. The innovation activity of enterprises and organizations of Uzbekistan is analyzed. The advantages of venture financing are highlighted.

KEYWORDS: *Innovation, Transformation, Venture Capital, Technology, Venture Financing.*

INTRODUCTION

Uzbekistan's entry into the group of leading countries in terms of GDP, per capita income and many other parameters is impossible without transforming the economy and requires a constant shift in the vector of investors to better use of human knowledge and skills to improve technology, economic outcomes and life in general. does. The Address of the President of the Republic of Uzbekistan to the Oliy Majlis recognizes that our country has entered the stage of innovative development in order to achieve modern progress. "Innovation is the future. We need to start building our great future ... based on innovative ideas. It is no coincidence that we are moving towards innovative development and the digital economy. Because who will win in today's fast-paced world? A state based on new ideas, new ideas and innovations will win. " [1]

In recent years, in the development of economic policy of Uzbekistan, more and more attention is paid to the strategic direction of innovative development, according to which only effective and systematic use of scientific and technological potential of the country can ensure its sustainable economic development. Accelerating the innovative development of the economy is the most important priority of socio-economic development of the country in the long run.

One of the most important and serious problems in Uzbekistan is the implementation of the results of scientific and technical activities. The paradox is that a significant amount of unfulfilled scientific achievements and discoveries have accumulated, and as a result of the physical and spiritual obsolescence of technology in many sectors of the economy, there is ample room for the use of these achievements and discoveries. At present, Uzbekistan does not have a chain of fundamental science - applied research - the real sector. New technologies and discoveries are slowly being introduced into the manufacturing sector, which leads to a decrease in the competitiveness of Uzbek products in domestic and foreign markets. This could have serious consequences, such as the country becoming an outsider in science and technology.

The implementation of innovations, innovations, as well as scientific and technical achievements in the production of new or existing goods, technologies and services is important for the development of the country's economy and improving the living standards of the population; increase labor productivity, create new industries, services and jobs, improve the quality of services and increase the competitiveness of domestic goods in the world market. [2]

The level of innovation activity of organizations in Uzbekistan is not yet high (Table 1), so in modern conditions there is an objective need to transform the economy of Uzbekistan, its transition to an innovative scenario of development.

TABLE 1 INNOVATIVE ACTIVITY OF ENTERPRISES AND ORGANIZATIONS IN UZBEKISTAN, 2018-2019 [3]

Innovations	Number of enterprises and organizations that have introduced innovations, together *		Number of innovations introduced, unit	
	2018 year	2019 year	2018 year	2019 year
Total	1024	1587	2558	4567
Technological innovations	982	1514	2482	4427
Marketing innovations	17	28	42	128
Organizational innovations	25	45	34	13
* Organizations implementing several types of innovations are listed once in the "total" category				

At present, a number of state initiatives aimed at the development of science and technology in Uzbekistan have been developed: “2017-2021 йилларда Ўзбекистон Республикасини ривожлантиришнинг бешта устувор йўналиши бўйича Ҳаракатлар стратегияси”(Action Strategy for the five priority areas of development of the Republic of Uzbekistan in 2017-2021), “2019-2021 йилларда Ўзбекистон Республикасини инновацион ривожлантириш стратегияси” (Strategy for Innovative Development of the Republic of Uzbekistan in 2019-2021), Innovative Development and The Fund for Support of Innovative Ideas was formed, the concept of complex socio-economic development of the Republic of Uzbekistan until 2030 was developed.

The main thing here is the demand for knowledge, the restoration of the country's innovative potential through the development of modern innovative projects, not only the creation of

individual examples of technically complex developments, followed by the development and sale of innovative products for domestic and global markets.

At present, the main transformation processes are mainly associated with the development of technological innovations that act as a catalyst for the adaptation of economies to the conditions of formation of the latest technological order. The peculiarity of today's world economy is that it has a high level of competition in the field of technology and a wide range of opportunities for their rapid transfer. Under such conditions, the formation of national innovation systems as the main mechanism of development has become a key factor in the long-term growth of the world economy. Countries can no longer be passive in ensuring the required level of innovative development; otherwise an unhappy prospect awaits them: dependence on external financial and technological resources makes them the only suppliers of raw materials.

The importance of an innovative approach to economic development is emphasized by many economists.

The concept of "innovation" itself is associated with the name of the Austrian economist J. Schumpeter, who was one of the first to study the impact of scientific and technological progress on the level of economic development in the first half of the twentieth century.

Schumpeter said, "Production is a combination of things and forces that exist in our sphere. The manufacturer believes that it is something else, or in other words, to create other combinations of these things and forces"[5].

In Schumpeter's Theory of Economic Development, the content of innovations is revealed:

1. "Creating new, that is, goods that are not yet known to consumers, or developing a new quality of this or that blessing.
2. The application of a new method (method) of production that is not based on a new scientific discovery, as well as a new method of commercial use of the relevant commodity, which may not exist at all in this industry.
3. Development of a new market for sale, ie a market in which this industry has not yet been demonstrated. It does not matter whether this market has existed before or not.
4. Assimilation of a new source of raw materials or semi-finished products: regardless of whether this source previously existed or was not, or simply ignored or considered unattainable, or whether it should now be created.
5. Appropriate reorganization, for example, by securing a monopoly position (through the establishment of a trust) or by destroying the monopoly position of another enterprise."[5]

Russian economist Nikolai Kondratyev developed the theory of long waves in the 20s and 30s of the twentieth century. According to him, the state of the economic system is subject to periodic fluctuations lasting at least 50 years. At the same time, scientific and technical innovations serve as a factor in the transition of the economic system from one period to another.

Most researchers prefer to divide innovations into technological, management, and product innovations.

It is pointless to argue which of a product or technological innovation is more important from an economic point of view, but it is safe to say that product innovation plays a key role in times of

economic boom or strong demand for a new look for a product. Technological innovations play an important role in the relative saturation of the market, which uses new technological production processes to reduce the cost of production of existing products. [6]

Unlike an existing product or technological process, any major innovation that affects not only the micro but also the macro level has an important feature as a scientific and technical innovation. Different innovations have different levels of innovation, so it is so important to look for its reliable indicators from a scientific, technical and economic point of view. For example, a sharp increase in aircraft speed is possible, but this leads to serious economic losses in return for increased fuel consumption. The true novelty of a product or process must be related to the growth of the economic benefits derived from their use. [6]

Another important feature of innovation is that it represents not a rare one-time event, but a more or less continuous process, a continuous chain from the emergence of a technical idea or discovery to their application to a new technological process, or a qualitatively new product. Between these two perspectives are the interrelated stages of research, development, invention, design, demand analysis, production decision making, and more, culminating in the commercialization of a new product in the market or the economical use of a new technological process in production. [6]

The fact that innovation is a leading role that can be described as a process aimed at creating the best and / or previously non-existent goods (services) and technologies in terms of economic growth is beyond doubt today. As mentioned earlier, the innovation process itself must end with the sale of a product that the market demands.

It is known that large companies receive about half of their income from the sale of new types of products with a shelf life of no more than five years. Industrial companies want to increase spending on research, but are constantly faced with a number of challenges.

The paradox of innovative business is that it is much easier for small businesses to implement new technologies due to high mobility, sensitivity to technological innovations and willingness to take risks; they are not afraid that, unlike large companies, the introduction of a new product may affect the current situation in the market. Large companies often face problems in introducing new ideas and technologies, so in practice they use small innovative enterprises for this purpose.

Thus, effective innovative reproduction is formed on the basis of integration of small and large enterprises, where small enterprises operate in the field of innovation, and large enterprises in the field of investment.

The so-called "corporate venture" model of innovative business is widespread. Under it, enterprises solve their problems of innovative development independently, while the major parent company, which directs resources to the implementation of innovative projects, remains the main investor. If the innovative project is not organized by the parent company, funding is usually provided through a venture fund that is corporately dependent (captive).

Another important factor supporting the establishment and development of small innovative businesses was a significant increase in scientific discoveries and inventions of various research centers. Many scientists and engineers in such institutions began to emerge as entrepreneurs by

setting up small firms to implement their inventions, and this became widespread in foreign practice.

Financing of such small innovative enterprises is carried out mainly at the expense of venture investment technologies. Venture capital is an important source of extra-budgetary funding for research, development and innovation. The share of venture capital in the total investment resources of the world economy is not relatively high, but it is very important for the successful development of individual countries. This is confirmed by the fact that many large internationally renowned companies have succeeded precisely because of venture capital. As T. Perkins, the founder of the Venture Movement, put it, "the money we make is, in fact, a by-product, ... driven by the desire to create amazing technologies that are at the tip of the spear and have to change the world. "

The importance of venture capital for small high-tech firms is explained as follows. Young high-tech firms often fail to succeed in the competitive struggle that takes place through development based on self-financing. Bank loans also cannot be considered as a source of financing for small innovative enterprises due to the credit history of such companies and the lack of sufficient collateral. Moreover, the organizers of such enterprises sometimes do not have sufficient management skills. The function of venture capital is to solve such problems in the development of small innovative enterprises.

The venture investor's funds are used by the company as a unique financial lever that helps small innovative businesses grow and develop rapidly. The company's organizers and venture investors strive not only to achieve high returns, but also to become leaders in these markets by influencing the development of the innovative sector of the economy, creating new directions of scientific and technological processes, creating new markets and achieving innovative monopolies. The growth potential of the company's value depends on the level of innovation, ie the novelty of the project.

Venture capital allows you to commercialize advanced ideas, create new innovative companies and an entire industry, and support existing ones. It plays a huge motivating role by encouraging enterprises to redirect the type of development and stimulate the growth of their scientific, technical and innovative activities. Emerging innovation firms often act as generators in the creation of new technology manufacturers, new types of products and innovative development sources for large enterprises, reorienting their investment and innovation policies, creating the conditions for achieving high competitiveness as quickly as possible.

A number of studies reveal the essence of individual methods using venture capital innovations and new high technologies to encourage the establishment of companies. S. Kortum and D. Lerner analyzed the activities of 20 industries in the United States in 1960-1990 and found that the participation of venture capital leads to an increase in patent activity by 5-18%. Using data on 173 newly formed companies in Silicon Valley, T. Hellmann and M. Puri showed a significant reduction in product launch times for companies using venture financing. [7]

M.Aoki noted another important factor in the participation of venture capital in the popularization of technological innovations. Young high-tech companies in Silicon Valley specialize in developing innovative products that provide the conditions for the emergence of a new chain of value creation. In the context of high levels of uncertainty and competition inherent in modern technology and market development, innovative firms will need to

continuously create and distribute data among contractors that constantly affect all emerging value chains. However, companies need to combine and protect specific data that is critical to their products at the same time, because that alone guarantees them a competitive advantage. This bias leads to an increase in the exchange and distribution of technological knowledge between firms gathered in the Silicon Valley. Venture capitalists play a key mediating role in these processes. [7]

A similar conclusion was reached by P. Robertson and R. Langlue. They argue that financial innovators help accelerate the development of individual companies and disseminate the innovations they implement by building and maintaining broad connections within areas where innovation activity has increased. In addition, the development period of groups of innovative firms from the "established" state to the transformation of large technology clusters before the emergence of venture capital is more than 20 years. [7]

The advantages of using venture financing mechanisms include:

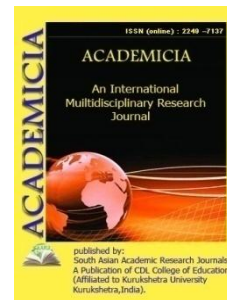
- intensification of the establishment and development of high-prospects innovative enterprises;
- support for high-tech sectors of the economy, especially dynamically developing ones;
- application of innovations in the economy and increase the speed of their spread;
- increase the level of commercialization of scientific developments;
- development of the social sphere (education, health, culture, etc.);
- improving the quality of life;
- Creating new competitive jobs through the development of innovative companies.

Thus, the innovative development of venture capital is manifested as a factor in the structural transformation of the economy. It helps to create a unique investment mechanism of innovative activity that increases the efficiency of the economy as a whole by ensuring the interaction of all links of the "science-production-market" chain. Venture capital is the driving force behind the innovative renewal of the economy, the factor that accelerates its growth.

LITERATURE:

1. Mirziyoev Sh.M. Address of the President of the Republic of Uzbekistan to the Oliy Majlis. - T.2018, pp. 19-20.
2. Gamidov G.S., Kolosov V.G., Osmanov N.O. Fundamentals of innovation and innovation. - SPb.: Polytechnic, 2000. -- B. 15.
3. Uzbekistan in numbers. Statistical collection 2018-2019. State Statistics Committee of the Republic of Uzbekistan. Tashkent 2020. B. 256.
4. Naryshkin S. Innovative component of investment processes // Economic Issues, No. 5, 2007. - B.52
5. Schumpeter J.A. Economic development theory. Capitalism, socialism and democracy - M.: Eksmo, 2007. -B. 132

6. Innovation policy of developed capitalist states. Sat. scientific. works. / Ed. Gvishiani D.M., Gromeka V.I. -M.: VNIISI. 1990. - Issue. 3. - B.5.
7. Sergienko Y., Frenkel A. Venture investments and innovative activity. // Economic Issues - No. 5, 2006. - P. 118



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THE ART OF POETRY IN "GULSHANI DILAFGOR"

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ABSTRACT

This article classifies some of the poems in the "Gulshani Dilafgor" collection. The study of lyrical works in the collection of the poet "Gulshani Dilafgor" shows that Dilafgor could not avoid the themes that accompanied the poets in Uzbek classical poetry.

KEYWORDS: "Gulshani Dilafgor", "kalomi jomi'", gazelle, devon, nat, poem, literary criticism, "tavshih", verbal, spiritual.

INTRODUCTION

The influence of the works of Ahmad Yassavi, Sulayman Boqirg'oni, Fuzuli, Huvaydo, Hazini are felt in Dilafgor's work. Also, most of the poet's poems are in sync with the lyrical works of poets such as Furqat, Muqimi, Hamza, Khislat, Kami, imbued with the ideas of nationalism and enlightenment. He, too, relied on the progressive ideas of his time in continuing the traditions of his predecessors, who had shaken the pen before him. While composing "Gulshani Dilafgor", the poet Dilafgor, like his predecessors, traditionally begins the collection with praise to Allah and praise to the Prophet. The first verse of the verse dedicated to Muhammad (peace and blessings of Allah be upon him) begins with artistically powerful lines such as:

It should be noted that the supreme universe Muhammad (s.a.v) had at first had great difficulty in spreading Islam in his homeland, but later enlightened the Arab world with the light of Islam. Then that pure light illuminated the foreign lands. The above verse also praises the fact that our Prophet ruled Islam in the Arab world like a king, that he was enlightened in other lands, not by himself, and that such a king and such a monk would be blessed. Even one line shows how much potential the poet has.

In the East, lyrical works are important because they are rich in wisdom. Even in poetry bouquets such as "Gulshani Dilafgor", the work of "Be adorned with something like admonition,

wisdom, and time to complain to the brethren” (Badoyi us-sanoyi) is a natural process. Poems like this, which are dominated by advice, wisdom, and the motive of complaining about the brethren of the time, give rise to the art of the “word-of-mouth” art. Dilafgor's:

*Guys, we still can't strive for the nation,
Lying in a bed of ignorance, we still can't open our eyes.*

Or:

*Your life is over, O heart, do not go to bed, wake up,
If you are a king, go to bed early in the morning.*

Or:

*You are a gangster, O tongue, seek the consent of the Lord,
If the Ummah dies, look for the true Mustafa.*

His gazelles, which begin with the mats, are frozen from head to toe with the art of the "kalomi jomi".

The "Mazhabi kalomiy" is one of the spiritual arts, and in prose and poetry it consists of subtle arguments to prove one's point. Evidence can be clear as well as hypothetical. From Navoi's poetry, especially in his gazelles, proof of thought has been used in a variety of forms as a special art.

In the gazelle, the sectarian word is often used within a byte. Evidence is made through various auxiliary words and conjunctions (why, why, because, morning, not strange, not strange, not strange, who, etc.).¹

Dilafgor's gazelle also contain the art of the "Mazhabi kalomiy":

***It is strange** that a sick slave dies when his soul dies.
If you dream, I'll be in my head.*

Or:

*But Dilafgor relationship hopes that he will not cut,
One day, **strangely** enough, he lost his friend.*

Or:

*My labor is on my head, my interlocutor is in pain,
My wonder is my misfortune, my happiness is ink, O God.*

Or:

*My mind is always on you,
Surprisingly, you are hurting the mountain without a blessing.*

In the science of art, “when a poet uses various images or phrases to express his thoughts and experiences, he abandons his previous ideas (phrases, images) in the process of painting, rejects them and replaces them with new images and phrases. The art of “rujo” is born out of the desire

to express new thoughts and experiences in a more powerful way, replacing phrases and images that seem to be incapable of fully expressing their purpose.² It is noteworthy that the art of "rujo" can be found not only in the poems of the poet Dilafor, but also in his "muhammas".

The use of the words or in the poet's work served to expand the possibilities and further strengthen the artistic love:

*When you cry like a madman, your heart bleeds,
When you cry, your tears flood,
Or like a nightingale in the morning,
Please pray for the fairies,
If unkind, the effect of prayer will be rare.*

According to the data, the essence of the art of union is that the poet uses his name or nickname in the poem in such a beautiful way that the lexical and terminological meaning of the word comes to the reader's mind at the same time.³

Given the fact that the word "Dilafor" means a sick heart, a broken heart, an overly sad person, the poet in the process of using the nickname also tries to express those destructive heartaches:⁴

*Dilafor osiymen, oh rabbano, have mercy on me,
I beseech thee, O God.*

Or:

*Posted by Dilafor sadly, if the mistake is forgiven,
Old and young still can't respect each other.*

Or:

*Dilafor is not happy, although he is having a party.
It doesn't matter, you idiot.*

According to the Dictionary of Literary Criticism, "tavshih" (Arabic - "tavshih" - embellishment) is a poetic art in classical literature, the derivation of a word (noun) from a set of letters at the beginning of a verse or byte (sometimes at the border of the tablets). A poem based on this art is called muwashshah.⁵

The poems in the collection "Gulshani Dilafor" belong to a unique genre in terms of expression and content, and the poet has created works in such genres as gazelle, "muhammas, muwashshah, musaddas, tarje'band, chiston and fard", which are widely used in our classical poetry. It is known that every artist creates in harmony with the period, so the signs of the existing system in his works are in some sense subdued. This can also be seen in the work of Dilafor. The collection "Gulshani Dilafor" contains 51 poems of the poet, 23 of which are gazelles. It is obvious that the role of the gazelle genre in the work of the writer is great.

In addition to the above-mentioned arts, the art of talmeh was also used effectively in these gazelles. The arts used in the ghazals, in turn, reveal the inner spiritual world of the artist. This is especially true of lyrical works on religious and philosophical themes.

In conclusion, it is also clear from the above observations how high the poet's artistic skill was. Dilafgor was able to create unique lyrical patterns using the verbal, spiritual, common forms of art used in our traditional poetry. In his lyrics, the poet made extensive and appropriate use of many of the arts typical of our classical literature.

There are a number of types of art in Dilafgor's work. In particular, the "darj" type of art of "quotation" in art adorned the works of the poet. In the poet's work, one of the oldest poetic methods of rhyme, "radd ul-matla'" or "iyto", is used, for example, one of the two types of iyta, iytoyi hafiyy (closed, hidden repetition).

LIST OF REFERENCES

1. Ishokov Yo. Dictionary of word art. - T.: Zargalam, 2006. - . 32.p
2. Dictionary of Navoi works (Compilers: P.Shamsiyev, S.Ibragimov). - T.: G'afur G'ulam Publishing House of Literature and Art. 1972. - . 190.p
3. Quronov D. Dictionary of Literary Studies. - T.: Akademnashr, 2010. - . 298.p



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THE IMPORTANCE OF TRAINING CONSULTATION IN HORSES

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ABSTRACT

In this article, you will have a complete knowledge of the origin of horses, the history of evolution, snake networks, consultations on the stench of horses, training, proper assessment of the ester of body parts, orientation in the right direction according to the position of horses.

KEYWORDS: *Evolution Of Horses, Snake, Training, Equine Ecstasy, Body Parts, Index, Horse Feathers, Phonandus, Brain.*

INTRODUCTION

In order to develop horse breeding, breeding and horse sports in our country, to increase the number of domestic breeds of horses, to popularize modern sports beshkurash and polo, to attract a wide range of foreign investments directly to the sphere, as well as to strengthen the material and technical base:

The following are the main directions of further development of horse — riding and horse-riding in Uzbekistan (in subsequent places-horse-riding), as well as modern beshkurash and polo sports: in the country, the system of turning horse sports, as well as modern five-track and polo sports into one of the most popular sports among the population, selection of talented young people, selection (selection) and training of them as professional athletes is established;

The formation of the necessary material and technical base and infrastructure for horse sports and polo sports, including the development of the activities of horse sports clubs, effective organization of the training process for national teams; Step-by-step introduction of horse sports, as well as modern five-track and polo sports to the physical training of the Armed Forces and law enforcement bodies; equestrian sports, as well as modern beshkurash and polo sports to a level that can compete with developed countries, training specialists on the basis of international requirements and standards, holding world and continental championships among major international competitions, including the youth and women's teams of adolescents;

Agriculture is the most important branch of livestock farming. In the following years, this network has been given wide opportunities. To this day, this sphere was the field of animal husbandry, which remained unnoticed. Horses are fed in the national economy for manpower, sports, product acquisition, breeding and other purposes. The study of the origin of horses, knowledge of horse consults, ecstasy will help them to correctly identify the location of organs, distinguish them into species depending on the breed of horse breeds and appearance, qualified personnel in the same field, otchopars, Equestrian Club and horse sport. Failure to properly orient the horses to the species causes a change in them, losing their natural state of kop, without being able to properly distribute their power, can reduce productivity.

Relevance of the topic

Students, hawkers and other specialists who are now familiar with horses have a great importance in collecting information, equipping horses with the mountain, dividing their appearance, weight and other characteristics into groups with a high assessment of the ecster, moving to the right direction. It is known that horse sports today is one of the most developed areas. As a result, the demand for classic sports horses increases. Horse sports are characterized by beauty, pleasure and curiosity from other sports. To participate in the same horse sport, it is necessary to have information about the training, consulting with him, so that the horses are also obedient, beautiful, healthy.

According to the Zoological classification, a horse, donkey, zebra, a slave and many other ungulates belong to the class of mammals, the category of ungulates, the family of otsimons, the ancestor of horses. the evolution of horses tiny animals originated 50mln years ago from this.

12 has experienced a period. Horse ancestors were animals that looked like a fox or a dog. One of these is the phonandus, which has a body structure similar to a horse, a smaller animal. The horse came from the Wild Horse-tarpan, who lived in Europe, Asia, Africa. Tarpan were first cultivated in the three thousand years before milloan in the Danube and in the territory from the Balkans to the Urals.

The fact that horses can move quickly and walk on hard land was the reason for the formation of hoofs in them. The hooves were first shaped on the hind leg and then on the front leg. Feet uzayishi depends on their rich hanging. At the same time, their brain weight also increased. The horse was domesticated after the donkey, the dog, the sheep. Spread from North America to the continents of Asia, Europe, Africa. Horse sports, horse clubs, farms have been established on all continents in day.

Training, Consultation

Training improves the health of horses, increases endurance, facilitates their adaptation to the environment. Training in general is understood to engage in horse riding, training them, feeding, grooming, walking and other classes. Training begins with a small level, without suddenly starting from a large one on a new toy. From day to day its speed, condition, health is high and levels of anticipation are impressed. Constantly consulted, the breed of horses engaged in training is well and tolerant. The period of their preservation of these qualities was many. The higher the level of training of horses, the more tender it is, the more work capacity is relaxed, the less energy is required than before to fulfill the given norm. In addition, regular training on horses has a good effect on their health, the work of the cardiovascular, respiratory, digestive systems of the heart. Metabolism is accelerated, the central nervous system develops well. The training is not only in distinguishing good horse breeds, but also in increasing productivity in a snake.

There are the following ways of testing horses: a quick chop on four legs, a quick chop on four legs, crossing each homogeneous barrier, with a load on it or with a cart attached. the maximum load increase is to take it to the distance. Training is carried out according to certain rules, depending on the type of horses and the work they perform, age.

Horse consults and excerpts. The sum of the anatomical and physiological characteristics that cause the degeneration and individual development of the organism is called consultation. These characteristics determine the animal's body structure, along with the development of organs, as well as the productivity of its work. Or the first time the concept of consulting in science was introduced by the scientist Hippocrates, who lived in 377-460 years. In 1939, professor V.O.Viit and Sh.n.Zamyatin recommends that rural animals be divided into broad-body (eyrosomli) and narrow-body (leptosomli) types of consultation.

In the evaluation of pedigree horses, body parts cannot be bonitirovka without knowing the dimensions. He must be able to think and know the names of the body parts as if they were visible on the X-ray screen.

Capsule consultation-the bones of the animal are covered with flat, thick and coarse wool, the fat layer under its skin is stagnant, the trunk and head are disproportionately located on the body
hin consultation-the bones of the animal are thin, the head is small, the neck is thin, the skin and wool are thin. The hooves are thin.

Empty consultation - the animal's beak is large, the bones are bruised, the muscles are strained, but the joints are conspicuous .fluid can be found in the join

Dense consultation-the animal shakes its feet and developed a solid, skin stroke connective tissue stagnant. The muscles are dense and the temperament is high.

- The types of cover and dense consultation are clearly thrown into the cocoon. They are adapted to the conditions of Sagittarius.

Head, cover and fine-consulted types are mostly common in heavy-duty horse breeds.

- for horses (pure-blooded, arab, akhaltaka), a dense consultation is a harvest. The animal ecster is the designation of animal consultation on the outside.

And the external structure determines its pedigree, ability.

When monitoring the growth and development of young horses, during the bonitirovka, 4 dimensions are obtained in the animal: height, length of the trunk, circumference of the cockroach, and width of the palm. In order to fully haract the structure of the horse's body, one size is subtracted from the other, and this is called the index.

he following indexes are used:

- 1.length.
- 2.fun of cockroach cage.
- 3.strife.
- 4.bone building.
- 5.efficiency.
- 6 feet.
- 7.the strength of the palm.
- 8.depth of the cockroach.
9. height.
10. Magnanimity and others., aloobesity. bunda horse body looks fuller, the bristles seem to lick, but the work efficiency is reduced.

Factory or good obesity, sexual activity in such horses is high Working obese, such horses do not accumulate fat between the muscles, ixchsam was considered the most acceptable for working horses. Unsatisfactory obesity is observed when the conditions of animal storage are unsatisfactory, poorly nourished, sick or old.

Father's assessment of the ecster begins with the fact that he begins to eat, stand in his stables, eat food, eat appetite.

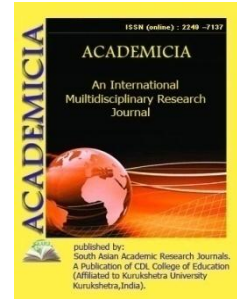
Then it is taken out and checked for nasal folds, eyes, breathing, convulsions. 5 or 6 steps away from it can be summarized depending on the total.

CONCLUSION

1. In order to properly Group horses in a snake, it is important to bypass and fully study them all. It is necessary to start the study from the intake of nutrients, to monitor appetite, to monitor breathing and all other small processes.
2. It is the second issue to apply the correct consults to them after studying horses. It is necessary to perform the exercises that the horse organism raises, stratifying them by degrees. Putting hard training on young horses leads them to fatigue of their organism.
3. Correct assessment of the ecster's location than the external Corinth on horses will help the horses in the direction of the task. For example: it would be a mistake to expect the efficiency of a horse entering a dense consultation from an external Corinthian to an empty consultation. Diseases caused by various physiological changes may arise when the error is studied.

REFERENCES:

1. D.X.Zire " lost in Test match Tashkent 2015
2. Tashtemirov R.M, NarziyevB.D, Uzakova D.P.Basics of horse training. Training manual. Samarkand, 2009.
3. Tashtemirov R.M, KarimovM.G, Orthopedics .Training manual. Tashkent 2013



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SPIRITUAL AND MORAL EDUCATION OF THE YOUNG GENERATION IN TEACHING RUSSIAN AS A FOREIGN LANGUAGE (TEACHING - TO EDUCATE)

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ABSTRACT

Spiritual and moral education of the younger generation is of great importance in the formation and development of a modern personality, whose activities are carried out in a multipolar socio-cultural space. Spiritual and moral education in the process should take one of the leading places in teaching Russian as a non-native (foreign) language. The article includes recommendations for teachers of Russian as a non-native (foreign) language, which can be used when writing teaching aids.

KEYWORDS: *Morality, Spirituality, Teaching, Education, Personality, Society, Activities, The Younger Generation, Classics*

INTRODUCTION

Each era, in accordance with its specific tasks, dictates the need for spiritual and moral education and personality formation.

In the 21st century, when there is a transition from the reproductive-pedagogical to the creative-pedagogical paradigm of education, there is an urgent need to search for new technologies of moral education aimed at developing a person's spiritual abilities (1.73). Moral education is one

of the most pressing and complex problems that must be solved today by everyone who is related to the upbringing and education of the younger generation. Morality in the learning process should take one of the leading places in teaching Russian as a foreign language. This is very important for the development of a highly moral, harmonious, physically developed and spiritually healthy personality, capable of creativity and self-determination. Morality, by the definition of S.I. Ozhegov, is the rules that determine behavior, spiritual and mental qualities necessary for a person in society, as well as the implementation of these rules (2).

Moral education is the educational impact of the school, family, community, with the goal of forming stable moral qualities, feelings, behavioral skills based on the assimilation of ideals, norms and principles of morality in practical activities (3). It is not difficult to formulate, set an educational goal of the lesson, but it is much more difficult, with what methods and techniques and on what material to carry it out. Teachers, when planning their classes and writing teaching aids for students studying Russian as a foreign language, can use material with a pronounced moral connotation with a great emphasis on texts that talk about kindness, humanity, mercy, conscience, love for the Motherland. For example, when planning independent work, you can use text material which encourages students not only to think, but also to form moral attitudes, activate creative thinking. For better memorization, use the techniques "Cluster", "Flight Diary", "Water Circles", etc. In our opinion, tasks that characterize a person by his actions and qualities, which encourage students to think about life, relationships between people, about the connection between the past, present and future, about their place in life, are of great educational value. In classes on the topics "Personality and society", "Spirituality and culture will save the world", provided for by the calendar-thematic plan of the practical lesson in the Russian language, we include texts about the life and work of the classics of Russian literature: A.S. Pushkin, L. Tolstoy, M. Lermotova. Faced with a book every day, we have the richest material for educating our youth, therefore it is advisable to include and memorize the verses of Russian classics in the independent work of students, which are also of great educational value. They should have a detailed conversation about hard work, truthfulness, courage, perseverance.

These stories encourage an excited conversation about the difficult problems of our life, about the difficult fate of the heroes of the work, about good and evil. Taking into account the above fact, we included in the independent work of students the story of Y. Bondarev "Forgive us!", K. Paustovsky "Steel ring", "Old cook", "Telegram". Plots of morality are reflected in fairy tales, aphorisms, proverbs and sayings. They are a source of an inexhaustible supply of moral experience, they are distinguished by deep content, which reflects the most essential aspects of morality and ethics, a metaphorical assessment of personal qualities, and folk wisdom. We recommend to include A.P. Chekhov, a remarkable Russian writer, who attached great importance to the fact that people have a sincere delicacy, which is deeper than just the external politeness of a person. When completing assignments, we recommend using the words: educated, polite, correct, delicate, tactful, educated, cultured.

Task 1. Explain the meaning of these words, translate them into your native language. Where possible, form short forms of adjectives. Cheerful, energetic, active, enthusiastic, hardworking, businesslike, educated, intelligent, witty, resourceful, noble, humble, tireless, sociable, caring, hospitable, generous, tactful, decent, naive, arrogant, flattering, cruel, vindictive, good-natured, intelligent, loyal, kind, sympathetic.

Task 2. Express your opinion about the following judgments: 1) An intelligent person is, first of all, one who knows how to feel someone else's pain. 2) Respecting the culture of another people means being an intelligent person. 3) Good manners are one of the most important signs of intelligence. 4) Do you think a person's character depends on the upbringing and self-education of the individual or is it inherited? It is impossible to educate a highly moral person without instilling in him moral values that are closely related to moral qualities: benevolence, the desire to do good deeds; tolerance for the shortcomings and mistakes of others, the ability to ask for forgiveness and forgiveness, the desire to reconcile the quarreling, not to answer evil for evil; philanthropy, respect for the individual and the opinions of others; honesty, the ability to see your shortcomings, to admit mistakes; solicitude, responsibility; hard work, respect for the work of another, the desire to please others with their work. It is necessary to pay great attention to tasks of a creative nature, which are of great educational value and characterize a person by his actions.

Task 3. Describe a person by his actions and qualities listed below. When answering, use the constructions that were studied earlier: I think that .. ", " I want to say that ... ", " If I'm not mistaken ... ", " This is not entirely true ", " It's a pity. By the way, ... "Sample: I think that a polite person is the kind of person who never forgets to say hello, say goodbye, and thank for the service. 1) Never forgets to say hello, to say goodbye, to thank for the service. 2) Apologizes for being late for a meeting, meeting, class. 3) Sits in the presence of elderly people. 4) Knows how to spare the pride and dignity of people. 5) Always, in any critical or unpleasant situation, patient, restrained. 6) Slams the door when the angry one leaves. 7) During a play, film or lecture, talks to a neighbor. 8) Greeting elders by age or position, calls them by name and patronymic. 9) Coming home late, when everyone is asleep, he tries not to make noise so as not to wake up his loved ones. 10) In a scientific discussion, he shows great and deep knowledge in various fields of science and culture. Working with the whole group, the teacher should not lose sight of individual students, therefore it is important to include in the classroom assignments of a game nature, where the teacher asks students to give examples: an act of principle, an evil that others have done to them, a good deed, which they have witnessed, a just deed, which was committed by a familiar person. Students love this type of assignment, where they are happy to argue, sometimes they argue with each other.

Task 5. Listen carefully to a few statements. Please tell me how much you agree with them. 1) I am often kind to my classmates and classmates. 2) It is important for me to help a classmate when he is in trouble. 3) I believe that you can not be restrained with some adults. 4) Probably there is nothing wrong with being rude to a person who is unpleasant to me. 5) I believe that being polite helps me feel good around people. 6) I think that you can afford to swear in response to an unfair remark addressed to me. 7) I am pleased to bring joy to people.

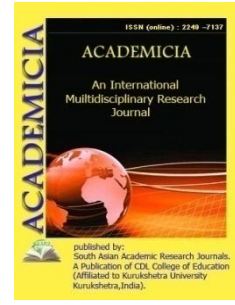
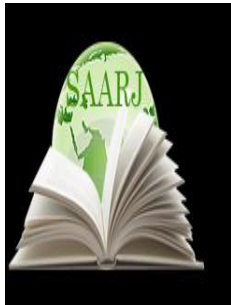
Task 4. Think and add the following sentences: 1) When I see someone in a ridiculous situation, then I 2) If someone laughs at me, then I 3) If I want to be respected, then I 4) When they interrupt me, then I 5) When I don't want to communicate with a classmate, then I

The texts and assignments in many textbooks on the Russian language for students of Uzbek groups of non-linguistic universities are devoted to the themes of patriotism. When studying the topic "Uzbekistan - a state with a great future", teachers use materials from the Constitution of the Republic of Uzbekistan. After reading texts about the basic law of the republic, students

answer questions about the rights and obligations of citizens of Uzbekistan, about protecting the Motherland as a sacred duty, about the right to work, education, individual freedoms. "They memorize proverbs: "Mother is a symbol of the Motherland", "To love the Motherland means to love people, the earth, nature", "Those who have lost their families cry for seven years, those who have lost their homeland have been crying for the whole century", "I glorify the Fatherland that is, but three times that will be", "For the good of the Motherland, do not spare your life", "A man without a Motherland is a bird without freedom. "Students expressively talk about the coat of arms, flag, anthem of our country, using in their speech the words peace, freedom, friendship, cooperation, brotherhood, stability, determine their meanings, make proposals and write essays. For example: "Homeland. Nothing sounds more proud than this short but extraordinarily succinct word. Homeland. This is our common home, the place where we were born and live, the land on which we walk. " For better memorization, when working on texts and other educational materials, we recommend using technologies for the development of critical thinking, in particular, the method of graphic research "Intellect-map", the method of TIPS(theory of inventive problem solving), "Circles on the water" (search for key concepts and disclosure their essential features), POPS - formula, method of KWF (we know, we want to know, we found out). During the learning process, it is necessary to constantly activate words and expressions: hello, thank you, please, good morning (afternoon)! All the best! Good luck! See you! Thus, the process of forming spiritual values is long and therefore there can be no quick result, but the work that is carried out by teachers in the classroom in Russian as a foreign language will help to plant a precious seed in the soul of our students.

LITERATURE

1. L.A. Ishanzhanova Theoretical Foundations of Realizing the Potential of the Russian Language in the Moral Education of Students of Non-linguistic Universities of the Republic of Tajikistan - AKD, 2009.
2. S.I. Ozhegov Explanatory Dictionary of the Russian Language.M.2002. P.478.
3. A.A. Petrov. Moral pedagogy. Russia. St. Petersburg. 20016.



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COMPUTER-AIDED DESIGN RADIO EQUIPMENT ASSEMBLIES FOR EMC

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ABSTRACT

Increasing the speed of digital systems and ensuring electromagnetic compatibility in the design of printed circuit boards. One of the main directions in the design of the electromagnetic compatibility of digital systems is the use of CAD. The emergence of new materials, the development of technology mikroperehodov, increased resolution and other technical factors contribute to the production of more advanced e sun dress design. Thus, the developer of the board must decide whether the use of a mathematical method in each case and then make a rational choice of a software environment that allows an analysis based on the selected method.

KEYWORDS: *Printed Circuit Board, Electronic Equipment, Automatic Design, Electromagnetic Compatibility.*

1. INTRODUCTION

In the design of electronic equipment (CEA) is mandatory accounting requirements for electromagnetic compatibility (EMC), ever escalating with increasing density and the upper frequency range of useful and interfering signals in the line, as well as a decrease in the levels of mineral and rising levels of interfering signals. Full-scale tests CEA EMC and its re-design due to dissatisfaction with increasingly stringent requirements of EMC substantial rise and slow design, creating serious obstacles to the production of finished products to market. Therefore, it is urgent modeling EMC problems at the design stage of CEA.

2. The purpose of the task

A very important step in the design of the equipment shall be the means of the automatic design (CAD) to predict the emission of radio frequency interference and susceptibility with sufficient

accuracy for the goals, based on the design parameters of the product. This will apply the appropriate technology EMC and avoid costly rework later.

Designed equipment requires a minimum number of errors, or that their absence. The solution lies in the proper organization of the development and addressing these issues early in the design. When designing high-speed electronic equipment has become virtually mandatory provision neiskazh e n tion signal, and therefore, no circuit board can be manufactured without the use of specialized software to facilitate the analysis of signal integrity and EMC.

Any problem of EMC can be represented in terms of the interference source and receptor path interference. The structure of the communication path may include as a mechanism of radiation and conductive, and it is often to be analyzed, such as voltage and current at the interface equipment is the result of communication equipment with an external field.

Analysis of EMC electronics assemblies for a comprehensive assessment of the quality of the design development, confirming the correctness of design and technological solutions for the operation of RES in the given conditions and with the required quality. EMC analysis is based on computer modeling. Initial data for the performance of the EMC analysis: a circuit diagram; List of electronic components; PCB design; a complete set of design documentation; technical project, which will include EMC requirements.

For modeling the electronic system on a virtual prototyping stage mainly used software packages. In these stages of circuit simulation and PCB layout design of integrated circuits or separated. First performed simulations of electronic circuits without parasitic effects inherent in the actual topology, and then after repeated simulation of designs with their account. This procedure is covered with a particular task to ensure the completeness of signal integrity and EMC. Below is a brief overview of the most well-known programs design and analysis of printed circuit boards with a view to illustrate the possibilities of CAD in this area.

Prospective CAD systems

CAD Company MENTOR GRAPHICS

CAD Mentor Graphics allows a full cycle of the verification fee. It uses the following subsystems:

- HyperLynx, ICX / Tau, Quiet Expert - analysis of signal integrity and electromagnetic compatibility;
- BetaSoft Board - analysis of the thermal regime of the printing unit;
- IDF Interface - bi-directional interface to CAM / CAD
- Fablink XE / Pro - post-processing to enhance manufacturability.

Package HyperLynx - the most powerful in the analysis of signal integrity. It has modules predtopologicheskogo (HyperLinks LineSim) and posttopologicheskogo (HyperLinks BoardSim) analysis (see. Above), works closely with the monitoring system limitations.

Package ICX performs verification signal integrity analysis of high accuracy, including the worst case. Analysis can be done for multcard systems in interactive and batch modes. An important feature is the ability to analyze component placement and routing of the electrical requirements.

Tau performs a comprehensive package of verification before and after tracing board.

The Mentor Graphics Design Kit are ready library blocks and component models, which are used for signal integrity analysis. This model Spice, IBIS, VHDL-AMS and others supplied by the manufacturers of chips.

CAD firm CADENCE

Another power of the proposed solutions is the company CADENCE. For top-level design of the proposed package PCB Design Studio. As an editor of printed circuit boards are used program Allegro, allows the development of multi-layer and high-speed, high-density components. As a full-time module auto placement and auto routing are using a program SPECCTRA, operates an extensive set of design rules and technology limitations. Analysis of signal integrity and EMC PCB layout is done using a special module SPECCTRA Quest SI Expert, and for a preliminary analysis of the project and preparation of sets of design rules used module Sig Xplorer.

CAD firms ZUKEN

The third most popular in the world is quite powerful product - Visula company ZUKEN. The products the company provides through the design cycle and offer an effective means of simulation and synthesis of programmable logic with the subsequent development of the PCB. There is a standard set of tools, as well as its own funds autoplacement and autorouting. It should be noted that the company ZUKEN also offers users integrated tools tr e hmernyh solid modeling developed devices.

CAD firms ALTIUM

In 2002 the company released a ALTIUM package Protel DXP, which is a continuation of their own original product line Protel. This package provides a through-cycle design of mixed analog-digital circuit boards. All the tools implemented on the basis of an integrated design environment Design Explorer, running the operating system Windows XP. By means of the previously existing posttopologicheskogo signal integrity analysis added the ability to perform predtopologicheskyy analysis (Fig. 2). But the main innovation of Protel DXP was supposed to be a topological auto router Situs, designed to implement a new approach to the automatic wiring boards.

CAD Quantic EMC

Compliance - System posttopologicheskogo electromagnetic compatibility analysis on printed circuit boards. Compliance Package allows you to assess the impact of structural features of printed circuit boards on their electrical characteristics (Fig. 3), as well as simulate the electromagnetic compatibility of devices esch e to the actual manufacture of structures, thereby reducing the time and cost of designing with a significant increase in quality.

Designing high-speed circuit boards requires the construction of adequate models for the analysis of signal integrity and EMC. Levels of performance achieved increase the sensitivity of the design to various variations of materials, dimensions of structural elements and characteristics of the components. The emergence of new materials, the development of technology mikroprehodov, increased resolution and other technical factors contribute to the production of more advanced e sun dress design. Thus there is a refinement of models to be analyzed. For example, if a relatively low-frequency circuit board calculation capacity between conductors can

be carried out under the simplified expressions, which do not take into account the thickness of the wire, then the convergence of the values of the gaps between the conductors and the thickness of the account of the last parameter is mandatory.

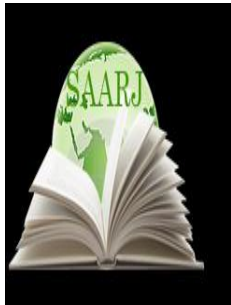
3. CONCLUSION

EMC problem is complex, requiring provision of the necessary requirements at all levels of modularity in the design of equipment. Increasing the level of modularity leads to increasing costs and reduced EMC measures available. EMC achieved by different design and technological measures, including the choice of the element base, rational layout elements, shielding individual circuit elements, modeling of the interference field elements, etc. The absence of algorithms for the optimal placement of ERE on the board with which ensure that their EMC unwieldiness and complexity of the mathematical description of the use of different CAD systems require for a quick and high-quality design of electronic digital devices.

As seen from the survey, unfortunately, there is no universal product for analyzing signal integrity and EMC estimates of the parameters. Thus, the developer of the board must decide whether the use of a mathematical method in each case and then make a rational choice of a software environment that allows an analysis based on the selected method. The most optimal solution is still a combined method of using multiple software products in the design board.

LITERATURE

1. Knyazev, A. D. Designing of radio-electronic and electronic-computing equipment taking into account electromagnetic compatibility [Text] / A. D. Knyazev, L. N. Kechiev, B. V. Petrov. M.: Radio and communication, 1989. 224 p.
2. Chermoshentsev S.F. Information Technology Electromagnetic Compatibility of Electronic Means: Tutorial. - Kazan: KSTU, 2000. - 152 p.
3. Habiger, E. Electromagnetic Compatibility. Fundamentals of its provision in engineering / E. Habiger; per. with him. I.P. Kuzhekin; by ed. B.K. Maximov. - M.: Energoatomizdat, 1995. - 304 pp., Ill.
4. Paul, Clayton R. Introduction to electromagnetic compatibility [Text] / Clayton R. Paul.-2nd ed. Wiley Interscience. 2006
5. The physical basis of the design of radio-electronic means: proc. Method. complex for students of the specialty 1-39 02 01 "Modeling and computer design of RES". In 2 hours. Part 2 / T. V. Molodechkina, V.F. Alekseev, M.O. Molodechkin. - Novopolotsk: PGU, 2013. - 224 with
6. Fomin, A.V. Engineering quality assurance methods for design / A.V. Fomin, O.N. Umrikhin, M.F. Mityushin. - M.: Publishing House of the MAI, 2007. - 276 p.



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THE RELATIONSHIP BETWEEN ABULKHAIRKHAN AND THE RULERS OF TEMURIDS

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ABSTRACT

This article describes the political activities of Abulhairkhan, a skilled politician and commander, based on information from historical written sources. The city of Tura and its environs were also under the control of Adabbek and Kepakbek, the chiefs of the eagle tribes. The right tributary of the Ishim River, the left tributary of the Otbosar, was ruled independently by another nomadic Uzbek khan, Mustafa Khan. In short, the Uzbeks, who established their rule in modern Uzbekistan and Central Asia in the late 15th and early 16th centuries, played an important role in the formation of not only the Uzbek people, but also the Kazakh people.

KEYWORDS: *Abulhairkhan, Shaybani Dynasty, Turkestan, Movarounnahr, Science Of Hadith, Fiqh, Safavids, Mysticism, Teachings, Poetry.*

INTRODUCTION

Since independence the studies of the revival of our rich ancient history, including all spheres of our society, many aspects of our national spirituality has been researched. In this regard, President Shavkat Mirziyoyev noted in his address to the Oliy Majlis: "... It is necessary to understand our national identity, study the ancient and rich history of our country, strengthen research in this area, fully support the work of scientists in the humanities." [1]. This article is based on written sources from the rise to power and military campaigns of Abulhairkhan, the founder of the Uzbek Nation.

MATERIALS AND METHODS

It is known that the Shayban ulus (southwestern Siberia and the Syrdarya basin) was ruled by several independent khans in the 1920s. In particular, according to the events of 1425, one of

these khans, the rule of Jumadukhan (1425-1428) was established in the area adjacent to the Mangit ulus, north of the Aral Sea, between the Sarisuv and Emba rivers.. At the same time, Muhammad Yusuf Munshi writes that after the death of the Sheikh Oglon, the struggle for power in this nation intensified and as a result, his youngest son Abulhair Khan abdicated [2,49]. According to Mahmud ibn Wali: "Since the blessed prince (Abulhayr khan) was immature and his lucky star was still a few days away, Jumadukhan ibn Sufi, known in the sources of the Shayban sultans as Yumaduq, rolled up his sleeves. , by plotting, made the work of the heir to the throne (Abulhair khan) difficult, and thus captured the hearts of all the nomadic tribes and soldiers by throwing nets of lies in his path "[3,34-35]. Seeing that Abul-Khair Khan had lost power, Jumadukhan ibn Sufi, among others, recognized the oglon's rule.

Another khan who ruled the Shayban nation independently was Mahmudhoja ibn Koonbek. The city of Tura and its environs were also under the control of Adabbek and Kepakbek, the chiefs of the eagle tribes. The right tributary of the Ishim River, the left tributary of the Otbosar, was ruled independently by another nomadic Uzbek khan, Mustafa Khan. In the Mangit ulus, Idiku (Edigey) was ruled by Gozibi, the son of an Uzbek. Sources do not have enough information about the internal life of these countries and their interaction. According to Mahmud ibn Wali, the quarrels between all the Shaybani tribes, which began soon after Jumadukhan came to power, continued in the Manghit nation. It was this nation that marched to punish the rebels. They were executed according to the decisions of 'Ja Bahadir, Sarig' Uthman and others) [4,45-48].

At that time, a young man named Abulhair, who was in charge of Jumadukhan's army, was also taken prisoner. However, not only was his life saved, but with the help of elders such as Sarig 'Uthman and OlashaBahodir, the young Abulhair later gathered a number of fighting troops and returned to his nation in the spring of 1428. There are several tribes of Abulhair here, including Qiyat, Mangit, Dormon, Koshchi, Otoji, Nayman, Uqarash-Nayman, Tubai, Taymas, Jot, Chinese, Uyghur, Qarluq. , usun, qarlaut, tuman-ming, tangut, chiefs of bells and representatives of the clergy: SayyidKulmuhammad, supported by the Black Sayyids, proclaimed him khan. According to Mahmud ibn Wali, Abu al-Khair Khan was supported by about two hundred representatives of the tribes and clans at that time [3,38]. The reason for this support was that the aristocracy, which at the time feared that the tribes and nations would continue to plunder each other and that the nomads might cause popular uprisings, united around the khan, who had the power to centralize the country. , was forced to build a state system capable of keeping the working people in obedience. These factors led to the formation of a state of nomadic Uzbeks under the leadership of Abulhairkhan, and this state was not the first state of nomads, but similar to the states of the Huns, Turks and other nomadic peoples of Central Asia, only it was a new look that had been restored.

According to Muhammadyar ibn Arab Qatagan'sMusahhir al-Bilad, who lived and worked in the middle of the 16th century, "... After the martyrdom of Khoja Mahmudkhan, the DashtiKipchak kingdom, that is, Turkestan, from the border of Signak, passed into his hands. At the age of twenty-four, ShahrukhMirzo ibn Amir Temur freed Khorezm region from the clutches of Koragon and relied on the heights of the khanate and the sky of secularism "[8, pp. 23-24].

In short, when the fame of his royal heroism and the sound of his glorious glory spread everywhere, those around him turned to the Ka'bah of the needy. Each returned with the desired amount of survival and the needs of both worlds. In particular, Sultan Abusa'id Mirza (1451-1469) and his younger brother Manuchehr Mirza and Muhammad Joki Mirza and Sultan Hussein

Mirza, descendants of Amir TemurKoragon, came to the service of Hazrat and became a state official of Humayun. and they achieved their desires because of his grace and protection.

Abul-Khairkhan, who was planning to establish a centralized state, set himself the goal not only of uniting the Shayban nation, but also of subjugating the territories that were once part of the Golden Horde, that is, the lands east of the Ural River. had done. Initially, he made a military expedition to Tura in 1428-1429. The mayors of the city (beks) Adabbek, Kepakhoja and the nobles of the city submitted to Abulhairkhan without resistance. After a sermon was delivered in his name and coins were minted here, Tura remained the capital of the Shaybanid (i.e., Uzbek nation) state until 1446.

Thus, according to the narration of Mas'ud ibn 'Uthman al-Kuhistani, a number of beys and sultans who were famous at that time, including Bakhtiar sultan, a descendant of Arabshah, the son of Khidr Khan, who was a loyal soldier until the end of his life).

In a very short time (between 1428-1431), Abul-Khair Khan managed to unite the Shayban nation and establish his rule.

In other words, the author of Bahrul-Asror, Mahmud ibn Wali, also wrote that Abul-Khairkhan did not submit to the descendants of TuqayTemur, who ruled in the Golden Horde at that time, and declared the independence of his state. Abulhairkhan, like the governors of all nations, will be invited to the congress after Muhammad Khan ascends the throne of his ancestors in Saraychik in Tukay-Temurid. The withdrawal of Abulhairkhan and other Shaybanis, who did not want to obey the decision to gather troops at this congress, led to the breakdown of the alliance between the TukayTemurs and the Shaybanis after this event (5, 76-77).

However, the last rulers of the Shayban ulus (Davlat Sheikh, Jumaduq, Mahmudhoja) were to some extent mute to the TukayTemurids.

During the subsequent marches, in 1431-32, Khorezm (Hafiz Tanish Bukhari, 1999. pp. 53-54) and his brothers Ahmadkhan and Mahmudkhan, his fathers Kichik Muhammad, Javak Sultan and Bashak, he defeated the combined forces of the sultans in Egritepa (prof. Semyonov called this place Iqri-tur, according to "Tarihi Abulkhairkhani", Iqritub. Prof. Semyonov assumed that its location was in the steppes along the Syrdarya) which occupied the Orda bazaar (once Sainkhan, i.e., the residence of Botukhan) (Ahmedov, 1992. pp. 44-45) and thus strengthened its position in the western part of DashtiKipchak. As a result of Abulkhairkhan's 15-year (1431-1446) military campaigns to expand his possessions, a patriarchal state was established, although not centralized in the Syrdarya and Kazakh steppes.

There were forces on the borders of Abul-Khairkhan's state that threatened his state. That is, on the one hand, the fact that sultans such as Ibakhan, Burka Sultan, Janibek and Garoy were fighting against him, and one of his active rivals, the Uzbek khan Mustafa Khan, turned a large part of the mangits to his side. , on the other hand, were the Tuqay-Temurids, who were migrating to the south-west, especially waiting for a convenient opportunity to obtain the blood of defeat in Egritepa.

Nevertheless, Abul-Khairkhan resumed his march in the 1840s. In particular, in 1446, Shahrukh ibn Amir Temur skillfully took advantage of the difficult situation and political disintegration in Mongolia to build fortresses on both banks of the middle reaches of the Syrdarya, namely,

Akkurgan, Arquq. Conquers fortresses such as Signak and Suzak (6, p. 53). Archaeological maps show the location of these fortresses on the left bank of the Syrdarya (3, p. 47-48).

The vast area is rich in cities and a culture of irrigation based on artificial irrigation. In other words, Zagryazhsky, who conducted research in 1874, noted that the lands between the Syrdarya, Aris, Karatag and Turkestan were well irrigated by the rivers Today, Chayon, Borjar and Ikan, which flow from Karatag. . In later centuries (i.e., the twentieth century), Kallaur and Richkov proved that these areas were indeed prosperous and irrigated (7, 70).

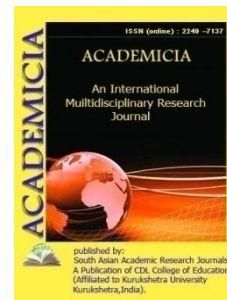
In short, the Uzbeks, who established their rule in modern Uzbekistan and Central Asia in the late 15th and early 16th centuries, played an important role in the formation of not only the Uzbek people, but also the Kazakh people. They were also considered an ethnic component of the Uzbek people and soon became part of the Turkic community of Movarounnahr, giving it only its own name. Therefore, the opinion of some scholars that the Uzbek people are known only after the XV century is completely wrong.

CONCLUSION

In conclusion we can note that some historians such as Ivanov and Semyonov believe that the state of Abulkhairkhan was a temporary state union. However, the existing state courts, devons, government officials, tax regimes, and the fact that coins were minted in the name of the head of state, the khan, and intercultural relations with other states, especially the Timurids, were signs of his temporary state union indicates that it was a patriarchal state, though not centralized.

REFERENCES:

1. <http://xs.uz/uzkr/post/ozbekiston-respublikasi-prezidenti-shavkat-mirziyoevning-olij-majlisga-murojaatnomasi>
2. Mohamed Yusuf Munshi. Mukim-khan story. / Per. With Tajik., Foreword, note., And indexes prof. A.A. SemyonovaTarzh. - Tashkent: Publishing house of the Academy of Sciences of the SSR, 1956. Pp. 49.
3. Ahmedov B. The Uzbek nation. - Tashkent, 1992. 152-p.
4. Axmedov T. Council, consultation and advice in the history of the Uzbek national statehood. Tashkent, Zarqalam. 2006. pp. 40-68.
5. Vamberi, Herman. History of Bukhara or Movarounnahr. Excerpts from the book. / Collected by: S.Ahmad /. - Tashkent, GafurGulom Publishing House of Literature and Art, 1990. 96 p.
6. Hafiz Tanish Bukhari. Abdullanoma. Book 1. Tashkent, Sharq, 1999. 416-p.
7. Akhmedov B. State of nomadic Uzbeks. M., 1965, p. 70.
8. Muhammadyar ibn Arab Qatagan. Musaxxir al-bilod / Sh.Vohidov. Tashkent, New Age Generation, 2009.430-p.



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INTERPRETATION OF OPINIONS ON SOCIAL AND POLITICAL TERMS IN QUTADGHU BILIG

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ABSTRACT

This article uses the interpretation and lexical meanings of ideas about social and political terms in Yusuf Hos Hajib's Qutadghu Bilig to study words as a system and to classify words into specific groups. The interpretation of the terms is explained.

KEYWORDS: *Socio-Political Vocabulary, Community, Social Life, Image-Synchronous Direction, Historical-Diachronic Direction, Comparative-Typological Direction, Lexical Layer, Lexical Field, Genetic Group.*

INTRODUCTION

The lexicon of the language "Qutadghu bilig" is colorful, it contains lexical units specific to different areas of the ancient and old Uzbek language. In particular, it contains lexical knowledge and lexical-semantic groups specific to socio-political lexicon, which, if studied linguistically, will naturally play a special role in determining the historical development of socio-political lexicon of the Uzbek language.

Before thinking about the topic of socio-political lexicon in Qutadghu Bilig, it is important to cover social and political concepts and the study of this field, as well as the interpretation of terms (terms such as layer, field) used to classify words as lexical systems. At the present time in modern linguistics there are different views on the analysis of the socio-political lexical system, the use of "social" and "political" lexemes as terms, as well as the study and definition of lexical units. Interpreting the views in this area, we analyze the socio-political vocabulary and lexical units in the work "Kutadgu bilig" on the basis of the proverbial direction.

The term social is lexical, in general, in all dictionaries, including H.K. Baranov's "Arabic-Russian" dictionary, as follows: society serves to convey concepts. In general, the lexical scope of the social term is defined by the following relations.

1. The main differences between classes, their place in social production and their relation to the means of production;
2. Human activity in society, social movement, development of social thought, social attitude, social life, political, professional, cultural, etc., related to collective services;
3. Relationships related to common, common areas;
4. Relationships in non-individual, public, accessible institutions;
5. Organized by the collective, issues related to non-personal meanings were considered socially specific.

But in the process of analyzing the research, it becomes clear that there is no clear idea about the terms "social" and "political", including the socio-political lexicon, which are interpreted differently by scholars. According to some sources, the terms "social" and "political" can be interpreted as follows.

1. The terms "social" and "political" are a set of closely related fields in social studies, the object of its study, various spheres of social life;
2. Social sciences such as philosophy, sociology, social psychology, law, economics, political science as academic subjects;
3. Socialism, based on specialized knowledge, studies the social, economic, political and religious aspects of life;

In linguistics, however, there are different views on socio-political lexicon. These views can be divided into 3 groups:

1. Socio-political vocabulary in the descriptive-synchronous direction;
2. Socio-political vocabulary in the historical-diachronic direction;
3. As a socio-political lexicon in a comparative-typological direction.

Most of the research was done in the first direction.

It is known that the study of the socio-political lexeme in the historical-diachronic direction is left out of the view of our linguists. There is almost no special work in this area. In the present case, however, it is limited to the interpretation of the history of some words.

In the course of the analysis of the research, it became clear that there is no unity in the opinions of scholars on socio-political vocabulary and the terms "social" and "political", and no definite conclusion has been reached on this issue. However, summarizing the views expressed, they can be divided into three groups:

The first group of scholars add some of their political knowledge to the social structure.

The second group of scholars clearly distinguishes between social lexicon and social terminology and does not include political terms in the structure of social lexicon.

The third category of scholars use the term and the word as synonyms. Uzbek researcher A.Kh. Turakhodjaeva says that in her research, a lexeme and a term contradict each other in terms of generality (being understandable to the general public) and specificity (being understandable to a certain social circle). At the same time, he considers that units with the sign of specificity can be divided into terms (conference, diplomat), and units with the sign of common can be divided into lexemes (meeting, minister, reform).

Some linguists, including P.K.Milshin, I.F. According to Protchenko, much of the socio-political lexicon is known, understood by all, and refers to the relationship between the past and present of life processes. In some similar studies, socio-political lexicon does not refer to a system in a particular shell, it is considered to be specific to other categories of lexicon as well. Therefore, they do not include political terms in the socio-political lexicon. Finally, a third group of scholars does not add political science terms to the socio-political term.

A.A. Buryachok sees socio-political lexicon as a broader phenomenon than socio-political terminology.

Yu.Belchikov also added the terms of social sciences to the socio-political lexicon. This has broadened the scope of the socio-political lexicon. Such socio-political lexicons include some philosophical, legal, and literary terms, as well as some similar linguistic terms. The term socio-political lexicon is used in the scientific literature. From what has been said, it is clear that a lexicographic analysis of words in this context has not been carried out and they have not been studied on the basis of a certain terminological rule.

It can be concluded from the above. The question of defining the socio-political lexicon or defining its content has not been resolved. There is no clear distinction between social and political terms. Nevertheless, the views of some scholars are noteworthy. For example, according to L.A. Zhdanova, some political terms are also included in the social lexicon. Political reality gives us discrete just like any other reality. Linguistic analogues are manifested through existing structures. It is this linguistic process that shapes the linguistic system through its relationship to language, its internal connections, and its laws. Social lexicon is a lexical system that reflects the political structure and political life of a society.

Similar views have been interpreted in the research of scholars such as AH Turakhodjaeva. In defining the concept of socio-political lexicon, he first refers to the social essence, content and features of the concept of "politics". In the explanatory dictionary of the Uzbek language, the lexical meaning of the word "politics" is "Implementation and management of forms of state power; the path of state power in governing the country and in international relations. For example, the concept of "politics" is used in a narrow and broad sense. In the narrow sense, it represents the changes that take place in a particular sphere of society, that is, in its political sphere, and is applied to the sphere itself. In a broad sense, it reflects the events and changes that take place in various spheres of society.

On this basis, A.Kh. Turakhodjaeva expresses the following views: Both the essence of the concept of "events" and the diversity of thematic classifications can be explained by the above-mentioned meanings of the term "politics". In particular, the inclusion of lexemes related to economic processes in the socio-political lexicon in various studies is, without exception, related to the broader meaning of the term politics. However, the fact that hundreds of branches are developing in a particular field or science, and many new concepts and events are now operating

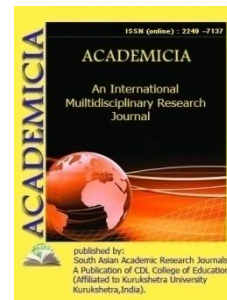
as independent fields, suggests that the narrow definition of the term "politics" leads to the most accurate conclusions in defining the sum of socio-political vocabulary. In this case, it is appropriate to connect the essence of the word social in the lexicon of the term "socio-political" with the social phenomenal nature of politics. Therefore, Z. Isakova admits that "it is impossible to study the lexical units of the socio-political sphere separately, that is, by separating them into social and political lexicon."

Thus, based on the above ideas, A.Kh. Turakhodjaeva defines the socio-political lexicon as follows: It is a changing layer formed on the basis of economic, spiritual, enlightenment, cultural and religious factors.

We have also come to the conclusion from the interpretation of the above literature that the question of how to look at and define socio-political lexicon separately in social and political form, or whether the question of defining its content has not been resolved, is still debated in this area. There is no clear distinction between social and political terms. Therefore, it is clearly stated that the above-mentioned opinions are mostly interrelated socio-political lexicon, as L.A. Zhdanova said, social lexicon is a lexical system that reflects the political structure and political life of society. Hence, it is necessary to interpret the socio-political lexicon as a whole.

REFERENCES

1. [Turakhojaeva A.X. Development of socio-political lexicon of the Uzbek language in the conditions of independence.-T.: Philol. fan.nomzodi diss ... avtoref., 2012, 9-p. (P. 26).]
2. [Begmatova E. Lexical layers of modern Uzbek literary language.-T.: Science, 1985.34-p.]
3. [Gak V.G. Theoretical terminology of the French language (translated by Ibodulla Mirzaev) .- Samarkand: SamDCHTI]
4. [Faxri Kamol. Modern Uzbek, -T.:1953. Pages 21-45; Modern Uzbek.-T.: "Science", 1957, pp. 89, 96-99]
5. [Modern Uzbek literary language.1.-T.: 1966.164-188-p.]
6. [Modern Uzbek Literary Language, pp. 186-188.]
7. [Pinxasov YA. Modern Uzbek lexicon. T.: 1960, 50-p.]
8. [Tursunov U., Mukhtorov J., Rahmatullaev SH. Modern Uzbek literary language.-T.: 1975, pp. 47-50.]
9. [Tursunov U., Mukhtorov J., Rahmatullaev SH. Modern Uzbek Literary Language, p. 63.]
10. [Doniyorov H. Vocabulary of Kipchak dialects.-T.: 1979. 78-p.]
11. [Modern Uzbek literary language. -T.:1980.120, 121,124, 127-bb.nashri, 2002, 15-p.]
12. [Begmatov E. The work cited, pp. 34-47.]



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INDUCTION OF SUPEROVULATION IN CATTLE

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ABSTRACT

Induction of superovulation in the body of donors is the main task in embryo transplantation. If superovulation is successful and a large number of egg cells are released, we will get good results in transplantation. Folliculostimulating hormone (FSH) can also be used to induce multiple ovulations. Many researchers and scientists recommend selecting animals for embryo transplantation taking into account additional criteria reflecting hormonal status and metabolic activity potential. Gonadotropins can adversely affect the development of the fertilized egg after ovulation in animals. In some cases, the chances of developing follicular cysts in the ovary are also high.

KEYWORDS: Donor Animal, Recipient Animal, Superovulation, Transplantation, Metabolic Homeostasis, Folliculostimulant, Metabolic.

INTRODUCTION

Since the 1970s, research and applications in the field of transplantation have grown rapidly. In cattle, the calf was first frozen in 1973 and then obtained by transplanting thawed beef.

The analysis shows that 5,413 head of transplanted calves were received in Canada between 1973 and 1982, and by 1990, the number of transplanted calves in the United States (34th member of the International Society for Transplantation in 1984) had reached 500,000 and 12,000 in Russia.

In the last 12 years of the 21st century, record-breaking results have been achieved in breeding: 136 calves from one donor cow in the United States, 80 in France, 57 in Germany, and 216 calves from 44 donor cows at the Russian Livestock Research Institute.

The use of modern methods of induction of superovulation in livestock has been proven in practice and production to increase the maturation of ovaries in the ovaries by 10-20 times, ensuring simultaneous maturation of 25 eggs in cows and sheep, 40-45 in pigs, 5 in bees and 90 in rodents. From the best donors it is possible to get 5-8 times a year.

In animal husbandry, breeding animals are selected that have the ability to induce superovulation (maturation of multiple follicles) and obtain a viable ovary for long-term transplantation. In order to induce superovulation in donor animals, they are treated with various hormonal drugs (GSJK, follegon, pregmagon, etc.) - bovine bile blood serum is taken on days 60-90 of calving, FSH, etc.) according to a certain plan.

The Main Findings and Results

Many researchers and scientists recommend selecting animals for embryo transplantation taking into account additional criteria reflecting hormonal status and metabolic activity potential. These criteria, the ability of the donor to ovulate multiple times and the washing of viable embryos from him are of practical importance. It is believed that in order to obtain at least 8 ovulations and 7 embryos from the best donor, the amount of estradiol in the blood of cows at the beginning of the sexual cycle should be 15.3. Testosterone - 0.18 ng / ml, LH - 1, 46 IV / l in cows, progesterone levels ranged from 2.0 to 5.0 ng / ml (mean 3,150) and LH was 1.52 IU / l on day 10 of the reproductive cycle. Induction of superovulation in cattle Induction of superovulation when the level of cholesterol in the blood is not less than 3.55 mmol / l, b - carotene - 8.80 μ mol / l, vitamin A - 4.40 μ mol / l and alanine aminotransferase activity not less than 0.25 μ m gives an effective result.

In cattle, the use of GSJK (follegon) - gonadotropins in donor animals in the middle of the reproductive cycle (from 8 to 16 days) is a guarantee of good results. These drugs are administered once in a dose of 2-3 thousand XB, and after 48 hours prostaglandin F2-alpha analogues (estrofan, magestrofan, cloprostenol, superfan, clatraprostin, etc.) or one of its other synthetic analogues of these drugs are used. In donor cows, after 2 days, the sexual arousal phase of the sexual cycle begins, in which the phenomena of ejaculation, general arousal, sexual arousal and ovulation are clearly visible. Once these signs are observed, the donor animals are artificially inseminated.

In agriculture, follicle-stimulating hormone (FSH) can also be used to induce multiple ovulations. These hormones also have similar effects as GSJK. But doing this practice, getting

them, is a very complicated process. In farms, FSH prepared from the pituitary gland of sheep and pigs can be used to induce superovulation, and its inactivation in the body takes only a short time (5 hours). This drug is administered in a reduced dose twice a day for 5 days (5 mg in the morning and evening on the first and second days, 4 mg on the third day, 3 mg on the fourth day and 2 mg on the fifth day), resulting in a total of 10 doses of FSH good results can usually be obtained when sent from the 9th to the 11th day of the sexual cycle.

At present, standard gonadotropic hormones are used in the form of high-purity drugs: sergon (Czech Republic), folligon (Netherlands), prelmagon (Germany). These drugs are administered to donors according to the guidelines, once every 11-12 days of the sexual cycle, at a dose of 2000-3000 TB. corresponds to a live weight of 600 kg of the animal. The use of these gonadotropins ensures multi-grain ovulation in 75–80% of animals and an indexation of an average of 4.0–4.5 embryos per donor.

The advantage of GSJK is that it is easy to find biologically (if there are 60-90-day-old buffaloes, you can take blood from them and prepare a good specialist whey in any farm), and the disadvantage of this drug is that it takes a long time to inactivate the animal, the inactivation of gonadotropins in the body in which this drug is used takes an average of 6 days, but in experiments, drug residues can be detected in the blood even 10 days after drug administration. Gonadotropins can adversely affect the development of the fertilized egg after ovulation in animals. In some cases, the chances of developing follicular cysts in the ovary are also high. After observation of superovulation in livestock, it is recommended that a donor animal be given an anti-GSJKG serum.

CONCLUSION

GSJK (follegon) - good application of gonadotropins to donor animals (cows) in the middle of the sexual cycle (from 8 to 16 days). The drug is given to cows once in a dose of 2-3 thousand XB. After 48 hours, prostaglandin F2 (estrofan, magestrofan, cloprostenol, superfan, clatraprostin, etc.) or one of its other synthetic analogues is administered.

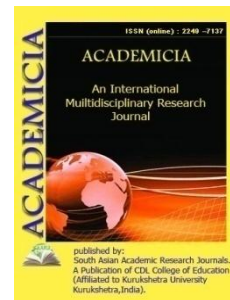
If the yellow body diameter in the cow's ovary at the time of gonadotropin injection is 1.5 cm, it is possible to expect effective results from superovulation. Poliomyelitis is reduced in bovine ovaries. In addition to a well-developed corpus luteum in the ovary at the time of drug administration, the intensity of multiple ovulation is also reduced if there is a developed follicle, follicular or luteal cyst. The effectiveness of superovulation is mainly determined by the physiological condition of the ovaries, and these indicators are taken into account.

The results of theoretical research and production experiments show that superovulation is considered effective when donor animals are given gonadotropic hormones that promote the growth and development of several follicles simultaneously in the middle of the reproductive cycle if at least 6 eggs are released. The main purpose of hormonal treatment in livestock is to ensure the separation of 10-20 eggs from the ovary by inducing superovulation.

Animals sent to GSJK are required to be fed a complete diet (protein, carbohydrates, vitamins, etc.) because starvation of animals can lead to a decrease in the number of ovulations.

REFERENCES

1. Eshburiev B.M. Veterinary obstetrics. Tashkent, Science and Technology Publishing House, 2018.
2. Fertility and Obstetrics in the Horse. Third Edition Gary C. W. England 2005 by Biacko' yell Sciynce Ltd.
3. Veterinary obstetrics, gynecology and reproduction biotechnology.
4. A.P. Students, V.S. Shipilov, V.Ya. Nikitin and others; Ed. V.Ya. Nikitin and M.G. Mirolubov. - 7th ed., Perirab. and add. - M.: Kolos, 1999. -p. 495



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PHYSICO-CHEMICAL ANALYSIS OF POLY VINYLETHYNYLTRIE TO XYSISILANE

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ABSTRACT

The article presents the optimal methods for the synthesis of vinyl ethynyltriethoxysilane in a solvent medium and the maximum reaction yield in a diethyl ether medium is reached. The synthesized polymer was also analyzed using UV spectroscopy to determine the shift of the absorption lines of the chromatophore group.

KEYWORDS: Acetylene, Vinylacetylene, Tetraethoxylane, Ethyl Ether, Benzene, Tetrahydrofuran, Adsorption, Solution, Monomer, Polymer, Emulsifier, Organ silicon Compound, Stabilizer, Thermo polymerization, Viscosity, Density, Light Refractive Index, UV Spectrum, Absorption.

INTRODUCTION

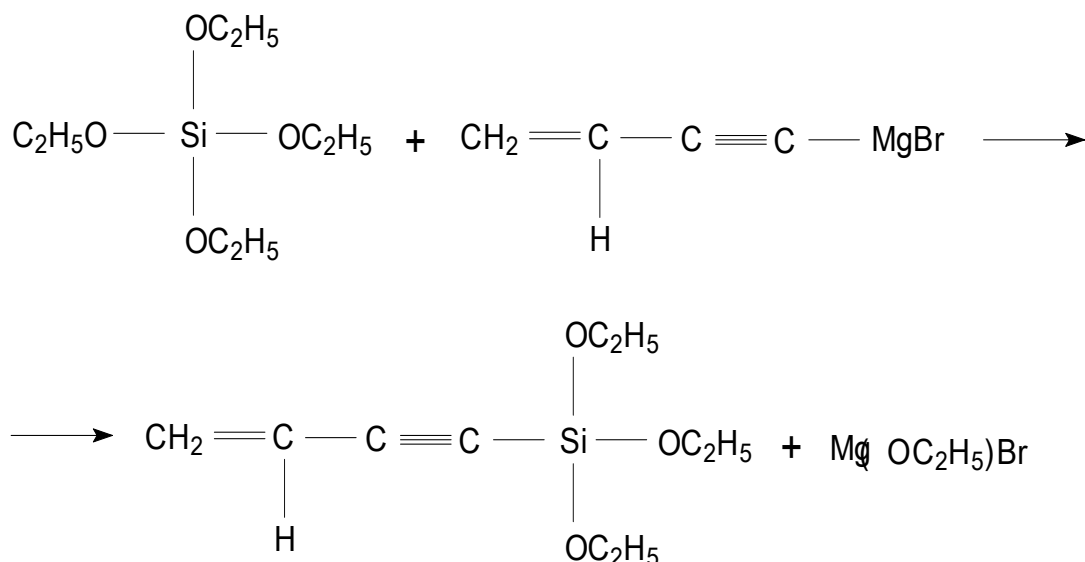
Since the 1940s, inorganic silicon materials have been produced commercially. Over the past period, the production of inorganic silicon materials has increased and began to be used in many areas, including mechanical engineering, construction, electricity, transport, aviation, defense, medicine, textile and cosmetic industries.

The world pays great attention to the production of moisture protection products based on modern technologies and their use to increase the moisture resistance of building materials and structures. The creation of chemical materials that increase hydrophobicity and their inclusion in the composition of building materials is an urgent problem in all respects [2,3].

Therefore, it is important to create a new generation of complex chemicals based on innovative technologies in the creation of moisture resistant hydrophobic materials and their use in various fields.

The discussion of the results

In view of the above, it is possible to obtain a new type of polymer compounds based on tetraethoxysilane to expand the range of currently most widely used organosilicon compounds. Vinylethynyl magnesium bromide and tetraethoxysilane were used according to this procedure for the synthesis of vinyl ethynyltriethoxysilane[1,4]. The interaction of tetraethoxysilane and vinylethynyl magnesium bromide in equimolecular ratios is accompanied by the formation of vinyl ethynyl triethoxysilane according to the following scheme:



Unlike dry ether and benzene, the reaction yield is low in reactions carried out in toluene, dioxane, and other solvents.

Synthesized vinyl ethynyltriethoxysilane, light yellow, soluble in liquid, ethers, benzene, chloroform, tetrahydrofuran, dioxane, hexane, poorly soluble in acetone, pyridine, dimethylformamide, dimethyl sulfoxide, completely insoluble in water and alcohols.

At 30 °C and a reaction time of 6 h, the effect of the ratio of the starting materials and the nature of the solvents on the formation of vinyl ethynyltriethoxysilane was studied. The data obtained are presented in table 1.

As can be seen from Table 1, the starting reagents react up to 69.7% depending on temperature, the ratio of solvents and substances, and the rest do not react. The influence of the nature of solvents on the reaction kinetics was studied in solutions of ethers, benzene, chloroform, tetrahydrofuran, and dioxane. It has been observed that the reaction rate increases with increasing polarity of the solvents. The highest reaction rate and the highest yield of the final product are observed in ether and benzene. In addition, the viscosity values were determined, which are very typical for product samples [5,6].

TABLE 1 INFLUENCE OF THE RATIO OF SUBSTANCES ON THE REACTION YIELD

Molar ratio "Tetraethoxysilane: vinyl ethynyl magnesium bromide"	Molar ratio "Solvent: tetraethoxysilane + vinyltinyl magnesium bromide", 0.5: 0.5	Yield, wt%
10:90	Ethyl ether	62,5
	Benzene	57,6
	Tetrahydrofuran	52,8
30:70	Ethyl ether	63,5
	Benzene	56,3
	Tetrahydrofuran	58,9
50:50	Ethyl ether	69,7
	Benzene	62,4
	Tetrahydrofuran	60,3
70:30	Ethyl ether	66,9
	Benzene	63,4
	Tetrahydrofuran	60,5
90:10	Ethyl ether	62,3
	Benzene	61,5
	Tetrahydrofuran	60,0

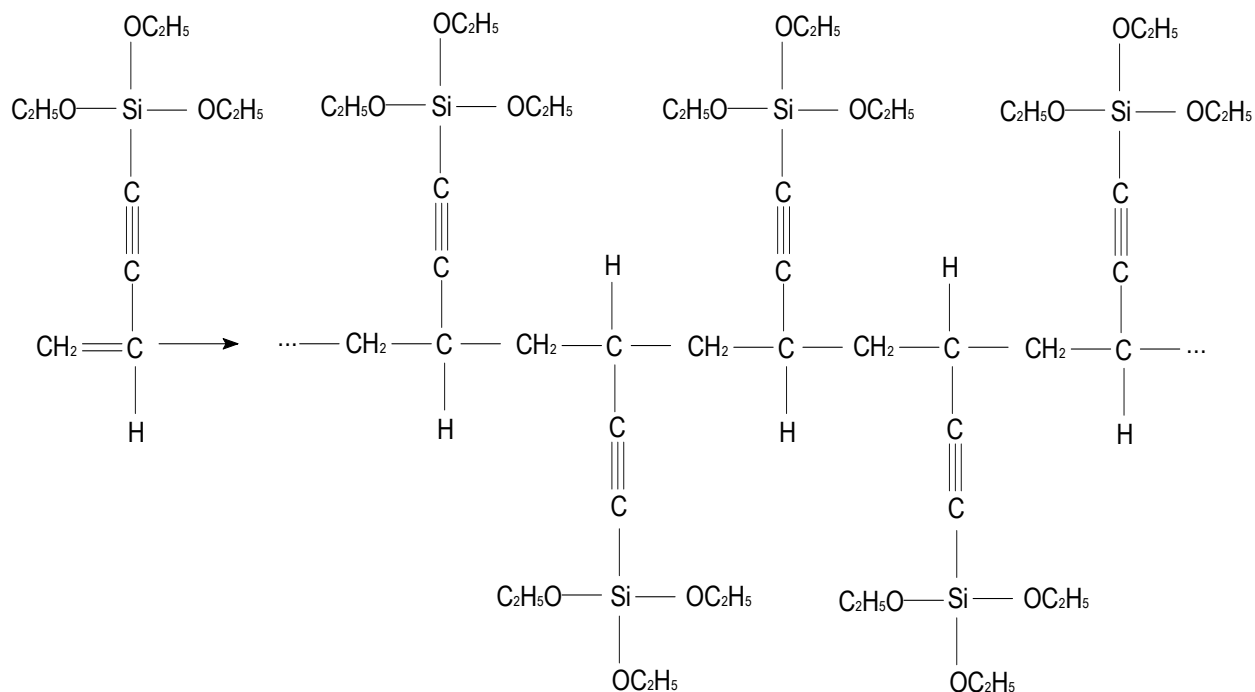
With increasing temperature, the reaction rate and the yield of the resulting semi-finished product increase.

In the solvents discussed above, the reactions of interaction of tetraethoxysilane with vinyl ethynyl magnesium bromide proceed almost continuously, without an induction cycle. The experimental results show that a change in the initial equimolar ratio of tetraethoxysilane and vinyl ethynyl magnesium bromide also leads to an increase in the rate of the process.

The reaction yield in ether solution is high when the substances are prepared in a 1: 1 ratio at a temperature of 30 °C.

The most common method for the polymerization of organosilicon monomers is the method of thermopolymerization of these monomers.

The scheme of thermal polymerization of vinyl ethynyltriethoxysilane monomer at a temperature of 30-40°C can be represented as follows:



The resulting product is rectified for the presence of water, ethyl alcohol and unreacted monomer in polyvinylethynyltriethoxysilane, resulting in a product with polyvinylethynyltriethoxysilane in 150 ml (50%) or benzene in 140 ml (48%), n^{20}_D 1.456 1.0183. n^{20}_D 1.4560; d_{420} [7].

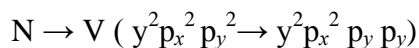
Viscous polyvinylethynyltriethoxysilane - colorless, non-toxic - odorless, non-volatile substance, insoluble in water. Insoluble in lower alcohols, but soluble in many organic solvents and has high hydrophobic properties, heat-resistant, characterized by a slight change in viscosity with increasing temperature. Table 2 lists some of the main physical properties of the obtained products [8].

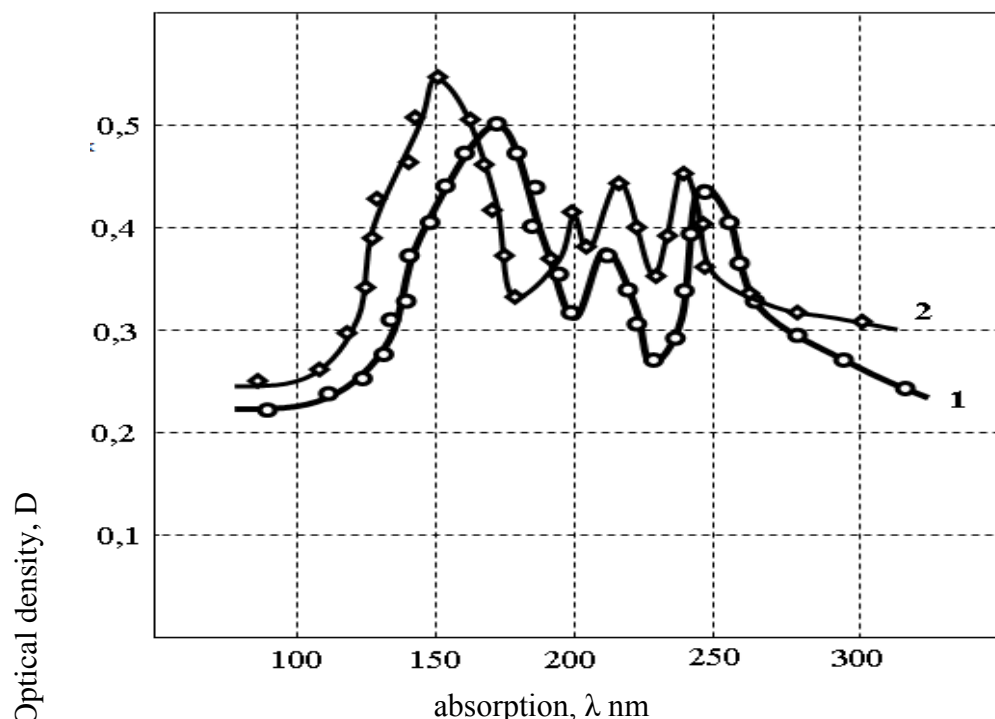
TABLE 2 BASIC PHYSICAL PROPERTIES OF ELEMENTARY INORGANIC MONO(POLY)MERS BASED ON SILICON

Products	Density at 25°C, g/sm ³	Refractive index of light, n^{25}_D	Viscosity at 25°C, mm/s ²
Vinylethynyltriethoxysilane	1,1154	1,13526	120
Polyvinylethynyltriethoxysilane	1,3372	1,3862	410

We also analyzed the UV spectra of the synthesized substances.

Chromoforms are often groups of unsaturated bonded atoms. However, vinyl ethynyltriethoxysilane and polyvinylethynyltriethoxysilane containing unsaturated C = C bonds are only 200 shows the spectrum in the absorption region above nm. The samples with the ethynyl group -C≡C- have broad absorption lines up to 240 nm, and it should be noted that this is due to the possibility of particle transition.





Rice. 1. UV spectrum of vinyl ethynyltriethoxysilane and polyvinylethynyltriethoxysilane

There are also two systems, the 180-165 nm series and the Rydberg series, a wide fuzzy network in the 152-105 nm region. In addition, the presence of two pairs of bonds between carbon atoms is detected, which leads to strong decay in the region of 225 nm.

It is known that the C-C bond between carbon atoms is usually absorbed only in the far ultraviolet region. In this regard, when the length of the hydrocarbon chain increases, that is, the conversion of vinyl ethynyltriethoxysilane to polyvinylethynyltriethoxysilane $\text{CH}_2 =$. It was found that the excitation effect requires significantly less energy due to the interaction of the groups.

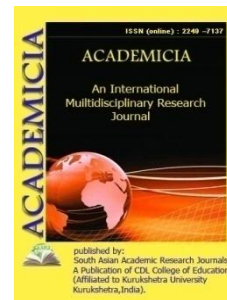
CONCLUSIONS

In this regard, it can be concluded that an increase in electromagnetism from left to right causes a stronger bond of electrons, so that (λ_{max}) the wavelength shifts towards shorter waves. $\text{CH}_2 = \text{CH}$ - 200-205 nm.

In addition, depending on the conditions in which the chromoform is located, the absorption line of the chromophore group (neighboring atoms, solvent, etc.) can shift within certain limits. Thus, for the first time, a vinyl ethynyltriethoxysilane monomer based on tetraethoxysilane and vinyl ethynyl magnesium bromide was synthesized.

REFERENCES

1. Pomogailo A.F., Sebastianov V.S. Metal-containing monomers and polymers based on them. - Moscow: Chemistry, 1988. - 26 p.
2. Akhmedov V.N., Niyazov L.N., Rakhimov F.F., Makhmudjonov S., Obidov Kh.O. Synthesis and study of the main properties of organoelement mono (poly) mers based on silicon compounds "Fan va texnologar tarakkiyoti" Ilmiy-tehnika zhurnal. No. 3/2018
3. Morrisette J.M., Carroll P.J., Bayer I.S., Qin J., Waldroup D., Megaridis C.M. A methodology to produce eco-friendly superhydrophobic coatings produced from all-water-processed plant-based filler materials Green Chemistry. 2018. Vol. (22). P. 5169-5178.
4. Rakhimov F.F., Akhmedov V.N., Aminov F.F., Method of obtaining hydrophobic compositions Universum: chemistry and biology journal 4 (70) Moscow 2020 63-65 S.
5. Akhmedov V.N., Niyazov L.N., Rakhimov F.F., Panoev N.Sh., Ruzieva K.E. Hydrophobization in construction Monograph Bukhara, Durdona, 2018
6. Rakhimov F.F. Technology for obtaining polyvinylethyltriethoxysil based on tetraethoxysilane Universum: technical sciences 10 (91) Moscow 2021 97-100 pp.
7. Akhmedov V.N., Niyazov L.N., Rakhimov F.F., Panoev N.Sh. Method of obtaining organosilicon compounds Science News of Kazakhstan Scientific and technical journal. No. 3 (141) Almaty. 2019 35-43 C
8. Akhmedov V.N., Niyazov L.N., Rakhimov F.F., Panoev N.SH. The method of producing hydrophobic organosilicon polymers based on hydrolyzed polyacrylonitrile. Химический журнал Казахстана, 2 (66) Алматы. 2019 90-96 C.



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INTERPRETATION OF TERMS USED TO DIVIDE WORDS INTO CERTAIN GROUPS IN THE STUDY OF VOCABULARY AS A SYSTEM IN THE WORK OF QUTADGHU BILIG

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ABSTRACT

In this article are described an interpretation of some of the terms used to classify words into specific groups in the study of lexicon as a system in Yusuf Hos Hajib's Qutadg'u Bilig, as well as an interpretation of opinions on social and political terms and lexical analysis. The above-mentioned cases on the use of the concept and term of the layer in linguistics are also present in Russian linguistics. In Russian linguistics (as well as in Turkology), different terms are used when thinking about the concept of layer. In this case, lexical units are divided into two layers according to their specific speech patterns: general speech layer and specific layer. H. Doniyorov uses the term layer in the description of methods.

KEYWORDS: *Descriptive-Synchronic Direction, Historical-Diachronic Direction, Comparative-Typological Direction, Lexical Layer, Lexical Field, Genetic Group, Socio-Political Lexicon, Community, Social Life.*

INTRODUCTION

The correct way to study vocabulary as a system is to analyze words by grouping them into specific groups. Just as the introduction of system linguistics into the science of linguistics played an important role in this, the formation and development of the field of lexicology as a science laid the foundation for the development of system-structural linguistics.

Linguistic units, including its lexical groups, also emerged on the basis of a dialectical relationship of system, structure, and norm or norm. In this case, the system consists of an integral set of elements, and the structure consists of the internal structure of this complex. Therefore, the study of linguistic phenomena in system-structural ethics requires, firstly, the

definition of the set of elements that make up the system and, secondly, the definition of internal relations and connections between these elements, their hierarchical arrangement and ways of forming one element from another. . This can be observed in the study of words in the lexicon of the language by dividing them into certain groups.

It should be noted that in linguistic lexicon, various concepts and terms are used in linguistics in the study of words into certain groups. Among these, the most widely used terms are lexical layer and lexical field. There are also cases when different terms are used instead of these terms. It is therefore appropriate to make some comments on this issue.

In linguistics, the concept and term of the lexical layer have a wide place in the division of words into certain groups. In Uzbek linguistics, the lexical layer, including terminological systems, is studied not only in terms of spiritual content, but also in terms of thematic grouping. Some sectoral terminological systems are also explored. But in linguistics, on the one hand, there is no uniformity in the clear and coherent understanding of the layer phenomenon, and on the other hand, in the systematic use of the term layer, which expresses this concept.

Linguist E. Begmatov in his work pays special attention to the lexical layers of the language, and in many studies expressed important ideas about the attitude to the phenomenon of layers and the use of the term layer. For example:

1. Some scholars in linguistics analyze lexical phenomena as a lexical layer, but do not call it only a layer or a lexical layer, but also use another term in a number of works. This situation, i.e. the use of different terms instead of the term lexical layer in the analysis of words into certain groups, exists not only in the Uzbek language, but also in the field of general linguistics.
2. Many linguists make extensive use of the concept and term lexical layer or lexical layer. But different terms are named at the same time with this term.

The views of Russian linguists on this issue played an important role in the emergence of the scientific concept of lexical layers in Uzbek linguistics. The above-mentioned cases on the use of the concept and term of the layer in linguistics are also present in Russian linguistics. In Russian linguistics (as well as in Turkology), different terms are used when thinking about the concept of layer. M.I. Fomina calls the concepts belonging to different lexical layers "genetic group of words". It can be observed that the concept of layering in Russian was used to group words in the lexicon of Turkic and other languages in general. In most works written in Russian, the word assimilation is referred to in various terms. Plast (layer), sloy (layer), Turkish lexicon, Turkism, Turkic names, element, Turkic lexical elements, Turkic element, Turkic borrowed words, fund (ancient fund, social fund). In using these terms, each author has acted from his own point of view.

In general, the understanding of the concept of layer in different senses and non-verbal use is widespread in Russian linguistics. In some works, the concept of layer term is also used with the terms discharge, group, active reserve. It is noteworthy that sometimes in the stylistic analysis of the Russian lexicon was used the term layer, and an attempt was made to define the concept of layer in detail.

For the first time in Uzbek linguistics the concept of layer was introduced by V.V. Reshetov and A. K Used in Borovkov's research. .

In works on Uzbek linguistics, such as Fakhri Kamal's work on Uzbek lexicon, he avoided using the term lexical layer for groups, which were considered to be the lexical richness of the language. Sometimes he used the term lexical element. However, it can be observed that in his research he also used the term layer, reflecting on changes in lexical layers, Persian and Arabic word layer, Arabic word layer, international word layer, basic lexical layers.

Observations show that the term layer, lexical layer, is widely used in Uzbek linguistics. But the concept of stratification also applies to meanings specific to certain social or speech groups of words. Ya.Pinkhasov describes the social-dialectal groups of words with the term layer, while Sh.Rakhmatullaev used the term layer to name the groups of words specific to social networks. Words are also divided into certain layers according to their methodological branching characteristics. In this case, lexical units are divided into two layers according to their specific speech patterns: general speech layer and specific layer. H. Doniyorov uses the term layer in the description of methods. It analyzes lexical and stylistic layers. Academician A. Khojiev used the term layer when thinking about his own layer and assimilated layers in the Uzbek lexicon and specific lexical layers of the Uzbek language, and also uses this term to divide words into historical-functional groups.

In the works of Sh. Shoabdurahmanov, the term layer was used to divide words into groups of activity and passivity. In general, Sh. Shoabdurahmanov in his research divided the words in the Uzbek language into three layers: 1) the lexical layer, which is common to the literary language and dialects; 2) a lexical layer unique to a dialect; 3) traditional lexical layer in Uzbek language.

In some works, the term layering has been used to describe words related to the military and various branches of the profession. While I. Rasulov uses the term layer in the sense of words specific to the military sphere, N. Mirzaev and T. In Tursunova's works, the layer of ethnographic lexicon is used in the analysis of the ancient traditional layers of ethnographic lexicon.

A.D. Urazbaev used the term lexical layer in the definition of thematic-semantic groups of socio-political lexicon in the dissertation "Socio-political vocabulary in Agahi's work" "Riyazud-davla". The third chapter of the study is entitled "Structural analysis of socio-political vocabulary in the work" and includes "Structural analysis of socio-political lexicon of the Turkish lexical layer" and "Structural analysis of socio-political lexicon of the Iranian lexical layer" and "Socio-political lexicon of the Arabic lexical layer". structural analysis of vocabulary".

Although G.Muhammadjanova did not consistently use the term layer in her work and did not focus on the concept of layer and the essence of the term layer, which expresses it, she thought about the all-Turkish lexical layer and other layers. In some works, the concept of layer is also removed from the headings.

K. Yusupov also used the term layering in his book "Lexical, semantic and stylistic features of the Uzbek literary language", but some of the historical and etymological groups of words in the language dictionary are "Azerbaijani-Turkish words", "Arabicism", "Persian-Tajik words". grouped in forms.

In the first chapter of the dissertation, A.Kh.Turahojaeva, along with the use of the term layer (such as "the emergence of new structures belonging to the socio-political stratum"), widely used the term field.

Hence, in linguistics, the concept of layer is interpreted differently and accordingly the term layer is used in different senses. In this case, E. Begmatov concludes:

“1. The social differential groups of words are called layers: social-dialectal layers, like the layer of dialectal words.

2. Diachronic and synchronously functional groups of words are called layers: modern layer; old and modern layer; like a layer of old words and a layer of new words.

3. Groups of words that are active or passive according to their use are also called layers: active word layer, passive word layer.

4. The methodological differential groups of words are also called layers: such as the general layer and the custom layer.

5. Groups of words within a literary language and dialects, as well as inter-dialects or groups specific to one dialect are also called layers: literary language layer, lexical layer common to Uzbek literary language and dialects, layer common to all Uzbek dialects, single dialect like a specific lexical layer.

6. According to the normative, i.e. historical, groups of words are also called layers: traditional lexical layer, like the ancient traditional layer.

7. Groups of words related to specific areas, such as occupations, are also referred to as strata: military strata, ethnographic lexical strata or ethnographic strata, such as lexical strata related to occupational sectors.

8. Groups of words belonging to a particular style or different styles are also called layers: stylistic layers, lexical-stylistic layers, expressive-stylistic layers of lexicon, stylistic colored layers, stylistic layers of language.

9. Historical and etymological groups of words in the language dictionary are also called layers: layers of Persian and Arabic words, layers of Arabic words, layers of Russian-international words, primitive Turkic lexical layer, Turkish lexical layer, assimilated lexical layer, own layer, assimilation layer, The groups of words defined by the period of their appearance are also called layers: the oldest layer, like the layer that appeared later.

According to the scientist, not all such lexical phenomena can be considered as a single lexical layer. Because lexical layers are a group of words that have a certain position in the lexicon of the Uzbek language, forming a significant volume. Lexical layers mean that words belonging to different genetic sources, with a certain amount, are layered in the lexical system of the language in different historical periods. It is possible to agree with this conclusion. But the scholar argues that the amount of words in it should be taken into account when determining the lexical layer. For example, in the Uzbek language there are some words typical of ancient Sughd, ancient Sanskrit, ancient Greek. But they are not so numerous in number. Can these words also be called an independent lexical layer? In our opinion, it is expedient to call such lexical phenomena lexical elements, not a lexical layer. The scientist also considers the group of words that have entered the lexicon of the Uzbek language at different times as a lexical layer.

In our opinion, all the words present in the Uzbek lexicon form a lexical layer. This can also be understood from the lexical meaning of the term layer. For example, let us draw attention to the

lexical meaning of the term layer. In fact, this concept and term came into Uzbek on the basis of a translation from Russian linguistics. For example, the word layer used in the Uzbek language in the sense of a linguistic term is the Uzbek translation of the Russian words *plast* or *sloy*. In fact, in the Russian-Uzbek Dictionary, the word *plast* in Uzbek is mainly: 1. layer, translated as layer, and *plastpochvy-soil* (earth) layer; *ugolnyyplast-coal* layer; 2. *Plast-layer, gang, group*; *plastnovykh slovarnykh zaimstvovaniy* - like a layer of new assimilation words. The term *Sloy* is also translated into Uzbek mainly in the sense of layer, however; The forms used in the form of *sloygliny*, *sloylda*, *tolstysloykraski*, *verxniesloiatmosferi*, *shirokiesloinaseleniya* are also interpreted in the sense of a layer of clay, a layer of ice, a layer of thick paint, the upper layers of the atmosphere, the general population.

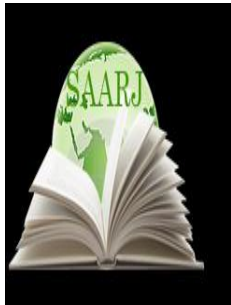
The term layer refers to the products that make up certain layers. In the Uzbek Soviet Encyclopedia, layer is defined as a geological term: Layer (in geology) is the basic form of sedimentary rock placement. The composition of the layer is the same and is bounded by surfaces that are almost parallel to each other. Hence, the term layer (*plast* or *layer*) literally refers to products in which the surface of one is parallel to the other (overlapping or overlapping), layered (layered).

This means that regardless of the amount of words in the language lexicon, they are all located in parallel in the lexical layer of the language and form a common layer, but they form lexical units according to their semantic meanings. According to E. Begmatov, words in the lexicon of the Uzbek language can be applied to historical and etymological groups. The concept of layer is mainly specific to the lexical layer phenomenon. Although this concept and term does not express the essence of other areas of linguistics, it can be applied conditionally to them as well. In general, there is still no consistency in the use of this term in linguistics. Therefore, in linguistics, the concept of field is used in conjunction with lexical layers in the study of areas in the system of language lexicon in groups.

REFERENCES

1. [Turahojaeva A.X. Development of socio-political lexicon of the Uzbek language in the conditions of independence.-T.: Philol. fan.nomzodi diss ... avtoref., 2012, 9-p. (P. 26).]
2. [Begmatov E. Lexical layers of modern Uzbek literary language.-T.: Science, 1985.34-p.]
3. [Gak V.G. Theoretical terminology of the French language (translated by Ibodulla Mirzaev) .- Samarkand: SamDCHTI]
4. [Faxri Kamol. Modern Uzbek, -T.,1953. Pages 21-45; Modern Uzbek.-T.: "Science", 1957, pp. 89, 96-99]
5. [Modern Uzbek literary language.1.-T.: 1966.164-188-p.]
6. [Modern Uzbek Literary Language, pp. 186-188.]
7. [Pinxasov YA. Modern Uzbek lexicon. T.: 1960, 50-p.]
8. [Tursunov U., Mukhtorov J., Rahmatullaev SH. Modern Uzbek literary language.-T.: 1975, pp. 47-50.]
9. [Tursunov U., Mukhtorov J., Rahmatullaev SH. Modern Uzbek Literary Language, p. 63.]
10. [Doniyorov H. Vocabulary of Kipchak dialects.-T.: 1979. 78-p.]

11. [Modern Uzbek literary language. -T.:1980.120, 121,124, 127-bb.nashri, 2002, 15-p.]
12. [Begmatov E. The work cited, pp. 34-47.]
13. [Begmatov E. Shown work]



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CYTOKINE DIAGNOSTICS IN THE PROGNOSIS OF CRITICAL CONDITIONS IN NEWBORNS BORN TO MOTHERS INFECTED WITH COVID-19

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ABSTRACT

The authors conducted a study of cytokines of newborns born to mothers with coronavirus infection. SARS-CoV-2 infection causes a sharp decrease in the number of lymphocytes, especially a decrease in CD4 T cells, accompanied by uncontrolled release of inflammatory cytokines, which leads to a second stroke and exacerbates pathological changes in the respiratory system. Clinical symptoms vary among the infected population, suggesting that individual immune status is associated with susceptibility to COVID-19 and that immune dysfunction may play a significant role in the development of critical diseases.

KEYWORDS: COVID-19, SARS-Cov-2, Newborns, Critical Conditions, Coronavirus Disease, Cytokines

INTRODUCTION

The 2019 coronavirus disease (COVID-19) has spread rapidly around the world. With a sharp increase in the number of infections, the number of pregnant women and children with COVID-19 is also growing [6,23,24].

Since the first reported case of neonatal COVID-19 in February 2020 [20], concerns have been expressed about the possible vertical transmission of SARS-CoV-2 [9,10,12,23].

Early Chinese reports suggested that vertical transmission of SARS-CoV-2 does not occur because amniotic fluid, vaginal mucus, placenta, umbilical cord, umbilical cord blood and neonatal stool samples tested negative for the virus [6,7,11,15,17,19,21,24]. In addition, smears from the nasopharynx of these newborns immediately after delivery were negative. Moreover, there have been no reports of vertical transmission during outbreaks of Severe Acute Respiratory

Syndrome (SARS) and Middle East Respiratory Syndrome (MERS) due to genetically similar coronaviruses [4,16].

In other series of cases, serological testing of seven newborns with limited postpartum exposure (mothers born by caesarean section wore masks, and newborns quickly separated from their mothers) showed the presence of virus-specific antibodies, including three with high IgM levels, despite negative virological testing [9,10]. This may indicate the transplacental passage of SARS-CoV-2, since IgM does not cross the placenta, although IgM assays are difficult to interpret due to frequent false positive results [12]. While postnatal transmission of infection to newborns is most likely, current data are inconclusive regarding intrauterine transmission [5].

It is known that critical conditions of newborns are characterized by organ dysfunction and multiple organ failure, the treatment of which requires urgent aggressive therapeutic measures. Changes in clinical, laboratory and physiological parameters in critical conditions are often considered and interpreted in isolation from each other. Timely adoption of clinical and organizational decisions in the treatment of patients in critical conditions is very important [1-3].

The frequency of critical diseases caused by COVID-19 is about 19%, of which in most cases progress to acute respiratory distress syndrome and respiratory failure, accompanied by acute immune dysfunction. SARS-CoV-2 infection causes a sharp decrease in the number of lymphocytes, especially a decrease in CD4 T cells, accompanied by uncontrolled release of inflammatory cytokines, which leads to a second stroke and exacerbates pathological changes in the respiratory system. Clinical symptoms vary among the infected population, suggesting that individual immune status is associated with susceptibility to COVID-19 and that immune dysfunction may play a significant role in the development of critical diseases. Due to the special immunological status of pregnant women, the inflammatory reaction of the mother to a coronavirus infection can affect the structural and functional development of the fetus and newborn [13,19].

In children, COVID-19 is weak or asymptomatic.¹²; however, the virus can remain in the body for a long time, and viral nucleic acids can persist in faeces, which suggests the possibility of non-respiratory transmission in children. Immaturity of immunological function in children and newborns leads to their increased susceptibility to viral infections, while immaturity of adaptive immunological development can make their clinical symptoms different from those in adults [8,13].

Together, these aspects raise serious questions about why the clinical manifestations of infected children and newborns differ from those of adults with immunosuppression and what effect the inflammatory response caused by maternal infection has on the immunological function of the fetus [14].

The aim of the study was to study blood and urine cytokines of newborns born to mothers infected with COVID-19 to predict the outcome of critical conditions.

Materials and methods of research:

Under observation were 120 newborns with critical conditions hospitalized in the BODMPMC in the period 2020-2021. A clinical and laboratory examination of 64 newborns was conducted: 33 newborns born to mothers with COVID-19 (group 1), 30 newborns with perinatal CNS lesion (CNS) (2nd group) and 31 healthy newborns. The exclusion criteria were congenital

malformations, prematurity, traumatic lesions of the central nervous system. All newborns underwent conventional clinical and laboratory methods of examination. To determine the molecular markers in the urine, the morning, first portion of urine was collected in special sterile plastic urine collectors with lids. Determination of the content of the main pro- and anti-inflammatory cytokines (IFN γ , IL-17A, MCP-1, IFN α , VEGF) in urine and serum (IFN γ , IL-17A, MCP-1, IFN α , VEGF) on the 5th day of life was carried out by solid-phase enzyme immunoassay using sets of reagents from Vector-Best (Novosibirsk, RF). The results were expressed in pg/ml. Statistical processing of the obtained results was carried out by methods of variational statistics using the Statistica for Windows application software package. Digital data was processed on an IB MPC personal computer using the memory of Microsoft Excell-97 application programs. The information was considered reliable under the condition that $t \geq 2$ and $P < 0.05$.

Research results and their discussion: To compare the immunological parameters of blood and urine, as well as to determine the dynamics of cytokines and reduce invasive procedures, the study of pro and anti-inflammatory cytokines in blood serum and urine in newborns was carried out. Modern literature says that the immune system in the neonatal period and in the postnatal period is in a state of physiological suppression. The biological meaning of suppressing immune reactions in newborns and in the postnatal period is to prevent the risk of developing severe immunopathological reactions with massive contact of the child with environmental antigens [8]. It has been established that the human immune system is inextricably linked with the interferon system. Interferons- α and - γ affect the activity of natural killers. Also, one of the important properties of interferons is the ability to interfere with intracellular replication of viruses, activating the cell's response to viral infection. Interferon triggers a cascade of biochemical reactions in cells that lead to suppression of the synthesis of viral proteins, as well as to suppression of the assembly and release of viral particles and activation of the process of apoptosis of an infected cell [3,22].

Prognostically unfavorable for the development of infectious and inflammatory diseases of the pulmonary system in premature infants is a decrease in the indicators of alpha and gamma interferons in the blood [4].

As a result of the analysis, it was found that the concentration of IFN γ increases in newborns of the 1st group to -23.64 ± 0.83 pkg/ml ($p < 0.05$), and in the 2nd group to -29.20 ± 1.28 pkg/ml ($p < 0.05$), in relation to the control -20.96 ± 0.66 pkg/ml (Table 1).

At the same time, an increase in the concentration of IFN α was also noted in newborns born to mothers with COVID-19 (group 1) to 33.71 ± 1.22 pkg/ml in relation to the control indicators -26.49 ± 1.20 pkg/ml ($p < 0.05$), and children of group 2 with PPCNS had a statistically insignificant decrease to 24.43 ± 1.36 pkg/ml.

TABLE 1 THE CONTENT OF CYTOKINES IN THE BLOOD OF NEWBORNS

Cytokines pg/ ml	Control groupn=31		1-groupn=33		2-groupn=30	
	min-max	Average	min-max	Average	min-max	Average
IFN γ	14,48-27,35	20,96 \pm 0,66	15,27-32,25	23,64 \pm 0,83*	17,05-39,63	29,20 \pm 1,28*
IFN α	15,83-38,21	26,49 \pm 1,20	21,79-47,37	33,71 \pm 1,22*	16,92-35,49	24,43 \pm 1,36
IL-17A	29,93-64,97	46,99 \pm 1,70	55,34-92,06	70,63 \pm 1,70*	24,22-56,17	38,74 \pm 2,07*
MCP-1	98,29-305,71	196,69 \pm 9,92	422,15-1058,15	765,66 \pm 33,07*	74,22-166,43	116,47 \pm 7,86*
VEGF	19,21-59,93	38,47 \pm 2,23	25,17-54,67	40,05 \pm 1,49	30,12-54,45	42,15 \pm 1,82

Note: *-significantly relative to the control ($p < 0.05$)

Consequently, the obtained results of studying the interferon status of observed newborns on the first 5th day of life show activation of interferon formation in full-term newborns born to mothers with COVID-19. Interleukin-17 belongs to proinflammatory cytokines and is involved in many stages of the immune response. It stimulates the production of chemokines and, as a result, stimulates the migration of neutrophils to the site of inflammation. IL-17 triggers an extensive tissue reaction leading to the migration of neutrophils into the inflammatory zone [7]. IL17A is a dimeric glycoprotein (15 kDa) consisting of 155 amino acids. Its biological function is aimed at ensuring the interaction between innate and acquired immunity [18,36].

The study of IL-17A levels in the serum of observed newborns showed a statistically significant increase in group 1 children to -70.63 ± 1.70 pg/ml ($p < 0.05$), and in group 2 a decrease to 38.74 ± 2.07 pg/ml ($p < 0.05$) versus control- 46.99 ± 1.70 pg/ml. The results obtained indicate the presence of an inflammatory process and activation of the phagocytosis system in the first 5 days of life in full-term newborns born to mothers with COVID-19. And a significant decrease in its level in newborns with PCNS confirms an increase in INF γ and the absence of inflammation. Thus, full-term newborns born to mothers with COVID-19 are characterized by an increase in the synthesis of INF γ and IFN α against the background of an increase in IL-17A, which confirms the activation of phagocytosis and interferon synthesis in response to viral load for the first time 5 days of life.

It is known that monocytic chemotactic protein (MCP-1) is widely involved in physiological (teething, nociception, angiogenesis, etc.) and pathophysiological processes in the body, participates in the pathogenesis of a number of diseases. MCP-1 is mainly expressed by macrophages in response to the action of a wide range of cytokines, such as IL-6, TNF- α and IL-1b. Due to its targeted cell specificity, it has been postulated that MCP-1 plays a pathogenic role in a variety of different diseases characterized by infiltration of mononuclear cells. Elevated levels of MCP-1 were also detected in connection with bone inflammation, as well as in myocardial ischemia and viral infection [5].

In our studies, when studying the concentration of MCP-1 in the blood serum of observed healthy and sick newborns with critical conditions, a statistically significant increase was found

in group 1 children to -765.66 ± 33.07 pg/ml ($p < 0.05$), and in group 2 a decrease to 116.47 ± 7.86 pg/ml ($p < 0.05$) versus control- 196.69 ± 9.92 pg/ml.

Consequently, the established increase in the level of MCP-1 in group 1 newborns confirms the development of inflammation at the endothelial level and indicates the onset of systemic inflammatory response syndrome (SIRS).

Currently, seven different CoV strains have been found to infect humans, including HCoV-229E, HCoV-NL63, HCoV-OC43 and HCoV-HKU1, which usually cause self-resolving symptoms. In addition, coronavirus can cause severe acute respiratory syndrome (SARS), Middle Eastern respiratory syndrome (MERS-CoV) and lethal acute respiratory syndrome, which causes the recently identified SARS-CoV-2. Four types of HCoV, including HCoV-229E (α -CoV), HCoV-NL63 (α -CoV), HCoV-OC43 (β -CoV) and HCoV-HKU1 (β -CoV), are endemic to humans and usually cause mild respiratory infection with self-resolving symptoms, which accounts for 15-30% of acute respiratory diseases (ARI). As a rule, this type of infection occurs in young people, but in older age, especially in patients with cardiovascular and bronchopulmonary pathology, it can cause hospitalization, including emergency [30]. Vascular Endothelial Growth Factor (VEGF)-activator of angiogenesis, responsible for restoring oxygen supply to tissues in a situation where blood circulation is insufficient. In physiological concentrations, endothelin (ET) acts on endothelial receptors, causing the release of relaxation factors, in higher concentrations it activates receptors on smooth muscle cells, stimulating persistent vasoconstriction primarily at the level of microcirculation [19]. The constrictor activity of endothelin-1 may be a factor of vasospasm enhancement, closing the vicious circle of pathobiochemical reactions and aggravating cerebral ischemia [9].

In our studies, the study of VEGF concentration showed a tendency to increase, regardless of nosology, to 40.05 ± 1.49 and 42.15 ± 1.82 in relation to control- 38.47 ± 2.23 in newborns with critical conditions of the 1st and 2nd groups, respectively (Table 1). The established phenomenon indicates the involvement in the development of CVD during the first 5 days in newborns of the observed group both with coronavirus infection and with PDCNS in the absence of COVID-19.

To reduce invasive manipulations and compare blood serum and urine values in newborns of the observed group, urocytokinodiagnostics was performed.

The studied indicators in urine allowed us to conclude that during the first 5 days of life of full-term newborns with perinatal pathologies, reliable results of urocytokinodiagnostics can be obtained. Thus, in full-term newborns with perinatal pathologies, the concentrations of INF γ , IFN α and IL-17A significantly increase in urine both during infection and in the absence of COVID-19 in the mother. The studies revealed a statistically significant 3-fold increase in the level of INF γ to 16.84 ± 0.66 pg/ml in children of group 1, and a 2-fold increase (10.21 ± 0.41 pg/ml) in children of group 2, against the control- 5.94 ± 0.23 pg/ml ($p < 0.05$). This tendency to increase was noted in relation to the level of IFN α in urine: up to 7.60 ± 0.39 pg/ml and 9.49 ± 0.43 pg/ml against the control- 5.78 ± 0.23 pg/ml, in newborns of the 1st and 2nd groups, respectively (Table 2).

TABLE 2 THE CONTENT OF CYTOKINES IN THE URINE OF NEWBORNS

Immunologic parameters of urine	Control group n=31		1-group n=33		2-group n=30	
	min-max	Average	min-max	min-max	Average	min-max
IFN γ	4,25-8,75	5,94 \pm 0,23	10,08-24,11	16,84 \pm 0,66*	6,94-15,42	10,21 \pm 0,41*
IFN α	3,68-8,06	5,78 \pm 0,23	4,33-11,87	7,60 \pm 0,39*	5,48-14,33	9,49 \pm 0,43*
IL-17A	20,05-38,48	30,75 \pm 0,93	41,15-92,50	65,48 \pm 2,30*	23,55-54,67	37,07 \pm 1,43*
MCP-1	74,51-130,2	99,25 \pm 2,63	16,72-33,10	23,36 \pm 0,75*	39,45-71,27	54,75 \pm 1,80*
VEGF	18,36-34,97	26,99 \pm 0,87	10,26-30,15	19,79 \pm 1,02*	14,48-33,05	22,72 \pm 0,96*

Note: *-significantly relative to the control ($p < 0.05$)

The study of the concentration of MSR-1 in urine revealed a 4-fold decrease to 23.36 \pm 0.75 pg/ml in COVID-19 and a 2-fold decrease to 54.75 \pm 1.80 pg/ml in full-term neonates against control-99.25 \pm 2.63 pg/ml. And the concentration of VEGF in urine also had a significant tendency to decrease to 19.79 \pm 1.02 pg/ml and 22.72 \pm 0.96 pg/ml against the control -26.99 \pm 0.87 pg/ml, which indicates the absence of an activator for oxygen delivery to tissues and inadequate renal circulation during the first 5 days of life of full-term newborns both in the presence of COVID-19 and in its absence in newborns with PDCNS, respectively.

CONCLUSION

The obtained results of cytokine diagnostics allowed early diagnosis and prediction of the health status of newborns for the development of critical conditions.

Newborns born from a mother with COVID-19 develop CVD during the first 5 days of life. In critical conditions in newborns with a coronavirus load, an increase in the synthesis of INF γ and IFN α was found against the background of an increase in the level of IL-17A, which confirms the activation of phagocytosis and interferon synthesis for the first time 5 days of life.

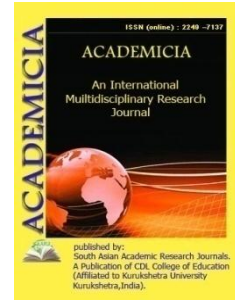
The established processes are accompanied by an increase in the level of MCP-1 in the blood by 3.89 times, with a decrease in its urine by 4.25 times in newborns born from a mother with COVID-19, which indicates the severity of the course of CVD. Both with COVID-19 infection and with PDCNS in newborns without COVID-19 infection, there is a tendency to increase VEGF in the blood, against the background of a statistically significant decrease in its urine. Consequently, the observed dynamics of cytokines in the blood and urine of newborns with CVD indicates the activation of phagocytosis, interferon formation and inadequate renal circulation during the first 5 days of life.

REFERENCES

1. Bakhranova N.R., Yuldasheva G.G. (2021). Pathogenetic Aspects Of Coronavirus Infection In Pregnant Women. Central Asian Journal Of Medical And Natural Sciences, 64-69. <https://doi.org/10.47494/cajmns.vi0.351>
2. GanievaSh.Sh., Radzhabova G.B. Clinical And Laboratory Assessment Of The Health Status Of Patients With Chronic Obstructive Pulmonary Disease Who Have Undergone Coronavirus Infection. CAJMNS [Internet]. 2021Oct.18 [cited 2021Oct.28];76-0. Available from: <http://cajmns.centralasianstudies.org/index.php/CAJMNS/article/view/353>
3. Ershov, F.I. Interferons and their inductors/F.I. Ershov, O.I. Iselev //Moscow: GEOTAR, 2005.-368 p.
4. Zhuravleva L.N. Interferon System In Premature Newborns With Congenital Pneumonia And Respiratory Distress Syndrome//Protection of motherhood and childhood No.1 (31) 2018.- p.5-8.
5. Monocytic Chemotactic Protein\1 In Physiology And Medicine K.A. Kolotov1*, P.G. Rasputin2 Perm Medical Journal No.3. volume XXXV,-2018. DOI 10.17816/pmj35399%105.
6. NavruzovaSh.I., Khamraeva D.R. Regional Features Of The Spread Of Chronic Constipation In Children // Eurasian Bulletin of Pediatrics. — 2021; 2 (9): 76-82. <https://cutt.ly/XWRsfvZ>
7. Nasonov EL, Denisov LN, Stanislav ML. Interleukin 17 is a new target for anti-cytokine therapy of immuno-inflammatory rheumatic diseases. Scientificandpracticalrheumatology. 2013;51(5):545–52
8. 2013;51(5):545–52
9. Neonatology–National Guidelines / ed. aka demika RAMS prof. N.N. Volodina. -M.: GEOTAR-Media, 2008. -749 p.
10. StepanovaYu.I., Gonchar I.A. Endothelin-dependent effects
11. in cerebrovascular pathology of ischemic genesis, Medical news. - 2013. - No. 10. - pp. 12-18.
12. Alserehi H, Wali G, Alshukairi A, Alraddadi B. Impact of Middle East Respiratory Syndrome coronavirus (MERS- CoV) on pregnancy and perinatal outcome. BMC Infect Dis. 2016;16:105. [PMC free article] [PubMed] [Google Scholar]
13. Amatya S, Corr TE, Gandhi CK, Glass KM, Kresch MJ, Mjtsce DJ, Oji-Mmuo CN, Mola SJ, Murray YL, Palmer TW, Singh M, Fricchione A, Arnold J, Prentice D, Bridgeman CR, Smith BM, Gavigan PJ, Ericson JE, Miller JR, Pauli JM, Williams DC, McSherry GD, Legro RS, Iriana SM, Kaiser JR. Management of newborns exposed to mothers with confirmed or suspected COVID-19. J Perinatol. 2020 Jul;40(7):987-996. doi: 10.1038/s41372-020-0695-0. Epub 2020 May 21. PMID: 32439956; PMCID: PMC7241067.
14. Chen H, Guo J, Wang C, et al. Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records. Lancet. 2020;395(10226):809-815. doi:10.1016/S0140-6736(20)30360-3PubMedGoogle ScholarCrossref

15. Chen Rong, Zhang Yuan, Huang Lei, Cheng Bi-heng, Xia Zhong-yuan, Meng Qing-tao. Safety and efficacy of different anesthetic regimens for parturients with COVID-19 undergoing Cesarean delivery: a case series of 17 patients. *Canadian Journal of Anesthesia/Journal canadien d'anesthésie*. 2020;67(6):655–663. [PMC free article] [PubMed] [Google Scholar]
16. Cruz AT, Zeichner SL. COVID-19 in children: initial characterization of the pediatric disease [published online ahead of print March 16, 2020]. *Pediatrics*. <https://doi.org/10.1542/peds.2020-0834>. [PubMed]
17. Cui Yuxia, Tian Maolu, Huang Dong, Wang Xike, Huang Yuying, Fan Li, Wang Liang, Chen Yun, Liu Wenpu, Zhang Kai, Wu Yue, Yang Zhenzhong, Tao Jing, Feng Jie, Liu Kaiyu, Ye Xianwei, Wang Rongpin, Zhang Xiangyan, Zha Yan. A 55-Day-Old Female Infant Infected With 2019 Novel Coronavirus Disease: Presenting With Pneumonia, Liver Injury, and Heart Damage. *The Journal of Infectious Diseases*. 2020;221(11):1775–1781. [PMC free article] [PubMed] [Google Scholar]
18. Dong L, Tian J, He S, Zhu C, Wang J, Liu C, et al. Possible vertical transmission of SARS-CoV-2 from an infected mother to her newborn. *JAMA*. 2020. 10.1001/jama.2020.4621. [PMC free article] [PubMed]
19. Fan C, Lei D, Fang C, Li C, Wang M, Liu Y, et al. Perinatal transmission of COVID-19 associated SARS-CoV-2: should we worry? *Clin Infect Dis*. 2020. 10.1093/cid/ciaa226. [PMC free article] [PubMed]
20. Gaffen SL. Structure and signalling in the IL-17 receptor family. *Nat Rev Immunol*. 2009;9(8):556–67. DOI: <http://dx.doi.org/10.1038/nri2586>.
21. Kawanabe Y., Nauli S.M. // *Cell. Mol. Life Sci.*–2011. – Vol.68 (2). – P.195–203,
22. Kimberlin DW, Stagno S. Can SARS-CoV-2 infection be acquired in utero? More definitive evidence is needed. *JAMA*. 2020. 10.1001/jama.2020.4868. [PubMed]
23. Kollmann T.R., Kampmann B., Mazmanian S.K., Marchant A., Levy O. Protecting the newborn and young infant from infectious diseases: lessons from immune ontogeny. *Immunity*. 2017;46:350–363. [PubMed] [Google Scholar]
24. Kushnareva, M. The use of intravenous immunoglobulins in premature newborn children in hardware lung ventilation / M. Kushnareva, E. Vetrova, G. Dementyeva // *Int. J. Medical Science*. –2014.–Vol. 5.–№2.–P. 23–25
25. Liu P, Zheng J, Yang P, Wang X, Wei C, Zhang S, Feng S, Lan J, He B, Zhao D, Li J, Zhang Y. The immunologic status of newborns born to SARS-CoV-2-infected mothers in Wuhan, China. *J Allergy Clin Immunol*. 2020 Jul;146(1):101-109.e1. doi: 10.1016/j.jaci.2020.04.038. Epub 2020 May 11. PMID: 32437740; PMCID: PMC7211641.
26. Liu W, Wang Q, Zhang Q, Chen L, Chen J, Zhang B, et al. Coronavirus disease 2019 (COVID-19) during pregnancy: a case series. *Preprints*. 2020;2020020373.
27. Lu R, Zhao X, Li J, Niu P, Yang B, Wu H, et al. Genomic characterisation and epidemiology of 2019 novel coronavirus: implications for virus origins and receptor binding. *Lancet*. 2020;395:565–74. [PMC free article] [PubMed] [Google Scholar]

28. Mullins E., Evans D., Viner R. M., O'Brien P., Morris E. Coronavirus in pregnancy and delivery: rapid review. *Ultrasound in Obstetrics & Gynecology*. 2020;55(5):586–592. [PubMed] [Google Scholar]
29. NavruzovaSh.I, Akhmedov A.T. Autoimplantation Of Thymus In Surgical Correction Of Congenital Heart Defects . *Cajmns* [Internet]. 2021May26 [cited 2021Oct.28]; 2(3):88-. Available from: <http://cajmns.centralasianstudies.org/index.php/CAJMNS/article/view/178>
30. Schaller B.J. // *Arch. Med. Sci.* – 2006. – Vol.2, 3. –P.146–158 .
31. Schwartz D.A., Graham A.L. Potential maternal and infant outcomes from coronavirus 2019-nCoV (SARS-CoV-2) infecting pregnant women: lessons from SARS, MERS, and other human coronavirus infections. *Viruses*. 2020;12:194. [PMC free article] [PubMed] [Google Scholar]
32. Su S, Wong G, Shi W, et al. Epidemiology, genetic recombination, and pathogenesis of coronaviruses. *Trends Microbiol*. 2016; 24 (6): 490–502. DOI: 10.1016/j.tim.2016.03.003
33. Wang L, Shi Y, Xiao T, Fu J, Feng X, Mu D, et al. Chinese expert consensus on the perinatal and neonatal management for the prevention and control of the 2019 novel coronavirus infection (First edition) *Ann Transl Med*. 2020;8:47. [PMC free article] [PubMed] [Google Scholar]]
34. Wang S, Guo L, Chen L, Liu W, Cao Y, Zhang J, et al. A case report of neonatal COVID-19 infection in China. *Clin Infect Dis*. 2020. 10.1093/cid/ciaa225.
35. Yuldasheva Gulnoz Giyasovna, Bakhranova Nasiba Ramazanovna, & Baratov Sunnat Samiyevich. (2021). Statistical Analysis Of The Structure Of The Birth Rate Of Underweight Children In The Bukhara Region. *Art of Medicine International Medical Scientific Journal*, Volume-1(Issue-2), 73–81. <https://doi.org/10.5281/zenodo.5155178>
36. Zeng L, Xia S, Yuan W, Yan K, Xiao F, Shao J, Zhou W. Neonatal Early-Onset Infection With SARS-CoV-2 in 33 Neonates Born to Mothers With COVID-19 in Wuhan, China. *JAMA Pediatr*. 2020 Jul 1;174(7):722-725. doi: 10.1001/jamapediatrics.2020.0878. PMID: 32215598; PMCID: PMC7099530.
37. Zhu H, Wang L, Fang C, et al. Clinical analysis of 10 neonates born to mothers with 2019-nCoV pneumonia. *Transl Pediatr*. 2020;9 (1):51-60. doi:10.21037/tp.2020.02.06PubMedGoogleScholarCrossref
38. Zhu S, Qian Y. IL-17/IL-17 receptor system in autoimmune disease: mechanisms and therapeutic potential. *Clin Sci*. 2012;122(11):487–511. DOI: <http://dx.doi.org/10.1042%2FCS20110496>



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PATHOGENETIC ASPECTS OF ABNORMAL UTERINE BLEEDING IN TEENAGE GIRLS

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ABSTRACT

This review presents data revealing the pathogenesis of uterine bleeding during puberty, examines neuro-endocrine and immune mechanisms of regulation of the menstrual cycle in adolescent girls. The authors have formulated a conclusion summarizing modern research devoted to the study of the regulatory mechanisms of the reproductive system.

KEYWORDS: *Uterine Bleeding, Puberty, Adolescent Girls, Reproductive System.*

INTRODUCTION

In modern society, improving the reproductive health of women of all age groups is an important task for the formation of future generations of healthy, capable of full-fledged, social functioning and creative self-expression of people. Gynecological pathology of the puberty period, in particular, uterine bleeding, has a noticeable effect on reproductive health. Women who had uterine bleeding during puberty, subsequently represent a risk group for menstrual cycle disorders and generative function, hormone-related diseases [1,2].

Puberty is a critical period in the formation of the reproductive system. The main difference in the endocrine status in this age period is the immaturity of the hypothalamic-pituitary-ovarian system and inadequate sensitivity of target organs to the effects of gonadotropins. Therefore, it is during this period, under the influence of various both endo- and exogenous influences, various disturbances of the hormonal regulation process are possible, and as a consequence of this, a violation of menstrual function occurs. This is most often manifested by uterine bleeding of the pubertal period (UBPP), the share of which in the structure of gynecological pathology is 20-30% on average [3].

In the pubertal period, abnormal uterine bleeding (AUB) is usually considered to be associated with hormonal dysfunction and changes in the structure of the endometrium. Their frequency in the structure of gynecological morbidity ranges from 10% to 37.5%. However, in more than 50%

of cases, the pathogenesis of the disease remains unclear, which makes it impossible to use a unified treatment regimen. Known mechanisms of uterine bleeding include a violation of contractile activity of the uterus, a decrease in the tone of the uterine arteries due to a violation of the balance of vasoconstrictor and vasodilator prostaglandins, a violation of endometrial regeneration and pathology of thrombosis, especially in the platelet-vascular link, as well as as a result of activation of the fibrinolytic system. Regardless of the mechanisms that initiate abnormal bleeding, the significance of hemostatic reactions that provide thrombosis at the endometrial level is unanimously recognized, since their adequacy prevents the pathological consequences of blood loss and secondary organic changes in the endometrium [4].

One of the most important and clinically manifest forms of menstrual function disorders are UBPP, previously known as juvenile. The more familiar term has been changed recently in accordance with the recommendations of the International Classification of Diseases of the Xth revision. Due to the variety of conditions and causes for the occurrence of uterine bleeding, the term "abnormal uterine bleeding" is more often used in foreign literature to designate them [5].

The first clinical manifestations of UBPP manifest themselves during the formation of the menstrual cycle. The main causes of bleeding caused by changes in blood clotting are associated with impaired platelet function and, most often, Willebrand factor pathology. The functional activity of platelets and the level of the Willebrand factor depend on the general condition of the body, taking medications, physical activity, past illnesses, as well as the patient's blood type. The level of activity of the Willebrand factor in girls can also be influenced by the phase of the menstrual cycle. Hormonal disorders and related changes in prostaglandin levels, endometrial conditions and uterine contractility can also cause hyperpolymenorrhea. After a single study of blood clotting, it is almost never possible to identify the cause of uterine bleeding [6].

AUB in puberty is bleeding from the uterus, excessive in duration (more than 8 days), volume of blood loss (more than 80 ml) and/or frequency (less than 24 days), which has an adverse effect on physical, social and emotional well-being, the ability to verbal learning and memory in adolescent girls aged from menarche to 17 years inclusive. The frequency of AUB is 25-30% of all adolescent girls aged from menarche to 17 years inclusive who have sought medical help. In 33-69%, the disease has a tendency to chronic course and relapses. AUB in the pubertal period, Ovulatory dysfunction ("O") is the most common cause of AUB in adolescent girls aged from menarche to 17 years inclusive. Coagulopathy ("C") is determined in 20% of adolescent girls aged from menarche to 17 years inclusive. Willebrand's disease is found in 36% of teenage girls with regular menstruation. Organic pathology (polyp-P/adenomyosis-A/leiomyoma-L/malignancy and atypical hyperplasia-M) are collectively detected with a frequency of up to 10% in the structure of the causes of AUB in adolescent girls aged from menarche to 17 years inclusive [7].

The etiology of UBPP is diverse: infections of various nature, metabolic disorders, psycho emotional state, significant physical exertion occupy an important place. According to the literature, the pathogenesis of UBPP is mainly associated with changes in the central nervous and endocrine regulation of the menstrual cycle in adolescent girls, which is accompanied by a change in the concentration of gonadotropin, leads to a violation of folliculogenesis and anovulation. Iron deficiency anemia of varying severity due to chronic iron loss is often a complication of UBPP [8].

The functional state of the higher nervous activity controlling the regulatory mechanisms of the reproductive system is unstable during puberty; the development of differentiations in the cerebral cortex and, especially, the hypothalamic-pituitary centers is insufficient. The uterus has not yet completed its final development, its receptors are imperfect, the potential for the uterus to perceive irritations and conduct them into the central nervous system is poorly expressed. At the same time, the pituitary gland receives perverted impulses and the synthesis of gonadotropins is not coordinated in it; follitropin production prevails, and lutropin and prolactin are not produced sufficiently. Various external and internal stimuli acting against this background can easily disrupt the regulatory mechanisms of the reproductive system, preventing the establishment of its stereotype and accompanied by uterine bleeding. The hormonal function of the ovaries during this period in girls is insufficiently expressed due to the imperfection of the receptor apparatus, as a result of which follicular and steroidogenesis is disrupted, and bleeding is most often of a hypoestrogenic nature. Prolonged monotonous exposure to low estrogen levels causes necrobiotic processes in the endometrium, which is accompanied by the appearance of bleeding. Taking into account that the mechanism of bleeding is not associated with a sharp drop in hormones, as it happens during normal menstruation, therefore, the endometrium is not rejected simultaneously, but in separate areas, therefore bleeding is more often not abundant. Since the level of estradiol is not high enough for rapid regeneration of the endometrium, bleeding is prolonged. Along with this, the question of the role of the endometrium itself in the occurrence of bleeding is discussed. It is assumed that endocrine, hemostasiological, as well as immunological mechanisms are important in the development of bleeding at the endometrial level [9].

Relative hyperestrogenism in puberty is due to the insufficiency or absence of the luteal phase of the cycle, which leads to disruption of secretory transformation processes and the development of endometrial hyperplasia [10].

The study of uterine bleeding is impossible without taking into account the peculiarities of the state of the blood coagulation system. Blood clotting is an important protective mechanism, the violation of which can lead to serious conditions, even to death. The maintenance of the liquid state of the blood is provided by the principle of self-regulation with the formation of an appropriate functional system. The main reaction apparatuses of this functional system are the coagulation and anticoagulation systems. In the study of the blood clotting system, the greatest attention is paid to thrombocytopoiesis due to the fact that platelets are the main supplier of thromboplastin, from which the blood clotting process begins [11].

The main modulators of cell growth with pronounced mitogenic properties in the tissues of the uterus and ovaries are insulin-like growth factor (IGF) -1, endothelial growth factor (EGF) and vascular-endothelial growth factor (VEGF). Angiogenesis is considered as a key factor in the development of tumor processes, but normally cyclic changes and the development of new microvessels from existing ones occur monthly in the ovaries and eutopic endometrium – cyclic angiogenesis. In other intact tissues of an adult, angiogenesis is not detected. The main inducers of the angiogenesis process are VEGF, angiogenin and the main fibroblast growth factor (FGF-2). VEGF expression is detected only in well-vascularized tissues: ovarian cysts, "mature" follicles, yellow bodies in the vascularization phase, in the epithelium of the fallopian tubes, in smooth muscle cells and ovarian gates. Changing the processes of cyclic angiogenesis leads to inadequate vascularization of follicles, which disrupts their growth and can contribute to both

atresia and persistence at various stages of maturity, up to cystic formation. VEGF expression is not observed in atretic follicles and degenerating corpus luteum [12-14].

With inadequate vascularization of the corpus luteum, luteal phase insufficiency develops, leading to various obstetric and gynecological pathology associated with progesterone deficiency.

R. Barbieri's studies have confirmed the role of insulin and insulin-like growth factors in the regulation of ovarian function. Both substances have a mitogenic effect, stimulating the proliferation of granulosa cells, which, by potentiating the effect of gonadotropins, leads to increased steroidogenesis in the ovaries. Insulin and IGF-1 stimulate the synthesis of estradiol and progesterone induced by follicle-stimulating hormone (FSH) in granulosa cells and luteinizing hormone (LH)-induced androstenedione synthesis in theca and stroma cells. A direct inducing and activating effect of insulin and IGF-1 on aromatase was noted [15,16].

Reviews have shown that hyperplastic processes in the uterine mucosa occur against the background of neuro-endocrine disorders and a progressive decrease in the ability of cells to apoptosis, which leads to a decrease in the degree of degradation of deoxyribonucleic acid (DNA) and an increase in the number of proliferating cells. Apoptosis is the natural end of the life cycle of any cell, the mechanisms of its regulation are universal, do not have tissue specificity and can act at various levels. The development of tumors, pathology of the cardiovascular system, neurodegenerative diseases, acute and chronic inflammatory processes is associated with a violation of the processes of regulation and implementation of apoptosis in the form of its premature induction or pathological suppression.

Currently, the uniformity of the premorbid background has been established in patients with various combinations of hyperplastic processes in hormone-dependent organs of the reproductive system, which suggests a similarity of the pathogenetic mechanisms of their development. Cytokines, growth factors and other proteins included in the cell microenvironment participate in the regulation of apoptosis. Tumor necrosis factor- α (TNF- α) is a cytokine that exhibits cytotoxicity by activating the corresponding receptors — p55 (TNFRI) and p75 (TNFRII) [17].

According to modern views, UBPP is associated with a violation of the function of the regulatory centers of the brain, namely the hypothalamic-pituitary system, which is a reflection of the age characteristics of the adolescent organism - the physiological immaturity of the regulatory centers and their unsteady connections with the ovaries. The functional state of the higher nervous activity controlling the regulatory mechanisms of the reproductive system is unstable during puberty, the development of differentiations in the cerebral cortex and, especially, in the hypothalamic-pituitary centers is insufficient. The uterus has not yet completed its final development, its receptors are imperfect, the potential for the uterus to perceive irritations and conduct them into the central nervous system is poorly expressed. At the same time, the pituitary gland receives perverted impulses and the synthesis of gonadotropins is not coordinated in it – the production of follitropin prevails, lutropin and prolactin are not produced in sufficient quantities. Various external and internal stimuli acting against this background can easily disrupt the regulatory mechanisms of the reproductive system, preventing the establishment of its stereotype and accompanied by uterine bleeding [18].

Polymorphism of phenotypic manifestations of hereditary disorders, and often connective tissue dysplasia, is associated today with an increased risk of the formation of vascular intracranial

abnormalities. Violation of the development of connective tissue involves not only somatic, but also all parts of the reproductive system. The formation of the function of the latter in adolescence is interrelated with the collagen formation of the reproductive organs and the functioning of vascular-platelet and coagulation hemostasis. The mutual influence of these links determines the preservation of not only the reproductive, but also the general somatic health of a teenage girl [19].

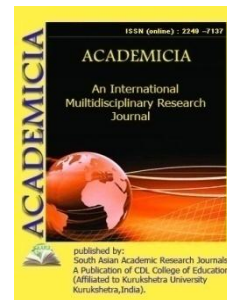
CONCLUSION

1. The pathogenesis of UBPP is caused by a complex of neuroendocrine, metabolic and immune disorders, among which the main place was previously given to the phenomenon of relative or absolute hyperestrogenism.
2. Endocrine, hemostasiological, as well as immunological mechanisms are important in the development of bleeding at the endometrial level.
3. The main modulators of cell growth with pronounced mitogenic properties in the tissues of the uterus and ovaries are insulin-like growth factor (IGF) -1, endothelial growth factor (EGF) and vascular-endothelial growth factor (VEGF).
4. The functional state of the higher nervous activity and its receptors are imperfect, the potential for the uterus to perceive irritations and conduct them into the central nervous system is poorly expressed. At the same time, the pituitary gland receives perverted impulses and the synthesis of gonadotropins is not coordinated in it, preventing the establishment of a normal menstrual cycle and accompanied by uterine bleeding.

REFERENCES

1. Sibirskiy V.K., Stepanov V.G. Knowledge management and human capital in the era of innovation: Monograph. - Moscow: CHOUVO "MU named after S.Yu. Witte", 2014. - P. 272
2. Adamyan Leyla Vladimirovna, Sibirskaya Elena Viktorovna, & Bogdanova Elena Aleksandrovna (2014). Therapy of uterine bleeding during puberty from the point of view of evidence-based medicine. Reproductive health of children and adolescents, (5 (58)), 17-21.
3. Khuraseva Anna Borisovna (2015). Uterine bleeding of puberty - problems and solutions. Reproductive health of children and adolescents, (2 (61)), 84-88.
4. Valeeva, F. V., Zubairova, L. D., & Tagirova, A. A. (2019). Clinical and diagnostic significance of microvesiculation of blood cells in abnormal uterine bleeding. Prakticheskayameditsina, (34), 109-112.
5. Goodman, A. Abnormal genital tract bleeding / A. Goodman // Clin.Comerstone. – 2000. – Vol.3, No. 1. – P. 25-35. 36. Guint, E. H. The conservative management of abnormal bleeding in teenagers with development disabilities / Guint E. H. // J. Pediatric Adolescent Gynecology-2003. – Vol.16, No. 1. – P. 54 - 56.
6. Dmitriev, V. V., Mozheyko, L. F., & Guzey, I. A. (2014). Blood clotting disorders as a cause of juvenile uterine bleeding in adolescent girls aged 12-18 years. Oncohematology, (1), 47-51.

7. Elena Vitalievna Uvarova (2021). Clinical Recommendations (Draft). Abnormal Uterine Bleeding During Puberty. Reproductive health of children and adolescents, 17 (3), 5-30.
8. Sashkina A.E., Sibirskaya E.V., & Ordin G.V. (2017). Some aspects of pathogenesis and pathogenetic treatment of uterine bleeding during puberty. Medical business, (2), 63-65.
9. Kalashnikova, I. V., Orlova, V. S., & Adjey, O. K. (2011). Pathogenetically significant factors of abnormal uterine bleeding in puberty. Actual problems of medicine, 16 (22 (117)), 5-12.
10. Andreeva, V. O., Mashtalova, A. A., & Linde, V. A. (2019). The role of growth factors in the pathogenesis of uterine bleeding during puberty. News of higher educational institutions. The North Caucasus region. Natural Sciences, (3), 81-85.
11. Melon V.A. (2015). Violations of dynamic equilibrium in the blood coagulation system in abnormal uterine bleeding of the puberty period. Actual problems of medicine, 32 (22 (219)), 73-80.
12. Regulation of Vascular Endothelial Growth Factor (VEGF) Splicing from Pro-angiogenic to Anti-angiogenic Isoforms / D. Nowak [et al.] // J. of Biological Chemistry. 2019. Vol. 285, No. 8. P. 5532-5540.
13. Cyclic angiogenesis of the eutopic endometrium / Burlev V.A. [et al.] // Problems of reproduction. 2016. No. 6. pp. 22-30.
14. Burlev V.A. Autoparacrine disorders of angiogenesis regulation in proliferative forms of diseases of the female reproductive system // Obstetrics and gynecology. 2016. No. 3. pp. 34-40.
15. Manukhin I.B., Gevorkyan M.A., Chagai N.B. Anovulation and insulin resistance. M., 2016. 416 p. 9. Smirnov A.N. Elements of endocrine regulation. M., 2018. 352 p.
16. Andreeva, V. O., Mashtalova, A. A., & Linde, V. A. (2019). The role of growth factors in the pathogenesis of uterine bleeding during puberty. News of higher educational institutions. The North Caucasus region. Natural Sciences, (3), 81-85.
17. Andreeva, V. O., & Mashtalova, A. A. (2017). The role of apoptosis factors in the pathogenesis of oligomenorrhea and uterine bleeding during puberty. Bulletin of St. Petersburg University. Medicine, (4), 69-80.
18. Orlova, V. S., & Kalashnikova, I. V. (2017). Bioelectric activity of the brain on the background of uterine bleeding in adolescence. Actual problems of medicine, 16 (22 (117)), 44-49.
19. Kudinova Evgeniya Gennadievna, Uvarova Elena Vitalievna, & Maximova Polina Evgenievna (2017). Manifestations of vascular syndrome in adolescent girls with menstrual disorders. Reproductive health of children and adolescents, (4-5 (75-76)), 32-39. doi: 10.24411/1816-2134-2017-00030



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A STUDY OF ACADEMIC ACHIEVEMENT OF SENIOR SECONDARY SCHOOL STUDENTS IN RELATION TO THEIR CREATIVITY

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ABSTRACT

This study examined the academic achievement of senior secondary school students in relation to their creativity. The study adopted a descriptive survey method of research. Participants were 800 senior secondary school students randomly selected from sixteen schools in Gurgaon and Rewari districts of Haryana state (400 boys & 400 girls) belongs from urban and rural areas. The research instruments used for data collection were: Divergent Production Ability Test by Dr. K.N. Sharma and matric examination marks/ grades were taken for academic achievement, tested at the 0.05 & 0.01 level of significance. The findings indicated that there exist a significant difference in academic achievement of senior secondary school students in relation to their High and Low Creativity. There is a significant difference in academic achievement of male and female senior secondary school students in relation to their High and Low Creativity. There is a significant difference in academic achievement of urban and rural senior secondary school students in relation to their High and Low Creativity.

KEYWORDS: *Divergent, Randomly, Examined*

INTRODUCTION

Creativity, we usually understand an activity resulting in some new product of a definite social value. Creativity is also a very important process for progress and major advances in every field. Research indicates the importance of creativity in student's achievement, career success, personal well being to improve student's achievement and success. It is the basis of all social development and new inventions and discoveries in the field of science and technology.

Academic achievement is the accomplishment or acquired proficiency in the performance of an individual in a given skill or a body of knowledge. In other words it means the pupil's needs or drive towards the achievement of success in academic work. Educators have therefore been interested in those factors which influence or associated with academic achievement. Academic achievement is influenced by a multitude of factors. In the beginning, psychologists focused only on cognitive aspects like intelligence but research has shown that social and emotional factors like emotional intelligence, creativity, anxiety, personality, family relationship etc. affect the achievement of students. So, the variables Academic Achievement and Creativity of the students need inquiry for proper understanding of a student. Hence the present study is a humble attempt to search an empirical database with certain hypothesis.

Objectives of the study

1. To study the academic achievement of senior secondary school students in relation to their High and low Creativity.
2. To study the Academic Achievement of male senior secondary school students in relation to their high and low creativity.
3. To study the Academic Achievement of female senior secondary school students in relation to their high and low creativity.
4. To study the Academic Achievement of urban senior secondary school students in relation to their high and low creativity.
5. To study the Academic Achievement of rural senior secondary school students in relation to their high and low creativity.

Hypotheses of the study

1. There is no significant difference in academic achievement of senior secondary school students in relation to their High and Low Creativity.
2. There is no significant difference in academic achievement of male senior secondary school students in relation to their High and Low Creativity.
3. There is no significant difference in academic achievement of female senior secondary school students in relation to their High and Low Creativity.
4. There is no significant difference in academic achievement of urban senior secondary school students in relation to their High and Low Creativity.
5. There is no significant difference in academic achievement of rural senior secondary school students in relation to their High and Low Creativity.

Need of the Study

School education is an important segment of the total educational system contributing significantly to the individual as well as to national development. A good school provides environment conducive for development of cognitive, affective and psychomotor domains for all round development of individuals. The primary function of the school is the imparting of academic skills. Early research on the predictors of academic achievement focused primarily on intellectual and ability factors. There is considerable evidence that intelligence alone does not

account for all the variance in academic achievement (Lavin, 1967, Cattell Butcher, 1968, Vernon, 1950). Although intelligence is perhaps the still most effective predictors of academic achievement research has shown that social and emotional factors like emotional intelligence, creativity, anxiety, personality, family relationship etc. affect the achievement of students.

Hence, it was thought worthwhile to understand the complete abilities and potentialities of the child before giving him/her education. Creativity is also a very important process for progress and major advances in every field. Research indicates the importance of creativity in student's achievement, career success, personal well being to improve student's achievement and success. It is the basis of all social development and new inventions and discoveries in the field of science and technology. So, the variables Academic Achievement and Creativity of the students need inquiry for proper understanding of a student. Moreover, no such coherent endeavor has been undertaken on senior secondary school students of Gurgaon and Rewari District and hence the present study is a humble attempt to search an empirical database with certain hypothesis.

Research Design

Methodology

The present study was conducted through descriptive survey Method. This method is one of the important methods in education, because it describes the current position of the present research.

Sample

Random sampling was used in the present study, where every individual has equal chance of being selected in the final sample. Eight hundred (800) male and female, urban and rural, government and private senior secondary school students were included in the present study as subjects. Sixteen (16) senior secondary schools affiliated to the Board of School Education, Haryana, Bhiwani were taken in the study. The study included two districts of Haryana i.e. Gurgaon and Rewari.

Research Tools

The following tools were selected and used in the study:

1. Divergent Production Ability Test by Dr. K.N. Sharma (2006).
2. Marks/Grades obtained by the students in 10th class examination conducted by Board of School Education, Bhiwani (Haryana) taken as indicator of academic achievement of the students.

Statistical Techniques used:

Mean, Standard Deviation and t-test was used.

Testing Hypotheses

1. ACADEMIC ACHIEVEMENT OF SENIOR SECONDARY SCHOOL STUDENTS IN RELATION TO LOW AND HIGH CREATIVITY

The mean and 't' score of senior secondary school students having low and high creativity is given in table 1.

TABLE 1 'T' VALUE FOR THE ACADEMIC ACHIEVEMENT SCORES OF SENIOR SECONDARY SCHOOL STUDENTS HAVING LOW AND HIGH CREATIVITY

Group	N	Mean	S.D.	't' value
Low creativity	216	54.79	7.76	19.970**
High creativity	216	74.20	5.50	

**Significant at 0.01 level of significance.

Table 1 reveals that 't' value between senior secondary school students having low and high creativity ('t' = 19.970) is significant at 0.01 level. In the context of mean scores, it was found that mean score of senior secondary school students having high creativity is higher than mean scores of senior secondary school students having low creativity. Hence, the null hypothesis framed earlier, "There is no significant difference in academic achievement of senior secondary school students in relation to their high and low creativity" is not retained. This shows that students having high creativity have better academic achievement than students having low creativity.

2. ACADEMIC ACHIEVEMENT OF MALE SENIOR SECONDARY SCHOOL STUDENTS IN RELATION TO LOW AND HIGH CREATIVITY

The mean and 't' score of male senior secondary school students having low and high creativity is given in table 2.

TABLE 2 'T' VALUE FOR THE ACADEMIC ACHIEVEMENT SCORES OF MALE SENIOR SECONDARY SCHOOL STUDENTS HAVING LOW AND HIGH CREATIVITY

Group	N	Mean	S.D.	't' value
Low creativity	108	51.19	5.83	21.824**
High creativity	108	73.01	6.58	

**Significant at 0.01 level of significance.

Table 2 reveals that 't' value between male senior secondary school students having low and high creativity ('t' = 21.824) is significant at 0.01 level. In the context of mean scores, it was found that mean score of male senior secondary school students having high creativity is higher than mean scores of male senior secondary school students having low creativity. Hence, the null hypothesis framed earlier, "There is no significant difference in academic achievement of male senior secondary school students in relation to their high and low creativity" is not retained. This shows that male students having high creativity have better academic achievement than male students having low creativity.

3. ACADEMIC ACHIEVEMENT OF FEMALE SENIOR SECONDARY SCHOOL STUDENTS IN RELATION TO LOW AND HIGH CREATIVITY

The mean and 't' score of female senior secondary school students having low and high creativity is given in table 3.

TABLE 3 ‘T’ VALUE FOR THE ACADEMIC ACHIEVEMENT SCORES OF FEMALE SENIOR SECONDARY SCHOOL STUDENTS HAVING LOW AND HIGH CREATIVITY

Group	N	Mean	S.D.	‘t’ value
Low creativity	108	50.81	5.66	20.133**
High creativity	108	70.18	8.24	

**Significant at 0.01 level of significance.

Table 3 reveals that ‘t’ value between female senior secondary school students having low and high creativity ($t = 20.133$) is significant at 0.01 level. In the context of mean scores, it was found that mean score of female senior secondary school students having high creativity is higher than mean scores of female senior secondary school students having low creativity. Hence, the null hypothesis framed earlier, “There is no significant difference in academic achievement of female senior secondary school students in relation to their high and low creativity” is not retained. This shows that female students having high creativity have better academic achievement than female students having low creativity.

4. ACADEMIC ACHIEVEMENT OF URBAN SENIOR SECONDARY SCHOOL STUDENTS IN RELATION TO LOW AND HIGH CREATIVITY

The mean and ‘t’ score of urban senior secondary school students having low and high creativity is given in table 4.

TABLE 4 ‘T’ VALUE FOR THE ACADEMIC ACHIEVEMENT SCORES OF URBAN SENIOR SECONDARY SCHOOL STUDENTS HAVING LOW AND HIGH CREATIVITY

Group	N	Mean	S.D.	‘t’ value
Low creativity	108	49.31	5.87	19.671**
High creativity	108	69.37	8.82	

**Significant at 0.01 level of significance.

Table 4 reveals that ‘t’ value between urban senior secondary school students having low and high creativity ($t = 19.671$) is significant at 0.01 level. In the context of mean scores, it was found that mean score of urban senior secondary school students having high creativity is higher than mean scores of urban senior secondary school students having low creativity. Hence, the null hypothesis framed earlier, “There is no significant difference in academic achievement of urban senior secondary school students in relation to their high and low creativity” is not retained. This shows that urban students having high creativity have better academic achievement than urban students having low creativity.

5. ACADEMIC ACHIEVEMENT OF URBAN SENIOR SECONDARY SCHOOL STUDENTS IN RELATION TO LOW AND HIGH CREATIVITY

The mean and ‘t’ score of rural senior secondary school students having low and high creativity is given in table 5.

TABLE 5 'T' VALUE FOR THE ACADEMIC ACHIEVEMENT SCORES OF RURAL SENIOR SECONDARY SCHOOL STUDENTS HAVING LOW AND HIGH CREATIVITY

Group	N	Mean	S.D.	't' value
Low creativity	108	53.93	5.60	16.094**
High creativity	108	73.64	5.49	

**Significant at 0.01 level of significance.

Table 5 reveals that 't' value between rural senior secondary school students having low and high creativity ('t' = 16.094) is significant at 0.01 level. In the context of mean scores, it was found that mean score of rural senior secondary school students having high creativity is higher than mean scores of rural senior secondary school students having low creativity. Hence, the null hypothesis framed earlier, "There is no significant difference in academic achievement of rural senior secondary school students in relation to their high and low creativity" is not retained. This shows that rural students having high creativity have better academic achievement than rural students having low creativity.

Main Findings:

1. There is a significant difference in academic achievement of senior secondary school students in relation to their High and Low Creativity. This shows that students having high creativity have better academic achievement than students having low creativity.
2. There is a significant difference in academic achievement of male senior secondary school students in relation to their High and Low Creativity. This shows that male students having high creativity have better academic achievement than male students having low creativity.
3. There is a significant difference in academic achievement of female senior secondary school students in relation to their High and Low Creativity. This shows that female students having high creativity have better academic achievement than female students having low creativity.
4. There is a significant difference in academic achievement of urban senior secondary school students in relation to their High and Low Creativity. This shows that urban students having high creativity have better academic achievement than urban students having low creativity.
5. There is a significant difference in academic achievement of rural senior secondary school students in relation to their High and Low Creativity. This shows that rural students having high creativity have better academic achievement than rural students having low creativity.

CONCLUSION

The study revealed that significant difference was found in academic achievement of senior secondary school students in relation to their High and Low Creativity. This shows that students having high creativity have better academic achievement than students having low creativity. **Chauhan and Sharma (2017)** investigated the relationship of student's creativity and academic achievement and found the creativity is important in predicating the students' academic achievement.

There was a significant difference found in the academic achievement of male and female senior secondary school students in relation to their high and low creativity. This shows that male and female students were having high creativity have better academic achievement than male and

female students having low creativity and data also shows that the male students were more creative than the female students. Data also revealed that rural area students showed more creativity compared to urban area students. **Ai (1999)** studied the relation between creativity and academic achievement and found that creativity was related to academic achievement for both boys and girls.

Suggestions for further Research

- Similar study can be done on a large sample.
- Similar study may be conducted on college students.
- The present study was restricted to class XI. Other classes of school can also be included in the sample.
- The statistical techniques, which were used in the present study, are mean, standard deviation and t-test. More statistical techniques may be used in the same study.
- This type of study can be done to other cities of Haryana State.

REFERENCES

Anwar, Mohammad Nadeem, Anees, Muhammad, Khizar, Asma, Naseer, Muhammad and Muhammad (2012) Relationship of Creative Thinking with the Academic Achievement of secondary school students, International Interdisciplinary Journal of Education, (13), 44-47.

Asch, M. (2004) Creativity and learning strategies , IVY Publishing House, Delhi.

Asha, C.B. (1980) Creativity and academic achievement among secondary children, Astan Journal of Psychology and Education, 6, 1-4.

Bently, J.C (1996) Creativity and academic achievement, Journal of Educational Research, 59, 269-272.

Berrett, D. (2013) Creativity: A cure for the common curriculum. Chronicle of Higher Education.

Bhatnagar, A.B. & Bhatnagar, M. (2006) Advanced educational psychology, International Publishing House, Meerut.

Chadha, N.K. (1984) Perspectives in creativity, Ess Publications, New Delhi.

Chamundeswari, S. (2013) Emotional Intelligence and Academic Achievement among Students at the higher secondary level. International Journal of Academic Research In Economics and Management Sciences, 2(4), 178-187.

Chaudhary, Vineeta (2008) Impact of Academic Achievement on Creativity. Indian Journal of Psychometry & Education, Vol. 39 (2).

Chauhan, S. and Sharma, A. (2017) A study of relationship between Creativity and Academic Achievement among public and private school students in both the Gender, International Journal of Science Technology and Management, 6 (1), 39-45.

Drever, J. (1964) A Dictionary of Psychology, London: Penguin Book.

Guilford, J.P. (1983) Traits of creativity in Creativity and its cultivation, New York: Harper and Row.

Hennessey, B.A. & Amabile, T.A. (2010) Creativity: Annual Review of Psychology, 61, 569-598.

Jha, A. Avdesh (2012) A study of Creativity of the High School Students in relation to Certain variables, Voice of Research, 1(2). 1-5.

Kaboodi, Mahnaz and Jiar, Yeo, Kee (2012) Creativity and Academic Achievement: Comparison between Cognitive and Trait Creativity: Faculty of Education, Universiti Teknologi of Malaysia.

Kamaei, A. and Weisani, M. (2013) The relationship between Achievement Motivation, Critical Thinking and Creative Thinking with academic performance, Indian Journal of Fundamental and Applied Life Sciences, 3(4), 121-127.

Kapil, H.K. (2006) Elements of statistics in social science, Vinod Pushtak Mandir, Agra, (U.P.).

Mayer, R.E. (1999) Fifty years of Creativity Research, In R.J. Sternberg (Ed); Handbook of Creativity (pp 449-460). Cambridge England: Cambridge University Press.

Nami, Y., Marsooli, H. and Ashouri, M. (2013) The relationship between Creativity And Academic Achievement, Procedia – Social and Behavioral Sciences, 114, 36-39.

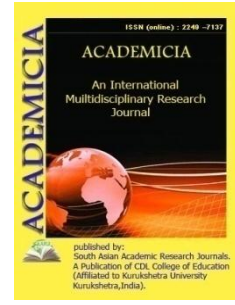
Reddy, Sudhakara Y. (2003) Creativity in Adolescents, Discovery Publishing house, New Delhi.

Renzulla, J.S. (2012) Reexamining the role of Gifted Education and Talent Development for the 21st century: A four- Part Theoretical Approach. Gifted child quarterly, 56, 150-159.

Sharma, Kusum (1991) Creativity and Related factors, National Psychology Corporation, Agra.

Surapuramath, A.K. (2014) A study of relationship between Creativity and Academic Achievement of secondary school pupils, International Journal of Social Science, 3, 305-309.

Trivedi, K. And Bhargava, R. (2010) Relation of Creativity and Educational Achievement in Adolescence, Journal of Psychology, 1(2), 85-89.



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THE NATIONAL NATURE OF THE IMAGE IN ABDULLA ARIPOV'S POEMS CREATED ABROAD

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ABSTRACT

The article analyzes the national features of the poetic image in the poems of the People's Poet of Uzbekistan Abdulla Aripov, created abroad. The interpretation of universal ideas in the poet's work has been studied comparatively with the masterpieces of Uzbek and world literature. The interpretation of the national psyche at the heart of universal ideas is revealed through detailed images. As a result, new scientific and theoretical generalizations about the poet's artistic and aesthetic world were published.

KEYWORDS: *National Character, Detailed Image, Artistic Discovery, Comparative Analysis, Tradition, Universal Idea, Poetic Interpretation.*

INTRODUCTION

In Abdulla Aripov's lyrics, the first thing that every student can feel in the process of studying the issue of images is that the images have a universal and national character. There are such images in the poet's work that the author absorbs universal issues into the essence of these images. In fact, the more extensive and global the concept of image in literature, the more comprehensive and lifelong the work created by the author. At the same time, it should not be forgotten that the image does not reflect the dreams and aspirations of the people of the world, but also reflects the aspects of the society in which the author grew up, the elements of the mentality in which the writer lived. For example, Martin Eden, who is familiar to readers all over the world in prose, and lyrical heroes created by Pushkin in poetry, no matter how much they reflect the universal character and aspirations, are completely devoid of national characteristics of the nation from which he was born. Laylo Osarova, commenting on the images and expression of the national spirit in the work of Abdulla Aripov, writes: "Apart from the artistic image, neither literature nor poetry, which is its most active form, can exist. After all, image is a

condition of the existence of fiction, and figurative thinking is a key factor in the creative process. The role of the artistic image in the expression of the national spirit is especially special "[6.62]. Based on these ideas, it can be said that every image created by Abdulla Aripov drank water from the source of national values. But there are also images in the poet's work, in which the author fully absorbs the national spirit and mood. As soon as the reader reads, he realizes that these images belong to the Uzbek nation. In Abdulla Aripov's poems created abroad, the national nature of the images is reflected in Uzbek objects, Uzbek customs, traditions and features, Uzbek folk proverbs and wise sayings.

The artist's creativity is seen in his ability to update the poetic images that exist in literature. According to Professor Nurboy Jabborov: "Innovating in an image is more complicated than in the form. But the true rise of poetry depends more on this poetic phenomenon "[2.33]. The analysis of the poet's poems created abroad shows that Abdulla Aripov is an innovative poet in the creation of images, and the images created by the poet never lag behind the images found in the masterpieces of world literature. Content, form, philosophical views, theoretically exceed them, but not less. But there is one aspect of his poems that is superior to all literary specimens that it is impossible not to grasp. No matter where and on what subject the poet works, in the essence of his poetry there is a real Uzbek psyche, worldview, that is, the national spirit. The poet himself says about this situation: "Let there be a desire for greatness, let there be acquaintance with the most advanced ideas of the world, humanity, let them think at the level of the West, Europe, America, Latin America, the Moon, Mars ..., but let the Uzbek think, think in Uzbek! If this "small" condition is met, we will definitely achieve the rest "[3.178]. As the poet himself said, it is possible to read in his poetry that a real Uzbek child thinks. Especially in Abdulla Aripov's poem about the Motherland, the Uzbek national spirit prevails. The poet infuses the national spirit into his poetry through various details typical of the Uzbek people. From literary theory it can be said that on the basis of the national nature in the images it is possible to understand which nation the author represents. For example, if we look at the poems of Russian poet Sergei Esenin written as a result of his travels to the East and Abdulla Aripov's poems written during his travels abroad, we can see that the national spirit is at the forefront in the poetry of both artists (especially in their lyrics on the Motherland). In the works of poets, the sense of patriotism is reflected in almost the same way. None of them will forget their homeland wherever they are. This is evident in the process of their skillful assimilation into the poetry of the customs and traditions, objects, concepts of their mentality associated with their homeland. While Abdulla Aripov's travels often use objects and situations such as doppi, belts, tea, teahouses, teapots, Esen's work repeatedly refers to concepts and objects reminiscent of the Russian environment, such as birch, harmonium, kingdom, cap, potato. Undoubtedly, the love of the Motherland and the memory of the Motherland will be hidden.

In Esen's poem "Letter to my sister":

Yodimdadir bayram,
O'sha so'lim may,
Sabzalar bezangan,
Gullagan siren,
Oppoq qayinzorni

Quchoqlab tinmay,
Sho'x-xandon maydon ham
Mastroq edim men.

Abdulla Aripov yearns for his homeland, especially for tea and tea drinking, and proudly writes that the concept of a teahouse on Uzbek soil is actually compatible with concepts such as kindness, kindness, sincere conversation and mutual respect in a teahouse. wonderful value that is not found in any other country.

Goho oddiy muloqotdan yashnagay dillar,
Uchrashganday yiroq ellar, olis manzillar.
Sayohatda turfa gaplar bo'ladi, jo'ra,
Choyxo'rlik soz, jonjallashib yurgandan ko'ra.

Abdulla Aripov's poems written abroad are dominated by the use of Uzbek objects and traditions in instilling the national spirit in the images. In particular, the poet's poem, written in binary form with the title "Japanese" from the series "Japanese melodies", contains the following features:

Boshimda do'ppi-yu, egnimda chopon,
Mehmon bo'lib keldim, men senga, yapon.

Knowing that he is Uzbek through the robe on his head and the skullcap on his head, the poet looks at the Japanese people with ancient history and traditions with admiration and envy and asks the reason for their universal success:

So'rayman O'rta qo'yib vijdonni:
– Sen qanday zabt qilding butun jahonni?

While giving such a savoir-faire, the poet continues his thoughts with a slight smile on the reader's face:

She'r yozib, gap sotib turibman shu on,
Yapon-chi, ish bilan mashg'uldir yapon.

With these two verses, the poet himself answers his questions, illuminating the image of the Japanese and Uzbeks based on their own customs. While acknowledging the diligence and hard work of the Japanese people as a factor in their main achievements, the Uzbeks see the waste of time as a major enemy of their people. To the poet, everything has its own norm. Of course, as noted in the poem "Tea in California", the gathering of friends and relatives leads to an increase in love, but the excess of this thing leads to a waste of time, a waste of life. While creating the Uzbek image with the help of Uzbek traditions, the poet takes an objective approach to everything. After all, there are two sides to everything. Which side to choose depends on the person himself. For example, the poem "Uzbek Teahouse in Osaka" proves our point. This poem seems to be a logical continuation of the poet's above-mentioned poems. While proudly writing about an Uzbek teahouse in the heart of Osaka, the poem notes that it is dedicated to an Uzbek businessman. In fact, he is proud of the work of an Uzbek young man who used everything effectively and did not waste his life:

Tandir gurullasa, o't yoqqan oni,
Axir qo'zg'atmaydi kimning havasin.
Kichkina quyoshdek o'zbekning noni
Qizdirib turibdi yapon havosin.

The poet is proud of the work of a young man who is doing business in faraway Japan, of Uzbek bread like a little sun. He teaches his reader that the pleasure of life is in honest labor.

In his poems, Abdulla Aripov depicts life and people as they are. Just as life does not go smoothly, so do the people in it. In the poem "Uzbek Teahouse in Osaka", a hard-working, honest businessman portrays a young Uzbek man in such a way as a teahouse, an oven, a loaf of bread, and in the poem "Osh" from "Inspirations of Ummonorti" he portrays a completely opposite image. We know that Osh is a process in the Uzbek mentality that embodies the traditions of people meeting each other and growing in love:

Kattakon qozonda pishirdik palov,
Tun buyi tinmadi o'choqda olov.
Tong otay deganda damlandi-ku osh,
Qozonni qurshab biz bo'ldik ko'z-qosh.

Among the people gathered around the cauldron, unfortunately, there are also those who spoil this harmony and good mood:

Va lekin bir kimsa, dilimiz g'ashlab,
Qochdi qurboqani qozonga tashlab.

In a slightly exaggerated way, the poet shows that people are different in life, that there are bad people next to the good, evil next to the good, and sorrow next to the happy. In order to shed light on this situation, he makes effective use of the Uzbek people's tradition of making soup and gathering relatives and neighbors in the process. As we have witnessed, the poet makes effective use of traditions and customs, national objects in revealing the nature of images. Through them, they not only instill the national spirit in the images, but also highlight the shortcomings and shortcomings in people. Given that Abdulla Aripov's poetry is the poetry of the time, it is not difficult to understand that using national means to expose the shortcomings of people alone is not enough for his work.

A. Hamdamov's dissertation on nationalism and its significance in Abdulla Aripov's poetry states: "Abdulla Aripov's poetry is a bright manifestation of the fiery love for the motherland and the Motherland. In this process, international poetic thinking, the spirit of nationalism emerges as an artistic and aesthetic pathos. At the heart of this is a love for humanity - a sense of humanity." [7.92]. In the poetry of the poet, nationalism is reflected through international events, objects, which, as noted above, reflect the boundless love for the Motherland. In some cases, a slightly muted, playful tone gives the poet more vivid spirit to the poetry. In particular, the same situation can be seen in his poem "Cream". The uniqueness of our people is reflected in a simple way:

Texasdek iqlimi

Qaynoq yo'q ekan,
Shundanmi, ayiq yo'q –
Maymoq yo'q ekan.
Jannatga o'xshaydi
Manzirim, lekin
Sigir ko'p ekan-u
Qaymoq yo'q ekan.

In fact, when a person travels to another country, he begins to miss the blessings of his own country. The poet tries to express this same expression of nostalgia through a light metaphor.

“Abdulla Aripov, as a thinker and poet, knows the hearts of the people, the Uzbek people who have gone through thousands of years of life experience, and who know the morally formed proverbs, sayings, stories and legends. The poet does not simply follow the diltortar tones of the people's heart to the spiritual treasure created by our people; He fully masters its essence and connects it with the criteria of his artistic thinking, the problems of the time in which he lives, the hearts of his compatriots and compatriots. [5.83]. In particular, in the poet's poem "Astana" he skillfully uses the proverb of the people "The homeland begins on the threshold", using the content of this proverb to create a completely new idea:

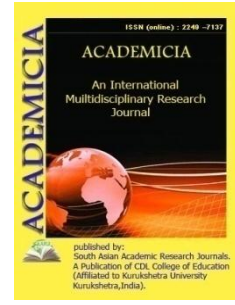
Ватан остонадан бошланар, болам,
Буни рад этолмас бирорта одам.
Бироқ билмасдирсан, шул остонадан
Гоҳо бошланади мусофирлик ҳам.
Vatan ostonadan boshlanar, bolam,
Buni rad etolmas birorta odam.
Biroq bilmasdiansan, shul ostonadan
Goho boshlanadi musofirlik ham.

This quartet, created as a product of alienation and moments of separation in the poet's life, can be considered as a product of the poet's innovation. It is a well-known notion that the homeland begins on the threshold, but the beginning of exile on the threshold is one of the artistic expressions found by the poet. In fact, this finding is a lyrical reflection of the poet's arduous life.

In short, there is ample reason to say that Abdulla Aripov's poetry has risen to the world stage in terms of the nationalism of the image and character, the poetic synthesis of important features of the Uzbek mentality. Achieving the expression of universal essence at the heart of national images are important factors that have ensured the artistic perfection and international fame of the creative works.

REFERENCES

1. Sergey Esenin. An expression of the bully's heart. Tashkent: Adib, 2013.
2. Jabborov Nurboy. Time, criteria, poetry. - Tashkent: NMIU named after Ghafur Gulom, 2015.
3. Oripov Abdulla. A celebration of great truths. / Selected works. The fifth volume. - Tashkent: Adolat, 2005.
4. Oripov Abdulla. Selected works. Tashkent: Sharq. 2019.
5. Ravshanova G. Abdulla Aripov's comedy skills. - Karshi, 2020.
6. Osarova Laylo. The expression of the national spirit in the work of Abdulla Aripov. Filol. Doctor of Philosophy in Science ... diss. - Tashkent, 2020.
7. Hamdamov Akrom. The problem of international poetic thinking in Abdulla Aripov's poetry. Filol. fan. nomz diss. - Tashkent, 2011.



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DIDACTIC FACTORS AFFECTING IMPROVEMENT

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ABSTRACT

In this article, the author discusses the innovative approach used in conducting classes in the Department of Optics of Physics and its practical significance. It is proved that the technological development of modern physics and the use of advanced pedagogical and innovative technologies are highly effective in the implementation of laboratory work.

KEYWORDS: *Innovative Teacher, Skill, Method, Problem-Based Learning, Non-Traditional Learning, Debriefing, Formation Of Professional Competence In Students, Innovation, Technology, Approaches, Principles, Tools*

INTRODUCTION

In the world sciences of physics and pedagogy, a number of studies are being carried out aimed at developing innovative methods of teaching optical quantum generators, fiber optics, laser technology, photonics, medicine and nanotechnology. This plays an important scientific and practical role in strengthening the integration of science-education-production. In particular, there is a need to study the pedagogical, psychological, didactic and methodological possibilities of teaching physics on the basis of technological, systemic, activity-based, competence-based and integrated approaches.

In our country, the relevance of the modernization of the education system, the organization of the educational process aimed at training competitive personnel who meet the requirements of world standards, is consistently gaining relevance. Therefore, for the development of the exact sciences, such priority tasks have been identified as “further improving the system of continuing education, improving the quality of educational services and opportunities, continuing the policy of training highly qualified personnel in accordance with the modern needs of the labor market”, as well as “creating effective mechanisms for the implementation of scientific and innovative achievements into practice”. This, in turn, requires improving the teaching methods of optics

topics using innovative methods, ensuring the compliance of educational and regulatory documents with international standards. At the same time, a special place is given to targeted research, taking into account the expansion of the possibilities of educational and methodological support of physics, the improvement of the didactic capabilities of innovative methods and technologies.

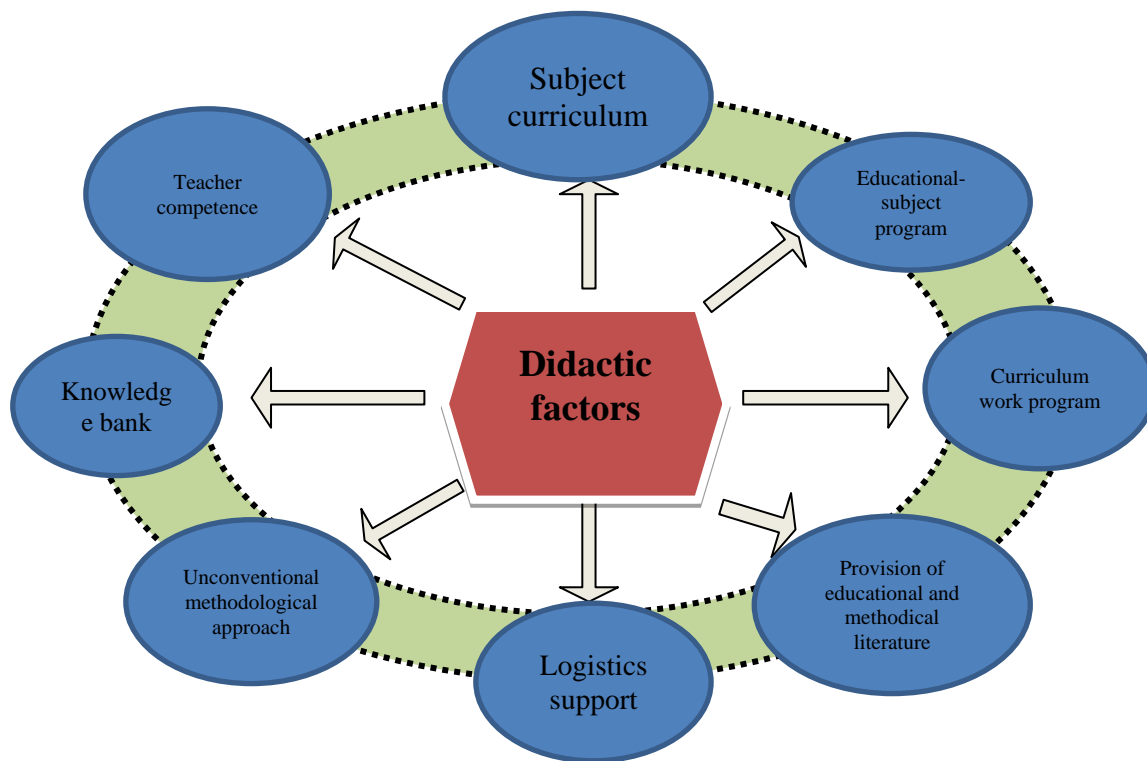
The article provides scientific and methodological works on the theoretical foundations of non-traditional teaching "Optics" of the physics section, outlines the organization, control and management of methodological planning in teaching it, improving the quality of education in order to ensure the effectiveness of this process, pedagogical and psychological foundations and didactic factors of teaching the optics section based on the use of interactive methods in education based on non-traditional learning technologies.

Research papers and literature are analyzed, an analysis of the development of mechanisms for improving non-traditional teaching methods "Optics" of the physics section is given on the basis of modern trends in innovative development, the formation of thinking through the widespread introduction of experimental methods of teaching and educating students, the presentation of optical processes, the problem of the formation of mental activity and qualifications in the course of laboratory exercises.

The psychological factors influencing the relationship between the student and the teacher are revealed, the organization of the educational process by the teacher based on the study of pedagogical and psychological characteristics of students and the development of students' assimilation abilities are theoretically substantiated through non-traditional methods of teaching optics in the physics section based on pedagogical and psychological laws.

Improving non-traditional teaching methods is an activity related to the learning process, didactic factors for the development of individual psychological characteristics of a person, motivation for learning and intellectual abilities have been developed. The didactic factor is an unconventional methodological approach that requires the formation of teaching methods based on the fundamental knowledge of the student. According to scientists-psychologists, every twenty minutes of an eighty-minute lesson, the student's attention (listening and mastering the lesson) begins to pass into a passive mode. Thus, it was found that the popularization of the use of at least four innovative methods during an eighty-minute lesson is important as an important didactic factor for improving the quality and effectiveness of education, the formation and development of the educational and cognitive process among students. Among the didactic factors, the teacher's competence is of particular importance, since the enrichment with new ideas, the constant improvement of teaching methods, control, replenishment and strengthening of students' assimilation, improving their qualifications in the process of teaching the optics section requires pedagogical skill.

The main participant in the educational process is the student, whose important task will be to independently study the innovative paradigms of the optics section in the process of research in real educational practice. The teacher must study the assignment himself and demonstrate ways to solve educational problems. Students learn to analyze and evaluate their personal actions based on the information provided, examples, can notice their own mistakes and shortcomings. The teacher establishes joint activities of the participants and motivates them for research (Fig. 1).



Rice. 1. Didactic factors influencing the improvement of non-traditional teaching methods

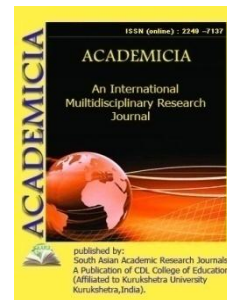
The results of the study of paradigms associated with the section of optics, theoretical rules and conclusions are generalized and, accordingly, reflects the content of teaching the subject to students. The process of acquiring physical knowledge by students is considered in connection with the level of development of thinking, imagination and other cognitive processes, the development of motivational-volitional and sensual (emotional) activities. Improvement of non-traditional teaching of the optics section based on the choice of forms, methods and means of teaching the subject of physics is determined based on educational goals. Consequently, the improvement of non-traditional teaching of physics lessons develops by generalizing the essence of the interaction and interdependence of physical phenomena, laws and formulas, through didactic factors of life reflection of the processes of reality in the minds of students. When improving the methodology of non-traditional teaching of the optics section, attention was paid to the following aspects: correct understanding of optical phenomena and laws, analysis of formulas and theoretical ideas appropriate for this phenomenon; determination of each optical quantity; identifying the formulas associated with this phenomenon and their relationship, that is, the desire to understand the optical formulas that reflect each law; awareness of the characteristics of the process of the course of all physical phenomena; presentation of a clear manifestation of physical laws; ensuring the uniqueness of creative development reflected in each physical phenomenon.

As a result of the study, the formation of experimental skills of future teachers of physics and astronomy of students in pedagogical higher educational institutions was studied in conjunction with the problems of developing non-traditional methods of teaching the organization of theoretical, practical and laboratory training in the field of improving the teaching of optics and

training competitive personnel. It was studied and concluded that the knowledge of didactic factors influencing the improvement of non-traditional teaching of the optics section in physics lessons and the ability to assess the level of their impact is a complex process that requires special competence.

REFERENCES

1. N.N.Nematov. Interactive methods of group organization. Buxoro, 2008.
2. Khushvaqtoy B.N. Textbook of laboratory work from the Department of Optics of the General Physics course. //Tashkent: 2020. 71 p.
3. Toshpulatova Sh.O., Fayzullayev J.J. Information security of teenage students // EPRA International Journal of MULTIDISCIPLINARY RESEARCH, Volume-7, Issue-5, May-2021. Impact factor-8,047.
4. Khushvaqtoy B.N. Journal of Ethics and Diversity in International Communication // Innovative Fundamentals of Non-Traditional Teaching (on The Example of The Optics Department) | e-ISSN: 2792-4017 | www.openaccessjournals.eu | Volume: 1 Issue: 39-12 p.
5. Khushvaqtoy B.N. Integrative model of improving the content of classes in optics // European Journal of Research and Reflection in Educational sciences - Great Britain, 2019. №7 (12). 132-134 p.
6. Toshpulatova Sh.O., Fayzullayev J.J., Xidirov M. Didactic model development of logical thinking of a future teacher based on creativity // POLISH SCIENCE JOURNAL ISSUE 10(43) WARSAW, POLAND Wydawnictwo Naukowe "IScience" 2021



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PECULIARITIES OF HEMORHEOLOGICAL DISORDERS IN THE PATHOGENESIS OF MICROCIRCULATOR DISORDERS OF THE LIVER DURING THE DEVELOPMENT OF HYPOXIC HYPOXIA

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ABSTRACT

The experiments were carried out on 50 white rats of a mixed population with an initial weight of 150-220 grams, kept in a vivarium on a standard laboratory diet. The state of the microvasculature of the liver has been studied, and a quantitative assessment of the changes occurring during experimental hypoxic hypoxia has been given. A comprehensive analysis of the state of the rheological properties of blood in close relationship with the properties of the erythrocyte membrane in the dynamics of the development of experimental hypoxia is presented.

KEYWORDS: *Hypoxia, Microcirculation, Hemorheology, Liver.*

INTRODUCTION

The problem of oxygen starvation of biological systems continues to be the focus of attention of researchers. This is due to the fact that hypoxia is a leading factor in the occurrence and development of many pathological processes associated mainly with dysfunctions of the blood, circulatory and respiratory systems [1,8].

Modern ideas about the mechanisms of pathological changes in hypoxic conditions are based on experimental and clinical data. In this aspect, the study of the hypoxia of critical states, which is a complex multifaceted biological phenomenon arising as a result of disorders in the activity of various organs and systems of the body, is of great importance.

In recent decades, the problem of hypoxia has been intensively developed in various directions [2,3,4]. At the same time, along with the indisputable successes, a number of issues of fundamental nature and requiring in-depth methodological analysis were clearly identified.

Various aspects of the hypoxic state were studied with a predominant study of the function of external respiration, respiratory failure and the state of arterial oxygenation [5].

However, in most cases, hypoxia is formed at practically all stages of the body's vital activity and at all stages of oxygen transport from the alveoli to the cell, i.e. represents changes in essentially all bodily functions. That is why the assessment of hypoxia as a clinical phenomenon requires the study of many body functions.

Modern methods of studying the manifestations of hypoxia, unfortunately, do not allow us to obtain comprehensive information about the essence of physiological events occurring in the body. Understanding hypoxia, its pathogenesis and clinical essence is impossible without simultaneously studying the processes occurring in the liver, blood, the microcirculatory component of oxygen transport and the state of tissue metabolism.

The development of hypoxia is accompanied not only by an increase in energy imbalance, but also by structural and functional damage to cells and tissues, changes in the reactivity of blood vessels, a violation of their nutrition, and sharp violations of the rheological properties of blood [6,7]. These disorders lead to altered functions of vital organs with high metabolic activity, characterized by abundant blood supply and sensitive to oxygen starvation. Therefore, a comprehensive study of the rheological properties of blood and the state of microcirculation of internal organs (liver, kidneys, pancreas) is of great scientific interest in order to deepen the understanding of the pathogenesis of hypoxia.

According to some authors, during the first hours of hypoxic hypoxia, the alkaline reserve changes little, there is only a decrease in $p\text{CO}_2$ due to hyperventilation, followed by an increase in blood pH. After a few hours, the alkaline reserve begins to decrease, and the degree of its decrease depends on the severity of the hypoxic state [8,11]. The authors found in the terminal stage of hypoxic hypoxia a decrease in the alkaline reserve to 8.8 vol%. The accumulation of carbon dioxide leads to the expansion of arterioles and capillaries, however, Shvets D.A. [9], express doubts that carbon dioxide really increases blood flow, since, in this case, respiration is stimulated.

Studies to study the effect of hypoxia on the cardiovascular system were undertaken with the aim of accumulating factual material and elucidating the mechanisms of hemodynamic reactions. The main results of these studies can be summarized as follows. A short stay at high altitude is accompanied by an increase in heart rate and slight changes in systolic blood pressure. Enhanced

blood circulation due to increased heart rate begins at an altitude of 2000 m, slowly increases to 7000 m, and then develops faster, and it is usually pronounced in untrained individuals, while in trained individuals, adaptation is carried out mainly due to an increase in the stroke volume of the heart. At an altitude of about 5000 m and above, disorganization in the activity of the cardiovascular system is observed, the strength of the heart contraction decreases, but the increase in the heart rate can continue. With the ineffectiveness of compensatory reactions providing an increase in the activity of the circulatory apparatus, the redistribution of blood and the centralization of blood circulation, i.e. maintaining normal blood flow in vital organs such as the brain and heart [4,10].

The Purpose of the Study: The aim of this work was to assess the relationship between vascular liver lesions and changes in the rheological properties of blood in experimental hypoxic conditions.

Materials and Methods of Research: The experiments were carried out on 50 white rats of a mixed population with an initial weight of 150-220 grams, kept in vivarium conditions on a normal laboratory diet.

Hypoxic hypoxia was induced by placing rats in a pressure chamber SPT-200 Vaccum-DRIER. The animals were kept in a pressure chamber at an altitude of 9000 m for 3 hours.

The studies were carried out at 1, 3, 24, 96 hours after the reproduction of hypoxia.

Study of the Viscosity And Shear Rate Of Blood: One of the main indicators of the rheological properties of blood, viscosity (or fluidity) was determined by the Copeley method modified by V.M. Udovichenko. For this purpose, a system consisting of a measuring capillary preostat and a thermostatic installation was assembled at the Department of Basic Medical Disciplines of the Fergana branch of the Tashkent Medical Academy. Viscosity indices were determined in the following shear stresses 2, 4, 8, 12, 16 mm of water. Art. The results were calculated using the following formula:

$$Z = \frac{100 \text{ gz}}{8\pi \cdot 1 \cdot L} P \cdot t \text{ (cP)}$$

where, π is the radius of the capillary in the wide part.

z - radius of the narrow part.

L - wide part length.

t - blood flow time.

P - pressure supplied from the capillaries from the preostat.

g - acceleration of gravity equal to 980 cm/s

The shear rate of blood at a given viscosity was also calculated using the following formula:

$$4R^2L$$

$$V = \frac{\text{---}}{z \cdot t} \text{ sec}^{-1}$$

$z \cdot t$

Based on the obtained values, a dynamic viscosity curve was constructed.

Intravital biomicroscopy was performed under general anesthesia (the animals were injected intraperitoneally with Na etaminal at a dose of 8 mg / 100 g of body weight).

In order to optimize the study and improve the quality of the results obtained, we used an interactive system for monitor digital analysis of microcirculation parameters with computer data processing. The system consists of a luminescent microscope “Lumam IZ”, a monitor camera, a monitor capillaroscope, a digital memory device with an adjustable recording interval, a video monitoring device and a Pentium-IV type personal computer.

Biomicroscopy was performed with contact objectives 10x0.40 and 25x0.40.

Such parameters of microcirculation as the diameter of microvessels and the linear velocity of blood flow were assessed.

The digital data were processed by the method of variation statistics. Numerical differences were considered significant under the condition when $t \geq 2$, and $P < 0.05$.

RESULTS AND ITS DISCUSSION: Metabolic processes in internal organs depend on the preservation of the structure and function of erythrocytes, the most important of which is the transport of oxygen to organs and tissues.

The blood viscosity in animals was determined after 1, 3, 24, 96 hours, as well as at the pressure values applied to the blood flow: 2,4,8,12,16 mm. water Art. The results of changes in blood viscosity in white rats during hypoxic hypoxia, depending on the duration of the experiment and blood pressure, are shown in Table 1.

In the intact group of animals, it was found that the viscosity of blood at a pressure of 2 mm cP. is 5.0 ± 0.42 cP, and at 16 mm cP. 3.81 ± 0.26 cP. In experimental animals, in the dynamics of the development of a hypoxic state, there is a significant increase in blood viscosity and a significant decrease in the shear rate during the study period at various values of hydrostatic pressure.

TABLE 1 INDICATORS OF BLOOD VISCOSITY AND SHEAR RATE DEPENDING ON THE PERIOD DURING HYPOXIC HYPOXIA.

Study groups	2 mm water column		16 mm water column	
	Viscosity	shear rate	viscosity	shear rate
Intact	$5,0 \pm 0,42$	$7,63 \pm 0,08$	$3,8 \pm 0,25$	$76,5 \pm 0,27$
1 hour	$6,2 \pm 0,13^*$	$4,55 \pm 0,18^*$	$4,3 \pm 0,14^*$	$73,6 \pm 2,9$
3 hours	$9,3 \pm 0,26^*$	$3,97 \pm 0,13^*$	$6,5 \pm 0,27^*$	$50,7 \pm 2,2^*$
24 hours	$7,5 \pm 0,16^*$	$6,84 \pm 0,18^*$	$5,1 \pm 0,12^*$	$69,4 \pm 1,2^*$
96 hours	$5,8 \pm 0,31$	$7,35 \pm 0,35$	$4,2 \pm 0,37$	$75,6 \pm 2,8$

Note: * - The results are reliable in relation to intact gr. ($P < 0.05$)

With hypoxic hypoxia, the blood viscosity indices after 1 hour at the minimum pressure increased by 24%, and at the maximum one exceed the value of intact animals by 13.1%.

It was found that after 3 hours after hypoxic exposure, the severity of these processes increases and the studied parameters at minimum and maximum applied pressures increase by 86 and 71.5% compared to the intact group, and by 50 and 51.1% compared to the previous period, respectively.

After 24 hours, the severity of changes in comparison with the previous period decreases somewhat: the increase in viscosity at the minimum and maximum applied pressures is 19.4 and 21.6%, but at the same time, in relation to the intact group of animals at the minimum pressure, the blood viscosity remains high 50 %, and at the maximum by 34.2%.

In the subsequent period - after 96 hours, the tendency to a decrease in viscosity at the minimum and maximum applied pressures continues. So, in relation to the intact group of animals, at the minimum pressure, the blood viscosity remains increased by 16% and at the maximum pressure by 10.5%, which indicates the preservation of blood hypercoagulation.

The blood shift rate in the intact group of animals at the minimum pressure was $7.65 \pm 0.08 \text{ C}^{-1}$, and at the maximum pressure $76.5 \pm 0.27 \text{ C}^{-1}$.

It is noted that already 1 hour after hypoxic exposure at a minimum pressure, the blood shear rate decreases by 32.5%, and at a maximum pressure by 35.7%. 3 hours after the experiment, the severity of these changes increases with the minimum and maximum applied pressures; by 48.0 and 43.8% in relation to the intact group of animals. One day after hypoxic exposure, an increase in the shear rate is observed - at a minimum pressure compared to the previous period by 72.2%, and at a maximum pressure by 36.8%, respectively. 96 hours after the hypoxic state, the shear rate at minimum and maximum pressures continues to increase in comparison with the previous period and almost returns to the initial level.

Thus, the results obtained indicate that in hypobaric hypoxia, the most pronounced changes are observed after 3 hours, and by the end of the experiment they tend to recover.

The viscosity of the blood at the minimum pressure was found to be higher than the values at the maximum pressure and high shear rates.

A decrease in the shear rate of blood and an increase in its viscosity will certainly affect the state of the vessels of various organs, the functional failure of which can lead to stagnation of blood and the development of organ hypoxia. Taking this into account, we subsequently investigated the state of microcirculation of internal organs.

The State Of Liver Microcirculation In Experimental Hypoxic Hypoxia: The most important physiological parameter of microcirculation is the blood flow velocity in microvessels and their diameter, which determine, in particular, the conditions for oxygen transport to the liver tissues [3,6,8].

Proceeding from this, the task of our work was to study possible disorders of the microcirculatory bed of the liver, determine its static and dynamic parameters, fluctuations in these values in the norm and their changes in some forms of experimental hypoxia.

When observing the surface layer of the liver of intact rats using a contact lens, it was found that at a depth of 20-30 microns there are a large number of hepatic venules with sinusoids flowing into them. Portal terminals, from which the sinusoids originate, are located at great depths and therefore were available to our observation much less frequently. They had a length of about

200-400 μm and a diameter of $9.5 \pm 1 \mu\text{m}$ on average. The diameter of the portal venules was $32.1 \pm 0.4 \mu\text{m}$, the blood flow velocity was $0.345 \pm 0.01 \text{ mm/sec}$. The diameter of the sinusoids was $9.5 \pm 0.2 \mu\text{m}$, with a blood flow rate of $0.290 \pm 0.002 \text{ mm / sec}$. In the central collecting venule, the diameter was $45.1 \pm 0.8 \mu\text{m}$, and the blood flow velocity was $0.206 \pm 0.002 \text{ mm / sec}$. In the sinusoids in the center of the lobules, the blood flow velocity is faster than in the sinusoids located to the periphery. The results of morphometric studies are shown in Table 2.

As can be seen from the table, 1 hour after hypoxic hypoxia, the diameter of the portal venules increased by 23.6%, sinusoids by 50.5%, central collecting venules by 13.7% and a slowdown in the blood flow velocity in them by 43.2, 36.3 and 26.9% compared to the intact group. In the microcirculatory bed of the liver, there is a decrease in the number of functioning portal, collecting venules and sinusoids. In the vessels of the liver, empty sinusoids alternate with dilated ones, filled with blood. There was a significant decrease in the rate of hepatic blood flow. Hepatic venules became full-blooded, somewhat dilated, with areas of microaneurysms.

TABLE 2 MORPHOMETRIC ANALYSES OF THE VESSELS OF THE MICROVASCULATURE OF THE LIVER DURING HYPOXIC HYPOXIA

Research objects	Portal venules		Sinusoids		Central collecting venules	
Timing of the experiment	diameter (μm)	blood flow velocity (mm/s)	diameter (μm)	blood flow velocity (mm/s)	diameter (μm)	blood flow velocity (mm/s)
Intact	$32,1 \pm 1,16$	$0,345 \pm 0,002$	$9,5 \pm 0,18$	$0,290 \pm 0,002$	$45,1 \pm 0,59$	$0,206 \pm 0,002$
1 hour	$39,7 \pm 0,23$ *	$0,196 \pm 0,008$ *	$14,3 \pm 0,09$ *	$0,185 \pm 0,002$ *	$51,3 \pm 1,95$ *	$0,130 \pm 0,001$ *
3 hours	$45,3 \pm 2,25$ *	$0,114 \pm 0,004$ *	$18,5 \pm 0,94$ *	$0,136 \pm 0,001$ *	$57,2 \pm 1,36$ *	$0,104 \pm 0,003$ *
24 hours	$36,4 \pm 1,43$ *	$0,245 \pm 0,01$ *	$12,7 \pm 1,23$ *	$0,213 \pm 0,001$ *	$48,1 \pm 1,82$	$0,168 \pm 0,002$ *
96 hours	$33,5 \pm 1,42$	$0,278 \pm 0,002$ *	$10,8 \pm 0,064$	$0,256 \pm 0,003$ *	$46,7 \pm 0,89$	$0,186 \pm 0,003$

Note: * - The results are reliable in relation to intact gr. ($P < 0.05$)

An hour after the experiment, microcirculatory disorders in the liver are aggravated. There is a statistically significant increase in the diameter of the portal venules, sinusoids and central collecting venules by 41.1, 94.7 and 26.8%, with a slowdown in the blood flow velocity in them by 67, 53.2 and 49.6% compared to the intact group of animals, in some areas there is a presinusoidal edema, especially in the center of the lobules, and along the periphery of the lobules there is an increase in the number of "plasma" sinusoids. The tendency to aggregation of blood corpuscles is intensified and areas of the so-called "dumb zones" appear in which signs of diapedesis are noted. In this case, the vessels are sharply dilated, tortuous, filled with aggregates of blood corpuscles. And the blood flow is sharply slowed down, in some places even

completely stopped (stasis). Arteriovenular anastomoses function, shunt blood flow is observed.

After 24 hours of the experiment, plethora and expansion of the sinusoids are still observed. Thus, the diameter of the portal venules, sinusoids and central collecting venules was significantly increased by 13.3, 33.6, and 6.6% in comparison with the intact group, and the blood flow velocity in them decreased by 29, 26.6 and 18.5%, respectively. In this period, areas of petechial hemorrhages are noted in the liver parenchyma, at the same time there is a separation of plasma in the capillaries and the functioning of arterio-venular anastomoses. In all visible terminal hepatic venules and sinusoids, the blood flow is slowed down, intermittent, plasma gaps are clearly traced, which indicates a pronounced aggregation of blood corpuscles, which are caused by a change in the aggregation of erythrocytes and the rheological properties of blood.

We have found that by 96 hours of the experiment in rats with hypoxic hypoxia, the above-described mosaicity of changes is somewhat preserved in the microcirculatory picture, but in some areas there is a tendency to recovery. This is confirmed by changes in morphometric data. Thus, the diameter of the portal venules, sinusoids and central collecting venules, in comparison with the previous period, decreased by 8.15 and 3%, and the blood flow velocity increased by 13.4, 20.1 and 10.7%. But, at the same time, in relation to the intact groups, the diameter increased by 4.3, 13.6 and 3.5%, and the blood flow velocity decreased by 19.5, 11.8 and 9.8%, respectively. The number of functioning sinusoids is noticeably increased mainly along the periphery of the lobules, mainly due to the inclusion of previously non-functioning sinusoids. The perisinusoidal edema is somewhat reduced compared to the previous period, but the vessel walls remain blurred.

It is known that vasoactive substances that come from foci of tissue hypoxia and affect microcirculation play an important role in the development of primary microcirculatory and hemorheological disorders. Experiments have shown that the linear velocity of blood flow in the vessels of the liver after 3 hours with hypoxic hypoxia decreases by more than 2 times. In venules, due to pronounced rheological disorders, the blood flow rate decreases, vasodilatation is observed. Aggregates of shaped elements begin to appear, while there is a decrease in the speed of blood flow. Plasma separation from erythrocytes, multiple micro thrombosis, stasis phenomena in venules, capillaries and sinusoids lead to the development of tissue hypoxia.

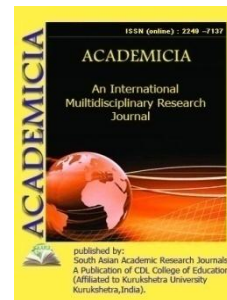
CONCLUSIONS

1. Acute hypoxic hypoxia is accompanied by pronounced disturbances in the rheological properties of blood.
2. Disorders in the liver microcirculation during hypoxic hypoxia are unidirectional and depend on its genesis: at 98 hours of hypoxic hypoxia, normalization of the diameters of the liver vessels is observed, against the background of a reduced blood flow rate in them.

LITERATURE

1. Voronina T.A. The role of hypoxia in stroke and convulsive states. Antihypoxants. FSBSI "Zakusov Institute of Pharmacology", Moscow, Russia For citation: Reviews on Clinical Pharmacology and Drug Therapy, 2016, vol. 14, No. 1, pp. 63-70. (In Russ).

2. Goldberg E.D., Dygai A.M., Zyuzkov G.N. The mechanisms of regulation of the blood system in oxygen deficiency and the participation of neural stem cells in adaptation to hypoxia // Bulletin of Siberian Medicine, No. 2, 2006. P. 43-51.
3. Hypoxia. Adaptation, pathogenesis, clinic / Ed. Yu.L. Shevchenko. SPb.: OOO ELBI-SPb., 2000.384 p.
4. Zinchuk V.V., Gatsura S.V., Glutkina N.V. Correction of oxygen transport function of blood in pathology of the cardiovascular system / Monograph. GRSMU. - 2016.-312 p.
5. Zyuzkov G.N. Mechanisms of hematological changes in the posthypoxic period. Bulletin with RAMS, No. 1 (107), 2003. p. 20-23.
6. Lukyanova L.D. Modern problems of hypoxia // Bulletin of the Russian Academy of Medical Sciences. - 2000. -No. 9. - S. 3-12. [Lukyanova LD. Modern problems of hypoxia. Vestnik Rossiiskoi Akademii meditsinskikh nauk. 2000; 9: 3-12. (In Russ).]
7. Lukyanova L.D. Mitochondrial dysfunction as a typical pathological process, the molecular mechanism of hypoxia. Problemy gipoksii: molekulyarnye, fiziologicheskiye I meditsinskiye aspekty. Ed. by LD Lukyanova, IB Ushakov. Moscow: Istoki; 2004:8-50. (In Russ).
8. Ushakov I.B. Hypoxic mechanisms of combined impacts. Problemy gipoksii: molekulyarnye, fiziologicheskiye I meditsinskiye aspekty. Ed. by LD Lukyanova, IB Ushakov. Moscow: Istoki; 2004:297-397. (In Russ).]
9. Shvets D.A. Pathogenetic substantiation of the use of helium-oxygen therapy in the correction of hemorheological and autonomic dysfunctions in hypoxic conditions of obstructive-respiratory genesis // Dis, Cand. honey, sciences. M., -1996. - p. 136.
10. In'tAnker P.S., Noort W.A., Scherjon S.A. et al. Mesenchymal stem cells in human second-trimester bone marrow, liver, lung, and spleen exhibit a similar immunophenotype but a heterogenous multilineage differentiation potential // Haematologica. 2003. V. 88. P. 845-852.
11. Li C., Jackson R.M. Reactive species mechanisms of cellular hypoxia-reoxygenation injury // Am. J. Physiol. Cell Physiol. (USA). 2002. V. 282. №2. P. 227-241.



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PSYCHOPHYSIOLOGICAL CHARACTERISTICS OF PUPILS OF PRIMARY SCHOOL AGE WITH LEARNING DIFFICULTIES

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ABSTRACT

The main goal of primary education is to preserve and support the individuality of the child, his physical and mental development, the formation of the ability to learn. It is in elementary school that children begin to master a variety of activities and forms of activity, which later determine the style of behavior in the learning process. The school should build its influence on the child so that this style effectively helps each student to know the world and himself. To be able to learn means to be able to carry out learning activities independently and effectively. To be able to learn means to be able to choose types and forms of your own learning, calculate your strength, and use modern means and ways of getting information.

KEYWORDS: Teacher, School, Psycho physiological, Pupil, Characteristic, Primary Education, Different.

INTRODUCTION

What is a young pupil who has a difficult journey of learning under the guidance of a teacher, whose interest in learning has awakened by a teacher? The early elementary school age is a stage of a child's development that corresponds to the period of elementary schooling. Chronological boundaries of this age vary in different countries and in different historical conditions. These boundaries can be conventionally defined in the interval from 6-7 to 10-11 years, their specification depends on the officially accepted terms of primary education [4, 74]. The child's enrollment in school poses a number of tasks to the institution during the period of work with younger students: to identify the level of his/her readiness for schooling and individual features of his/her activity, communication, behavior, mental processes. Which will have to be taken into account during the training; to compensate possible gaps and increase school readiness, thereby

preventing school disadaptation; to plan strategies and tactics for the training of a future schoolchild taking into account his/her individual capabilities [5, 27]. The solution of these tasks requires in-depth study of the psychological features of modern schoolchildren who come to school with different “baggage” representing a set of psychological new formations of the previous age stage – preschool childhood. Each age stage characterized by the child’s special position in the system of socially accepted relations. Accordingly, children of different ages fill their lives with specific content – special relations with peers and a special, leading activity for a given stage of development. We would like to note that L.S. Vigotsky allocated the following types of the leading activity:

Infants– direct emotional communication;

Early childhood – manipulative activity;

Preschool children – game activity;

Younger schoolchildren – educational activity;

Teenagers– socially recognized and socially approved activity;

Senior schoolchildren – educational and professional activity [1, 328]. Entering school radically changes the character of the child's life. From the first days of school, there is a major contradiction – between the constantly growing demands that imposed on the child's personality, his attention, memory, thinking, speech, and the present level of development. This contradiction is the driving force of development in the younger pupil. As the requirements increase, the level of mental development pulls up to their level. Junior school age is a qualitatively peculiar stage of development of the child. Development of higher mental functions and the personality as a whole occurs within the framework of the leading activity at this stage (educational - according to D.B. Elkonin’s periodization), replacing play activity which was leading in preschool age. The inclusion of the child into educational activity marks the beginning of reorganization of all mental processes and functions [5, 48].

Certainly, not at once younger schoolchildren form the correct attitude to learning. They do not yet understand why they need to learn. Soon it turns out that learning is work that requires volitional effort, mobilization of attention, intellectual activity, and self-restraint. If the child is not used to it, then he gets disappointed, there is a negative attitude towards learning. To avoid this, the teacher should instill in the child the idea that learning is not a holiday, not a game, but serious, hard work, but very interesting, because it allows you to learn a lot of new, entertaining, important, and necessary. It is important that the organization of the educational work itself reinforce the teacher's words. In the beginning, he gets interested in the very process of learning activity without realizing its meaning. Only after the emergence of interest in the results of his learning work interest formed in the content of the learning activity, in the acquisition of knowledge. This is the basis and is a favorable ground for the formation of motives of learning of high social order, associated with a truly responsible attitude to learning activities. Formation of interest in the content of learning activities, acquisition of knowledge is associated with the experience of schoolchildren feeling satisfied with their achievements. In addition, this feeling supported by approval, praise of the teacher, who emphasizes each, even the smallest success, and the smallest progress. Younger students feel a sense of pride, a special lift of strength when the teacher praises them. The great educational impact of the teacher on the youngest students is

because the teacher becomes an unquestionable authority for them from the very beginning of their stay in school. The teacher's authority is the most important prerequisite for learning and education in the early grades [9, 151].

There is a functional improvement of the brain – the analytic-systematic function of the cortex develops; the ratio of excitation and inhibition processes gradually changes: the process of inhibition becomes increasingly stronger, although the excitation process still prevails, and elementary school students are highly excitable and impulsive [4, 70]. Learning activities in the early grades stimulates, first, the development of mental processes of direct knowledge of the world around – sensations and perceptions. Younger schoolchildren distinguished by sharpness and freshness of perception, a kind of contemplative curiosity [6, 152]. The most characteristic feature of the perception of these students is its low differentiation, where they make inaccuracies and errors in differentiation in the perception of similar objects. The next feature of students' perception at the beginning of primary school age is its close connection with the actions of the schoolchild. Perception at this level of mental development connected with the child's practical activity. To perceive an object for a child means to do something with it, to change something in it, to do something with it, to take it, to touch it. A characteristic feature of pupils is a pronounced emotionality of perception. With training, perception restructured; it rises to a higher level of development and takes on the character of purposeful and controlled activity. During training, perception deepens, becomes more analytical, differentiating, and takes on the nature of organized observation.

Some age specific features are inherent in the attention of elementary school students. The main one is weakness of voluntary attention. Possibilities of volitional regulation of attention, its control at the beginning of primary school age are limited. The voluntary attention of the younger schoolchild requires so-called close motivation. Whereas older students maintain voluntary attention even in the presence of distant motivation. they can force themselves to concentrate on uninteresting and difficult work for the sake of the result expected in the future, younger students can usually force themselves to concentrate only in the presence of close motivation: prospects to get an excellent mark, to earn praise from the teacher, to do the task best [8, 200]. Involuntary attention much better developed in younger school age. Everything new, unexpected, bright, interesting attracts pupils' attention by itself, without any effort on their part. Age-specific features of memory in the younger school age develop under the influence of training. The role and specific weight of verbal-logical, semantic memorization strengthens and the ability to consciously control your memory and regulate its manifestations develops. In connection with age-related relative predominance of activity of the first signal system, younger students have more developed visual-logical memory than verbal-logical. They remember specific information, events, persons, objects, facts better, faster and more firmly than definitions, descriptions, explanations. Younger students tend to remember things mechanically, without grasping the meaningful connections within the material they are remembering [3, 518].

The basic tendency of development of imagination in younger school age perfection of procreative imagination. It is connected to the representation of previously perceived or creation of images according to the given description, scheme, drawing, etc. The procreative imagination perfected by reflecting reality more and more correctly and completely. Creative imagination as the creation of new images associated with the transformation, processing of impressions of past experience, combining them into new combinations, combinations, also develops [4,82].

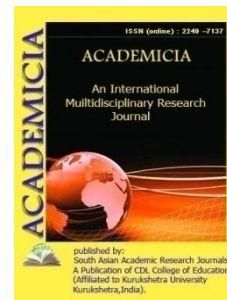
Under the influence of training, there is a gradual transition from the knowledge of the external side of phenomena to the knowledge of their essence. Thinking begins to reflect the essential properties and features of objects and phenomena, which makes it possible to make the first generalizations, the first conclusions, to make the first analogies, to build elementary conclusions. On this basis, the child gradually begins to form elementary scientific concepts. Analytic-synthetic activity at the beginning of primary school age is still very elementary and is mainly at the stage of visual-actual analysis based on direct perception of objects [9, 198]. Junior school age is the age of sufficiently noticeable formation of the personality. It is characterized by new relationships with adults and peers, inclusion in a whole system of collectives, inclusion in a new type of activity – learning, which imposes a number of serious requirements on the student. All this decisively affects the formation and consolidation of a new system of relationships to people, the team, to learning and related responsibilities, forms the character, will, expands the range of interests, and develops abilities. In junior school age the foundation of moral behavior laid, there is an assimilation of moral norms and rules of behavior; the social orientation of the personality begins to form. The character of younger schoolchildren has some features. First, they are impulsive, inclined to act immediately under the influence of immediate impulses, motives, without thinking and without weighing all the circumstances, for random reasons. The reason is the need for an active external discharge with an age-related weakness of volitional regulation of behavior [7, 288].

Age peculiarity is also a general lack of will: the younger schoolchild does not yet have a great experience of long struggle for the intended purpose, overcoming of difficulties and obstacles. He or she can give up in case of failure; lose faith in his or her strength and impossibility. Capriciousness and stubbornness often observed. The usual reason for them is a lack of family upbringing. The child was used to the fact that all his desires and demands were satisfied and he never saw anything rejected. Capriciousness and stubbornness are a peculiar form of the child's protest against those firm demands, which the school imposes on him, against the need to sacrifice what he wants in the name of what is necessary. Younger schoolchildren are very emotional. Their emotionality reflected, first, in the fact that their mental activity usually colored by emotions. Everything that children observe, think about, and do evokes in them an emotionally colored attitude. Secondly, younger schoolchildren cannot restrain their feelings, or control their outward manifestation; they are very direct and frank in expressing their joy. Grief, sadness, fear, pleasure or displeasure. Thirdly, emotionality expressed in their great emotional instability, frequent change of moods, a tendency to affect, short-term and stormy displays of joy, grief, anger, fear. As the years go by, the ability to regulate ones feelings, to restrain their undesirable manifestations develops more and more [2, 14]. The elementary school age provides great opportunities for fostering collectivistic relations. In a few years, a junior high school student accumulates an important for his further development experience of collective activity – activity in the team and for the team. Fostering collectivism helps children participate in public, collective activities. It is here that a child acquires the basic experience of collective public activity.

LITERATURE

1. Vigotsky L.S. History of the Development of Higher Mental Functions. – Moscow, 2003, P. 328.

2. Davidov V.V., Slobodchikov V.I., Tsukerman G.A. The junior schoolboy as the subject of educational activity // Questions of Psychology. – Moscow: 2002. № 3-4. P 14-19.
3. Danilov M.A., Kompov B.P. Didactics. – Moscow: Publishing house of the Russian Academy of Pedagogical Sciences, 2007. P. 518.
4. Danilov M.A. Mindfulness education. Diagnostic of learning activity and intellectual development of children. – Moscow: NIOPS, 2016. – P. 27.
5. Zankov L.V. Development of schoolchildren in the learning process.– Moscow: MIR, 2017. P.152.
6. Kabanova-Meller E.N. Formation of examples of mental activity and mental development of students. – Moscow: Prosveshcheniye, 2018. P. 288.
7. Kalmykova Z.I. Productive thinking as the basis of learning. – Moscow: Pedagogy, 2020. P. 200.
8. Kirillova G.D. Theory and practice of the lesson in the conditions of developmental learning. – Moscow: AST, 2017. P. 198.
9. Chikisheva O. V. Psychological and pedagogical features of children of primary school age // Problems and prospects for the development of education: Proceedings of the II International. – Perm: Mercury, 2012. – P. 90-92. URL: <https://moluch.ru/conf/ped/archive/58/2267/>



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STATE OF MILITARY TERMS IN GERMAN LANGUAGE

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ABSTRACT

This article describes the formation and application of military terms in German. The image of the world language and its role in human society, its influence on language development are also shown. The conceptual image of the world is a characteristic of all human beings. Because man is in constant contact with the world around him, his brain is constantly receiving new information about this world.

KEYWORDS: *World Image, World Language Image, Semantic Words in German, Words Formed From Many Units, -Keit Affix in German and Its Meaning in Uzbek.*

INTRODUCTION

A person, as a subject of science, is an object that carries certain information. Therefore, in today's world of science, scientific or secular views have their own system in different fields and have different views. While this system in different disciplines has its own name, it is expressed in different ways, that is, they have secular views in the field of science, the conceptual system of the world, the secular model or the image of the world.

The concept of "secular image" has a long history, as does the concept of man. In general, the problem of the "image of the world" is still attracting the attention of many scientists, because the concept of science is one of the basic concepts that reflect the relationship of man to the reality around him. In the study of this concept, L. Wittgenstein, M. Heidiger, Ch. Fillmore, Yu.S. Yakovlevna, B.A. Serebrennikov and other scientists contributed.

In general, the conceptual concept of the world refers to the initial state of global thinking, which consists of a person's direct understanding of the world, the formation of his thinking ability through perception, and a combination of other important knowledge or ideas [1. B.160].

The conceptual image of the world is a characteristic of all human beings. Because man is in constant contact with the world around him, his brain is constantly receiving new information about this world.

In order to solve certain problems, man, by his nature, organizes and summarizes information about the world. It follows that empirical experience provides knowledge, and knowledge creates a conceptual image of the world [2].

In order to form the image of the world, man first of all has a great emphasis on language, that is, speech. In general, language is an important tool that helps to consolidate and standardize the knowledge of an objective society [3].

The concept of secular linguistic imagery refers to the relationship between language and reality, that is, through language a person expresses a situation through speech. In general, language serves to convey the secular image to the other person as much as possible through speech, just as a person expresses the world in his mind.

Today, in modern linguistics, the concept of "world language image" focuses on the study of scientific and linguistic culture problems, including the study of linguistic facts and linguistic problems. The "World Language Image" is a great help in organizing, sorting, and categorizing the world around a person according to their spelling meanings [4].

The term is a word with these features, which distinguishes it in a special category of language symbols. Unlike ordinary words, a term can be associated with only one object of reality, which can be a single concept, a single symbol, or a group of identical objects. One and the same term cannot be associated with different semantic levels; in this sense the term does not always have the same meaning. However, this ambiguity can be observed only in one field of knowledge, because in another field the same sign can mean a completely different concept or a completely different object of reality. However, in one area of human activity and knowledge, the term tends to remain ambiguous.

If the lexical meaning of a word is determined by the context, then the meaning of the term in the same field of knowledge is not determined by the context, that is, in any context within a single field of knowledge, the term always depends on only one object. If we are limited to military affairs, we must recognize that there are many areas in this vast area that can be considered as independent fields of knowledge or activities. Therefore, we cannot talk about the concept of "military term", but we must distinguish between tactical, organizational, military-technical terms, terms related to different types of troops and armed forces. All of these are different areas of military knowledge and activity, each with its own terminology.

Military terms are basically just a concept, and they are used only by people in the field, and they differ in that they are self-explanatory. This is due to the origin of the terms. We know that terms are formed in two different ways.

That is, the first is that the meaning of a word that has many meanings in the vernacular is narrowed and becomes a single word that expresses the concept of science, while the second is that it refers only to the field of science and technology. is the transformation of words into terms. Of course, Type 1 terms are often the most widely used terms. Type 2 terms are mostly borrowed from other languages.

Language and speech not only reflect the being in the world, but also interpret it. In general, the "world language image" is assessed anthropocentrically by scientists. However, the "world language image" does not reflect all the objects, events and their signs in the universe, but only those that are interesting and important to him from a human point of view.

In addition, the concept of "image of the world" is ethnocentric, and this concept may have its own characteristics in a particular ethnos. This means that each ethnos has its own linguistic features in the features of perception and understanding. All possible interrelations of the term can be imagined using this term in various speech works. However, for a translator, such an approach is unacceptable due to inefficiency, so it is useful to refer to a military bilingual dictionary.

It follows that the military dictionary is a part of the world language image, which contains a special layer of the language dictionary. In general, a military dictionary has several features, the comprehension and comprehension of which involves reading or understanding special texts. The military dictionary consists of terminological and non-terminological words (dictionary). A military dictionary is a collection of military terms that describe different concepts of military service.

In addition to military terms, science and technology terms are widely used in the military lexicon. Today, military terms can be divided into general-military and specialized lexical meanings. Common German military terms:

Atomwaffe - nuclear weapon; Atomic energy - nuclear war; Abrüstung - disarmament.

Due to the narrow range of specialized terms, these terms are known only to specialists.

Bergepanzer - armored, special conveyor (tank) for repair or evacuation; Brückenkegepanzer - a special tank that breaks the bridge; Faltstraße is a special corridor.

It should be noted that each military lexical term must represent an object, but experience shows that in German there are also synonymous terms for the expression of an object. These synonymous terms can also confuse the linguist. Gefechtsfahrzeug and Einsatzfahrzeug are synonymous terms and mean "war machine". Older terms, as well as terms from another language, can be used to denote the name of an object in German. For example: Motor - (from English) motor or engine, in German the term Antrieb is also used; Fahrzeugkran or Hebezeug - truck crane (heavy lifting device); Brückenlegepanzer or Brückenschieber - a special tank that breaks the bridge; Minenräumpanzer Keiler or Wühl-schwein - a special transporter (special tank) that digs the ground; There are also regional variants of the term in German for the same objects. For example, a grenade launcher is a special grenade launcher, also known as the Minenwerfer in southern Germany.

Expansion of military dictionary terms in German is carried out in different ways, that is, by changing the semantic structure of the word, by forming new words (affixation), by learning words from other languages, and by abbreviation. For example, the term Kette means tank chain, but now it also means aviation units. If in German the meanings of terms formed by a phrase are determined by the meaning of the components, the affixive meaning is determined by the affixes. For example:

Turmwaffe - a tower (bashnya) throwing device, Kleinkalibergewehr - a small-caliber weapon (pistol). These military terms are made up of phrases, Prison (tower) + Waffe (weapon); Klein (small) + Caliber (caliber) + Gewehr (pistol).

Brennbarkeit - flammability; Kletterfähigkeit is the ability to climb. In this case, the words are formed by affixes. This affixoid in Uzbek means ability to perform, to have a certain ability. In German military terminology, in addition to two-component words, there are also multi-component lexical words: Grundwehrdienst - military service; Luftlandetruppen - airborne forces.

There is also the influence of other languages on German military terms. English is especially influential today. This is because German words are now widely used in German military terms: Allrounder - a multi-purpose vehicle; Teamarbeit - combat training in the team.

Abbreviations are widely used in German today. In German military terms, all abbreviations can only be used in writing: SPz - Schützenpanzer - landing combat tank (that is, the landing forces move behind this tank, and the tank acts as a bullet protection); PS - Pferdestärke - horse power; TMG - Turmmaschinengewehr - tower machine gun; MKF - Militärkraftfahrer - military driver; MSA - Modulare Schutzausstattung - modular protection devices; NMWA - Nebelmittelwurfanlage - smoke extraction tool; Rh - Rheinmetall - German company Reynmetal (This company specializes in the production of military equipment in Germany and Europe) [5]; TAF - Taktische Forderungen - tactical requirements; WBG - Wärmebildgerät - a device that describes heat, ie thermo temperature; LKW - Lastkraftwagen - truck; FLA - Fliegerabwehr - Air Defense Forces; MK - Maschinenkanone - automated gun; EloKa - Elektronische Kampfführung - forces against enemy radio-electronic forces; MAN - Maschinenfabrik Augsburg-Nuremberg - Augsburg-Nuremberg Machine-Building Plant; SEM - Sender / Empfänger mobile radio station. SLT - Schwerlasttransporter - heavy truck and others.

In German, some acronyms are spoken orally, just like ordinary horses, and have their own plural forms. The word labor can be abbreviated in German because it creates complex military terms in German: Laborzug is a laboratory group. The same is true for horses with the suffix -er: Brückenleger oder Brückenlegepanzer is a special tank-breaking vehicle.

Semi-abbreviated abbreviations are widely used in the German military lexicon today, with one or more complex components of the term being abbreviated and the rest being used in an expanded form: ABC-Waffe - a weapon of mass destruction; FLA-Maschinengewehr - anti-aircraft machine gun (anti-aircraft machine gun); FLA-Lenkrakete - anti-aircraft guided missiles.

Thus, the German language uses a wide range of methods to express key terms in the field of military service. In the formation of a certain vocabulary and the further development of the level of knowledge, the thinking of this or that specialist is closely connected with the secular linguistic image, and it has its own characteristics in each nation.

An important component of military terms in German is the widespread use of complex (compound) words. Most of the military terms in German - complex words - have a semantically pure structure. For example: Luftangriff - air attack. Luft - air, Griff - attack.

However, there are terms in the German language that are mistranslated during the translation process, and the exact meaning of these terms can be found through their semantic properties.

For example, Gratismaterial in German means the free delivery of combat equipment to another country, while Gefechtpistole means torpedo barbie, not a combat pistol.

It is known from linguistic lexicology that the terms expand as the development of science in society accelerates. Military texts of any genre are also saturated with different terms. The rapid development of military science, and especially military technology, is leading to the emergence of new terms, terminological expressions.

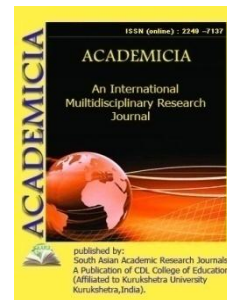
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REFERENCE:

1. Suleymanova E.D Ponyatie smysla v sovremennoy lingvistike Almaty: Mektep, 1989. – P.160 .
2. Teliya V.H Metaphorization and the role of food in the creation of the picture of the world // The role of the human factor in the language: The picture and the picture of the world. - M .: Nauka. 1988. - P. 173–204.
3. Apresyan Yu. D. Obraz cheloveka po danniyam yazyka: popytka sistemnogo opisaniya // Voprosy yazykoznaniya. - 1995. - №1. - P. 37–67.
4. Pavilions R.I. Modern logical-philosophical analysis of the problem smysla yazyka. - M .: Miysl, 1983. – P.286 .
5. Rheinmetall - <https://ru.wikipedia.org/wiki/Rheinmetall>



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THE WAYS OF IMPLEMENTING VOCABULARY ACTIVITIES IN TEACHING PROCESS

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ABSTRACT

This article is devoted to the ways of implementing vocabulary activities and principles for developing vocabulary abilities. Vocabulary is obviously a very important element within a language as the overwhelming majority of meaning is carried lexically; and, therefore, something to be taken into consideration both in Second and Foreign Language Teaching - although not the only one that conveys meaning. There are certainly other elements such as grammar, stress, rhythm, and intonation, tone of voice, pauses, hesitations or silences.

KEYWORDS: *Context, True-False, Cluster, Mind Mapping, Content Words, Communicative Approach.*

INTRODUCTION

Nowadays to learn foreign languages is very important in the world. One of the important issues in educational sphere in Uzbekistan is to raise the quality of teaching education. To reach the required standards the Republic of Uzbekistan accepted presidential decree in December, 2012.

The first president of the Republic of Uzbekistan, Islam Karimov said that “When our people have acquired independence after a very long period of time Uzbek people began determining their own way of development there existed lots of inner and outer threat aimed at overturning the newly born state, to disturb the peaceful life established in Uzbekistan. The Uzbek people understood that they must strengthen the independence gained and what hard obstacles were waiting us in further steps of the development. (Karimov I.A. Yuksak ma`naviyat – yengilmas kuch)

Many people learn English because they think it will be useful in some way for international communication. Such students of general English often do not have particular reason for going

to English classes, but simply wish to learn to speak (read and write) the language effectively for wherever and might be useful for them.

The purpose of people for learning will have an effect on what they want and need to learn – and as a result will influence what are taught. Business

English students, for example, want to spend a lot of time concentrating on the language needed for specific business transactions and situations. Students living in target – language community need to use English to achieve their immediate practical and social needs.

For example, in our military school teaching English is very up to date and it requires all the cadets to improve their all skills actually vocabulary.

Vocabulary is obviously a very important element within a language as the overwhelming majority of meaning is carried lexically; and, therefore, something to be taken into consideration both in Second and Foreign Language Teaching - although not the only one that conveys meaning. There are certainly other elements such as grammar, stress, rhythm, intonation, tone of voice, pauses, hesitations or silences. Learning a language cannot be reduced, of course, to only learning vocabulary, but it is also true that even though the students learn grammar successfully, they need to use vocabulary in meaningful way(McCarthy 1990:VIII).

Nevertheless, in spite of the importance of this element, vocabulary is often the least systematized and the most neglected of all the aspects of learning a second language, not only in EGP but in ESP as well This lack of attention is not only characteristic of older grammatical syllabuses but of more recent communicative approaches (Kennedy & Bolitho 1984).

In my opinion, our students need to be made aware of the importance of this element because we have observed that, in general, there is a tendency to concentrate on grammar, paying little attention to vocabulary.

When making decisions about content, one of the first questions the language teacher will have to address is what vocabulary to teach. For many of them this will be determined by the choice of the course book, the syllabus designers, or other factors.

Even so, the teacher should be concerned about the different criteria used when designing their syllabuses and materials, the ones followed in making decisions about vocabulary content in language courses, and what the objectives of these particular decisions are. Otherwise, it becomes difficult to evaluate syllabuses and materials, to understand why particular vocabulary is to be taught as well as to explain to learners why they must learn particular words (McCarthy 1990:79).

If we want to organize our vocabulary teaching on a subject basis it may be a good idea to work out what the most frequent words are in that subject area either intuitively, with the aid of teachers of other subject matters (ESP), through the study of a limited set of related texts or with the help of a dictionary, e.g. topic dictionaries (see McArthur 1981, Pheby (ed.) 1985, Walter 1995).

Furthermore, teachers try to teach a foreign language through synonyms, antonyms and different kind of exercises. As for students it is very easy to remember more often used words. They are simple to catch by contexts.

Teachers who take their own texts into the classroom will often have to decide from experience, intuition or even the use of a dictionary, which words are likely to have the most useful range, a job which has already been done to a great extent in good course books. (Gaims & Redman 1989: 59).

The classroom will also often dictate the need for certain vocabulary without which the SS may fail to understand their teacher, classmates or the activity they are engaged in. One of these areas is grammatical terminology. Many teachers do not wish to burden their SS with too many grammatical labels, but it is also true that understanding such items can be very helpful.

On the one hand, the explanations given can be shorter and, on the other hand, the student can make a more profitable use of dictionaries and grammar books. It is the teacher who, taking into account factors such as age, course duration, etc., must weigh up the possible benefits or harm of using such terminology. The same would apply to phonological terminology.

Another area of classroom language has to do with the items which often appear in language activity instructions. Although constant exposure alone usually guarantees that these items will eventually be assimilated, it is possible to speed up the process by designing classroom activities containing many of these items and so avoid confusion or misunderstanding. (Gaims and Redman 1989: 57)

The importance of vocabulary in four evidences is emphasized. All exams, tests are based on mostly vocabulary, future workers will be considered the best if they have a large vocabulary, vocabulary is the source for trading and so on. Building and activating learners' background knowledge, motivating them are some of the main goals in teaching vocabulary skills.

If students develop their vocabulary skills, if they read with a clear purpose in mind and learn to apply various strategies, like guessing from the context, using context clues, using keyword technique and using dictionaries and so on, they will engage in reading with greater understanding and effectiveness will learn to solve problems, be creative and will become independent learners.

From the observations, I noticed that those groups of cadets who practiced grammar activity with games felt more motivated and interested in what they were doing. However the time they spent working on the words was usually slightly longer than when other techniques were used with different groups. This may suggest that more time devoted to activities leads to better results.

The marks cadets received suggested that the fun and relaxed atmosphere accompanying the activities facilitated their learning. But this is not the only possible explanation of such an outcome. The use of games during the lessons might have motivated cadets to work on the vocabulary items on their own, so the game might have only been a good stimulus for extra work.

REFERENCES:

1. Harbiy fanlarni ingliz tilida o'qitishning innovatsion usullari. (99871) 233-54-15
2. Karimov I.A. Yuksak ma'naviyat – yengilmas kuch.-Toshkent: Ma'naviyat, 2008. - p 20-21
3. Kennedy & Bolitho -1984-In classroom/An ESP Speaking Course for Internation
4. McArthur 1981, Pheby (ed.) 1985, Walter 1995

5. McCarthy - The importance of vocabulary in language learning-The Cambridge press
6. <http://eduplace.com>
7. <http://readinguoregon.edu/voc/voc-sbooks.phb>
8. [http://www.dedl.org/reading/frame work.pdf](http://www.dedl.org/reading/frame%20work.pdf)



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PRINCIPLES AND METHODOLOGY OF CREATING A KNOWLEDGE BASE IN AUTOMATED VARIANT DESIGN

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ABSTRACT

It is proposed to create a knowledge base in automated variant architectural and construction design. Logical-linguistic models of variant design of industrial buildings, which are a complex set of groups of evaluation criteria for the quality of design solutions, can be taken as a basis.

KEYWORDS: *Expert System "VARIANT", Knowledge Base, Subject Image, Logical Model.*

INTRODUCTION

The development of automated variant design is closely connected with the application of artificial intelligence achievements, the development of expert systems based on the knowledge of highly qualified specialists in a specific subject area.

This requires the definition of principles and the development of methods for presenting weakly structured tasks of automated variant design in the form of a knowledge base.

Automated variant design can be improved on the basis of achievements in the field of artificial intelligence by developing, for example, an expert system "Variant".

One of the ways to further improve the automated variant design is the intellectualization of the automated design system of construction objects based on advances in artificial intelligence. This

process is carried out by developing expert systems at the initial design stage - the expert system "OPTION", which has the ability to qualitatively and quantitatively evaluate a limited set of options, followed by the selection of the most effective design solutions for further development.

The Expert system OPTION contains the following main components: interface - Expert system, meta-knowledge base, logical-linguistic models of qualitative evaluation of the effectiveness of design solutions, information-logical models of quantitative evaluation of the effectiveness of design solutions, knowledge base, database, communication, linguistic processor, linguistic knowledge base, and user menu of the Expert System OPTION.

The core of the expert system is the Knowledge Base. It is a set of knowledge of highly qualified specialists in a specific subject area in a formalized form and a logical inference mechanism that, when asked by the user, is able to explain the results of solving the problem.

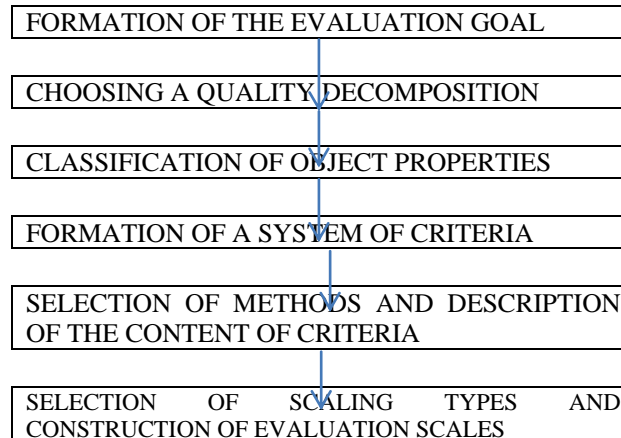
Research on the creation of a knowledge base in subject areas shows the possibility and effectiveness of creating a knowledge base in architectural and construction design, in particular automated variant design. The main feature here is the weak structuring of the objects and processes under consideration.

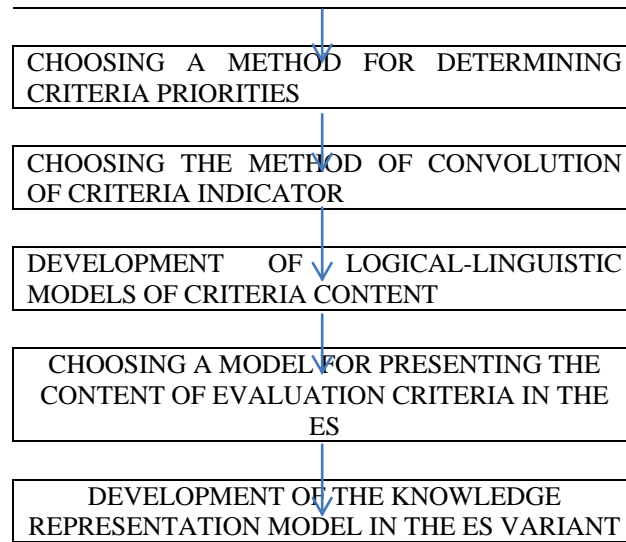
When creating a knowledge base, the logical-linguistic models of variant design of industrial buildings developed by us can be taken as a basis.

To formalize and present knowledge, it is necessary to solve the following tasks:

- To distinguish the distinctive features of knowledge from data in automated variant design;
- To substantiate linguistic criteria for assessing the quality of design solutions for presentation in the knowledge base in the form of knowledge of highly qualified specialists;
- To develop the structural components of the knowledge base in the variant design;
- Develop meaningful knowledge base structures;
- Develop the principles of creating a knowledge base;
- Develop a methodology for creating a knowledge base;
- Develop knowledge representation models.

THE PROCEDURE FOR ASSESSING THE QUALITY OF OBJECTS AND PROCESSES IN THE EXPERT SYSTEM OPTION





Evaluation of the effectiveness of design solutions can be structured in the form of decomposition from general to particular. For example, "operating conditions of production - flow - human flow - orientation", etc.

Formally, the fuzzy set A of the universal set of elements U is defined by the membership function $\mu_A: U \rightarrow [0,1]$ which corresponds to each element $u \in U$ the number ____ from the interval $[0,1]$, characterizing the degree of membership of the element u to the set A .

Linguistic variables are the concepts: COMPLETED, PARTIALLY COMPLETED, NOT COMPLETED. They make up a set of fuzzy variables X , which can be interpreted in the interval $[0,1]$. The function of belonging is the task of the theory of psychological measurements in psychometric methods, which are actively being developed at the present time. In practice, it is possible to set an approximate representation of the form of the function μ_A , which is as follows: the error will not increase when combining fuzzy sets both using operations and using methods of the theory of possibility, since in this case, for the most part, only the operations of finding the minimum and maximum are used.

CONCLUSION AND RECOMMENDATIONS

1. The study of knowledge representation models "Expert System" shows the expediency of using logical models to represent the content of evaluation criteria for the quality of design solutions, since the formal axiomatic system of predicate logic of the first order, which is used to describe the content of criteria, has well-understood mathematical properties and a powerful inference mechanism can be directly programmed. With the software implementation of this Knowledge Base in the automated variant design of industrial buildings, the use of the representation of knowledge of the PROLOGUE language as a tool is provided.

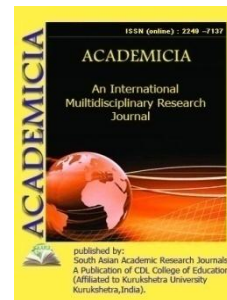
2. The study of the content of the evaluation criteria of quality gives grounds to classify them as the knowledge of highly qualified specialists in this subject image, since their development was carried out with the participation of a group of experts on the design of industrial buildings of food industry enterprises.

Logical models of knowledge representation in the expert system of automated variant design of industrial buildings VARIANT have been developed. The developed logical models can be divided into groups: operating conditions of production, working conditions, layout, composition and flexibility, etc. In general, the developed logical models represent a complex set of groups of evaluation criteria for the quality of design solutions of industrial buildings in relation to the food industry.

The developed approach of presenting qualitative knowledge contributes to the intellectualization of the computer-aided design system of construction objects, and, in particular, the procedure for conducting automated variant design at the initial stage of development.

LITERATURE

1. Artificial Intelligence: What Everyone Needs to Know Today About Our Future. 2018
2. Jones M.T. Programming artificial intelligence in applications. Translated from English. Osipov A.I.- M: DMK Press, 2006. 312 p.
3. Kloksin U., Mellish K. Programming in the PROLOGUE language. Translated from English by M. Mir, 1987. 336 p.
4. McConnell J. Fundamentals of modern algorithms: Textbook. Stipend. - Moscow: Technosphere, 2004. 366 p.
5. Pospelov D.A. Logical-linguistic models in control systems. - Moscow: Energoizdat, 1981. 231 p.
6. Russell S. Artificial intelligence. - M: Williams, 2007. 1410 p.



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NEW APPROACHES TO ENSURING QUALITY EDUCATION ON THE EXAMPLE OF LASER PHYSICS

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ABSTRACT

The organization of the educational process using Multimedia technologies opens up new opportunities for the development of students ' creative abilities. With the joint efforts of employees of the educational sphere, scientists, programmers, multimedia educational devices manufacturers and teachers-practitioners, a new information and educational environment is created, in which the integration of educational and information approaches to the content, methods and technologies of teaching is crucial. In this article, Laser Physics is an application in the form of interactive Java applets; the concept of designers and its implementation are considered. The electronic designers and models created with their help allow simple operation both on personal computers and in network mode, including remote access through the Internet.

KEYWORDS: *Laser Physics; Multimedia Technologies; Teaching Methods; Digital Modeling; Individualized Education; Adobe Flash CS3 Professional Portable; 3ds-Max; Java Programs.*

1. INTRODUCTION

A new level of quality has emerged in the opportunities offered to a wide range of users by modern computer technologies, and new, very attractive prospects for the use of information and communication technologies in education have opened up. Information, digital and multimedia technologies can be used in its teaching in the most natural way [1,2].

New technologies that are of interest in the study of laser physics include computers and multimedia projectors, high-quality audio and video editing software, image editing and animation, remote access technology, and video conferencing support. As a result of the

introduction of these technologies in the educational process, there is a need to develop new approaches to the creation of e-learning products based on them.

The development of methods for the introduction of multimedia technologies in education, the use of which in education can make a significant contribution to the effectiveness of knowledge has become relevant [3,4].

One of the most interesting and demanding tasks at the current stage of computerization of physical education is the transition to maximum individualization of education, which is not possible in the mass version. It encourages learners to offer individual learning trajectories that are characterized by a high level of preparation, skills, and motivation, as well as a degree of complexity, speed of development, and a share of independent creative work. In the future, students or their small groups will have the opportunity to choose the teacher who best suits their personal characteristics and intentions.

The task that has been formed today is no longer imaginary, because many of the problems that make it up today have their own technical and organizational solutions. Many of the professionally designed systems for e-learning that have already been proposed [5] are primarily aimed at mass individualized learning and include the ability to create individual lesson plans, formulate individual tasks, and account for their performance. The main challenge in realizing these opportunities is to change the way teachers work and to produce large amounts of person-centered learning materials.

2. MAIN PART

Teaching methods are the most important components of the pedagogical process, which include the goals and objectives of teaching, the content, the forms of organization of training and its results. The role of methods in teaching is determined by their types and functions, so the main didactic problem is the classification of teaching methods. There is no single classification of teaching methods, but the consideration of different approaches to differentiating teaching methods is the basis for systematizing them as didactic tools.

The use of multimedia technologies means that graduates of pedagogical and higher education institutions have special information training, skills in the mechanisms of information retrieval, collection and analysis, visual perception of the expression of ideas, concepts, processes and implies that they can implement their ideas through the use of a variety of information.

The introduction of multimedia technologies requires constant updating of the idea and content of university education and the training of new teachers capable of studying and implementing these technologies [3,4].

Features of multimedia technologies serves as a basis for the development of information direction. By introducing and using new technologies, this field means creating a product that informs the audience of a set of images, texts and data, along with sound, video, animation and other visual effects.

Multimedia technologies include interactive interfaces and other controls. To better understand what types of multimedia technologies are available, it is necessary to identify and highlight the main directions of their use. This is really important.

Today, multimedia technology is one of the most promising areas of informatization of the educational process. We see the prospects for the successful use of modern information technologies in education in improving the software, material base, as well as mandatory training of teachers.

Digital modeling is one of the most popular uses of computers in the teaching of laser physics. This type of learning material serves to develop individual forms of learning: independent research of virtual physical systems, development of new models and demonstrations, analysis of complex systems and their evolution is a logical continuation of traditional processes for studying laser physics [6-9]. These types of e-learning products should not be seen as an alternative to actual demonstration experiments and laboratory practices. Computer modeling, on the other hand, is an adjunct to the teaching techniques of the theoretical part of the course, and the creation and analysis of models significantly expands traditional teaching methods. The possibility of creating interactive modeling programs in terms of solving the problems of individualized learning and the development of its forms, aimed at the active mastering of the material, varies.

A distinctive feature of the approach considered in this study provides maximum ease of working with designers;

- 2) Provide the ability to build, model, and visualize its results for three-dimensional systems;
- 3) Any that can be done from a CD or remote server access to applet-Designer functions at a time.

3. RESULTS AND DISCUSSIONS

Despite the popularity of Internet video packages, it is very difficult for a wide audience to access these types of resources without problems, due to the relatively large flow of transmitted data. For example, in the context of self-study (connecting a computer to a network via a mobile phone), it is not possible to view almost any of these resources without pre-loading. However, in the latter, the presentation is usually accompanied by slides of presentations. The proposed alternative is to use audio recordings that are used as electronic analogues of traditional speeches. The Adobe Flash CS3 Professional Portable [11] environment is recognized as the most suitable environment for developing the proposed resource type, which is represented by drawings and formulas with a high quality audio line. A useful feature of the suggested resource is to draw the audience's attention to the material presented by the teacher. A very short format (10-20 minutes) was chosen for the electronic analogues of each of the 80-minute lectures. The focus of the resource development was not only on the selection of materials and the preparation of meaningful texts, but also on their audio recordings and the formation of the attached video layout. Graphic images with traditional calculations and drawings for video conferencing have been replaced by high-quality electronic analogues created by computer graphics methods.

Modern technology for creating very high quality short videos on a computer is well developed and today requires almost no significant changes and optimizations. The combination of 3d animations developed on the platform of the 3ds-Max [12] collection with real-time video recordings on real equipment was a major innovation in the creation of the new video library. The use of such videos with elements of technology allows to solve many interesting new educational and methodological problems. These include the ability to demonstrate a step-by-

step transition from a simplified idea of experiment to real experimental equipment and the phenomenon under study (Figure 1). The practice of creating hybrid video images described shows that using modern software packages allows you to create them without resorting to the services of video creation specialists.

Since modern Java versions of electronic constructors used in multimedia packages are based on the original development ideology created for the DOS operating system, it is appropriate to briefly discuss the main ideas and technical solutions used in them.



Figure 1. Application of 3D models (example: experiment with lasers and laser systems).

The Windows interface and design of the Java version of the designer were close to the standard available in the Windows environment (Figure 2). The features of 3D animated windows are complemented by three-dimensional scrolling capabilities and the placement of a graphic background from an external file. Added the ability to assign any graphic image, including animated images, to _particle-type objects. required expansion.

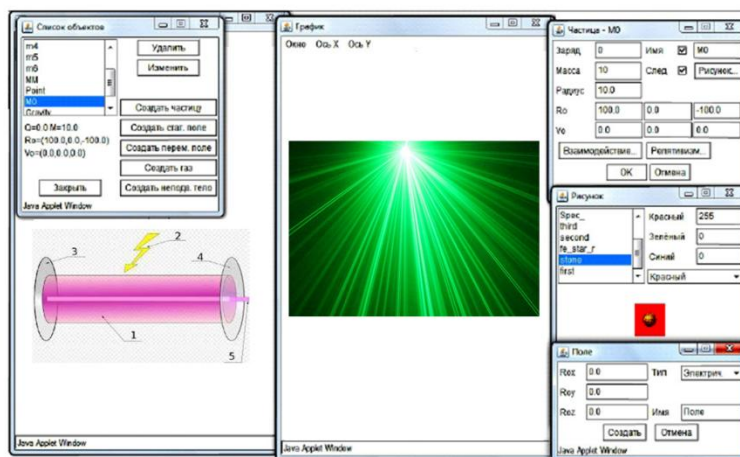


Figure 2 The interface and design of the main designer's animation and dialog windows, implemented in the form of a Java applet

We know that particle motion is very important in laser physics. Since the standard multi-window Windows standard did not yet exist during the creation of the first version of the designer, the DOS version of the designer program was implemented in a multi-window interface to simulate the motion of particles in constant fields (Figure 3 a, b). It provides access to a package of 50 ready-made models, and has the service of adjusting the work screen according to the specifics of the task.

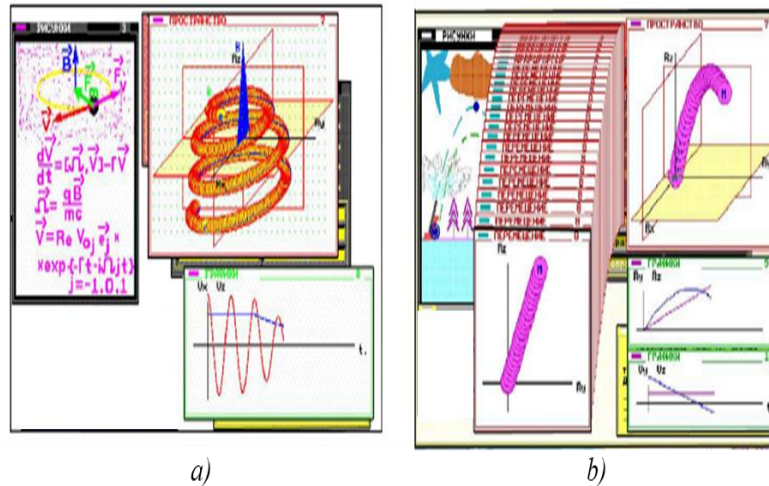


Figure 3. The interface of the first version of the interactive program is the designers of particle motion models in power fields (there is a non-traditional object designed to demonstrate the effects of switching between moving reference systems between windows for different purposes).

The algorithm of the created program objects (Figure 4) is based on the _something class, which is a moving area of the screen workspace containing a specific graphic image and stores information about the image in the closed part of the screen. At its base were built the main branches of the virtual designer: _particle, _field and _window.

Based on the program, _window has built many branches of text and dialog boxes that perform many types of service functions: (_phys_text) output and (_picture), physics and application interface (_help), user interaction (_menu) and others_space3 three-dimensional graphs (representing a modeled system in three-dimensional coordinate space, velocities, accelerations, etc.) and two-dimensional graphs _space2 (interdependence of different kinematic and dynamic properties at different times).

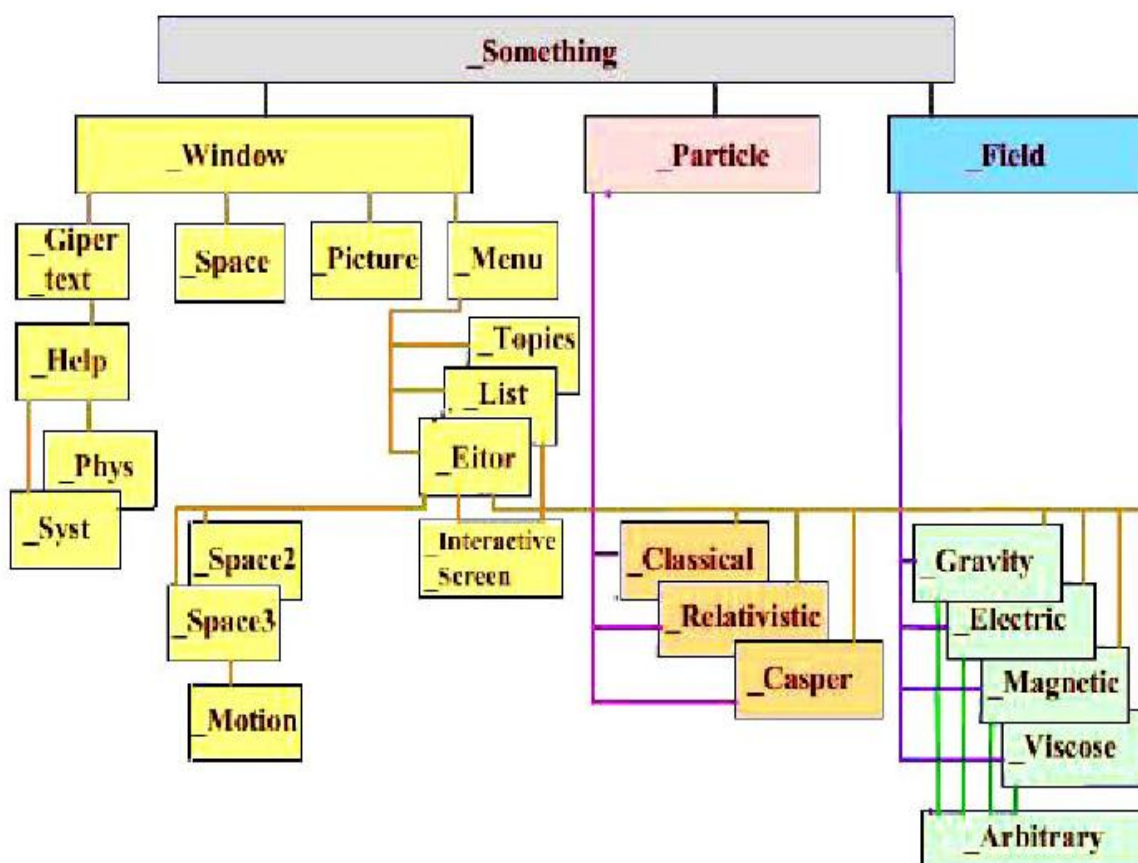


Figure 4. Classes algorithm of the first version of the program.

The program `_particle` is used to describe particles with initial properties (mass, charge, initial state, graphic image) and variable kinematic properties. Programming methods allow you to retrieve data from fields (objects in the `_field` class) and deliver their kinematic properties to the animation windows upon their request.

Our approach to the creation of test original versions of interactive simulators of laser physics laboratory complexes is a simpler multimedia explanation of laboratory rooms equipped with very sophisticated equipment. Take, for example, the work on the reconstruction and control of femtosecond lasers. As part of this, a technology for the development of electronic simulators based on the creation of a copier or a 3D model of the device was proposed and implemented. This model can be used to create static and dynamic images in different operating modes (regular and non-standard). These images form the basis for creating an interactive animated model in the Macromedia Flash environment (Figure 5), which is controlled by the user by “clicking with the mouse” across the screen areas containing the controls.

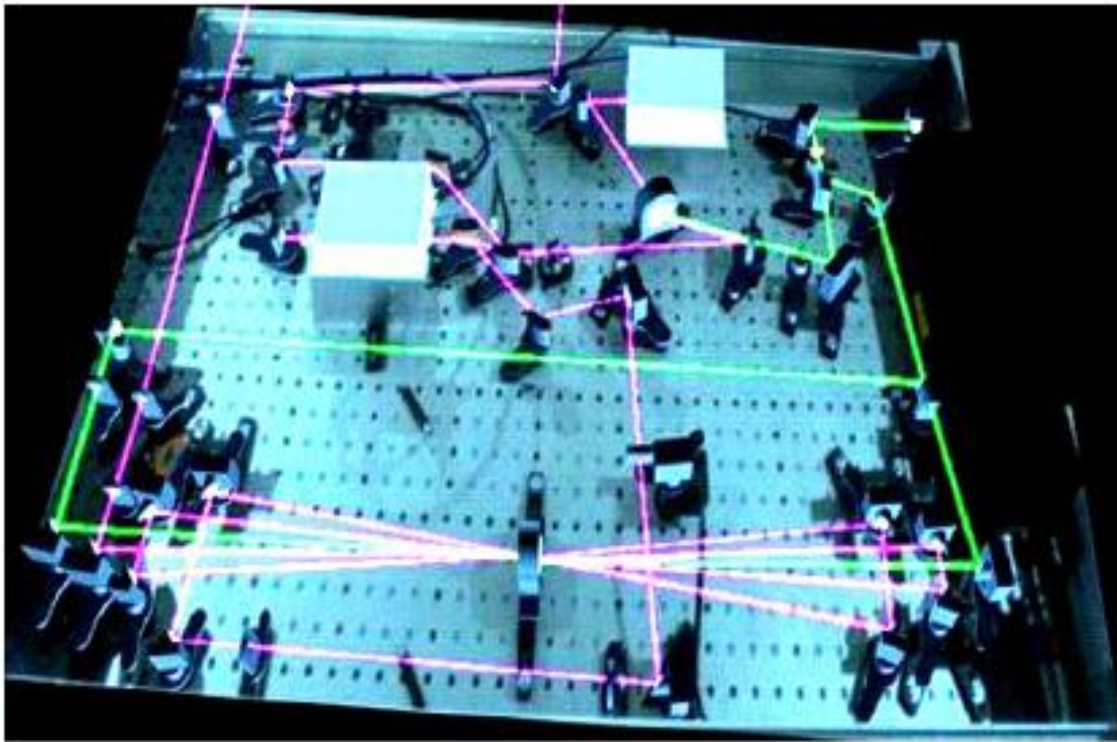


Figure 5. Interface and design of interactive computer simulators used to organize the preparation of students for laboratory work "Fem to second laser use and device."

The decision to respond to the user's actions in the model is made on the basis of digital modeling of physical processes that determine the state of the device. These simulators used the built-in Macromedia Flash programming language [13], the capabilities of which were sufficient to provide accurate digital simulation that met the requirements for proper operation of the simulator. Sophisticated equipment models developed in the 3ds Max environment are also used to create multimedia descriptions of laboratory work. The second is in the form of virtual tours of the device under study, and the main methods of working with them on a regular basis include video recordings.

Includes multimedia descriptions of laboratory work, interactive computer simulators, and reworked audio instructions for working with equipment, as well as a set of video graphics demonstrating the basic methods of working with equipment with very little textual description;

4. CONCLUSION

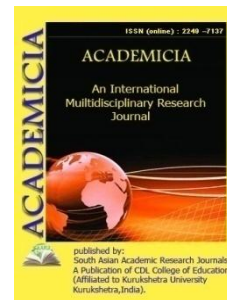
The above practice of creating video images shows that creating video using modern software packages allows you to create them without resorting to the services of specialists.

Many interactive demonstrations and computer problems are being developed based on a series of physical system model designers described in the form of Java applets. This was an important part of the collection of multimedia resources for the study of laser physics. These are the characteristics of the technical solutions used to create the original sources, and the descriptions of the laser physical ideas described by them.

The considered technical solutions have been successfully used in the creation of a number of electronic packages of multimedia resources to support the teaching of general physics block sciences for undergraduate students of physics departments of classical universities. This will make it possible to acquire a lot of knowledge in a simple and understandable way through e-learning, and at the same time make great strides in the future.

LIST OF USED LITERATURE:

1. Рейтинг популярности ресурсов. Физика. [Электронный ресурс] / Российское образование. Федеральный портал: [сайт]. [2010].
2. Физика в Интернете. Аннотированный тематический каталог Интернет ресурсов в физике.
3. Андресен, Бент. Б. Мультимедиа в образовании: специализированный учеб. курс: [пер. с англ] / Бент. Б. Андерсен, Катя Ван Ден Бринк. - 2 - е изд. ; испр. и доп. - М.: Дрофа, 2007. - 221 с.
4. Захарова, И. Г. Информационные технологии в образовании: [учебное пособие для высших педагогических учебных заведений] / И. Г. Захарова. - М.: Академия, 2003. - 188 с.
5. Марек В.П., Микушев В.М., Чирцов А.С. Использование информационных технологий при создании инновационной образовательной среды на физическом факультете классического университета. // Международный журнал экспериментального образования, 2009. № 6. С. 23–26.
6. Бутиков Е.И. Роль моделирования в обучении физике // Компьютерные инструменты в образовании, 2002. № 5. С. 3–20.
7. Кравченко Н.С. Комплекс компьютерных моделирующих лабораторных работ по физике: принципы разработки и опыт применения в учебном процессе // Физическое образование в ВУЗах, 2008. Т. 12. № 2. С. 85–88.
8. Кондратьев А.С., Ларченкова Л.А., Ляпцев А.В. Качественные методы при изучении физики // Компьютерные инструменты в образовании, 2007. № 5. С. 147–154.
9. Князев М.В., Колинко К.П., Чирцов А.С. Информационные технологии в обучении // Компьютерные инструменты в образовании, 1999. № 2. С. 3–22.
10. Чирцов А.С. Лазеры со сверхкороткими импульсами и их использование. [Видео лекция] / Интернет-Университет Информационных Технологий: [сайт]. [2010]. URL: <http://www.intuit.ru/video/>
11. Adobe Flash Professional CS3 URL: <http://www.adobe.com/products/flash/>
12. Autodesk 3ds Max Products. URL: <http://usa.autodesk.com>.
13. Марек В.П., Чирцов А.С. Исследование возможностей мультимедиа и компьютерного моделирования для организации самостоятельной работы студентов и их подготовки к работам физпрактикумов // В сб. Материалы X Межд. Конф. «Физика в системе современного образования» (ФССО-09)». СПб., 2009. Т. 2. С. 193–195.



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THE INTEREST OF JUNIOR SCHOOL AGE STUDENTS AND THEIR IMPACT ON SPEECH PERFORMANCE

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ABSTRACT

The article A 7-year-old child will have experience in managing his / her emotions, all of which are acceptable to the principles of that the child is ready in terms of school psychology, one of the important conditions in the preparation for school education is all that he/she said above. In the organization of pedagogical work in primary classes, it is necessary to take into account the level of social development of anatomical physiological characteristics of children of small school age.

KEYWORDS: *Fulfill The Various Requirements, Junior School Age Of Children, Physically And Psychologically.*

INTRODUCTION

The period of junior school age of children is from the age of 7 to 11 years of study in primary classes. The childhood period in the kindergarten age is over. Before coming to school, the child will be physically and psychologically ready to receive education, in other words, to fulfill the various requirements imposed on the side of the most important period of his life, that is, the school period, according to the following. The child will have a clear in drawing lessons, in the work of making something from plasticine, and in the simplest drawing lessons. Dressing the experience for a while will have the child make independent organization of their attention in the management of their attention. The vocabulary room of the 7 young children is also rich enough and the amount of concepts is much higher. The child understands what he hears, wide enough. As it turned out from the research of specialists, well-organized education develops the thinking of children from the age of 6 to the age of 7 years. They will be able to draw up and eat simple

exercises and issues. The feeling of duty and responsibility in them begins to wane. A 7-year-old child will have experience in managing his / her emotions, all of which are acceptable to the principles of that the child is ready in terms of school psychology, one of the important conditions in the preparation for school education is all that he/she said above. In the organization of pedagogical work in primary classes, it is necessary to take into account the level of social development of anatomical physiological characteristics of children of small school age.

MATERIALS AND METHODS

D.N. As Levitov correctly noted, at the age of one school does not depend on the state of Health and social development of the junior school age Max. The child develops from the age of 7 to 11 years in a relatively calm and uniform way physically. Height and weight the vital volume of the lungs of the body's clarity develops much more flat and smooth Psychologist L.S.Slavina shows that in the beginner class, children with insufficient cognitive activity can meet.

Such children become normally developed in terms of aspiration. This development is wetting in their game and practical activities. Active thinking is for them. Such pupils should be carefully looked at by the teacher. It is necessary to associate the performance of educational tasks with the game and practical activities in the early days, so that they have a comprehensive support of their achievements, adapting them to the activities of their thinking.

All the reading activities of junior school age students have been specifically targeted. First of all, students should be able to master the skills of reading, writing, and counting, improve their knowledge in arithmetic, native-language, history, geography and Natural Science, much larger than the elementary foundations of geometry. Secondly, the child's level of knowledge and interest in cognition develop well. The third is the development of cognitive processes, the development of reason. For active independent creative activity, the ability to find content and a productive attitude towards reading, the direction of reading should find high Factors in reading. We cognitive processes of junior school age students and their progress in their activities.

Understanding

Children of small school age differ in the purity of their perception. The perception of the students differs from the fact that they are given specific knowledge as a spectator.

Attention

The main characteristics of the attention of students of junior school age are in their voluntary weakness. At a small school age, attention will be limited to the ability to adapt and manage it with willpower.

Although the period of junior school age is not a period of silencing, which is fraught with the development of the individual, in our opinion, such a period is a period of adolescence, nevertheless, the content of the individual in this period is noticeable enough. As already mentioned above, entering the school is a turning moment in the life of the child. A new relationship with adults (teachers) and peers (classmates) comes to the field. The child is attached to a whole system of communions (general school, class). The inclusion of a new type of activity in the study, in which the teacher put before him a number of serious requirements, forces the student to categorically organize his life, obey the rules and the regime. All of them

have a decisive influence on the content and consolidation of the new system of relations in relation to the surrounding reality, education to other people, the collective, and the obligations associated with it. We find the content of the will of the circle of interests, determines the progress of abilities.

Memory

It develops in two directions with the effect of memory education in junior school age students. Word logic is the role of understanding and remembering the memory and its connotation, to the possibilities of regulation.

Due to the relative predominance of the activity of the first alarm system, in small school-age students, the visual-figurative memory becomes more developed than the memory called the word logic memory. Small school-age students look at the rules and explanations that make up concrete information, realities, images that make things and objects better quickly remembered and stored firmly in their memories.

It's a dream. Fantasy is one of the important psychic cognition processes. Without the fantasy that an inactive teacher is talking about and not knowing how to make an impression of what is written in the lessons, as well as working with visual images, We cannot really master what kind of educational subject.

The dream of a junior school age student is compounded by the impact and demands of his / her teaching activities. Along with this, direct taxis go and see, see the cinema, go to the exorcisms, work on the school land plot, etc.) Also develop the imagination.

Will be able to tell other people and absorb the thoughts of other people, will know the feelings and desires of other people. People communicate with each other in this way in their activities and everyday lives.

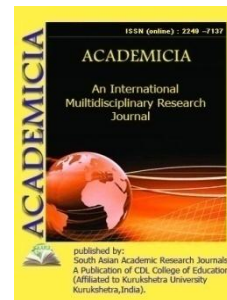
In the process of communicating with the means of speech, each person receives most of the knowledge from other people. Communication with the means of speech is a constant need of a person, and this communication serves to gain ideas.

A person cannot live without being treated by speech with other people. When a person is left alone, they often talk "in themselves" with the interlocutors in their dreams. If a person falls into the middle of one or more people who are unfamiliar to him, then the need to say something or hear something from those people will definitely arise. When this need is not met, a feeling of "unevenness" is born that makes a person sad. Such a need arises even when a person has "nothing to say". In such cases, he does not know "what to do". In such cases it appears that what should I talk about?", "as long as I'm talking about something", when the search for the topic begins. Depending on the age, knowledge, general level of research of each person, his speech will have its own characteristics. Characteristics of the profession of some people, what these people are interested in, their client and similar characteristics are manifested in their own speeches. Everyone speaks on their own, using one or more languages. each person has his own speech. Speech, which is a special function of the human mind, is studied by the science of psychology. And language is a social phenomenon. Language exists independently in some person. And the creator of the language is the people's own, the nation's own, historically composed.

With speech, the language is different, but at the same time it is impossible to distinguish them from each other; both speech and language are interconnected, they exist in unity. This unity is an expression that every language has emerged and grown in the course of historical progress in the process of connecting people with the means of speech communication. The way each language lives depends on what people speak in that language. If people do not speak a language, then this language also disappears: it becomes a "dead language". We know from written monuments that there are "dead" languages, where this language is reflected. For example, ancient Greek (Greek), Latin, here are such "dead" languages. The unity of speech with language is further manifested by the fact that each person uses a language in his speech, while some use several languages. In the interaction of people, their speech is manifested in different meanings or functions.

REFERENCES

1. Sodirjonov, M. M. "Some Thoughts On The Evolution Of Approaches To The Concept Of Human Capital." The American Journal of Social Science and Education Innovations 2.08 (2020): 144-150.
2. Sodirjonov M. M. Ethnosociological Factors Of Social Transformation In Modern Uzbekistan //Actual Issues Of Formation And Development Of Scientific Space. - 2020. - PP. 27-34.
3. Mahamadaminovich S. M. The essence of social capital consequences and their influences to the modern society //Bulletin of Science and Education. – 2020. – №. 2-2 (80).
4. Sodirjonov M. M. Some Thoughts On The Evolution Of Approaches To The Concept Of Human Capital //The American Journal of Social Science and Education Innovations. - 2020. - Vol. 2. - No. 08. - Pp. 144-150.



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LINGUISTIC MORPHOLOGICAL MEANS OF EXPRESSING AN ANALYTIC ATTITUDE

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ABSTRACT

The results showed that 688 respondents (43.16%) did not do sport outside school or university. 272 people (17.06%) reported jogging and playing sports games on their own. 634 respondents (39.78%) attended sports clubs and sections on a regular basis. The survey demonstrated that physically inactive students and schoolchildren violated daily routine. Such schoolchildren spent significantly more leisure time on television viewing (52.78%) compared to their peers attending sports clubs (41.36%). The percentage of schoolchildren spending much time on the computer among those not doing sport was also higher (58.59% vs 41.47%). The same trend was observed in the students: 36.24% of the students not practicing sport spent most of their leisure time on the computer. Physically active students spent enough time outdoors as compared to those not doing sport (23.40% vs 11.15%).

KEYWORDS: *Fulfill The Various Requirements, Junior School Age Of Children, Physically And Psychologically.*

INTRODUCTION

The attitude of comparison is reflected in almost all levels of linguistics.

Although some aspects of the comparative attitude to this day have been studied, the attitude towards comparison in Uzbek linguistics has not yet been sufficiently studied.

The manifestation of linguistic means at different levels of language, which creates a comparative attitude, has not been studied in detail. The meaning side of the word is with its objects, phenomena, etc.

It follows from the binding. It is without direct contact it occurs through reflection of existence in the mind of a person.

H.Ne'matov and R. Rasulovs revealed: "members of society a ready-made, general, binding, consisting of a stable combination of form and content, something in reality, character, feature and relationship the formative is a morpheme-type lexeme that can attach grammatic morphemes in speech and dictionary to itself."

Lexical composition of the language from Dictionary units-independent meaningful words will organize.

Participate in the speech process with the meanings of words, express the thought in addition, the main task in the delivery of specific information to the listener it does.

The function of words in the composition of the sentence is quite extensive. Because they are involved in the formation of human speech as the main unit. Comparison in the process of speech participates in the expression of content. To what extent does a person know about existence it is reflected in his word? Because to know the existence is to have an understanding of things, events. And these are common and important signs of something and phenomena means separation from something else and events. Human experiences this concept, which is the result of the Universal declension, forms the basis of the word meaning, and makes up the core.

For example, the shape, function, characteristic of a human cloud taking into account its features, it is likened to another predicate it was a comparison.

Morphological means

The attitude of comparison in the current Uzbek language of literature also occurs with the help of morphological means. Some ointments as such morphological means and

We can indicate the words in the task of the assistant:

A) According assistant.

B) This assistant with the words of the exit agreement

When it comes to the predicate or circumstance in which the word in the exit agreement is expressed to another

It is compared, compared.

According to, despite the suitability, mainly concerning, co-workers ca like suitably- it is added to the names in the agreement.

An assistant is actually more applicable in the departure agreement than an assistant- despite being a make-up, the output agreement was not requires names to come up with.

B) Assistant than. This is the highlight, highlight, show the assistant subtracted, it also means comparison, comparison.

When the comparative meaning is expressed through the genitive assistant, the word representing the sign is often observed to come in comparative syllables.

C) Relative. This lexeme refers to the original word category. When the comparative, genitive meanings are reflected when used in the task of the assistant.

Analogy usually occurs with the participation of at least two subjects. But speech if from the process or logically the cultivation is understood, then by analogy the object that can be the basis is dropped, - the itself of the added element can take part in the sentence and represent a comparative meaning: I breathe, take it to a cold place.

Comparative degree, which is considered a kind of qualitative degree, among the morphological means involved in the expression of the comparative relationship

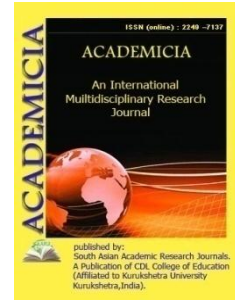
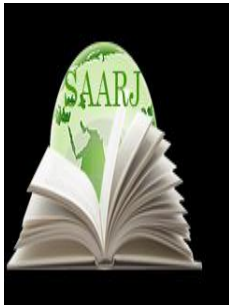
- The reflected through. One of the most important tools that form a comparative degree one is. - forms of quality, formed by, are powerless from the normal state of the co-sign along with the emergence of the meaning of comparisons specifies the window.

This six is something-phenomena, sometimes work-a sign of a concept in which an adjective is meant when a person is engaged in actions a little more than the same sign in another concept over means that.

REFERENCES:

1. Sodirjonov, M. M. "Some Thoughts On The Evolution Of Approaches To The Concept Of Human Capital." The American Journal Of Social Science And Education Innovations 2.08 (2020): 144-150.
2. Sodirjonov M. M. Ethnosociological Factors Of Social Transformation In Modern Uzbekistan //Actual Issues Of Formation And Development Of Scientific Space. - 2020. - Pp. 27-34.
3. Mahamadaminovich S. M. The Essence Of Social Capital Consequences And Their Influences To The Modern Society //Bulletin Of Science And Education. – 2020. – №. 2-2 (80).
4. Sodirjonov M. M. Some Thoughts On The Evolution Of Approaches To The Concept Of Human Capital //The American Journal Of Social Science And Education Innovations. - 2020. - Vol. 2. - No. 08. - Pp. 144-150.
5. Sodirjonov M. M. Ethnosociological Factors Of Social Transformation In Modern Uzbekistan //Actual Issues Of Formation And Development Of Scientific Space. - 2020. - Pp. 27-34.
6. Sodirjonov M. M. The Essence Of Social Capital Consequences And Their Influences To The Modern Society //Bulletin Of Science And Education. - 2020. - No. 2-2. - Pp. 113-116.
7. Sodirjonov M. M. Ethnosociological Factors Of Social Transformation In Modern Uzbekistan //Actual Issues Of Formation And Development Of Scientific Space. - 2020. - Pp. 27-34.
8. Mahamadaminovich S. M. The Essence Of Social Capital Consequences And Their Influences To The Modern Society //Bulletin Of Science And Education. – 2020. – №. 2-2 (80).
9. Sodirjonov M. M. Some Thoughts On The Evolution Of Approaches To The Concept Of Human Capital //The American Journal Of Social Science And Education Innovations. - 2020. - Vol. 2. - No. 08. - Pp. 144-150.
10. Sodirzhonov M. M. Bozor Iktisodietining Ethnik Muhitiga ta'siri Hususida Airim Muloazazalar //Journal Of Social Research. - 2020. - Vol. 3. - No. 6.

- 11.** Bobomurodovich B. M., Makhamadaminovich S. M. Human Capital Is Made In The Family
//Academia: An International Multidisciplinary Research Journal. - 2020. - Vol. 10. - No. 2.-
Pp. 144-150.
- 12.** Sodikjonovmukhriddinmahamadaminovich, Monitoring The Issues Of Human Capital
Research In Ethnosocial Processes And Social Trends. Social Policy And Social Partnership
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DICTIONARY IN TEACHING VOCABULARY COMPOSITION OF LANGUAGE TO JUNIOR SCHOOL AGE STUDENTS WAYS TO WORK

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Department of Primary Education Methodology,
Fergana State University, UZBEKISTAN

ABSTRACT

In the dictionary work, the pronunciation and spelling of the meaning of the word are paid attention. All the main objective of the study is to achieve the students ' use in speech when the need arises, it is to ensure that others understand their speech. For this, the teacher used in the lessons of his native language of each word, in educational processes: exorcism, mutual conversation, at various events, used a look at the meaning of the words with attention, which of them requires special performance must be identified.

KEYWORDS: *Fulfill The Various Requirements, Junior School Age Of Children, Physically And Psychologically.*

INTRODUCTION

Enrich the vocabulary of native speakers, reading children in the curriculum of primary classes.

Development of coherent speech, perfection of literary-aesthetic thinking, and culture of speech the formative is called the critical factor of ensuring the effectiveness of speech. These tasks study of mathematical topics, observation and analysis of exercise texts, special vocabulary - it is performed through grammatical exercises.

The main purpose of teaching mother tongue is also the role of language in society, with its function determined. Language is a means of communication-the speaker explains his thoughts through language, while the listener means the thought that comes to mind through language tools.

The native language science prepares teachers for the activities of explaining ideas and getting him to read. Idea

When going out into a dream through the language, everyone must know and its use.

knowledge is rich not only in mastering its – law rules, definition, but also in the native language it is to be able to make practical use of their capabilities, that is, to correctly express their opinion verbally and in writing, it is to be able to express clearly and competently. To achieve this, the native language on the dictionary particular attention should be paid to performance.

In the dictionary work, the pronunciation and spelling of the meaning of the word are paid attention. All the main objective of the study is to achieve the students ' use in speech when the need arises, it is to ensure that others understand their speech. For this, the teacher used in the lessons of his native language of each word, in educational processes: exorcism, mutual conversation, at various events, used a look at the meaning of the words with attention, which of them requires special performance must be identified.

In the lessons of native language for the assimilation of the dictionary wealth of the language by students it is introduced by the following meanings of words.

1. Introduce students to unfamiliar words and phrases.

It may be the first time that students encounter words and phrases in the textbook.

Although this word is not a newly appeared word, it means that the reader does not know its meaning,

It is a new word for the reader. For example, in the textbook of the 1st Class “mother tongue”.

(window curtains glued to transparent paper instead of Windows), (proud (stuttering, proud-humble), Kemal (comprehensively mature, establish, find Kemal-Khazan Hab), ruin (left unattended ruin), brother (friend, brother, relative-seed), comrade (together in military service, in the organization together), Basin (a picture of rivers or a set that is laid on rivers and lakes, forming it show), commander (Commander, soldier), zeb (decoration, fur.), ornaments (for beauty the serving item), the castle (Palace) are faced with such words. Such comment with meaningful words against by expanding the synonyms of the meaning of words.

It is possible to form an understanding through pictures, to solve the meaning by creating a sentence, to give. Such performance creates sensitivity in students towards word meanings.

2. To acquaint readers with the new meanings of the word. Students are many meaningful

If one understands the meaning of words, they cannot express the meaning of another. Children's words they cannot absorb all their meanings at once. Step to master their meaning phase is carried out. If in 1-2 class you get acquainted with one or two meanings of a multi-meaning word, then 3-4- in the classes you will learn more other meanings. Translate all levels of language: phonetics, lexis, vocabulary composition, morphology, syntax (in the elementary class these sections are called "Sounds and letters", "word",

In the process of studying (which is called" sentence“,” connecting speech") fine expressions, phrases, meanings of words with meaning, formative, anti-dependent meaning are based on different types of work understanding. In the textbook of the native language of the 1st Class hours it is given a thought disorder-portable meaning phrase compare with the combination of

the disorder. Which combination is used in a different sense? (Clock broken) which does the combination apply in another sense? (The idea is broken). How the idea meant a combination of disorder expresses? Children are explained that they think and say that the idea of the evil ones with the intention is a violation.

It turns out that the method of comparison is considered an effective method in interpreting the meaning of words. Throwing buns,

The lazy ate, the Blind played, the heart was fire, the tongue was found, and the pleasure was also on the meaning of the phrases tasted

It is processed in this way.

MATERIALS AND METHODS

All the reading activities of junior school age students have been specifically targeted. First of all, students should be able to master the skills of reading, writing, and counting, improve their knowledge in arithmetic, native-language, history, geography and Natural Science, much larger than the elementary foundations of geometry. Secondly, the child's level of knowledge and interest in cognition develop well. The third is the development of cognitive processes, the development of reason. For active independent creative activity, the ability to find content and a productive attitude towards reading, the direction of reading should find high Factors in reading. We cognitive processes of junior school age students and their progress in their activities.

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Memory

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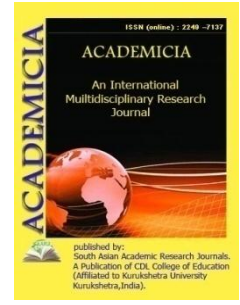
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REFERENCES:

1. Sodirjonov, M. M. "Some Thoughts On The Evolution Of Approaches To The Concept Of Human Capital." The American Journal of Social Science and Education Innovations 2.08 (2020): 144-150.
2. Sodirjonov M. M. Ethnosociological Factors Of Social Transformation In Modern Uzbekistan //Actual Issues Of Formation And Development Of Scientific Space. - 2020. - PP. 27-34.
3. Mahamadinovich S. M. The essence of social capital consequences and their influences to the modern society //Bulletin of Science and Education. – 2020. – №. 2-2 (80).
4. Sodirjonov M. M. Some Thoughts on the Evolution of Approaches to the Concept of Human Capital //The American Journal of Social Science and Education Innovations. - 2020. - Vol. 2. - No. 08. - Pp. 144-150.



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DEVELOPMENT OF PRACTICAL ACTIVITY SKILLS OF STUDENTS IN MATHEMATICS IN E-LEARNING ENVIRONMENT

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ABSTRACT

This article shows the ways of developing and forming practical activity skills of schoolchildren in the e-learning environment. In the development of practical activity skills of students in the field of mathematics, the organization of training taking into account their individual characteristics, requires the design of electronic educational resources as a basis. In this regard, the use of mathematics in educational and cognitive activities allows the teacher to create an individual educational trainee for the students, and the students can choose an individual educational direction for learning and evaluating their results in the conditions of developing practical skills in science with the use of different methods.

KEYWORDS: ICT, practical activity skills, multimedia, visual education.

INTRODUCTION

Due to the increase in the flow of information and the application of ICT in all spheres of human activity, the need for the development of practical activities skills of students in this subject arises by improving the requirements of general secondary schools for the teaching of mathematics.

In the development of practical activity skills of students in the field of mathematics, the organization of training taking into account their individual characteristics, requires the design of electronic educational resources as a basis. In this regard, the use of mathematics in educational and cognitive activities allows the teacher to create an individual educational trainee for the students, and the students can choose an individual educational direction for learning and evaluating their results in the conditions of developing practical skills in science with the use of different methods.

A distinctive feature of the development of practical skills of students in mathematics in the e-learning environment is the creation of an individual training course on its basis and the selection of the direction of education by each student taking into account individual cognitive methods of coding of information.

The role of e-learning resources in the teaching of mathematics is of particular interest, since their use can only increase the effectiveness of teaching due to the visual presentation of information that positively affects the formation and development of flexible mathematical thinking, thereby creating the idea of kenyingi activities related to the design, construction and processing of visual data. The importance of practice depends on the possibility of increasing the effectiveness of mathematics lessons, as well as the fact that the use of electronic educational resources in teaching is an important aspect of modern education, increases the interest of students in the study of mathematics, which contributes to the development of his practical activity skills.

U.N.Taylokov noted that the introduction of the e-learning environment is primarily related to the social potential of society, including the informatization of the educational sphere, and that the issues of the content and quality of education should be considered as a priority direction in society. In his opinion, the e-learning environment serves as an important tool in the development of practical skills of Secondary School students in the field of science.

I.V. According to kuznesova, the desire to use computer technology in mathematics lessons is caused by the following for social, pedagogical and technological reasons::

- Increases the requirements for the introduction of innovative technologies into the educational system;
- Increases the need for new tools izlash to improve the effectiveness of pedagogical education;
- The computer enables the transfer of educational information to a significant extent kengaytiradi, to increase educational motivation Kuchay and to actively engage students in the learning process.

Computerization of education is concerned with the prospects of increasing the effectiveness of the educational process, reducing the gap between the demands of the society on the younger generation and the practical school preparation.

If it is acceptable for students to harmonize the teaching methods used in school in the process of teaching mathematics with the use of information technology, then the effectiveness of the learning process will increase, because in this case the principles of visualizing the differentiation of Education will be most fully implemented, the motivation of the students will be underestimated.

Today, the main goal of the teacher is to train specialists who can enter the educational, information, economic space and know how to work. The task of the teacher is to provide the student with the correct use of resources, remember and apply the information, understand the purpose of the study, identify the link between real life and seeing the world from a different perspective, contribute to the awakening of the creative principleillarni in the student.

It has a variety of capabilities for use in modern information technology and their educational process. On the other hand, there are many problems in this area.

First, Information Technology is developing so rapidly that pedagogical research and methodological developments in their application in the educational process are also quickly outdated.

Secondly, the possibilities of using technical means in the professional activity of the teacher are very diverse and multifaceted, new ways of using them in the educational process will arise, and new tasks, problems associated with the competent use of computer technologies in the educational process will arise before the teachers.

Kengaytiradi the possibilities of using a variety of methods, taking into account the age, level of development and preparation of students in the use of modern information technology and technical equipment. Modern instructional technology has become an active participant in the joint work of both teachers and students .tiradi Because modern teaching tools allow to demonstrate independence and creative activity in the development and improvement of new didactic materials projects.

The methodology for the use of information technology involves the combined use of various additional teaching aids in mathematical lessons, not only with the use of traditional parts of instructional materials, but also with the ability to effectively solve didactic tasks. In our opinion, the use of Information Technology for teaching, which ensures the unity of the content of educational materials presented with their help, seems to be pedagogically purposeful. At the same time, the content of the lesson is better opened with the help of multimedia through visualized learning data.

In the process of teaching mathematics in the 11th grades, the methodology for the application of computer technology can not be reduced only, depending on the technical side of its implementation, although their application is sufficiently provided with computer equipment, it is also possible that the failure of the software will affect its success.

In the lessons of mathematics, the organizational side of the application of computer technology seems to be important. To determine the place and time of use of instructional materials as a component, to introduce ICT into traditional teaching manual into the learning process either sequentially or parallel. The use of computer capabilities of traditional textbooks and the content of instructional material can vary depending on the time they are used in the learning process. A similar situation is possible in the lessons of repetition, systematization and generalization of knowledge.

The use of ICT in mathematical lessons allows the teacher to::

- make the learning process more interesting and lively due to the richness of multimedia features;
- Effective solution to the problem of Visual Education;
- To expand the visualization of instructional materials so that it is understandable to the students.

Computer technology can be used at any stage of the lesson:

- Presentation of the subject of the lesson;

- At the beginning of the lesson, using the questions on the topic under study, to create a problematic situation;
- in addition to the teacher's explanation (presentations, formulas, diagrams, drawings, video clips, etc.);
- control of knowledge.

The main educational importance of information technology is that it allows you to create a more active interactive learning environment, which has opportunities at the disposal of both the teacher and the student.[1-2]

The advantages of computer technology over traditional technology are multifaceted. Along with opportunities such as more visual, visual presentation of the material, cognitive development, they include various organizational forms in the activities of students, teaching methods in the activities of the teacher. Classes using computer technology not only revitalize the learning process, but also increase the learning motivation.

Innovative technologies are considered important in the professional activity of the teacher so that he can always monitor the shortcomings of the student and take corrective measures. The pace of development of the present time requires teachers to build creativity in research areas in a new way. Therefore, XXI century is considered to be the age of innovation and educational process related to computer and Information Technology and form the thinking ability of the student. In the information society, the effectiveness of pedagogical technologies that shape the thinking abilities of students and enhance computer literacy is high, as a result of which the way to the formation of professional capacity is opened.

The methodology of teaching mathematics is closely related to pedagogy, in particular didactics. The main attitude that characterizes teaching in didactics is "teaching – learning", in methodology – "teaching - learning materials – teaching". Pedagogy determines the methods of teaching, educational goals, methods of scientific research. Taking these methods and goals from pedagogy as a basis, the methodology introduces its specific mathematical composition both in the educational process and in the scientific research work.

The methodology of teaching mathematics is aimed at the characteristics of students of a certain age group, taking advantage of the laws of individual characteristics of students of a certain age group. The effect of psychology in the methodology of teaching mathematics is explained by the attitude towards the introduction of personality-oriented education, which is characterized by the education of the student to the extent that he / she is capable of self-development, self-knowledge, research and finding.

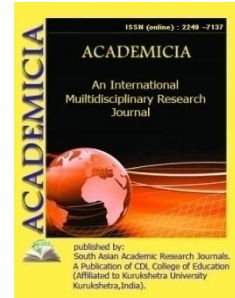
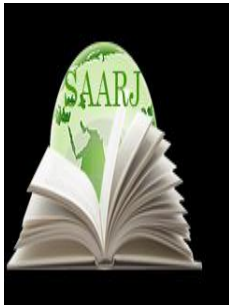
The teaching of mathematics to students is aimed at the following:

- Mastering the system of mathematical knowledge, the skills necessary for further study of mathematics and related subjects in order to solve practical problems;
- Development of spatial imagination, logical thinking of oral and written mathematical speech;
- formation of computational skills, algebraic transformations, solving equations and inequalities, as well as formation of instrumental and graphic skills.

Mathematics differs not only in size, system and depth of presentation, but also in the practical direction of the questions being studied.

BIBLIOGRAPHIC LIST

1. Busstra M. C., Paul J. M. Hulshof, Jan Houwen, Lucy Elburg, Peter C. H. Hollman Nutrient analysis explained for non-chemists by using interactive e-learning material Journal of Food Composition and Analysis Volume 25, Issue 1, February 2012, Pages 88-95.
2. Кузнецова И.В. Развитие методической компетентности будущего учителя математики в процессе обучения математическим структурам в сетевых сообществах // Диссертация на соискание ученой степени доктора педагогических наук. – Архангельск, 2015. – 483 с.



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AMIR TEMUR AND THE DEVELOPMENT OF NATIONAL-MILITARY GAMES

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ABSTRACT

The article describes the games related to the military activities of the great commander Amir Temur, their royal life, their role in the physical and moral development of the younger generation, the fighting potential of the army and its role in raising confidence in victory.

KEYWORDS: State, Army, Combat Training, "War Theater", Navkar's Physical And Mental Maturity, Folk Games, Military Games, "War-War" Game, Horseback Riding, Fencing, Archery, Javelin Throwing, Solo Singles Wrestling, National Wrestling, Horseback Riding.

INTRODUCTION

One of the priorities today is to study in depth the folk games created by our ancestors and passed down from generation to generation, in particular, games related to military activities, their history, development and significance today. Because in different periods of the history of our country, such games have been one of the important factors determining the beauty and appearance, physical, mental and intellectual maturity of our people. We can see this in the activities of the great statesman and invincible commander Amir Temur.

It is known that many sources describe the childhood of Amir Temur in a legendary way. In particular, under the protection of Timur's father Taragay Bahodir, he enjoyed all kinds of mental and physical education typical of the nobility at that time, and was trained both mentally and physically. From the time his tongue came out and recognized his mind until he was twelve years old, he enjoyed going to school, being literate, listening to fairy tales, then historical stories and legends, and playing various action games with his peers. Over time, the

games became more complex. These include horseback riding, racing, one-on-one wrestling, and "war-of-war" games. "I used to play with children on the street," Amir Temur wrote, - playing wars with the kids, appointing myself a commander, directing the game, and practicing fighting one group of kids with another group"¹.

It should be noted that the book "Temurnoma" by Mullo Salohiddin Tashkendi also mentions the game of "war-war", as well as illustrates the fact that Amir Temur grew physically strong and brave from childhood. Amir Temur argued, shot the butcher's six days with one finger, lifted the cart full of loads with one hand, bit the dragon's head with his teeth, and pulled the mesh out of the well by himself forty times alone. Amir Choku, who contributed to his upbringing, and Mirzo Sayfiddin, who was later appointed his minister, and his tribesmen and peers witnessed and watched such an extraordinary demonstration of Amir Temur's power.

According to the sources, Taragay Bahodir oglu Temurbek always said the same thing: that we are the descendants of ancestors famous for martial arts, so I was obliged to study martial arts from childhood. As much as Temurbek was eager to learn, whether under the influence of such invitations or because he was in his blood, his interest in military work was no less. In the areas bordering Kesh there were very large pastures, where herds of yearlings and wild donkeys grazed. Among them was a small herd that belonged to my father. Temurbek used to come here after school eager to learn to ride a horse. At first he was taught how to subdue these semi-savage horses, which no adult had ever ridden. He mastered all the rules of the job. He was later much more qualified in this regard. "When I was twelve years old," writes Amir Temur, "I began to play childish games"². Amir Temur now began to love horseback riding, horseback riding and hunting.

"When I was fifteen, I fell in love with horse hunting, and my skills in this field have matured," he says³. But even then, he did not give up the "war-war" game. Only now the game is played in a serious way with real horses, not with stray horses as before. There is such information in the sources about this.

It was not enough to ride a horse in the Sahibkiran pasture. He practiced fencing, archery, and self-defense on horseback. Of course, his teacher, who received the hadith of this art, would help him. I shot while running on horseback, but the arrow did not hit the target, and the sword did not give the expected result. Then his teacher rubbed him and said, "You are still young, your muscles are not strong. As you grow older, your body will become stronger - and you will be able to shoot long distances by mistake"⁴.

At the age of sixteen, Amir Temur mastered the martial arts to such an extent that none of his peers could compete with him in wrestling and shooting. His muscles were so strong that if he fired a shot into the sky, he would disappear into the clouds, returning a long time later. He was also distinguished by his agility from many heavyweight wrestlers. He tried to be superior to others in everything, to do exercises that were difficult for them to do. One such exercise was riding three horses side by side and jumping from one to the other.

"When I was in my twenties, I often went to war exercises with my peers: I divided them into two groups and trained one to fight the other"⁵. In this way a simple fun game becomes a real combat exercise.

Another of our great-grandfather's hobbies was grabbing the saddle of a horse that was running at high speed, jumping to and fro, and straightening his saddle without touching the ground. This exercise was later used in battles to give left to the arrows of the beast.

In addition to riding, the great commander Amir Temur also had great skills in swimming. The Jaihun River flows along the Movarounnahr. In the spring, it overflows and does not fit into the river. Swimming from one shore to another becomes difficult, and even the current becomes dangerous. Even in this situation, Temurbek swam to the opposite shore. To do this, he surrendered himself to the current as soon as he fell into the water. As he walked along the stream, he was in a slow motion to get closer to the other shore, a situation that lasted until he reached the shore.

It is known that according to the tradition of the XIV-XV centuries, battles and military marches were carried out to the sound of trumpets, drums and bolobons. The notion of "war theater" that has emerged in Western Europe and Russia in recent centuries can be applied to that period as well. After all, the fighting was also reminiscent of a big show. Amir Temur's marches and battles are no exception. One of Timur's rules is called "The big drum and flag-giving system". That is, the drum is held in place like a flag. "I have ordered," Amir Temur writes, "that each of the twelve great emirs be given a flag and a drum." Let them present to Amir ul-Umar with a flag and a drum, a district flag and a chart. And let them give the commander a flag and a trumpet. As for the rulers of the provinces, they should present one drill. Give each of my four princes a flag, a drum, a flute, and a trumpet"⁶.

Emirs, captains, centurions, and corporals were promoted with additional flags, flags, and drums, increasing their ranks according to their services in battle.

In the army of Amir Temur from time to time held various competitions, performances, demonstrations to awaken the necessary fighting spirit, the spirit of confidence in victory. At such meetings, the physical and mental readiness of the navkars was tested. After all, the Navkars regularly mastered the techniques of combat. Hundreds of special sticks, clubs, chains, rope fights, wrestling on the field and on horses, boxing, jumping, chilling, hitting the head, twisting the hands were used. The winners of such contests and competitions were awarded the title of hero and high ranks. Therefore, every navkari of Amir Temur, trained through trainings and public competitions, with his strength, skill, entrepreneurship, confidence in victory, mental freshness, stood up to a thousand soldiers.

Sahibkiran even used the dhikr of the Sufis, in which many hafiz and sages participated. According to the Temurnoma, before fighting against the Greek army, Amir Temur inspected his 40,000-strong army in ranks and formations. According to his judgment, they will bring forty thousand trumpets, drums, and bolobons. He orders the hunters to catch forty thousand swallows. They put them in cages and prepare the grain with water. After that, they start "four thousand hafiz khushkhan". In the evening, the soldiers, led by the vigilant hafiz, begin to recite dhikr. The swallows are released from the cages, they cover the blue face. Thousands of torches are lit. "By waving the flags on all four sides and chanting the takbir, the hafiz will sing the anthem and start marching against the Romans"⁷. The earth trembled and shook the hearts of the Greek people. Opposition soldiers in the square begin to flee.

As we study the life and work of the great master in depth, we see that he was very physically strong. In particular, "Temurnoma" contains information that Amir Temur fought with a number

of heroes. Here are two of them. One is that after the conquest of Herat, the merchants came to him and complained to the Emir of Kandahar, Bahodurkhan. Amir Temur dressed five hundred young warriors in the guise of a merchant and rode a herd of horses near Kandahar. Bahodurkhan invited them to his presence, lifted the elephant and walked around the square to show his strength. The owner goes around the field seven times as he lifts the elephant. Annoyed by Bahodurkhan, he called on Amir Temur to fight one by one. They fight from morning till night, and finally they beat their opponent on the ground, asking for help from the masters⁸. The second example is Amir Temur's fight with a hero named Sword Lion. The incident took place near the city of Tus. They fight first with a spear and then with a sword. The Sword Lion's horse fell and broke his neck. Then they get the waist. Amir Temur will win. After that, the master Sword puts a sarpo on the Lion and adds him to the ranks of his heroes.

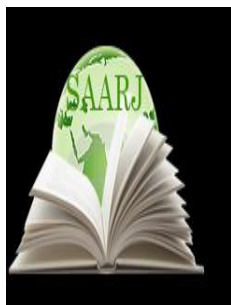
It is known that during the reign of Amir Temur special attention was paid to the national struggle. Special wrestling grounds have been built in different parts of the country. For example, in the presence of Amir Temur's grandson Pirmuhammad from India, two wrestlers wrestled. "Two men in short-sleeved leather jackets struggled," Clavijo wrote, "and couldn't knock each other down". Pirmuhammad said one of the two men in the fight must definitely fall. Eventually, one of them knocks down the other and presses for a long time without letting it stand"⁹.

The national wrestling, which was a picture in the time of Amir Temur, is divided into three types according to its practical application, task, order and form: combat, competition and spectacle wrestling. Among them, combat was of special importance. This type of wrestling was introduced mainly among military soldiers, specific troops. The commanders regularly trained their navkars for future battles. In this type of wrestling, fighters are first and foremost taught the secrets of bending, twisting, breaking, jumping with an unarmed foot, and hand-to-hand combat on the field. He also improved his skills in complex trades such as the use of special sticks, hammers, chains and ropes, horse and foot battles, strangulation, head hitting, and stabbing.

So, it is important to use the system of games related to the highly developed military activity during the reign of Amir Temur to bring up the younger generation as physically strong and spiritually mature people, to form in them a true love for our national values, selflessness, courage and determination. is important.

REFERENCES:

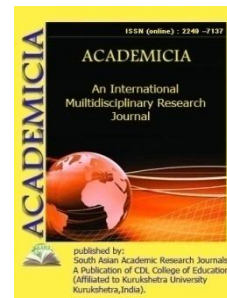
1. Amir Temur Kuragon. The Way of Victory (Biography). - T.: Nur, 1992. - 324 p.
2. Marcel Brion. My name is Temur. - T.: New Age Generation, 2018. - 572 p.
3. Timur's rules. - T.: O'zbekiston, 2012. - 184 p.
4. Temurnoma. - T.: Cholpon, 1990. - 348 p.
5. Ryui Gonzales de Clavijo. Diary of a trip to the palace of Amir Temur in Samarkand (1403-1406) // "Art", 1990, № 8.



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GOMPHERNA GLOBOSA: THE POTENTIAL NATURAL FOOD GRADE BETACYANIN

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ABSTRACT

Betalain are natural pigments and highly water soluble nitrogenous compounds which are commonly found in the order Caryophyllales and in some fungi species. Considering the significance of natural colourants in the food industry, the present study aimed to bring the benefits and potentiality of Gompherna globosa into limelight as a food dye. The pigment has been extracted using aqueous solution as a solvent and they are quantified by Spectroscopic method and HPLC method and the extracts were characterized for higher Anti-oxidant, Anti-microbial. The storage effects of different temperature and light intensities on the Gompherna extract were measured where maximum degradation was observed when the pigment was stored under room temperature and under light on 14th and 7th day of storage. On concerning the stability of Gompherna extract, the lyophilized extract was used as a dye by incorporating in Ice-cream and the dried flower was used for making tea. The betalain flavoured ice-cream and Gompherna tea were preferred more by the active respondents compared to the plain vanilla Ice-cream and black tea for the appealing colour, Texture, Taste and palatability.

KEYWORDS: Gompherna Globosa, Quantification, Anti-Oxidant, Anti-Microbial, Stability and Food Dye.

1. INTRODUCTION

Colour is a major character of flowers which not only add attraction, elegance and beauty but also serve as a source for natural pigments which in turn used in colouring of food products and textiles.

Synthetic dyes and pigments are the major pollutants affecting the environment, soil and water resources and thereby cause health issues to the humans. To overcome the harmfulness caused by the synthetic dyes to humans and environment, researchers have involved in the development of natural dyes and pigment (Kumar *et al.*, 2017).

Natural pigments are less stable due to different factors and are higher in cost of extraction compared to synthetic dyes and hence more attention is needed in their utilization and development. (Sabarudin *et al.*, 2016).

Betalains were one of the natural pigment found in Plants which is a potential food dye giving a wide range of colour from red to Violet. Betalains are highly water soluble nitrogenous compounds, commonly found in the order Caryophyllales and in some fungi species. Betalains are predominantly found in Beetroot, Opuntia, Bougainvillea, Gomphrena, Celosia etc.

Previous studies had stated that betacyanin was extracted from fruits of cactus (*Opuntia ficus-indica*), dragon fruit (*Hylocereus polyrhizus*) and red beet (*Beta vulgaris L. ssp. Vulgaris*) which is widely used as a food colourant in many dairy products, beverages, candies and cattle products that give vivid red colour. Apart from the use as a colourant, betalains have a wide range of biological activities with potential health benefits like they counter inflammation, protect the liver and have anticancer, antitumor and antioxidant properties.

Gomphrena species is an edible, Ornamental and medicinal plant commonly known as Globe Amaranth or Bachelor Button, belongs to the family Amaranthaceae. Though extraction procedures for betalains have been reported in crops like, red beet, and *Opuntia*, research on extraction of betalain pigments from flowers is meager and needs to be exploited. Considering the importance of flowers as sources of natural betalain pigments, the present paper aimed to extract, quantify and expose the antioxidant, antimicrobial properties and stability of betalains from *Gomphrena globosa* and their potential usage as a food dye.

2. MATERIALS AND METHODS

2.1 Sample preparation

One gram of shade dried Gomphrena petals were macerated with 100ml of solvent (HPLC grade distilled water) and kept in a shaker overnight for incubation. Then the pigments were extracted by filtering the solution in a Whatman no.30 filter paper and the filtrate was stored under -20°C for further analysis.

2.2 Estimation of total betalain content

The aqueous extracted pigment was diluted using McIlvaine buffer (pH 6.5, citrate-phosphate buffer). The absorption was measured at different OD values at 538, 480, and 600nm for the quantification of betacyanin, betaxanthin, and total betalains respectively using UV-VIS spectrophotometer (Eppendorf bio spectrometer) (Moßhammer *et al.*, 2005)

The betalain content (BC) was analyzed by the following formula,

$$\text{Betain Content}(mg/l) = \frac{A * DF * MW * 1000}{\epsilon * l}$$

Here,

A -Absorption value at 600 nm

DF - dilution factor

l -Path length (1 cm) of the cuvette

For quantification of betacyanins and total betalain- the molecular weights (MW) = 550 g/mol and molar extinction coefficients (ϵ) = 60 000 L/ (mol cm) in H₂O; λ =538 nm for betacyanin and λ =600 for total betalain.

For quantification of betaxanthins -the molecular weights (MW) = 308 g/mol; and molar extinction coefficients (ϵ) = 48 000 L/ (mol cm) in H₂O; λ =480 nm

2.3 Lyophilization

The aqueous extracted sample was concentrated for betalain pigments using lyophilizer (Lark, Penguin classic). Freeze drying at -80°C temperature and 0.1mPa pressure yielded freeze dried powder of the Gompherna betalain extract and were stored in vials at deep freezer(-80°C) to prevent from degradation.

2.4 Quantification by HPLC

Betanin was quantified by water modular liquid chromatographic system (Shimadzu LC- 88 A) equipped with two M510 pumps, a M996 photodiode array detector and a rheodyne model 7125 injector and a sample loop of 20 μ l was used, along with a Millenium 2010 chromatography data management system. A kromasil 100 C₁₈, 5 μ M, 25 cmx 4.6 mm I.D column was used and elution was carried out following a modification of the chromatographic program proposed by (Fernández-López *et al.*, 2002). The program consisted of two mobile phase solvent A (1% acetic acid in water) and solvent B (1% acetic acid in acetonitrile) with a flow rate of 1ml/min.

2.4.1 Preparation of betanin standard

The betanin standard was diluted with HPLC grade distilled water since betalain is highly soluble in water. Freshly prepared standard was used for analysis. The concentration of the standard used for HPLC was 100ppm.

2.4.2 Preparation of Gompherna extracts for HPLC quantification

The Gompherna extract was prepared by dissolving the freeze dried sample in HPLC grade distilled water. For each analysis, 20 μ l of the filtered extract was directly injected into the chromatographic column. The identities of the different chromatographic peaks were confirmed by their visible spectral characteristics in comparison with the standards and their retention times.

2.5 Assessment of antioxidant activity of Gompherna betalain extract

The antioxidant activity of Gompherna extract was analyzed by two major methods namely, Free radical scavenging activity and TotalReducing power assay. For the estimation of

antioxidant, the Gompherna extract was prepared at different concentrations using distilled water viz., 1250, 1000, 750, 500, 250 µg/ml.

2.5.1 Free radical scavenging activity

2.5.1.1 DPPH (2, 2-diphenyl-1-picrylhydrazyl) method

DPPH is a stable free radical which do not dimerize as other free radicals. Occurrence of purple colour indicates the delocalization of DPPH molecule, with an absorption of around 517nm. The betalain extract was measured for antioxidant activity by its ability to scavenge the stable DPPH (1,1-diphenyl-2-picrylhydrazyl) (Wong *et al.*, 2006). Hundred micro litre of the prepared extract was treated with three ml of a DPPH reagent having absorbance of 0.980 ± 0.02 in methanol initially and incubated at normal ambient temperature. After 20 min of incubation, the absorbance was measured at 517nm using UV/Vis spectrophotometer.

2.5.1.2 ABTS (2, 2'-azino-bis (3- ethylbenzthiazoline-6-sulphonic acid) method:

The oxidation of ABTS cation radical is determined by the loss of electron in a nitrogen atom which is physically indicated by the presence of bluish green color. 300 µl of the extract was mixed with 3 ml of 7mM ABTS and 2.45mM potassium persulphatereagent having absorbance of 0.7 ± 0.05 in methanol at 743 nm and incubated at normal ambient temperature. After 6 min of incubation, the absorbance was measured at 743 nm using UV/Vis spectrophotometer.

Ascorbic acid at different concentrations (1 mg/ml to 5 mg/ml) was used as standard for both the methods. The percentage of inhibition was calculated by the below formula,

$$\% \text{ inhibition} = \frac{(\text{Initial absorbance} - \text{final absorbance})}{\text{Initial absorbance}} * 100$$

The concentration required for 50% reduction of ABTS (IC₅₀) and DPPH (IC₅₀) was used to express the antioxidant capacity of the samples (Yıldız *et al.*, 2008)

2.5.2 Total reducing power assay

2.5.2.1 FRAP (Ferric ion reducing antioxidant power) method

The FRAP reagent was prepared by adding 25ml of 300 mM Acetate buffer maintained at a pH of 3.6 to which 2.5 ml of 10mM TPTZ (2, 4, 6- tri (2-pyridyl)-s-triazine) was dissolved in 40 mM HCL and added with 2.5 ml of 2.mM FeCl₃. 100µl of the extract was added to 1.9ml of FRAP reagent and the reaction mixture was incubated for 30 minutes under water bath and maintained at 36°C. The ferric ions get reduced after adding the extract indicating the antioxidant potential of the extract which was measured after incubation under UV/Vis spectrophotometer at 593nm. The Ferric reducing antioxidant potential of the flower extracts was expressed as µM Ascorbic acid equivalent (Brand-Williams *et al.*, 1995)

2.5.2.2 CUPRAC (Cupric reducing antioxidant power) method

CUPRAC reagent was prepared by mixing together 1mL of 1.0×10^{-2} M copper (II) chloride with 1mL of 1M ammonium acetate buffer maintained at pH 7.0, at which the reaction mixture was added with 1mL of 7.5×10^{-3} M neocuproine solution. Hundred microlitre of the flower extract was added to 1ml of CUPRAC reagent. The reaction mixture was then incubated at room

temperature for 30 minutes and their absorbance was recorded at 450nm using UV/Vis spectrophotometer. (Sahreen *et al.*, 2010) A standard calibration curve was developed using ascorbic acid and CUPRAC reagent. The cupric ion reducing antioxidant capacity of the flower extract was expressed as μM Ascorbic acid equivalent.

2.5.2.3 Chelating potential

The extracts were dissolved in water to prepare various sample solutions at 1250, 1000, 750, 500, 250 $\mu\text{g/ml}$. To 200 μl of the sample prepared, 100 μl of $\text{FeCl}_2 \cdot 2\text{H}_2\text{O}$ (2.0 mM) and 900 μl of methanol were added. After 5 min of incubation under room temperature, 5.0 mM of 400 μl of ferrozine is added. The absorbance was measured after 10 min at 562 nm using UV/Vis spectrophotometer

The chelating activity (%) was calculated using the following equation,

$$\% \text{ inhibition} = \frac{(\text{Initial absorbance} - \text{final absorbance})}{\text{Initial absorbance}} * 100$$

Ascorbic acid was used as a standard. The concentration required for the 50% reduction of the chelates (IC_{50}) was used to express the antioxidant capacity of the samples. (Karawita *et al.*, 2005).

2.6 Assessment of antimicrobial properties of betalain extracts

2.6.1 Preparation of betalain extract

Lyophilized *Gomphrena globosa* extract was dissolved in distilled water to get different concentrations as follows,

Treatments	Concentration of samples for inoculation
T ₁	100 mg/ml
T ₂	200 mg/ml
T ₃	300 mg/ml
T ₄	400 mg/ml
T ₅	500 mg/ml

2.6.2 Preparation of culture media

Common food borne species of bacteria and fungi (obtained from the Department of Microbiology, TNAU) were cultured and maintained on nutrient agar (NA) medium (Allen, 1953) and Potato dextrose agar (PDA) medium (Sabouraud, 1892). For the analysis of antimicrobial activity by, a loop of the organism *viz.*, bacteria and fungi was inoculated into 100 ml of the nutrient broth and potato dextrose broth respectively. The conical flasks were incubated at a temperature of 37°C for 24-48 h for bacteria and 3-6 days for fungi.

The antimicrobial activity of the *Gomphrena* extract was analyzed by Agar well diffusion method with a Each well was loaded with 20 μl of the prepared flower extract at different concentration using sterilized pipette with two replications maintained with a positive control

(antibacterial agent Ampicillin and antifungal agent cyclohexamide at a concentration of 10 mg/ml) and negative control as distilled water.

After an incubation period of 24 hours for bacteria and 3 days for fungi, the observations were recorded by measuring the inhibition zone (clearing zone), which indicate the absence of microbial growth around the well. The diameter of inhibition zone (Yıldız *et al.*) was measured and the mean DIZ was calculated. The antimicrobial activity was assessed by calculating the relative inhibition zone diameter (RIZD).

$$\text{RIZD (per cent)} = \frac{\text{DIZ of sample} - \text{DIZ of negative control}}{\text{DIZ of positive control}} \times 100$$

2.6.3 Microorganisms tested

	Bacteria	
1.	<i>Escherichia coli</i> (O157 strain)	Gram - ve
2.	<i>Pseudomonas aeruginosa</i>	Gram - ve
3.	<i>Bacillus subtilis</i>	Gram - ve
	Fungi	
1.	<i>Rhizopus spp</i>	
2.	<i>Aspergillus niger</i>	

2.7 Stability of betalain extract of Gompherna at different temperatures

The effect of different storage temperature on betalain stability was analyzed. The concentrated extracts were taken in screw-capped vials and stored at different temperatures as follows,

Treatments	Temperature levels
T ₁	- 80°C (deep freezer)
T ₂	-20°C
T ₃	0°C
T ₄	4°C
T ₅	30°C(room temperature)

The betalain content was measured on alternate days for first 7 days and at weekly intervals up to 28 days. The betalain content was measured using citrate phosphate buffer and expressed as mg/l.

2.8 Stability of betalain extract of Gompherna at different light intensity

Concentrated betalain extracts were taken in screw-capped vials and stored under ambient conditions at different light intensity as follows,

Treatments	Light levels
T ₁	Dark
T ₂	565 lux
T ₃	1140 lux

The above light intensity ranges were fixed based on earlier reports. White incandescent light was used as light source. The betalain content was measured on alternate days for first 7 days and at weekly intervals up to 28 days. The betalain content was measured using citrate phosphate buffer and expressed as mg/l.

2.9 Sensory Scoring of Gompherna tea and Ice cream

5g of dried Gompherna petals were used for the making tea at 100ml of water. Since the pigment is highly soluble in water, they readily dissolved in water by giving a Purple to violet colour. The Gompherna tea is compared to the Normal Black Tea. And for Ice cream, 30mg of the lyophilized extract of Gompherna is added to the 100g plain vanilla Ice cream to impart colour in it and it is compared to the plain non coloured Vanilla Ice cream. Scoring of the products was done by a panel of members consisting of educated professors, assistant professors and students of Floriculture and Landscape architecture department at Tamil Nadu Agricultural University (India) based on the Taste, Texture, Flavor, Appearance, Palatability and overall acceptability over the control using five point hedonic scale (1:Extremely good, 5: bad).

2.10 Statistical analysis - The statistical analysis was carried out using IBM SPSS Statistics 20, DSTAT and Graph pad prism 5 software.

3. Results

3.1 Total Betalain Content with respect to Spectroscopy method and HPLC method

The Gompherna showed a higher total betalain content, betacyanin and betaxanthin content of 30.51mg/l, 33.35mg/l and 22.76 mg/l using aqueous solution as a solvent respectively. The HPLC quantification of Gompherna extract for betanin (Betanidin 5-o-glucoside) standard showed several major peaks and minor peaks. The elution was monitored at 535 nm. The major peak detected at the retention time of 8.3 minute was readily identified as betanin (Betanidin 5-o-glucoside). Elution of the flower extract coincided with that of the standard. Based on the Rt and elution of standard and peak, the betanin content was quantified 88.41ppm.

3.2 Anti -oxidant activity of Gompherna globosa

3.2.1 Free radical scavenging activity

Significant results were obtained with regard to antioxidant activity of betalain extract. It was revealed that the flower extract scavenged the DPPH and ABTS free radicals depending upon their dosage level.

Antioxidant potential is observed in Gomphrena flower extracts with an IC₅₀ value of 181.24mg/ml when compared to ascorbic acid standard (54.23 mg/ml) by DPPH method. The standard ascorbic acid showed IC₅₀ at 81.26µg/ml concentration whereas the IC₅₀ of Gompherna flower extract is 27.2mg/ml by ABTS method.

3.2.2 Total reducing power assay

Significant results were obtained with regard to antioxidant activity of betalain extract by Total reducing power assay. By Chelating potential, the chelates get reduced systematically at higher concentration of betalain extract and results found that Gomphrena has 50% inhibition at 2.229mg/ml whereas, the IC₅₀ value of ascorbic acid standard is 7.17µg/ml respectively.

By CUPRAC (Cupric reducing antioxidant power) method and FRAP (Ferric ion reducing antioxidant power) method, irrespective of IC_{50} value, the antioxidant potential is given in terms of μg equivalence to standard (*i.e.*) ascorbic acid by CUPRAC method. Gomphrena showed the anti-oxidant potential as $49.05\mu\text{g}$ equivalence to that of ascorbic acid by CUPRAC. FRAP method exhibited $106.17\mu\text{g}$ equivalence to that of standard in Gomphrena flower extract.

3.3 Anti -Microbial activity

The data on antimicrobial activity of *Gomphrena globosa* against three bacteria *Escherichia coli*, *Pseudomonas aeruginosa*, *Bacillus subtilis* and two fungi (*Rhizopus spp* and *Aspergillus niger*) recorded significant results. Among the bacterial cultures highest inhibition zone of 2.98cm RIZD was observed against *Bacillus subtilis*. With regard to fungal cultures higher antimicrobial potential was registered against *Aspergillus niger* (3.52cm RIZD) at 500mg/ml concentration. Lowest inhibition zone was observed against *Rhizopus spp* with 1.78 cm of RIZD. No inhibition was observed at the concentration of betalain extracts from 100-300mg/ml against *Escherichia coli*.

3.4 Stability to different light and Temperature

Betalain extract of *Gomphrena globosa* exhibited significant results with regard to storage stability at different light intensities after a week of storage period.

Among the different light intensities, betalain extract stored under dark (T_3) condition showed the highest stability on 1st, 3rd, 5th and 7th day (25.92, 25.31, 24.89mg/l of betalain content respectively) followed by pigments stored at 565lux (T_2) intensity (25.3, 24.98, 24.01 mg/ml of betalain content respectively). Least stability of betalain extract was observed in case of pigments stored at 1140lux (T_1) light intensity as the degradation was faster (25.15, 24.01, 22.90mg/l of betalain content).

The stability of betalain extracts from *Gomphrena globosa* was significantly influenced by different storage temperatures. The lowest stability was observed in case of pigments stored at 30°C (17.7, 17.1, and 16.2, 15.02 mg/l of betalain content on 1st, 3rd, 5th and 7th day of storage. Higher stability was observed when pigments were stored at -80°C (21.89, 21.7, 21.57, 21.37 and 21.32mg/l of betalain content) on 5th, 7th, 14th, 21st and 28th day of storage followed by storage at -20°C (21.62, 21.58, 21.32, 21.28, 20.92mg/l of betalain content) after 5th, 7th, 14th, 21st and 28th day of storage. Degradation was less when pigments were stored at 8°C even up to 28 days.

3.5 Sensory evaluation of Gomphrena Tea and Ice cream

The Results was confirmed based on the acceptance of 80% respondent of the overall respondent. On comparing the Gomphrena tea and Black tea, the acceptability for the colour, Texture and taste was higher to Gomphrena tea. The overall acceptability was higher to Gomphrena tea due to its taste.

On comparing the plain Vanilla Ice-cream with beautifully coloured Gomphrena flavoured Ice-cream was preferred more due to its pleasing and colourful appearance, taste, texture and Palatability by 80% respondent.

DISCUSSION

Gomphrena is reported to have Gomphrenin-I (Minale *et al.*, 1966). Betanin is a sub group of betacyanins which are further classified as amaranthin, gomphrenin and decarboxy-betanin group (Strack *et al.*, 1980). So on comparing the Spectroscopy and HPLC method Gomphrena extract holds more Betacyanin content.

The betacyanin and betaxanthin content were reported for the scavenging activity thereby inhibiting oxidation. Various methods are reported for the analysis of antioxidant potential of Gomphrena pigments. The antioxidant potential of a compound is confirmed by analyzing the free radical scavenging activity and total reducing power using ABTS, DPPH, Chelating potential, FRAP, PFRAP and CUPRAC methods. Betalains were reported to have higher antioxidant property as illustrated (Escribano *et al.*, 1998). Betalains contain a cyclic amine which is similar in chemical structure of the antioxidant ethoxyquinone (Luisa Tesoriere *et al.*, 2004).

The Gomphrena extracts showed a higher anti-microbial activity against different food pathogens. The inhibition zone formed against *Pseudomonas aeruginosa* in the present study corroborates with the work of previous workers Hamiduzzaman *et al.*, (2012) in *Gomphrena globosa* which inhibited to a diameter of 14mm. Therefore, betalain extract from *Gomphrena globosa* is a potential food dye with good properties.

Betalain pigment from Gomphrena when stored at different temperature and light conditions they show a greater degradation at room temperature and high light intensity. Hence betalains very highly sensitive to light and temperature and are required to be stored under refrigeration and in dark. This was in accordance with Reshm *et al.* (2012) which was reported in betalain extracts of *Basella alba* fruit and (Castellar *et al.*, 2003) in *Opuntia stricta*. This difference in stability might be due to the breakage caused by light in the double bond of the electron in the betacyanin molecule which is in the excited stage resulting in the destruction of the betacyanin and that pigment degradation was influenced by many factors like pH, light and heat and not only by the temperature.

CONCLUSION

Gomphrenaglobosa a potential plant for betacyanin and to be used as food dye for their health benefits and aesthetic property that creates a appealing visual especially in the frozen products like Yogurt, Candies, Ice-cream, Squash etc., Further studies can be forwarded in terms of different extraction method and analyzing other different potential benefits.

REFERENCES

- Brand-Williams W, Cuvelier M.-E, & Berset C (1995) Use of a free radical method to evaluate antioxidant activity. *LWT-Food science and Technology* 28(1): 25-30.
- Castellar, Obon, & Fernandez-Lopez (2006) The isolation and properties of a concentrated red-purple betacyanin food colourant from *Opuntia stricta* fruits. *Journal of the Science of Food and Agriculture* 122-128. doi: 10.1002/jsfa.2285
- Castellar R N, J. M. O, Alacid M, & Pez J (2003) Color Properties and Stability of Betacyanins from *Opuntia* Fruits. *J. Agric. Food Chem* 51: 2772–2776.
- Custódio Lobo Roriz, João C.M. Barreira, Patricia Morales, Lillian Barros, Isabel C.F.R. Ferreira (2019) *Gomphrena globosa* L. as a novel source of food-grade betacyanins: Incorporation in ice-

cream and comparison with beet-root extracts and commercial betalains. LWT - Food Science and Technology 50(2):6438-6443.

Fernández-López J, Castellar R, Obón J, & Almela L (2002) Screening and mass-spectral confirmation of betalains in cactus pears. Chromatographia 56(9-10):591-595.

Hamiduzzaman M, & Azam A T M Z (2012) Antimicrobial, Antioxidant and Cytotoxic Activities of *Gomphrena globosa* (L.). Bangladesh Pharmaceutical Journal 15(2):183-185.

Karawita R, Siriwardhana N, Lee, K.-W, Heo, M.-S, Yeo, I.-K, Lee, Y.-D, & Jeon, Y.-J (2005) Reactive oxygen species scavenging, metal chelation, reducing power and lipid peroxidation inhibition properties of different solvent fractions from *Hizikia fusiformis*. European Food Research and Technology 220(3-4): 363-371.

Kumar R, Mishra A K, Dubey N, & Tripathi Y (2007) Evaluation of *Chenopodium ambrosioides* oil as a potential source of antifungal, antiaflatoxigenic and antioxidant activity. International journal of food microbiology 115(2): 159-164.

Minale, L., Piattelli, M., De Stefano, S., & Nicolaus, R. (1966). Pigments of centrospermae—VI.: Acylated betacyanins. *Phytochemistry*, 5(6), 1037-1052.

Moßhammer M R, Stintzing F C, & Carle (2005) Colour studies on fruit juice blends from *Opuntia* and *Hylocereus* cacti and betalain-containing models solutions derived therefrom. Food Research International 38:975–981. doi: 10.1016/j.foodres.2005.01.015

Reshm S K, Aravindhan K M, & Devi P S (2012) The effect of light, temperature, pH on stability of betacyanin pigments in *Basella alba* fruit. Asian Journal of Pharmaceutical and Clinical Research 5(4):107-110.

Sabarudin N A, Munaim M S A, & Wahid Z A (2016) Effect of extraction condition of natural dye pigment from *Bougainvillea* flowers' bract. Australian Journal of Basic and Applied Sciences 10(17):172-175.

Sahreen S, Khan M R, & Khan R A (2010) Evaluation of antioxidant activities of various solvent extracts of *Carissa opaca* fruits. Food chemistry 122(4): 1205-1211.

Strack D, Engel U, & Reznik H (1980) High Performance Liquid Chromatography of Betalains and its Application to Pigment Analysis in Aizoaceae and Cactaceae. *z. Pflanzenernähr. u. Bodenk.* 101: 215-222. doi: 10.1016/S0044-328X(81)80027-X

Wong S P, Leong L P, & Koh J H W (2006) Antioxidant activities of aqueous extracts of selected plants. Food chemistry 99(4): 775-783.

Yıldız L, Başkan K S, Tütem E, & Apak R (2008) Combined HPLC-CUPRAC (cupric ion reducing antioxidant capacity) assay of parsley, celery leaves, and nettle. Talanta 77(1): 304-313.

Antioxidant potential of *Gomphrena globosa* by ABTS, DPPH, and chelating potential method

Crop	ABTS(IC ₅₀)	DPPH(IC ₅₀)	Chelating potential(IC ₅₀)
<i>Gomphrena globosa</i> (mg/ml)	27.2 ± 0.24 ^b	181.243 ± 3.26 ^c	2.229 ± 0.09 ^c
CD value	0.36	2.37	0.08
SE(d)	0.18	1.18	0.04

Ascorbic acid (std) ($\mu\text{g/ml}$)	81.26 ± 0.43	54.23 ± 0.22	7.17 ± 0.07
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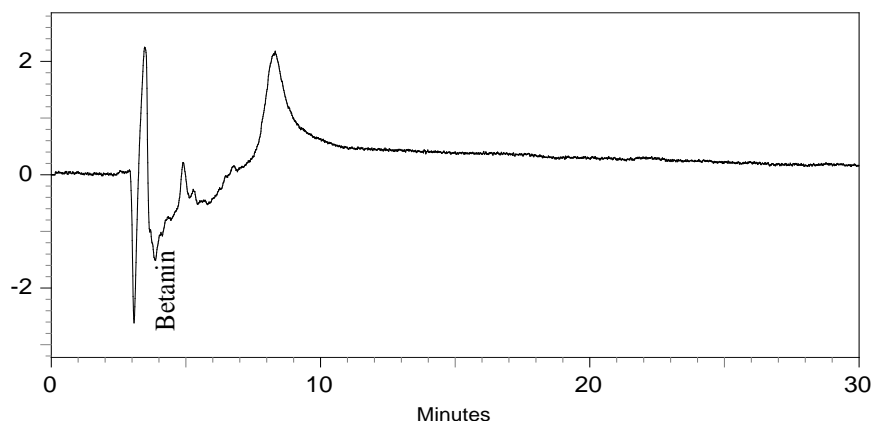
Anti-microbial potential of *Gomphrena globosa* on different microorganism

Concentration of <i>Gomphrena globosa</i> extract	Diameter of inhibition zone (cm)				
	Microorganisms				
	<i>Bacillus subtilis</i>	<i>Pseudomonas aeruginosa</i>	<i>Escherichia coli</i>	<i>Aspergillus niger</i>	<i>Rhizopus spp</i>
100 mg/ml	2.2 ± 0.01^c	0.79 ± 0.01^c	0^c	0.56 ± 0.01^d	1.26 ± 0.03^d
200 mg/ml	2.63 ± 0.07^b	2.45 ± 0.007^b	0^c	2.18 ± 0.02^c	1.59 ± 0.02^c
300 mg/ml	2.68 ± 0.006^b	2.70 ± 0.015^a	0^c	2.58 ± 0.05^b	1.69 ± 0.04^{bc}
400 mg/ml	2.73 ± 0.02^b	2.76 ± 0.06^a	0.79 ± 0.004^b	3.33 ± 0.01^a	1.78 ± 0.05^b
500 mg/ml	2.98 ± 0.06^a	2.82 ± 0.04^a	1.49 ± 0.03^a	3.52 ± 0.05^a	2.32 ± 0.06^a
Positive control (mm)	16.5 ± 2.5	18.5 ± 2.5	12.5 ± 0.5	17.2 ± 1.5	11.0 ± 0.5
1 $\mu\text{g/ml}$					
CD Value	0.08	0.08	0.04	0.11	0.07
SE(d)	0.04	0.04	0.02	0.05	0.03

The values are represented as mean \pm SD with triplicate determination

HPLC quantification of *Gomphrena globosa* for Betanin

Gomphrena extract



Effect of Light on stability of betalain pigment extracted from *Gomphrena globosa*

Light intensity (LUX)	Betalain content (mg/ml)					
	Storage period in days					
	0	1	3	5	7	14

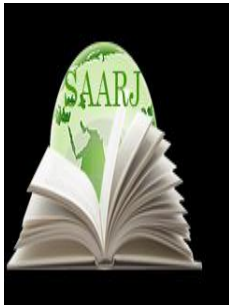
T₁(1140)	26.53± 0.25 ^a	25.15 ± 0.11 ^a	24.01 ± 0.28 ^{ab}	22.90 ± 0.88 ^{ab}	0 ^b	0 ^c
T₂(564)	26.5375 ± 0.25 ^a	25.34 ± 0.70 ^a	24.98 ± 0.02 ^a	24.01± 1.03 ^a	0 ^b	0 ^c
T₃(Dark)	26.53± 0.25 ^a	25.92± 0.25 ^a	25.31 ± 0.79 ^a	24.89±0.53 ^a	0 ^b	0 ^b
	Light(L)	Days(D)	LxD			
SE(d)	0.18	0.25	0.44			
CD	0.36	0.51	0.89			

The values are represented as mean ± SD with triplicate determination

Effect of storage temperature on stability of betalain pigment extracted from *Gomphrena globosa*

Storage temperature (°C)	Betalain content(mg/ml)							
	Storage period in days							
	0	1	3	5	7	14	21	28
-80	21.68± 0.63 ^a	21.67± 0.03 ^a	21.62± 0.64 ^a	21.52± 0.50 ^a	21.48± 0.07 ^a	21.3± 0.74 ^a	21.27± 0.23 ^a	20.98± 0.61 ^a
-20	21.68± 0.63 ^a	21.65± 0.46 ^a	21.58± 0.33 ^a	21.51± 0.21 ^a	21.41± 0.67 ^a	21.29± 0.72 ^a	20.89± 0.01 ^a	20.78± 0.55 ^a
0	21.68± 0.63 ^a	21.57± 4.35 ^a	21.42± 0.81 ^a	21.38± 0.28 ^a	21.19± 0.22 ^a	20.91± 0.92 ^a	20.71± 0.07 ^a	20.45± 0.90 ^a
4	21.68± 0.63 ^a	20.95± 0.37 ^a	20.65± 0.07 ^a	20.48± 0.59 ^a	20.27± 0.71 ^a	20.13± 0.78 ^a	20.03± 0.74 ^a	19.82± 0.32 ^a
8	21.68± 0.63 ^a	19.89± 0.860 ^a	19.82± 0.10 ^a	19.75± 0.24 ^a	19.63± 0.23 ^a	19.38± 0.85 ^a	19.27± 0.15 ^a	18.89± 0.50 ^a
30	21.68± 0.63 ^a	18.69± 0.47 ^a	18.21± 0.36 ^a	17.95± 0.17 ^a	0 ^b	0 ^b	0 ^b	0 ^b
	Tempera ture(T)	Days(D)	TxD					
SE(d)	0.15	0.17	0.43					
CD	0.30	0.35	0.87					

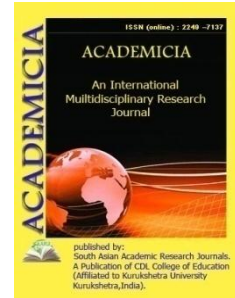
The values are represented as mean ± SD with triplicate determination



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ANALYSIS OF DIGITAL BANKING SERVICES IN UZBEKISTAN AND WAYS OF ITS DEVELOPMENT

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ABSTRACT

This article describes the process of providing digital banking services in Uzbekistan through banking platforms and develops its mechanism. The trends of interbank payment system transactions and the dynamics of global online commerce are also studied. A comparative analysis of the services provided by mobile applications of banks and payment providers was conducted. In addition, a mechanism for further development of banking services provided through digital banking platforms has been proposed.

KEYWORDS: Banking, Digital Ban Services, Banking Platform, Transaction, IT-Technologies, Payment System, Payment Providers, Mobile Banking, Internet Banking.

INTRODUCTION

In the context of globalization and cross-sectoral integration, new modern innovative forms of services and digital platforms are expanding. With their help, the representatives of the service sector have the opportunity to bring their services to the world stage, to increase the number of customers indefinitely. In particular, the role of innovative digital platforms in socio-economic processes and relationships is growing. Including, Google, Yandex, Amazon, Gov.uz, Olx and including other platforms.

All this is achieved through the achievements of modern information technology (IT) and their scientific and technological progress in the field of software.

In today's era of development, the role of digital banking services in the online communication of the population is also growing. This is because the population uses digital banking services directly to meet their daily needs (payments for goods and services, utility bills, other payments, international and local money transfers, currency exchange, keeping money in bank accounts or

using bank loans, etc.). This can be clearly seen in the example of digital banking platforms, which are organized on the basis of today's traditional banking systems and are constantly evolving.

Mobile banking applications are the most popular and successful system in the use of digital banking platform. The main reason for this is that a single mobile phone (tablet) is enough to use Mobile banking applications. The mobile phone (tablet) is the most common IT device today and it is convenient and inexpensive to connect it to the Internet.

ANALYSIS AND MAIN RESULTS

Integration of electronic payments, bank cards, credit cards, electronic money transfers, online loans, online deposits, Internet banking services, electronic payment providers and other related tools in the provision of services through digital banking platforms and the mechanism of this process is as follows (Figure 1).

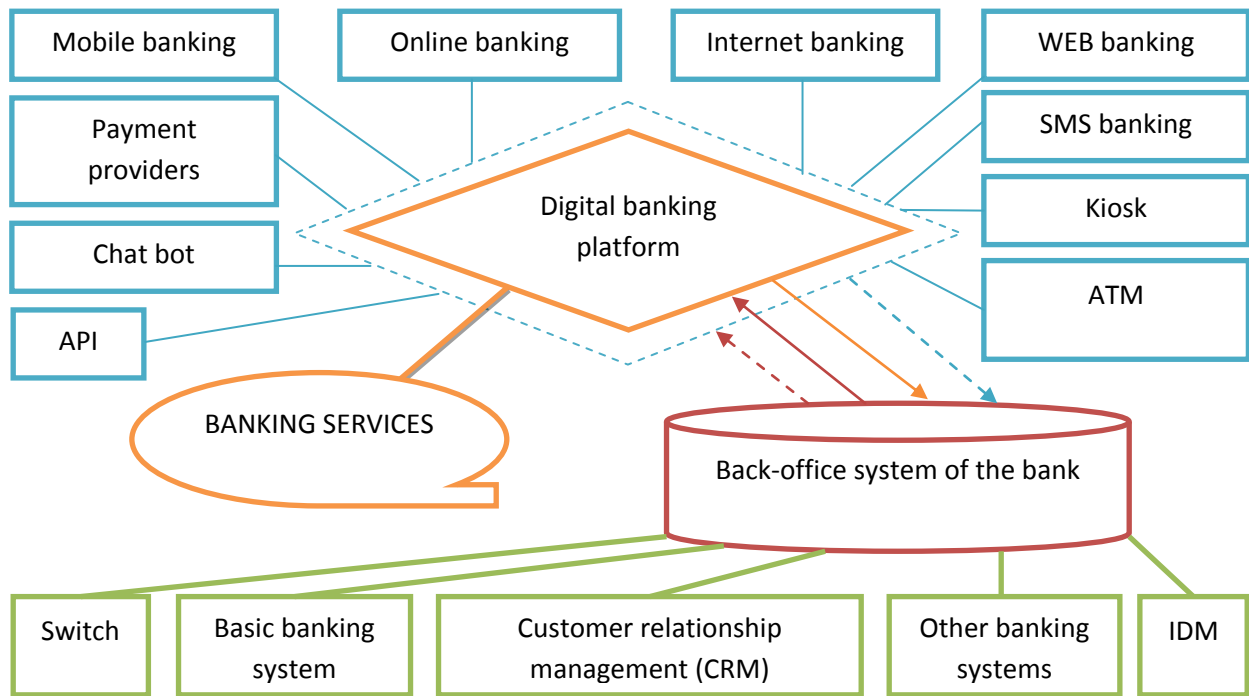


Figure 1. Mechanism of digital banking services.

Source: Author development.

At present, various payment providers are operating as a rapidly growing electronic system, competing with mobile banking applications in the field of electronic payments and other digital banking services.

However, it is more difficult and time consuming for users of mobile banking apps than both payment provider apps to learn how to use cross-border payment tools and set up processes to make optimal use of them.

It should be noted that one of the tasks of the Central Bank of the Republic of Uzbekistan in ensuring the stability of the payment system is to create a convenient, reliable and secure infrastructure of payment services that meet international standards.

As of June 1, 2020, there are 5 payment systems in the Republic of Uzbekistan, 3 of which are payment systems of the Central Bank (Interbank payment system, clearing system and express payment system) and the remaining 2 UZCARD ("Single Republican Processing Center" LLC) and HUMO (National Interbank Processing Center LLC) payment systems) are business entities licensed by the Central Bank in the prescribed manner.

Also, as of July 1, 2020, the Central Bank issued licenses to 27 legal entities to carry out the activities of payment organizations: Slick LLC, Brio Group LLC, Inspired LLC, National Innovative Payment Technologies. LLC, "Paybox" LLC, "Maroqand" LLC, "Milliy pochta paylari" LLC, "International Eco Pay" LLC, "Payment Aggregation Systems" LLC, "Alif Tech" LLC HK, "Wooppay uz" LLC, "Genesis Innovation" LLC, "Plum technologies" LLC, "Global solutions" LLC, "Automated transport payment system operator" LLC, "Mayasoft" LLC, "E-services house" LLC, "Yurt Pay" LLC, "Tea House" LLC, "Zplat" LLC, "Center for digital technology and innovation" LLC, "Tezpay" LLC, "Payload" LLC JV, "Interpay Sys" LLC, "Panda internet technology" LLC JV, "Multicard payment" LLC and "PAY-WAY" LLC.

In addition, there are systems that have an "electronic wallet" service and are registered with the central bank as an electronic money system. Including, "BRIO GROUP" LLC, "INSPIRED" LLC, "CLICK" LLC, "WOOPPAY UZ" LLC and "ALIF TECH" LLC (Table 1).

TABLE 1ELECTRONIC MONEY SYSTEM REGISTRY [1]

No	The name of the electronic money system	Operator name	Issuer name	Date of commencement of activities for the issuance of electronic money
1	OSON	"BRIO GROUP" LLC	"Turkiston" XATB	16.06.2020 й.
2	E-CARD	"INSPIRED" LLC	"Universal" ATB	21.08.2020 й.
3	CLICK	"CLICK" LLC	"Agrobank" ATB	21.08.2020 й.
4	WOOPPAY	"WOOPPAY UZ" LLC	"Kapitalbank" ATB	02.11.2020 й.
5	alif.mobi	"ALIF TECH" LLC	"Aloqabank" ATB	02.11.2020 й.

The interbank payment system of the Central Bank, as the most important electronic payment system in the country, is the basis for the functioning of all payment systems.

In order to make interbank payments to the Interbank Payment System of the Central Bank, all 31 commercial banks in the country are connected as participants in the payment system.

According to the analysis, in January-May 2020, the number of transactions made through the interbank payment system decreased by 16% compared to the same period last year, and the amount of transactions increased by 38%.

According to the analysis of this process by commercial banks, a total of 31 commercial banks in July this year received more than 1.1 million payments, of which 28709.39 billion soums. soums.

According to the analysis, in July alone, the National Bank made the largest number of payment transactions - 119844 payments (5426.11 billion soums), Uzpromstroybank - 120606 (5807.94 billion soums), Microcredit Bank - 86149. (796.49 billion soums), People's Bank 128540 (1324.86 billion soums), Qishloq Qurilish Bank 111090 (1085.93 billion soums) and Hamkor Bank 111863 (2314.89 billion soums) payment operations. performed.

These are payments made only through bank tellers, mobile banking applications and online banking platforms. In addition, many individuals also make payments through payment providers such as "Payme", "Click", "Click Evolution", "Oson" and "Woy-wo"

This shows that today the population's need for payment services is growing day by day.

Payment systems are one of the most important sectors of the economy. Because the country's economy cannot be imagined without payment systems based on modern technologies. Payment systems are an area where money is available. Payment systems are the basis for the stability of public finances, reduce operating costs in the economy, increase the efficient use of financial and other resources, increase the liquidity of financial markets and contribute to the conduct of monetary policy. For this reason, it is important to study the development of payment systems.

A payment instrument is any payment instrument that allows a user to transfer funds. In other words, a payment instrument can be called a means of payment. A bank card or other electronic object that contains information and allows the payer to make a payment, as well as perform other operations provided for in the contract between the payer and the issuer of electronic payment instruments [2].

Currently, the most common payment instruments are studied in five categories: digital payments, payments by bank payment cards, cashback; payments through mobile apps, fintex startups [3].

In the context of the digital economy, in order to make it easier for the population to provide payment services, "e-wallets" have been created on various Internet platforms. In particular, the general view of regional and global e-wallets covers the MENA system in India, China and Latin America, including Google Pay, Apple Pay, Yandex. company information. Also Money, Fitbit, Samsung Pay, Alipay.

According to the data, in 2019, 2.1 billion consumers worldwide used their mobile wallets to pay or send money. As it turns out, mobile wallets are handy[4].

With the expansion of online commerce and cross-sectoral integration processes, there is a growing demand for remote, real-time implementation. In particular, the volume of e-commerce in 2020 will reach 5855 billion. USD, the volume of mobile retail sales amounted to 1120 bln. USD and digital goods 139 bln. USD (Figure 3).

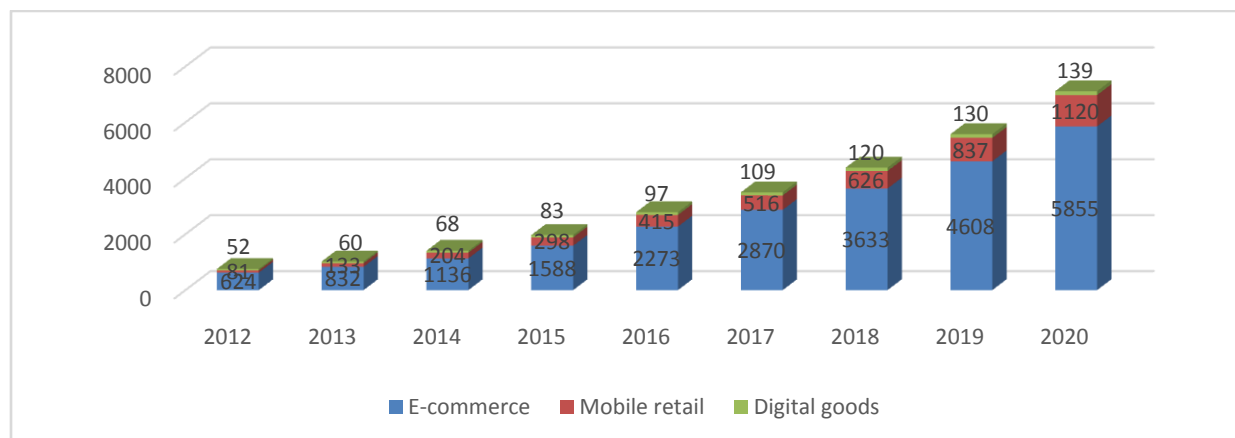


Figure 3. Global online commerce dynamics (billion USD) [8]

According to the analysis, in 2020, e-commerce increased by 2.6 times compared to 2016, 9.4 times compared to 2012, mobile retail sales increased by 2.7 times compared to 2016, 13.8 times compared to 2012, and digital goods increased compared to 2016. 1.4 times, an increase of 2.7 times compared to 2012.

Digital goods are an important element of the e-commerce market, including any non-physical goods and services purchased online. The first digital goods were digital forms of the usual physical goods, including music (from vinyl discs to MP3 files), movies (from celluloid reels to digital), software (from punch cards or wired boards to CDs), and books (from print to e-books) [5].

The technology and technical means used in the field of payments today are constantly evolving and expanding. These include devices that make payments based on NFC (contactless) and QR-code (Quick Response Code).

It should be noted that NFC is one of the brightest and most promising technological developments in the latest IT market [6].

In accordance with the "Concept for the development of digital banking in the Republic of Uzbekistan", the Central Bank launched a standardized and universal system of rapid payments QR-online (QR-online) in March this year.

Within the framework of this system, trade and service outlets (business entities) generate and register QR-codes through commercial banks serving them. Payments are made by buyers by scanning ("reading") QR-codes of sales and service outlets through mobile applications of banks.

At present, as part of the implementation of this system in Tashkent, commercial banks have provided sales and service outlets of more than 3,400 businesses with stickers of the QR-online system.

At the same time, the QR-online system allows you to quickly make payments from bank cards and electronic wallets of payment systems available in the mobile applications of all commercial banks and several payment organizations.

It should be noted that the QR-online stickers issued to businesses, in addition to the existing POS-terminals, allow you to make quick purchases and provide quality customer service. For

example, organizations operating in the field of delivery of products to the customer, passenger transport, will be able to quickly receive payments from customers via QR-code without the use of payment terminals.

The full launch of the QR-online system in the payment services market will serve to improve the quality of services provided, further expand the scope of cashless payments, as well as ensure the stability of the payment system, which is one of the main strategic goals of the Central Bank.

The results of the analysis of the content of mobile applications of banks and payment providers show that in the "transfers" section of the application there is an opportunity to make various bank card and e-wallet money transfers. However, payment providers have the advantage of having a "scan" or "NFC" function when entering a card number, as well as almost 2-3 times more options in the "payments" section, and a wider range of risk management capabilities in the "security" section.

The advantages of banking applications include electronic deposit, electronic credit, virtual card, electronic conversion, exchange rate data and some other banking products and services.

In general, the results of a comparative analysis of the services provided by banks and payment providers on mobile applications can be seen in the following table (Table 2).

TABLE 2 THE RESULTS OF A COMPARATIVE ANALYSIS OF THE SERVICES PROVIDED BY MOBILE APPLICATIONS OF BANKS AND PAYMENT PROVIDERS

No	Types of services	O`zmilliybank	Hfivkorbank	TBC bank	Anor bank	Tinkoft	Sberbank	Nubank	Revolut bank	PAYPAL payment	“Payme” payment
1	Interbank card money transfers	+	+	+	+	+	+	+	+	+	+
2	Payments (by routes)	+	+	+	+	+	+	+	+	+	+
3	History of income and expenditure operations	+	+	+	+	+	+	+	+	+	+
4	Order a card online	+	+	+	+	+	+	+	+	-	-
5	Electronic wallet	-	-	-	-	-	-	-	-	+	+
6	Online deposit	+	+	+	+	+	+	+	+	-	-
7	Online credit, microloan	+	+	+	+	+	+	+	+	-	-
8	Online overdraft	-*	-*	-*	-*	+	+	+	+	-	-
9	Repayment of online loans	+	+	+	+	+	+	+	+	+	+
10	Online conversion	+	+	+	+	+	+	+	+	-	-
11	International money transfers	+	+	+	+	+	+	+	+	+	+
12	QR payment or NFC	+	+	+	+	+	+	+	+	+	+
13	Reliable device	-	-	-	-	+	+	+	+	-	+
14	Password (PIN, fingerprint scanner, face scanner)	+	+	+	+	+	+	+	+	+	+

Source: Developed by the Author. **Note:** * this service is suspended.

Today, there is no industry that has not entered the digital transformation. Digitalization has accelerated, especially in the context of the COVID-19 pandemic. Due to quarantine restrictions, network and industry enterprises were forced to switch to digitization of their resources. As a result, in the new digital world, amazing and unique experiences of successful service have been formed and are evolving.

According to Efma and Infosys Finacle's Retail Banking Innovations report, 75 percent of financial institutions have identified digital banking transformation as a priority for 2021, with a particular focus on improving the customer experience [9].

However, while there is an understanding of the importance of digital transformation, most financial institutions consider their actions to be insufficient. According to a survey conducted by Efma and Infosys Finacle, only 7% of participating banks have shown that digital change initiatives are achieving the expected results.

CONCLUSIONS AND SUGGESTIONS

It should be noted that in the process of digital transformation, when the main focus is on the product, what management technology should be used is becoming a major problem for many bank managers.

The ever-evolving digital landscape, modern competition, and customer expectations have become the general rule for adaptation in almost all industries, including banking and financial institutions. That is why many banks need to monitor and adapt their customer experience.

It is important to analyze, study, and develop a development strategy based on customer experience and customer needs over time. Because today, the bank and its customers communicate through several electronic channels and platforms. Therefore, the customer experience is more social in nature [7].

As a solution to this problem and in the further development of digital banking services, it is advisable to use the following mechanism (Figure 4).

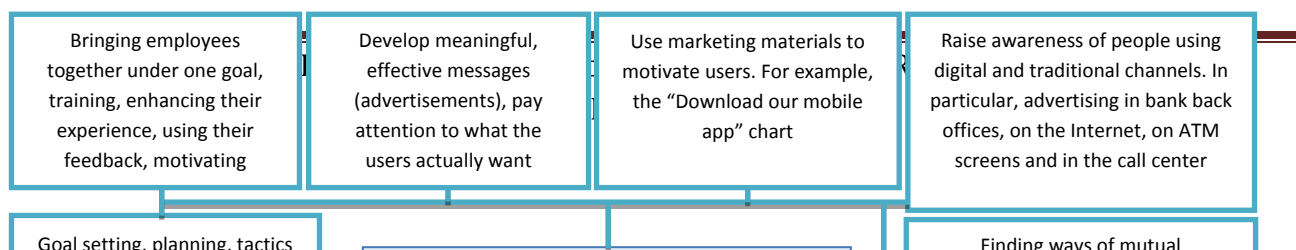


Figure 4. Mechanism for further development of banking services provided through digital banking platforms.

Source: Author development.

Customer experience in the banking sector is an important aspect of any strategic approach to meeting customer requirements. Banks and financial institutions, whether online or retail, need to be digitally transformed to provide a consistent banking experience.

The world's leading digital banking experience shows that in the sustainable development of the digital banking market, banks should not only expand the range of their customers, but also maintain the loyalty of their customers while sharing their experience. This will require easy access to banking services provided by users through digital banking platforms, real-time performance, individual services, data security and other conveniences and benefits.

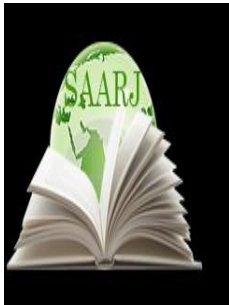
Many banks offer a digital banking experience, but it is important for customers to have a digital banking strategy that guides the process of creating the best online banking services. Customers

are not happy with being “good enough” in a world of so many options. Here’s how to improve online banking services and improve the digital banking experience in general.

While there are many ways for banks today to improve their customers’ digital and online experiences, there are a number of ways that these have been gaining popularity and continue to gain popularity in recent times. In particular, it helps to convince customers that their data is secure and that their experience is always of the highest quality, an institution that cares about every customer.

REFERENCES

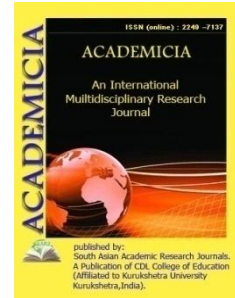
1. Central Bank of the Republic of Uzbekistan "Statistical Bulletin" 1st half of 2021, T.: MBR - 2021. - 307 p.
2. Sharipova N. Modern payment instruments in the economy and issues of their improvement // Electronic scientific journal of Finance and Banking. IV son. July-August, 2020.
3. Glasheen J. Payment Depot Popular Payment Methods for Millennial Customers, ThePaypers - Payment Methods Report Innovations in the Way We Pay. 2019. – p 57.
4. MihaelaMihaila. Payment Methods Report, June 2019. 158 p.
5. Bhattacharjee S. et al. Digital Goods and Markets: Emerging Issues and Challenges // ACM Transactions on Management Information Systems, Vol. 2, No. 2, Article 8, June 2011. p. 3
6. Shirsha Ghosh, JoyeetaGoswami, Abhishek Kumar and AlakMajumder. Issues in NFC as a Form of Contactless Communication: A Comprehensive Survey. 2015 International Conference on Smart Technologies and Management for Computing, Communication, Controls, Energy and Materials (ICSTM), Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology, Chennai, T.N., India. 6 - 8 May 2015. pp. 245-252
7. Katherine N. Lemon & Peter C. Verhoef. Understanding Customer Experience Throughout the Customer Journey // Journal of Marketing: AMA/MSI Special, Vol. 80, November-2016, pp. 69–96
8. Qosimov A. A. ANALYSIS OF STATE DEVELOPMENT PROGRAMS (ON THE EXAMPLE OF SURKHANDARYA REGION) //Theoretical & Applied Science. – 2019. – №. 11. – C. 115-120.
9. Melikov O. MOBILE BANKING-WAYS TO DEVELOP A MODERN BANKING SERVICE //International Finance and Accounting. – 2021. – T. 2021. – №. 2. – C. 16.
10. <https://agilie.com/en/blog/digital-wallets-types-ideas-and-future-of-such-products>
11. <https://www.edgeverve.com/finacle/>



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THE IMPACT OF DIFFERENT FERTILIZER STANDARDS AND PLANTING TIMES ON GRAIN QUALITY OF AUTUMN SOFT WILLOW VARIETIES

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ABSTRACT

In this article, the norms, terms of planting and the amount of mineral fertilizers in the conditions of irrigated hungry and hungry soils of Kashkadarya region are related to the quality indicators of Autumn soft wheat grain of Yaksart, Gazgon, Bunyadkar and Krasnodarskaya-99 varieties. According to the results of the experiment, it was observed that with a delay in planting times and an increase in the number of planting Meyers, the content of protein and gluten in the grain decreased. The increase in fertilizer yield has led to an increase in the quality of grain, on the contrary.

KEYWORDS: *Term, Norm, Fertilizer, Protein, Gluten, Grain, Soil, Fertilizer, Intensive, Natura.*

INTRODUCTION

At present, increasing the efficiency of the network of grain cultivation in agriculture is an urgent issue, while the need for food, grain and grain products of the world population is growing without interruption and the energy resources are shrinking. In such conditions, changes in the development of grain cultivation systems should not only increase its yield, but also ensure the quality, stability of grain.

The ever-changing global weather and climate in the world is leading to a reduction in the yield from agricultural crops, including grain-bearing crops, both high and high-quality. Taking this into account, taking into account the diversity of soil and climatic conditions of the Republic, it is necessary to create varieties that are suitable for soil-climatic conditions of each region, fertile,

morning, drought and heat-resistant, high grain quality, and improve The Agrotechnology of their cultivation in different soil-climatic conditions of the Republic [5;4].

Taking into account the soil-climatic conditions of the irrigated lands of the Republic, a number of research works have been carried out by researchers on the implementation of the most optimal planting periods and norms, fertilization standards of autumn soft Willow varieties. [3].

Field experiments in 2014-2016 and 2016-2017 in the conditions of hungry soils of the kashkadarya branch of the scientific research institute of grain and leguminous crops in the field of experimental fields were conducted production test experiments.

New "Yaksart", "bunker", "Gezgon" varieties of softwood, which are recommended to be planted in the southern regions to study the yield of autumn softwood varieties and the duration of planting on the yield components, the effect of planting and fertilization standards, as well as "Krasnodarskaya-99" varieties that are cultivated in large areas, were obtained.

The area of the pike perch, where each option is located, is 100 m² (the length of the rut is 41,7 m, eni 2,4 m), of which 50 m² is taken into account. The number of options was 36 units, the experience was placed in 3 returns, the options were placed in 3 Yaros. Our research was conducted on generally accepted recommendations and methodological guidelines.

Taking into account the biological characteristics of autumn softwood varieties in the conditions of hungry soils of kashkadarya region, optimal planting times, norms and norms of mineral fertilizer have been determined. Autumn soft Willow varieties in these conditions: "Yaksart", "bunker", "Goose" are planted in the early term (1.10.), the norm of planting is 4.0 million hectares. the number of fertile seeds and mineral fertilizers increased by N180 p108k54 kg/ha, by 5,0 ml per hectare at an acceptable time period (20.10). grain yield norm of fertilized seeds and Fertilizers amounted to N210P147K105 kg/ha, planting norm at late period (10.11) was 6,0 million. it was found that higher grain yield and economic efficiency were achieved from autumn soft varieties when the grains were increased to the sprouted seeds and fertilizers were used in the norms of N210P147K105 kg/ha.

In the early (1.10) period, autumn soft Willow varieties were planted in the fields of 4.0 million fertile seeds Krasnodarskaya-99 varieties of Dogi, 13.7% of the protein content in Yaksart varieties, 13.4% in the creative varieties and 13.5% in the goose varieties, these indicators were calculated in accordance with the varieties in 5-6 million fertilized 13,9-13,8%, 13,5-13,9; 13,6-13,7 and it was determined that it was 13,8-14,1%.

Autumn soft Willow varieties in the medium term (20.10) it was determined that the amount of protein in the planted control (without fertilizer) variants was 13.7-14.0% in Krasnodarskaya-99 varieties, 13.8-14.3% in Yaksart varieties, 14.2-14.4% in the builder varieties and 14.3-14.5% in the goose varieties. In the field of experiment, the norms of mineral fertilizers were used on the account of n180p108k54 kg/ha, the protein content of bug'doy Dogi in the pike perch is high, that is, in Krasnodarskaya-99 varieties 14,3-15,1%, in Yaksart varieties 14,5-15,3; In accordance with the norms of varieties and planting, the amount of protein in the grain grown in the stalls is increased (up to N210P147K105 kg/ha), while in the creative varieties it is 14,6-15,4 and in the goose varieties it is 14,7-15,6%. the norm of fertilizers is increased (up to N210P147K105 kg / ha). 15,2-15,8%, 15,3-16,1; 15,6-16,3 and it was noted that it was 15,7-16,8%.

Autumn varieties in the evening (10.11) are planted in 4,0, 5,0 and 6,0 million hectares of sprouted seeds, the amount of protein in cereals grown in fertilizer unused (controlled) stalls Krasnodarskaya-99 varieties 13,5-13,4 %, Yaksart varieties 13,5-15,6%; in the builder varieties 13,7-13,5 and in Goose varieties 13,8-13,9%, in the when applied to/from krasnodarskaya-99 varieties, the protein content in the cereal is 13,6-14,4%, in yaksart varieties 13,5-14,5%, in accordance with the above; 14,0-14,5 and 14,2-14,7% in the wild varieties, mineral fertilizers in these conditions n210p147k105 kg/kg of the amount of protein in the grain grown in the stalls in proportion to the varieties 14,6-15,6%, 14,6-16,1; 14,8-16,3 and it was 14,9-16,8%.

In our experiments, on the effect of sowing periods and norms on the amount of gluten contained in cereals, the same legality observed in protein was demonstrated. In the Krasnodarskaya-99, Yaksart, creative and Goose varieties of autumn soft Willow studied, the amount of gluten in the grain has changed significantly, depending on the duration and norms of planting.

For example, in the early term (1.10) and 4,0; 5,0; 6,0 million units of control (without fertilizer) planted in seedling, the amount of gluten in pike-perch, in Krasnodarskaya-99 varieties 21,9-22,3%, in Yaksart varieties 20,7-22,6; in the builder varieties 20,9 -22,4 and in Goose varieties 22,4-23,7%, when these 23,5-25,2%, 24,0-25,6 in yaksart variety; 24,6 -26,1 in bunyadkar variety and 25,2-26,4% in the goose Variety, the amount of gluten in the grain content obtained in the pike perch given the fertilizer norm N210P147K105 kg / in proportion to the varieties 26,3-28,0; 27,2-28,3; 27,5-28,6 and it was determined that it was 27,9-29,2%.

Autumn soft Willow varieties were planted in 4,0, 5,0 and 6,0 million hectares of fertile seeds for optimal periods (20.10), the amount of gluten in non –fed-controlled variants was 21,2-23,5 %, in accordance with the norms of planting in Krasnodarskaya-99 varieties, 21,7-23,8% in Yaksart varieties, 22,0-23,4% in creative varieties and Within this period and norms, the amount of gluten in the grain grown on the pike perch, which was planted and fed to N180P108K54 kg/ha, was high, which was 24,8-27,0% in Krasnodarskaya-99 varieties, 25,1-26,8 in Yaksart varieties, 26,1-26,9 in creative varieties and 26,8-28,0% in Goose varieties. Increasing the dietary norm (N210P147K105 kg/ha) ensured that the amount of gluten in all variants was relatively higher. The amount of gluten in cereals grown under these conditions was 26,5-29,2% in Krasnodarskaya-99 varieties, 27,4-29,5% in Yaksart varieties, 27,7-29,8% in creative varieties and 28,6-30,2% in Goose varieties.

In our experiments, the sowing periods and norms for the amount of gluten contained in the grains of autumn soft Willow varieties grown together affected. For example, the seeds of autumn soft varieties were planted in late periods (10.11), 4,0; 5,0 and 6,0 million unvchan seeds, the amount of gluten in non-fertilizer control options was determined to be 20,7-20,5% in accordance with the norms of planting, 21,6-21,2% in Yaksart varieties, 21,8-21,6% in the builder and there was a decrease with an increase in the standards.

1-TABLE THE DURATION OF PLANTING, THE NORM AND THE EFFECT OF FERTILIZERS ON THE TECHNOLOGICAL QUALITY INDICATORS OF AUTUMN SOFT WILLOW VARIETIES GRAIN (PLANTING TIME 20 OCTOBER, AVERAGE 2014-2016 YY.)

№	Fertilizer norm	Planting norm, million pieces	Name of the varieties	In composition of the cereals		Glass of grain-Simon league level, %	Don natura-si, g/l	
				Gluten, %	Gluten, %			
1	Control)	4,0	Krasnodarskaya-99	13,9	21,2	49	759	92
2			Yaksart	13,8	21,7	48	762	95
3			Founder	14,2	22	51	765	96
4			Sunflower seedelon seed	14,3	23,8	54	770	94
5		5,0	Krasnodarskaya-99	13,7	22,7	51	765	96
6			Yaksart	14,3	23,3	53	768	95
7			Founder	14,4	22,8	55	771	93
8			Sunflower seedelon seed	14,5	25,1	56	778	88
9		6,0	Krasnodarskaya-99	14	23,5	53	764	93
10			Yaksart	14,2	23,8	54	766	94
11			Founder	14,3	23,4	55	769	89
12			Sunflower seedelon seed	14,4	24,9	57	771	86
13	N ₁₈₀ P ₁₀₅ ,K ₅₄	4,0	Krasnodarskaya-99	14,3	24,8	54	776	87
14			Yaksart	14,5	25,1	57	776	87
15			Founder	14,6	26,1	58	780	86
16			Sunflower seedelon seed	14,7	26,8	60	784	82
17		5,0	Krasnodarskaya-99	14,5	26,1	55	781	86
18			Yaksart	15	26	59	782	84
19			Founder	15	26,6	62	785	84
20			Sunflower seedelon seed	15,3	27,2	64	789	80
21		6,0	Krasnodarskaya-99	15,1	27	60	783	88
22			Yaksart	15,3	26,8	63	784	89
23			Founder	15,4	26,9	65	786	86

24			Sunflower seedelon seed	15,6	28	66	790	84
25	N ₂₁₀ P ₁₄₇ , K ₁₀₅	4,0	Krasnodarskaya-99	15,2	26,5	66	789	82
26			Yaksart	15,3	27,4	68	790	81
27			Founder	15,6	27,7	72	793	80
28			Sunflower seedelon seed	15,7	28,6	73	797	76
29			Krasnodarskaya-99	15,4	28,3	69	794	78
30		5,0	Yaksart	15,6	28,9	72	796	77
31			Founder	16	29,1	75	801	77
32			Sunflower seedelon seed	16,2	29,7	77	805	75
33			Krasnodarskaya-99	15,8	29,2	72	793	82
34		6,0	Yaksart	16,1	29,5	74	794	81
35			Founder	16,3	29,8	76	799	81
36			Sunflower seedelon seed	16,8	30,2	77	800	79

But, when the feeding was carried out, on the contrary, it was noted that the amount of gluten contained in the grain increased not depending on the norms of planting. That is, when the feeding was carried out with N210P147K105 kg/ha, the amount of gluten was 25,0-27,1% in Krasnodarskaya-99 varieties, 25,4-27,0 in Yaksart varieties, 26,6-27,4 in the builder varieties and 26,5-27,5% in the goose varieties. It is known that since the swelling of the grain is inextricably linked with the amount of protein and gluten contained in it, it is also one of the important quality indicators. In our research, in the autumn acceptable terms (20.10) and in the norm, the swelling of the grain grown on the feedstock with n210p147k105 kg/ha, sown in the fertile seed of 5.0 million units, amounted to 69% in Krasnodarskaya-99 varieties, 72 in Yaksart varieties, 75 in the creative varieties and 77% in the goose varieties.

When analyzing the IDK indicators of the autumn soft Willow Krasnodarskaya-99, Yaksart, creative and Goose varieties studied in our research, it is determined that when planted on October 1 and November 10, Class III, that is, from 0 to 15, Hard unsatisfactory and from 105 to 125 weak unsatisfactory, as well as solid satisfactory quality indicators belonging to Class II (from 20 to 40). In our experiments, autumn soft Willow varieties Krasnodarskaya-99, Yaksart, bunker, Goose in the early term (1.10), 4,0; It was observed that the grain quality indicators were met with the demand of Grade II (from 80 to 100) in the options planted in 5,0 and 6,0 million seeds. It should also be noted that against the background of N210p147k105kg/ha Yaksart, geese in this term. It was found that the quality of grain in the variants planted in the cultivar varieties 5,0-6,0 million sprouts responded to the demand ("good") for Grade I (from 40 to 75).

It was shown that these varieties can be planted in early terms. When the autumn soft Willow varieties shown were sown in the above norms in late (10.11) terms, grain was obtained, whose

quality indicators meet the demand of Grade II. Bunda, when these varieties are sown in early terms, it is possible to observe a decrease in grain quality indicators.

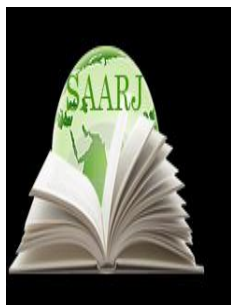
It was observed that autumn soft Willow varieties Krasnodarskaya-99, Yaksart, bunker and Goose were planted in the medium term (20.10), 4,0; 5,0 and 6,0 million seeds, fertilizer was not used (control), and quality indicators of cereals grown on the pedigrees applied to N180P108K54 kg/II grade (from 80 to 100) Meet the requirements of weak satisfactory. It was observed that autumn varieties were planted in the period indicated 5,0 million units of sprouted seeds, and grain quality indicators grown on feeders fed with N210P147K105 kg/ha were observed to meet the "good" demand of I-grade (40 to 75), IE gluten quality. It was found that it is important to properly conduct the nav agrotechnics in cases where the biological characteristics of each variety are due, and at the same time, to correctly specify the dates of their planting, the norms and feeding.

One of the most important indicators determining the quality of autumn soft wheat varieties, which are grown in different soil-climatic conditions of the Republic, is its nature, which determines the fullness of the grain and the value of the mill. Accordingly, grain nature is included in the list of state standards as one of the indicators that determines its quality. Fertilizer of our experiments is not used, planting 4,0; In accordance with the norms of planting in Krasnodarskaya-99 varieties 766-773 g/l, 769-777 in Yaksart varieties, 771-779 in creative varieties and 775-782 g/l in Goose varieties, N180P108K54 kg for feeding plants in the period and norms of this planting was established. when applied to/in accordance with the varieties, these indicators are used 784-787 G/L, 787-790 , 786-791 and 790-795 G/L, when the fertilizer norm is increased (to n210p147k105 kg/in) grain nature Krasnodarskaya-99 varieties 795-797 G/L, yaksart varieties 798-802, It was 801-806 G/l in the creative variety and 805-811 g / L in the goose variety. As a result of the research carried out in the field of experiment, it was observed that in the medium term (20.10), the indicators of autumn soft Willow varieties in the fertilizer unused (control) variant planted were lower than those of the variants in which the feeding was carried out. Bunda, the nature of the grown cereals Krasnodarskaya-99 variety 759-764 g/l, in Yaksart 762-766, in the builder 765-769 and Goose navidv 770-771 g/l, in the specified planting time and norms, the nature of the grain grown in the fields fed with plants N180P108K54 kg/l Krasnodarskaya-99 variety 776-783g/l. When used in Yaksart varieties 776-784, in the builder varieties 780-786, and in Goose varieties 784-790 g/l, the norm of fertilizers is increased (to N210P147K105 kg/l), these indicators are higher, in Krasnodarskaya-99 varieties 789-800 g/l. 790-794 in Yaksart varieties, 793-798 in creative varieties and 797-800 g/l in Goose varieties, it was determined that.

In conclusion, in the conditions of irrigated acreous soils of Kashkadarya region, the most favorable planting period for the Krasnodarskaya-99, Yaksart, creative and Goose varieties of autumn soft Willow is October 20, the norm is 5,0 million fertile seeds, when mineral fertilizers are used in the norms N210P147K105 kg/ha, the highest and highest quality grain yield (protein 15,4-16,2 it was found that the vitreous content was 69-77%, the grain nature was 744-805 G/L, the unit of IDK was 78-75, which provided cultivation to the 1st Class, that is, "good"). When autumn soft Willow varieties were planted early (1.10) or late (10.11) from the acceptable planting time and standards, it was taken into account that the quality indicators shown in the grain decreased.

REFERENCES

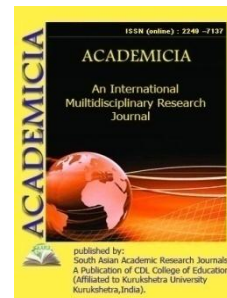
1. Abdurakhmonov S. The norms of fertilization and irrigation of the autumn variety "Sanzar-8". Notification of agricultural science of Uzbekistan. 2003, №3, 11p.
2. Amanov A. A., Nurbekov A.I. "Winter wheat breeding for resistance to rust diseases under irrigated conditions in Uzbekistan". Abstracts First Regional Wheat Yellow Rust Conference for Central and West Asia and North Africa. Garage, Iran 8-14 May, 2001, p. 30.
3. Kodanov I.M. Povishenie kachestva zerna. Moscow "Kolos" 1976, p. 87
4. Siddiqav R. If you say whether bread is quality. Agriculture of Uzbekistan. Number 4, 2004, 14-15 p.
5. Khalimov I., Sattorov M., Ismailov A. It is desirable to plant in moderation. // C. Agriculture of Uzbekistan, № 8, 2004, 16 p.



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THE EVALUATION OF HEALTHFUL PROPERTIES OF PUMPKIN FRUIT EXTRACT THROUGH THE ANTIOXIDANTIC INDICATOR

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ABSTRACT

The present article provides information on the importance of antioxidants in the human body, a number of natural and synthetic antioxidants widely used in the food and chemical industries. There is also information on the evaluation of the antioxidant properties of Cucurbita pepo L - variety pumpkin fruit extracts grown in Andijan region by comparing them with standard antioxidants quercetin and glyclazides.

KEYWORDS: oxygen oxygenase, oxidative stress, free radicals, antioxidants, ferment and vitamins, glyclazide, quercetin, pumpkin fruit extract.

INTRODUCTION

The exchange of oxygen in the human body is constantly monitored by physicians and biochemists. This is because oxidative stress in the human body occurs when the balance between the biochemical mechanisms of oxygen oxygenase utilization is disturbed. Reducing oxidative stress is accomplished using biologically active substances (BAS), particularly antioxidants. Antioxidants inhibit rapidly growing oxidative processes, forming inactive radicals and expelling them from the body [1,2].

Because free radical molecules lack one or more electrons, they attack healthy molecules aggressively and cause chain reactions. Free radicals usually accumulate in cell membranes and begin to break down them, resulting in the cells of our body gradually disintegrating and dying [3,4,5].

Antioxidants act as specific donors for free radicals, stopping the formation of free radicals by sacrificing their electrons and not turning them into free radicals. As a result, the oxidation of cells in the body is slowed down or even completely stopped [3,4,5]. Enzymes are the primary antioxidant protection that destroys active oxygen species. They convert reactive oxygen species

into hydrogen peroxide and less aggressive radicals, which are then converted to water and simple useful oxygen [6]. Vitamins and substances of vitamin nature, as secondary anti-oxidant protection, destroy aggressive radicals and prevent the development of a chain reaction that leads to the formation of new radicals that eliminate excess energy. These vitamins or vitamin-rich substances include water-soluble vitamins - C, R-vitamins (bioflavonoids - rutin, cercetin, citrine, hesperidin, ascorbutin), fat-soluble vitamins - vitamin A, beta-carotene, E, K, amino acids containing sulfur (gluta-thione, cysteine, methionine), C-cytochrome, chelates, microelements such as alcohol, selenium and zinc in micro doses [6].

Antioxidants are substances that prevent food from oxidizing under the influence of atmospheric oxygen. In this process, the antioxidants are expended in the oxidation process i.e. they are decomposed under the influence of oxygen in the air. Therefore, the more antioxidants a product contains, the longer its shelf life. However, the addition of large amounts of antioxidants can adversely affect food intake [7,8,9].

Today, there are a number of natural and synthetic antioxidants that are widely used in the food and chemical industries. These include ascorbic acid (E 300), sodium salt of ascorbic acid (E 301), butyloxylanisole (E 320), butyloxytoluene (E 321), sodium lactate (E 325), orthophosphate acid (E 339), citric acid and its salts (E 330 - 333) and other antioxidants can be added. Although these types of antioxidants increase the shelf life of food, they can also exhibit harmful properties [7,8,9].

EXPERIMENTAL PART

Aqueous extracts of localized Cucurbita pepo L variety pumpkin fruits were obtained for the experiment in Andijan region.

Using bidistillate water from the initial concentrated solution to be tested, ie 10% (900 ml of bidistillate water per 100 mg / ml test solution), 25% (750 ml of bidistillate water to 250 mg / ml test solution), 50% (500 mg / ml test solution to 500 ml). bidistillate water), 75% (250 ml of bidistillate water to 750 mg / ml test solution) and 100% (1000 mg / ml test solution) of 5 different concentrations.

The solubility and analysis conditions of the samples to be tested are given in Table 1.

TABLE 1. SAMPLES BEING TESTED

No	Samples	Solvent	Concentrations of solutions in vitro conditions mg / ml
1	Cucurbita pepo L	water	100/250/500/750/1000
2	Quercetin	30% alcohol	100/250/500/750/1000
3	Glyclazide	water	100/250/500/750/1000

The amount of the extract under study (concentration 1 mg in 1 ml) was used as standard. 0.2 M 2.0 ml buffer, 0.18% 56 mg / ml (5.46 mM) adrenaline was used as a control sample.

To check the optical densities of the test samples, 2.0 ml of 0.2 M sodium carbonate (Na₂CO₃-NaHCO₃) buffer with pH = 10.65, 56 mg / ml of 0.18% solution of adrenaline (epinephrine) hydrochloride and 30 mg / ml were added. the mixture was prepared by adding an antioxidant sample and the optical densities of the solutions were checked on a Cary 60 UV-Vis Agilet

Technologies spectrophotometer in a 10 mm cuvette with a wavelength of 347 nm for 30 seconds to 10 minutes by rapid stirring.

For comparative analysis, in addition to the samples examined, the optical densities of glyclazide and quercetin were also determined. Based on the values of the determined optical densities, the AA (%) activity of the samples was calculated based on the following formula:

$$AA = \frac{(D_1 - D_2) \cdot 100}{D_1}, \%$$

D₁-optical density of adrenaline hydrochloride solution added to the buffer;

D₂-the optical density of the extract under study and adrenaline hydrochloride added to the buffer.

The statistics were verified with the t-student criterion and the Original 6.1 U.S. program.

The antioxidant activity of the samples obtained for the study was carried out by inhibiting the autooxidation reaction of adrenaline under “in vitro” conditions, as well as by inhibiting the formation of the free form of oxygen. The method is based on the inhibition of the autooxidation reaction of adrenaline, in which the formation of adrenaline over time in "in vitro" conditions is expressed as a percentage of the formation of KFSH (active form of oxygen) and autooxidation (%).

RESULTS AND THEIR DISCUSSION

Optical density of 5 different concentrations of adrenaline hydrochloride solution added to a buffer solution of 0.2 M sodium carbonate (Na₂CO₃-NaHCO₃) pH = 10.65 as a control of the solutions of the tested samples, as well as the optical densities of the extract under study and adrenaline hydrochloride mixture were measured on a Cary 60 UV-Vis Agilet Technologies spectrophotometer in a 10 mm cuvette at a wavelength of 347 nm. The results of spectrophotometric analyzes are given in Table 2.

TABLE 2. INDICATORS OF SPECTROPHOTOMETRIC AND ANTIOXIDANT ACTIVENESS (AA%) OF PUMPKIN EXTRACT

№	Solutions to be analyzed	Control (D ₁)	Experiment (D ₂)	AA%
1	Cucurbita pepo L - (10%) 100 mg/ml	0,23611	0,1970	16,56
2	Cucurbita pepo L - (25%) 250 mg/ml	0,27326	0,2247	17,77
3	Cucurbita pepo L - (50%) 500 mg/ml	0,29455	0,2384	19,06
4	Cucurbita pepo L - (75%) 750 mg/ml	0,36258	0,2918	19,52
5	Cucurbita pepo L - (100%) 1000 mg/ml	0,36806	0,2927	20,47
6	Glyclazide - (10%) 100 mg/ml	0,02782	0,0235	2,0
7	Glyclazide - (25%) 250 mg/ml	0,03895	0,0329	2,8
8	Glyclazide - (50%) 500 mg/ml	0,06955	0,0587	5,0
9	Glyclazide - (75%) 750 mg/ml	0,11823	0,0998	8,5

10	Glyclazide - (100%) 1000 mg/ml	0,13909	0,1174	10,0
11	Quercetin - (10%) 100 mg/ml	0,11128	0,0940	8,0
12	Quercetin - (25%) 250 mg/ml	0,18778	0,1586	13,5
13	Quercetin - (50%) 500 mg/ml	0,27819	0,2396	20,0
14	Quercetin - (75%) 750 mg/ml	0,38251	0,3294	27,5
15	Quercetin - (100%) 1000 mg/ml	0,67247	0,5348	34,7

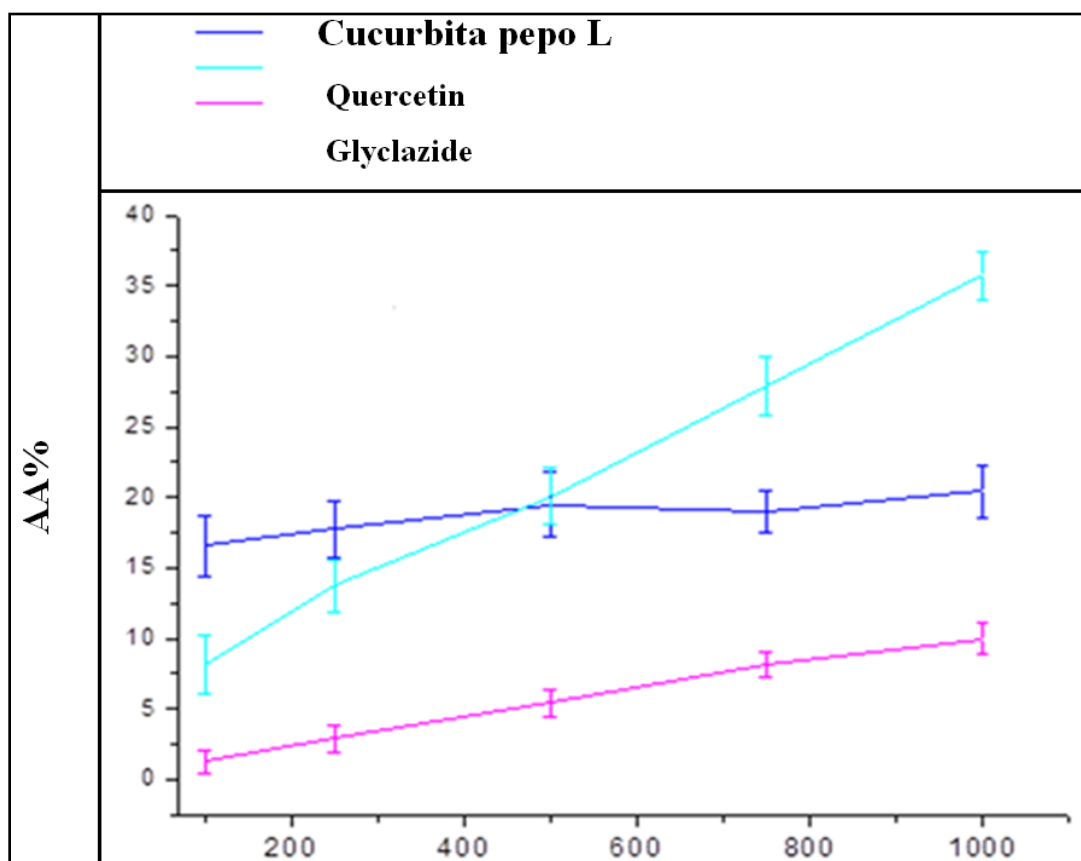


Figure 2.4. Dependence of the antioxidant properties of Cucurbita pepo L sample on concentration

The antioxidant activity of the test samples was calculated based on the values of their optical densities by preparing samples of 5 different concentrations from the test solution with bidistillate water:

$$AA = \frac{(D_1 - D_2) \cdot 100}{D_1} = \frac{(0,23611 - 0,1970) \cdot 100}{0,23611} = 16,56 \%$$

The results of the identified calculations are given in Table 2.

For a comparative analysis of the antioxidant activity of the samples tested, the optical densities of glyclazide used in pharmaceuticals and medicine, as well as quercetin substances used as BFQ in the food industry, and antioxidant activity based on these values were also determined.

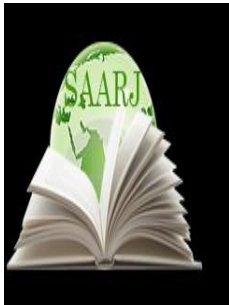
A graph of the concentration dependence of the AA activity of 5 different concentrated solutions of the Cucurbita pepo L-pumpkin fruit sample examined is shown in Figure 2.4.

CONCLUSIONS

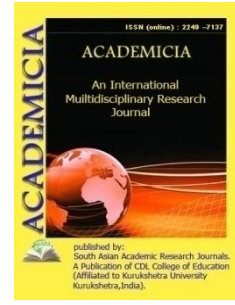
1. The AA activity of the test samples was explained by the inhibition of the autooxidation reaction of adrenaline in vitro and the formation of a free form of oxygen.
2. The antioxidant properties of Cucurbita pepo L pumpkin fruit extract samples were evaluated by comparison with quercetin and glyclazide antioxidants as standard antioxidants.
3. It was found that the AA activity of low-concentration solutions of all tested samples was higher than that of glyclazide, and the AA activity of high-concentration solutions was closer to that of quercetin.
4. Local Cucurbita pepo L pumpkin fruit extracts were found to have high antioxidant properties and were recommended for use in the food industry as a natural antioxidant.

REFERENCES:

1. А.И.Прида, Р.И.Иванова “Природные антиоксиданты полифенольной природы (антирадикальные свойства и перспективы использования)”. Пищевые ингредиенты. Сырье и добавки. 2004. №2. С. 76–78.
2. Е.И.Рябинина, Е.Е.Зотова, Е.Н.Ветрова, Н.И.Пономарева, Т.Н. Илю-шина “Новый подход в оценке антиоксидантной активности растительного сырья при исследовании процесса аутоокисления адреналина”. Химиярастительного сырья. 2011. №3. С. 117–121.
3. М.А.Рыжикова, Р.Р.Фархутдинова, С.В.Сибиряк, Ш.З.Загудиллин “Влияние водных извлечений из лекарственных растений на процессы свободно-радикального окисления”. Экспериментальная и клиническая фармакология. 1999. Т. 62, №2. С. 36–38.
4. С.Р.Хасанова, Т.И.Плеханова, Д.Т. Гашимова, Э.Х. Галиахметова, Е.А. Клыш “Сравнительное изучение антиоксидантной активности растительных сборов”. Вестник ВГУ. Серия: Химия. Биология. Фармация. 2007. №1. С. 163–166.
5. V. Gutteridge, T. Westermarck, B. Halliwell “Oxygen damage in biological systems” / Free radical, Aging and Degenerative Disease. Ed. By Yohson Y. New York, 1986.
6. В.М.Березовский- “Химия витаминов” / -М.: Пищевая промышленность, 1973. 632 с.
7. Г.И.Жунгиету “Хранение пищевых продуктов и кормов с применением консервантов”. Справочник.–Кишинев.: Изд-во «Карта Молдовеняскэ», 2015. 217 с.
8. Ғ.Н.Мадрахимов, А.С.Хожикулов, Л.А.Хакимова “Озиқ-овқатлар таркибидаги антиоксидантлар ва уларнинг хусусиятлари”, Халқаро илмий-техника конференция материаллари тўплами. Н.2019 й. 53-55 б.
9. Н.Е. Seifried, S.S. McDonald, D.E. Anderson, P. Greenwald, J.A. Milner “The antioxidant conundrum in cancer”. (англ.) // Cancer research. — 2003. — Vol. 63, no.15. — P. 4295–4298.



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THE ISSUE OF SPIRITUAL EDUCATION IN THE CONTENT OF POP SONGS

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ABSTRACT

This article describes the role and importance of national education in the essence of Uzbek pop music, the views and opinions of representatives of the Middle Ages, as well as the recognition of pop songs as the main means of education. The issue of training in pop singing has become one of the most important and urgent tasks today. Because it is appropriate to connect the urgency of this issue with the threat of "mass culture" in today's globalization. Because the main means of propaganda of popular culture is undoubtedly the art of music. Therefore, in this case, the variety is explained by some of its essential aspects.

KEYWORDS: *Basic Phrases: National Variety, Song, Tradition, Rap, Pop, Popular Culture, Musical Variety, Pop Singer.*

INTRODUCTION

Decree of the President of the Republic of Uzbekistan No. PP-1533 of May 20, 2011 "On measures to strengthen the material and technical base of higher education institutions and radically improve the quality of training of highly qualified specialists"; Resolution of the Government of the Republic of Uzbekistan dated April 20, 2017 No. PQ-2909 "On additional measures for the implementation of state policy", "On measures for further development of the higher education system", November 17, 2017 No. PP-3391 Resolution "On measures for further development", November 21, 2019 №940 "On the establishment of boarding schools specializing in the art of status", May 26, 2020 PF-6000 "On the role and impact of culture and art in society" The establishment of the Uzbek National Institute of Musical Arts named after Yunus Rajabi in accordance with the Decree "On measures to further enhance the ng, like other genres, laid a solid foundation for the further development of pop songs and its further promotion and propaganda among the population.

In the country, pop music has reached a qualitative stage of its development. It should be noted that this is due to the development of pop art. In this sense, the provision of pop vocal art with professional staff has become one of the important issues. It is known that pop art has not been in the Republic of Uzbekistan for a long time. However, today's music performance cannot be imagined without pop songs. Pop music has developed in our country so fast that it is difficult to find a home or a soul that does not belong to it [1].

The issue of training in pop singing has become one of the most important and urgent tasks today. Because it is appropriate to connect the urgency of this issue with the threat of "mass culture" in today's globalization. Because the main means of propaganda of popular culture is undoubtedly the art of music. Therefore, in this case, the variety is explained by some of its essential aspects.

Over the centuries, music has been able to show its new facets, evolve, improve and reflect the characteristics of different genres. One such genre of music is pop. Variety entered our social life so quickly that it developed rapidly and became somewhat popular, especially among young people.

The concept of variety is a Latin ascended specifically for show, meaning place. By the end of the nineteenth century, this concept began to mean performance in a single, small form. A playwright creates an image of a play, a director, a play, an actor. The three processes are embodied in one person, and if he creates a spectacle in a small form, it is called a number. Spectacle - the art of creating numbers has been called pop since the twentieth century. The person who created the number and performed it at the art level began to be hailed as a pop actor.

It is known that the XX century was a period of radical renewal in the Uzbek musical art, the emergence of "unconventional" compositions and new forms of concerts. In this regard, the concept of "variety" has entered the musical culture.

Initially, it was characterized by an extremely wide range of applications. In this regard, the following comments of O. Bekov are noteworthy: "The variety concert, which was formed on the basis of bright, colorful, dramatic changes, but not interconnected, demonstrated the" ability "to absorb virtually all types of art, from poetry and music to the circus. . And finally, in contrast to philharmonic concerts and theatrical performances, pop art has become the basis of the performing nature, such as a distinctive dialogue between the audience and artists, a light connection. In particular, the constant, direct contact with the audience during the show has led to the emergence of a variety genre, such as a conference. The author interprets the term "variety" in the field of performing arts, emphasizing its defining qualities as "lively, original simple musical forms, sometimes the authors' bright, well-directed intonation and approach to the" popular "dance methods." These ideas apply to the Uzbek musical culture, mainly in the 1920s and 1950s. It should be noted that in the reality of modern Uzbekistan, the term "variety" is used not only in connection with the stage, but also to describe a specific direction in music. Thus, in music culture, the term "variety" in the "narrow" sense refers to samples of music based on a certain unity of performance and artistic elements. The term "variety" is emerging as a private concept. Therefore, it is expedient to use the concept of "musical variety" in this section to understand the whole set of genres of stage music based on the "dynamic method".

From the lexical meaning of the word variety, as a broad concept of "stage art" and in the narrow sense, "musical variety" is a simple, quick-to-remember melody and mainly in the form and

content that serves the purpose of entertainment without special training, which combines dance methods (a bit of a "bit" on the ground), the rhythm is mainly the rhythm - the method gives the main content, and it is expedient to understand the musical samples in which the work is performed mainly on electronic instruments.

The use of the term pop music in a narrow sense ultimately means that it has the same meaning and the same pattern as the term "pop music". However, with the recent changes and developments, the rapid introduction of information and communication technologies in our lives, attitudes to the concept of music variety have changed radically. In particular, the concepts of variety, national variety began to be widely used in Uzbekistan.

It should be noted that the process of formation of Uzbek musical variety was an important basis for folklore. The dancing of songs, lapars and especially cheerful yallas, light melodies and polyphonic rhythms on electronic musical instruments were useful. At the same time, this has become one of the means of providing the national basis of "Uzbek music". Uzbek pop music, which began to take shape in the early twentieth century as a socio-political situation, can be divided into two periods:

- The first is the period of development of traditional genres - song, lapar, yalla, terma;
- In the second period, the genre of folklore began to develop stylistically on the basis of the requirements of the musical variety.

Songs about the Motherland, independence, freedom and the nation have been among the works of art created since the independence of Uzbekistan. Among other types of art, the most popular art form - a new system for the development of music, a new system has been introduced.

Most of us know a nation or a social stratum and group through a writer or poet who is one of its members. Fiction is a great idea in itself, along with elegance it also provides information about the social stratum to which the writer belongs. Unlike art, fiction has a wider range of possibilities. But art expresses that fiction in images, in visible and perceptible, impressive forms. "Literature is stronger than the atom," says Abdullah Qahhor. Fully agreeing with this idea, it can be admitted that art, which is the revival of literature, increases its power tenfold.

A lot of scientific research has been conducted on the role of pop music in the life of the Uzbek nation, people, tribes and clans, its development. There are many definitions of the concept of art by many thinkers. For example, Leo Tolstoy described art as a method of indirect communication between people, while Konstantin Sergeevich Stanislavsky described art as "the beautiful life of the human soul at one time and place." Just as gymnastics elastically corrects the human body, so art restores the human mind and spirit. Along with understanding the value of art, he realizes humanity in people, raises himself to the level of perfect beauty, rests. He says there is no greater happiness. Several other philosophers have also expressed a number of their very valuable, complementary ideas on the subject. It is natural to ask how to distinguish a true work of art from other products of creation, or what the main function of art is, and how people benefit from it. Perhaps another means can be found for entertainment and various other pleasures. What role does art play in it. In our opinion, the greatest task of art is to call these people to goodness and kindness. Art, including music, embodies only good wishes and good deeds. He never preaches evil. In any society where art is glorified, there are more and more people who promote beauty and goodness in this society. From this point of view, it can be

concluded that art means beauty. Art is a means of beautifying life.

The art of singing, which is an integral part of the Uzbek national musical culture, has been developing for a long time, embodying the role and place of people in public life. Singing alone and in groups has been associated with the whole life of almost all peoples since ancient times. It is known that traditional ceremonial folk songs were performed as a group of songs woven by the people on the occasion of this or that ceremony, and they have been performed to this day.

The art of singing, including pop, has a special place in the life of our people today. His voices are heard on radio and television, in theaters and concert halls, in schools and stadiums. In our country, large-scale events and celebrations with pop songs have become a tradition. As mentioned above, the basis of pop songs lies folklore sayings. Probably for this reason, the pop song is closely connected with all the events of our lives and demonstrates a commonality.

Our national-musical heritage, in particular, folk songs and their methods, have a special place in the upbringing of the younger generation on the basis of the traditions, values and culture of our ancestors, in the formation of their spiritual and moral qualities. As the President of the Republic of Uzbekistan Sh. Mirziyoyev said: "Education of high spiritual qualities in society, formation of national ideology, respect for our rich cultural heritage, historical traditions, universal national values, love for the Motherland is one of the key goals of all reforms in our country." . Good results can be achieved as a result of wide enjoyment of the scientific and spiritual heritage of our great ancestors, who lived and worked in the past, and the connection of advanced ideas and views to education today. Also, the theoretical foundations of music, its educational power, the musical heritage of the great poet and philosopher of the East Abdurahmon Jami, Alisher Navoi, music theorist Darvesh Ali Changi serve as a unique source for solving problems of musical and aesthetic education [9].

In the life and activity of a person through the art of music, all the sensory (emotional), intellectual (mental), motivating conditions are a very important and necessary type of activity to increase his work efficiency [8, 9]. In the process of educating students to improve their musical culture, it is important that the teacher takes into account the psychological and physiological characteristics of students. The psyche of the student plays a very important role in conducting music lessons. For this reason, we set ourselves the goal of analyzing the psychological characteristics one by one. In particular, attention is the focus of an activity on something at a particular time. It is mainly divided into two types. One is involuntary attention and the other is voluntary attention. However, it is worth mentioning another peculiar form of it. He is the main and long-lasting character of voluntary attention. It is a much more intense and productive mental activity, giving high efficiency to all kinds of labor.

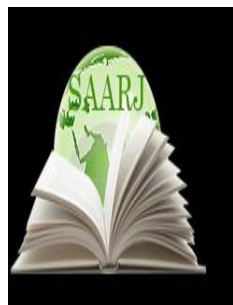
In the art of music, all types of musical activity are related to human attention. Special attention is paid to this concept, especially in pop performance. In fact, attention is a psychological concept. It should be noted that in modern psychology, the study of its qualitative features in the structure of attention. This includes attentional stability, displacement, distribution, and volume. Attention is one of the most important components of the learning process. All the great musicians had an extraordinary focus. For example, Mozart was able to write music calmly in a crowded room and in the presence of strange voices [6, 8].

In conclusion, it should be noted that in the context of the Uzbek national musical traditions, there are spiritual and moral views that serve to ensure the development of the individual, which

has an important educational value. Young people should pay attention not only to modern pop music, but also to singing and listening to national and traditional, classical songs. To do this, music lessons, media, Internet sites and other means of listening to music on CDs of songs offered to young people, the literature on the work of teachers and composers have found their own meaning, the melodies contain elements of national melodies. it will be necessary to establish efficient use. Because it is impossible to understand the essence of the true national tone of art without knowing the history of our art, the history of our teachers.

REFERENCES:

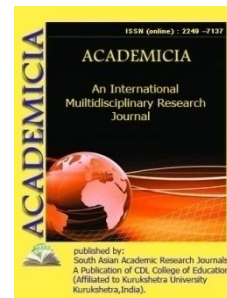
1. Sh.M.Mirziyoev Tanqidiy tahlil, qat'iy tartib intizom va shaxsiy javobgarlik har bir rahbar faoliyatining kundalik qoidasi bo'lishi kerak. O'zbekiston Respublikasi Vazirlar Ma'kamasining 2016 yil yakunlari va 2017 yil istiqbollariga bag'ishlangan majlisidagi O'zbekiston Respublikasi Prezidentining nutqi. // Xalq so'zi gazetasi. 2017 yil 16 yanvar, №11
2. Sh.M.Mirziyoyev Buyuk kelajagimizni mard va oliy janob xalqimiz bilan birga quramiz.Toshkent "O'zbekiston" – 2017 y.
3. Sh.M.Mirziyoyev Erkin va faravon demokratik O'zbekiston davlatini birgalikda barpo etamiz. "O'zbekiston" NMIU, 2016y.
4. Sh.Mirziyoyev. Qonun ustuvorligi va inson manfaatlarini ta'minlash – yurt taraqqiyoti va xalq faravonligining garovi. "O'zbekiston" NMIU, 2016 y.
5. "O'zbekiston Respublikasini yanada rivojlantirish bo'yicha Harakatlar strategiyasi to'g'risida" O'zbekiston Respublikasi Prezidenti Farmoni. 1-ilova: "2017-2021 yillarda O'zbekiston Respublikasini yanada rivojlantirishning beshta ustuvor yo'nalishi bo'yicha Harakatlar strategiyasi". Xalq so'zi gazetasi. 2017 yil 8 fevral soni va Internet resurs: www.lex.uz.
6. Mirzaeva N.A. Xonandalik uslubiyoti asoslari. Ma'ruzalar matni. Toshkent. 2008. 48 b.
7. Cat'rine Sadolin. Complete vocal technique. 2012. www.Completevocalinstitute.com
8. Qahharov N.V. Vokal asoslari. O'quv qo'llanma. Toshkent. Iqtisod-moliya. 2008. 314 b.
9. S.Mannopov. O'zbek xalq musiqa madaniyati. O'quv qo'llanma. Toshkent. Yangi asr avlodi. 2004 y. 100 b.



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TIMES IN LITERARY TRANSLATION

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ABSTRACT

Fiction is a product of the human mind and emotions. At the heart of fiction is the so-called miracle of human nature, the most intelligent, the most perfect being on earth, so we are not mistaken in calling this kind of art anthropology. Fiction reflects the human spiritual world, his thoughts and experiences. These experiences are embodied through vivid images.

KEYWORDS: Dictionary, Literature, Development, Language, Subject.

INTRODUCTION

When we talk about the concept of temporality in a literary text, the first question that arises is what the literary text itself is. There are several tariffs for text. The term "text" is interpreted differently in the scientific literature. The Uzbek Explanatory Dictionary points out that the word text is borrowed from Arabic, is an outdated biblical word, and is equivalent to the meaning of the word text. Exactly

The dictionary defines the word text as follows:

- 1 A written, copied, or printed work of art, scientific work, speech, document, etc., or part thereof, is text. For example: the text of the article.
- 2 A poem or word that is the basis of a piece of music, such as a song, opera, romance, and so on.
- 3 The name of one of the large fonts in polygraphy.

This means that only the written form should be considered when referring to the text. The annotated dictionary in the new edition also contains the following emphasis: text [Arabic - shoulder; written expression of speech, text].

- 1 An author's work or document formed in writing or in print.

2 The main part of the printed edition without pictures, drawings and comments.

L. Loseva, one of the textual scholars, points out the following three features of the text:

1 Text is information in written form;

2 The text is semantically and structurally complete;

3 The text reflects the author's attitude to the information provided (the author's approach).

A text is a unit with linguistic communicative, semantic features. The text has features of completeness and integrity. It is coherence, communicative, which provides logical-semantic relations

It is based on categorical indicators such as goal statement and informativeness (importance of information or level of novelty). Text is a unit of information exchange and it mainly serves to perform this function. In addition, the term "dikurs" is often used in many works on the study of textual problems in world linguistics. Although the term is widely used in text linguistics as well as in the fields of literature, sociology, political science, philosophy, logic, and psychology, it is also used in text linguistics.

Nor is there a single, widely accepted interpretation, meaningless. Initially, the terms "discourse" and "text" were used for the same concept, then "text" was used for written communication and "discourse" was used for oral communication. The word means "discours" in French.

In short, a text is a unit at the highest level of the syntactic level of a language, a structural, semantic, and communicative whole that occurs orally and in writing on the basis of the connection of a sequence of sentences.

According to the functional methodological essence of the text is a scientific text (thesis, article, lecture, reviews), literary text (prose, poetry), official text (reference, decision, order, description, recommendations), popular text (article, conversation, greeting, and speech texts).

It is necessary to distinguish between two opposing types of texts, the literary text and the non-fictional text, based on which of the two important functions of language, the communicative function or the aesthetic function, leads in the purpose of the text. It is better to call a text that is led by a communicative task in the main purpose as a non-fiction text, and a text that is led by an aesthetic task in the main purpose and essence. "The literary text reflects the diversity of all genres of fiction. It is dominated by emotion and aesthetic taste, and the form of expression is of great importance. In literature, artistic and emotional perceptions are stronger than logical perceptions of reality. Depending on the form and manner in which the content is presented, the emotional impact and aesthetic value of the work will be high. "

[30] In a literary text, the author conveys artistic pleasure to the reader through a variety of linguistic means. In a literary text, the writer chooses words and phrases depending on the theme, content and character of the work, makes effective use of syntactic construction, lexical, grammatical and semantic methods. In the text, along with the norms of literary language, the possibilities of live (spoken) language are used equally. Even slang phrases are used to individualize the language of the character.

The text is multifaceted and complex. Like any whole, a text is made up of the elements that make it up, the specific units.

In linguistics, which units form a text or which units are divided into parts of a text?

There is a lot of debate about the calculation. At first glance, defining text units does not seem to be such a complicated problem. But this is not the case, which is why there are so many different and controversial views among textual linguists. For example, I. R. Galperin states that a sentence cannot be a unit of text. According to the linguist, a large whole that combines several sentences - a whole larger than a phrase - can be a unit of text. The phrase, which is an integral part of the whole, says that a text cannot be a unit at the same time.

Most linguists, on the other hand, argue that the sentence is the main formative element of the text.

In fact, it is difficult to imagine the content of the text, its relation to the objective world, and, consequently, its correct understanding. Therefore, the place of the sentence in the text system, especially its ability to form text, cannot be denied. In the text, sentences are connected by various syntactic means. These include various lexical and grammatical units, such as repetitive parts, rhymes, xiasmatic constructions, units representing time and space, tense forms of cuts, and modal words.

Real life dominates the world around us. To the reader who reads a work of art, the work of art is taken from human life and is an objective, real-time expression, born of such observation. Yes, a work of art depicts human life, but when one studies the theoretical nature of the artistic age in which one lives, one realizes how wrong the above observation is. Below we will try to explore the difference between real and artistic times.

The relationship between the units of time and space in any text is inextricably linked, because any event takes place in a specific time and space.

The logical relationship between events in time and space can be divided into the following types:

- 1) Temporal semantic group;
- 2) Local semantic group.

Temporal relations have been studied in linguistics at different levels of lexical, morphological, and syntactic units. The semantic temporal relationship between the two sentences is interrelated.

Local relationships are also divided into the following types:

- a) The relation of action, the place of origin of the property:

She had stopped at a shop, over which was written, Krook, Rag and Warehouse [21; 57];

- b) The relation of action, the place of origin of the property;

- d) The relationship of the direction of motion, the direction of the property:

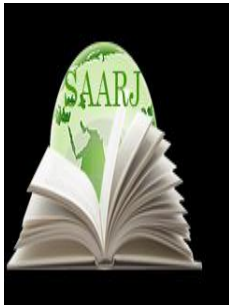
Jack went to his corner walking that funny jerky way and we got him down through the ropes and through the reporters' tables and out down the aisle [27; 145b].

The category of temporality plays an important role in shaping the content of a literary text. One of the most important parts of text referential modality is temporal semantics. The problem of analyzing the content and structure of the text, of course, requires the discussion of the question

of determining the place of the category of temporality or time in the content of the text. Researchers have already focused on this issue, noting that temporal integrity is one of the most important indicators of text structure. However, information on the temporal structure of the text is currently scarce and they are not sufficient to fully comprehend the role of time indicators in the formation of the textual content. The formation of the text and the connection of its components with the help of units representing time and space stems from the temporal properties and functions of the text. Integrity of time is one of the indicators of the text, because the content of the text requires the manifestation of temporal indicators, and without these indicators it is impossible to imagine a clear expression of any communicative purpose. In this regard, the category of time should be recognized as one of the main categories that shape the communicative content of communication units. Events in a work of art take place over a period of time. Only the time in a work of art differs from the regularity of time in real life. "Time lexemes are used to connect distant (distance, indirect) and contact (remote, indirect) parts of text. Some temporal words serve as lexical grammatical connectors, reflecting the chronological sequence in the text [9; 24b] ". L. A. Nozdrina discusses the concept of "text actualizers". According to the linguist, the main actualizers of the text are the motives for the interaction of the literary text with the reality behind the text: temporality, localism, personality, referentiality, and so on. At the heart of these categories are the interrelationships of morphological, lexical, syntactic, and word-formers, which are the means of language that serve to construct the typological characteristics of a text. These basic actualizers of the text are the text.

REFERENCES.

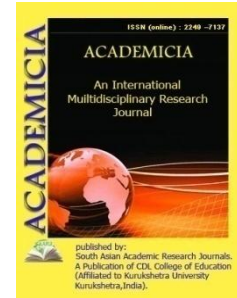
1. Arora, S. The Perception of Proverbiality. De Proverbio. 1984. – 244p.
2. Azar B.S. Understanding and Using English Grammar. Third Edition. – N. – Y.: 1999. – 420 p.
3. Blokh M. Y. A course in theoretical English grammar. Moscow. – 2001
4. Broukal M., Pineiro C. Grammar. Form and Function. N1. McGraw-Hill. – New-York.: 2004. – 416 p.
5. Broukal M., Pineiro C. Grammar. Form and Function. N2. McGraw-Hill. – New-York.: 2004. – 265 p.
6. Usmonov O'. U., Ashurov Sh. S. Ingliz tili nazariy grammatikasi fani bo'yicha ma'ruzalar matni. Samarkand: 2007 – 95b.
7. Yo'ldoshev M., Isoqov Z., Haydarov Sh. Badiiy matnning lisoniy tahlili. – Toshkent: Alisher Navoiy nomidagi O'zbekiston Milliy kutubxonasi, 2010 – 69 b.



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COMPARATIVE ANALYSIS OF RISK PERCEPTION AND RISK MANAGEMENT STRATEGIES AMONG VEGETABLE GROWERS IN PUNJAB STATE, INDIA AND NAKURU COUNTY, KENYA

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ABSTRACT

Vegetable growers are faced with wide range of risks that have to be managed, especially in developing nations. The risks are on a trajectory due to rise in trading of agricultural produce globally, ravages of climate change and emerging pandemics that jeopardise vegetable production enterprises. This study presents results of an investigation into risk perception by vegetable growers in two regions; Punjab State, India and Nakuru County, Kenya. Few studies have carried out a comparative investigation across two regions touching on risk perception among vegetable growers, risk management strategies adopted and barriers that prevent successful mitigation of the risks. Using descriptive and inferential statistics, data from 200 respondents was analysed and market risks was ranked as the leading source of risks. Improved agricultural practices was the main risk management strategy employed by (77%) of the growers in Punjab and (79%) in Nakuru. (63%) of growers in Punjab and (62%) in Nakuru also used market survey as a strategy. Lack of information on pests and diseases (53%), marketing challenges (50%) and lack of access to extension services (31%) were the major barriers to risk management strategies among vegetable growers in Punjab; compared to lack of access to capital (57%), lack of information on plants and diseases (47%) and lack of access to extension services (27%) in Nakuru. This study seeks to provide an understanding to existing risk challenges and suggest areas of improvement to support efforts for risk management and reduction.

KEYWORDS: barriers, risk, risk management strategies, risk perception, risk sources.

1. INTRODUCTION

Vegetable cultivation among small scale farmers has a key role in agricultural productivity. It has the potential to improve the social and economic condition of small scale and marginal farmers compared to other crops since its cultivation is considered to result in higher yields and higher economic returns within a short period of time (Mohammad et al., 2020). Vegetable production however occurs in highly variable biological, physical and economic conditions, mostly characterised by lots of uncertainty misfortune and loss (Harwood *et al* 1999; Huirne, 2003). This results from natural calamities and catastrophic events (Veber 2014); biotic factors such as diseases and pests (Anastacia *et al* 2011; Toroitich *et al* 2014; Wright *et al* 2016); technological changes, regulations and social concerns and also human factors (Belaineh& Lars, 2005). It is therefore necessary that growers recognize the risks involved in the vegetable cultivation so as to easily plan for their prevention and management (Drollette 2009).

Farmers generally make decisions on the basis of expectations, projections, and even on the basis of what they fear or hope is possible (Patt, 2001). Risk sources for vegetable growers should be understood in order to develop action plans towards crop management and adaptive systems. To understand how vegetable growers make decisions in risky and uncertain conditions, an analysis of their perception and reaction in risky situations is of utmost importance. Farmer perception on risk source and the subsequent response have bearings on the type of intervention strategies that would be considered across households and ecosystems (Sjoberg, Moen, and Rundmo, 2004; Váchal et al. 2013; Veber 2014).

India is ranked as the second highest vegetable producer in the world after China (Nasim, Sinha *et al* 2018). It has witnessed a rise of 59-61percent in the overall horticultural production sector and an annual 2-3 percent increase in demand (Govil, 2013; Sinha *et al* 2018). The ripple effect of the expansion in vegetable production has brought about an ensuing increase in vegetable cultivation in Punjab State; from an initial area of 100 thousand to over 208 thousand hectares, and a production of 168502.90 thousand metric tonnes per hectare (Anonymous 2016; Nair and Barche, 2014).

Vegetable production in Kenya has also continued to grow at an average annual rate of 5.11 percent (KENDAT, 2015), with over 90% production by small scale farmers and with a 96% local consumption (KNBS, 2019, FPEAK, 2021). The impressive growth has witnessed a consequent increase in vegetable production performance in Nakuru County, mostly for export farmers, while leaving out a vast majority of small scale growers (Francesco and Hanne, 2019).

The increase in vegetable production in the two regions can be attributed to changing habits and need for a diversified nutrition, use of the latest technology, availability of technical training and easier access to markets (Hazell et al 2007; Kadenyi, 2017; FPEAK, 2020).Despite the apparent remarkable achievement in production of vegetables, the increase in supply has not met the ever-increasing demand due to several challenges in cultivation (Aseto et al., 2020; Sunny & Sanjay, 2019). Vegetable production is at a point of stagnation in Punjab due to depleted water levels, decreasing land holdings, multiplication of insects and diseases (Singh, 2017); while in Nakuru, high dependence on rainfall patterns for production and harvesting cycles; small landholdings; a lack of the necessary knowledge and skills among most smallholder farmers, poorly organised marketing system has introduced an aspect of unreliability in production (AGRA, 2017; WFP, 2015; Aseto et al., 2020). There is need therefore to address these challenges in order continue exploiting the ever increasing rise in demand.

2.0 REVIEW OF LITERATURE

Vegetable growers generally experience and cope with risks from different sources (Huirne, 2003). The risks can lead to adverse effects on production such as decrease in yield and income, financial ruin, famine and even farmer health challenges (Komarek et al., 2020). The dependence on rain fed agriculture, small sizes of land and lack of access to financial aid and technical information makes them highly vulnerable to risks from different sources including; weather and climate change risk (Greiner et al., 2008; Rejesus et al., 2013; Harvey et al., 2014; Schreinemachers et al., 2017; Harvey et al., 2018); market risk (Musser and Patrick 2002; Manek& Ghosh, 2019); institutional risk (Lien et al., 2003; Flaten et al., 2005); financial risk (Palinkas and Székely, 2008; Musser and Patrick 2002; Jain and Parshad 2006; Pelka, 2015); production risk (Goodwin and Mishra 2000; Holt &Chavas 2002; Anju, 2017); human risk (Dercon et al., 2005) and bio-security threats (Heymann 2005; [FAO, 2013](#)). These risks can simultaneously affect a farmer, thus showing a need for in-depth efforts to address them because risks can be a barrier or a trigger for growth and expansion in vegetable production (Marraet al 2003).

Risk perception is the subjective evaluation of the chances of a specific type of misfortune occurring; and the level of preparedness for the outcome (Sjoberg, Moen, and Rundmo, 2004). Risk source perception aids in quantification of the negative and positive variations from planned outcomes (Váchal et al. 2013; Veber 2014); and also aids in prevention and management of potential risk (Harwood, Heifner, Coble, Perry &Somwaru, 1999). It is critical to understand how vegetable growers perceive risk in order to develop and implement programs and policies that support their management (Greiner et al. 2009). Research has shown that there is often a disconnect between risks which are perceived and the actual risks (Botterill and Mazur 2004); that the aim to change behaviour does not always lead to actual change in behaviour regardless of an individual's risk assessment and risk perception (Niles *et al* 2016). Menapaceet al (2015) also shows that the mental acceptance of existence of a risk factor; such as a first-hand experience with crop loss gives an explanation as to why some farmers perceive risks more than others. Some farmers are also risk averse and perceive risks differently from those who are neutral (Sulewski and Kłoczko-Gajewska, 2014). It is therefore imperative that the two categories are considered when assistance in decision making is being provided. Farmers from different countries live within different agro-ecological and institutional conditions, which can have an influence on risk perception. There is therefore need to establish whether risk perception differs based on vegetable growers' domicile.

Strategies related to risk reduction and risk transfer can significantly augment vegetable farmers' capacities to with stand shock. This therefore makes early detection of risks and their effective management paramount (Jankelova, Masar, Moricova 2017). Choice of risk management strategies is often influenced by farmer socio-economic characteristics (Velandiaet al 2009; Careret al 2018; Ullahet al 2015; Tudor et al 2014); hence affecting the decision making on ways of mitigation (Palinkas and Szekely, 2008). Vegetable growers employ different management strategies ranging from simple practices at the farm level to legally bound ones such as insurance and contracting (Lin, 2011; Gillespie and Mishra, 2011; Kisaka-Lwayo, and Obi, 2012). The suitability of the different coping mechanisms is at times of doubtful authenticity mostly due challenges of contextualisation. The current study therefore attempts to

establish the suitability and authenticity of some of the risk management strategies among vegetable growers in two different regions.

There are a range of barriers to successful management of risks among vegetable growers. Literature shows that barriers differ based on whether the agri-enterprises are in developed or in developing nations (Legesse and Drake, 2005; Ilbery et al., 2013). Small scale vegetable growers can experience difficulty in their productive process due to lack of access to information and technical knowledge, financial challenges, and poor production technologies (Legesse and Drake, 2005; Mannon, S.E. 2005); hence limit their productive capacity.

SIGNIFICANCE OF STUDY

While the existing literature has discussed different sources of agricultural risks for individual crops in different countries, those that cover individual crops in different countries in the context of agricultural risks, risk perception, risk management strategies and the barriers to the different strategies are few, if any. This study therefore seeks to fill this gap.

OBJECTIVES/HYPOTHESIS

The aims of this study are, therefore, to (1) assess risk perception, risk management strategies and barriers among vegetable growers, (2) identify the socio-economic factors that affect vegetable growers' perceptions and management strategies. The hypotheses guiding the study are (1) there is a difference in risk perception; risk management strategies and barriers to management (2) socio-economic factors have no effect on perception among vegetable growers.

RESEARCH METHODOLOGY

STUDY AREA

The study was conducted in two different countries, Punjab State in India (Fig. 1) and Nakuru County in Kenya (Fig. 2). The selected sites are among the leading areas for agricultural production both in India and Kenya and have embraced diversification into vegetable production (Singh et al 2009; Sharma et al 2014). They are areas with high vulnerability to weather shocks, large poor and vulnerable populations, and high dependence on rain-fed agriculture for Nakuru and high dependence on irrigation for Punjab.



Fig.1 Punjab State (source 2020 Government of Punjab)

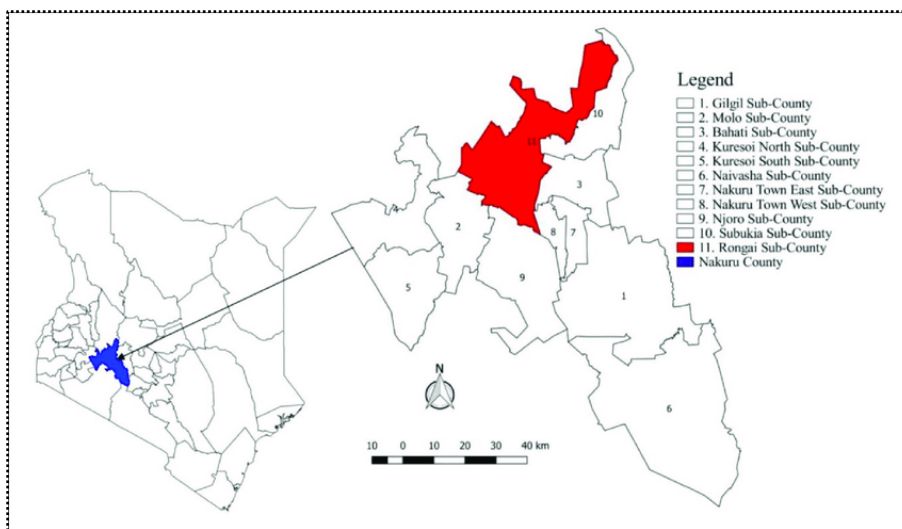


Fig. 2: Nakuru County (Source; Kiplagat et al, 2020)

DATA COLLECTION AND DATA ANALYSIS

Semi-structured questionnaires were used to elicit vegetable growers' socio-economic characteristics, their risk perceptions, risk management strategies and barriers to management. The schedule had statements which were categorized into market risk, financial risk, production risk, institutional risk, human risk, weather and climate change risk and bio-security threats. Respondents' perceptions of the risks were expressed in terms of a three-point continuum of critical, major and minor. Risk perception was categorized into critical, major and minor with a score of 3 for critical risks, 2 for major risks and 1 for minor risks. To calculate the scores, total points and maximum points were used. Friedman's test was used to find differences in rankings of the risk as perceived by the vegetable growers after it was established that the data met all requirements.

In order to document different strategies adopted by the farmers, thematic analysis of data was used to develop a list of eight strategies from qualitative data. These were then dichotomized into a score of 1 if the respondent followed the strategy and 0 if the respondent did not follow the strategy. Multiple Response in SPSS was then used to calculate percentage number of cases for each choice. To calculate barriers to the different strategies, thematic analysis of data was used to develop a list of ten barriers from qualitative data. These were dichotomized into a score of 1 if the respondent faced the barrier and 0 if the respondent did not face the barrier. Comparative analysis of socio-economic characteristics of the vegetable growers' in Punjab and Nakuru was done using Mann-Whitney u test. Multiple regression analysis of risk perception on socio-economic characteristics was also carried out after the data was found to have met the multiple regression assumptions.

RESULTS AND DISCUSSIONS

SOCIO-ECONOMIC CHARACTERISTICS

The sample population consisted of 200 farmers: 100 from Punjab and 100 from Nakuru. The findings were as shown in Table 1 below. Majority of the farmers were middle age in Punjab

(75%) as well as in Nakuru (61%). (100 %) were males in Punjab compared to (77%) in Nakuru. As regards education, (47%) of the respondents in Punjab had secondary education compared to (37%) in Nakuru; matric level was (19%) in Punjab and (24%) in Nakuru; and, graduate level at (18%) in Punjab and (11%) in Nakuru. The highest percentage of the sample (66%) and (64%) in Punjab and Nakuru respectively had 10-20 years farming experience; while (72 %) in Punjab and (61%) in Nakuru had less than 10 years vegetable growing experience in farming. (64%) of the farmers in Punjab and (99%) of those in Nakuru operated farm sizes of less than 2.5 acres. (83%) of the growers in Punjab leased land for vegetable cultivation compared to (99%) in Nakuru. The income from vegetable sales was high in Punjab (82%) with farmers earning above 7 lakhs than in Nakuru where the majority (47%) earned below 4 lakhs. Majority of the vegetable growers in Punjab sold their produce to wholesalers compared to in Nakuru; while majority (44%) of the farmers in Nakuru sold their produce to retailers.

TABLE 1. VEGETABLE GROWERS' SOCIO-ECONOMIC CHARACTERISTICS

S. No	Parameters	Category	Punjab (n=100)		Nakuru (n=100)	
			<i>f</i>	%	<i>f</i>	%
1	Age (years) [#]	Young (18-30)	24	24.0	26	26.0
		Middle (31-50)	75	75.0	61	61.0
		Old (>50)	1	1.0	13	13.0
2	Gender [#]	Male	100	100.0	77	77.0
		Female	-	-	23	23.0
4	Level of Education [#]	Illiterate	6	6.0	1	1.0
		Primary	-	-	16	16.0
		Middle	9	9.0	11	11.0
		Matric	19	19.0	24	24.0
		Secondary	47	47.0	37	37.0
		Graduate	18	18.0	11	11.0
		Post Graduate	1	1.0	-	-
6	Vegetable growing experience [#]	Low (< 10 years)	72	72.0	61	61.0
		Medium (10-20 years)	27	27.0	36	36.0
		High (> 20 years)	1	1.0	3	3.0
7	Operational Land holdings (acres) [#]	Marginal (<2.5)	64	64.0	97	97.0
		Small (2.5-5)	36	36.0	3	3.0
		Semi-medium (5-10)	-	-	-	-
		Medium (10 -25)	-	-	-	-
		Large (>25)	-	-	-	-
8	Land leased for vegetables [#]	Marginal (<2.5)	83	83.0	99	99.0

		Small (2.5-5)	16	16.0	-	-
		Semi-medium (5-10)	1	1.0	1	1.0
		Medium (10 -25)	-	-	-	-
		Large (>25)	-	-	-	-
9	Annual income	Low (< 4 lakhs)	4	4.0	47	47.0
		Medium (4-7 lakhs)	14	14.0	20	20.0
		High (>7 lakhs)	82	82.0	33	33.0
10	Market Outlet[#]	Direct consumers	3		28	28.0
		Retailers	34	34.0	44	44.0
		Wholesalers	84	84.0	37	37.0
		Exporters	3	3.0	-	-
		Processors	-	-	7	7.0
		Govt. Corporation	-	-	1	1.0
		Cooperative society	-	-	1	1.0
		Agrochemical Companies	-		34	34.0

**Data represented in frequency (percentages)*

COMPARISON OF SOCIO-PERSONAL PROFILES OF VEGETABLE GROWERS IN PUNJAB AND NAKURU

A comparative analysis of the socio-personal profiles of the vegetable growers was done to determine any there differences between the two regions. The results are shown in Table 2

**TABLE 2: COMPARISON OF VEGETABLE GROWERS IN PUNJAB AND NAKURU
BASED ON THEIR SOCIO-PERSONAL PROFILES**

S. No.	Socio-personal profile	U	Z
1	Age (years)	4855.50	-.354
2	Gender	3850.00	-5.085**
3	Education Level	3920.00	-2.764**
4	Vegetable growing experience	4427.00	-1.705
5	Operational Land Holdings (acres)	3348.50	-5.877**
6	Land leased for vegetables	4476.50	-1.511
7	Annual Income (rupees)	1613.00	-8.529**
8	Direct consumers	3844.00	-4.625**
9	Retailers	4232.00	-2.188*
10	Wholesalers	2742.00	-6.505**
11	Exporters	4841.00	-1.082
12	Processors	4350.00	-3.717**

13	Government Corporation	4650.00	-2.686**
14	Cooperative society	4650.00	-2.686**

*Mann-Whitney *u* test Note.* $p < .05$, ** $p < .001$

Age scores of vegetable growers in Punjab ($Mdn = 38$) were equal to that of vegetable growers in Nakuru ($Mdn = 35$). This shows that majority of the vegetable growers in the two regions fell into a category which was almost equal, which from Table 1 was found to be middle age group. Singh et al., (2006) and Mohammad et al., (2020) have also reported findings that majority of farmers in their studies fell into the middle age groups. The gender scores in Punjab ($Mdn = 1$) were less than those for Nakuru ($Mdn = 1$). A Mann-Whitney test indicated that this difference was statistically significant, ($U_{n_1=n_2=100} = 3850.00, z = -5.085, p < .001$). This is because there were no female respondents; thus collaborating previous observations by Munshi, (2020), Singh & Vinay (2013), Munmun & Arindam (2014), Bala, (2010) and Amekawa et al., (2021) that though several women are engaged in agricultural activities in Asia, a large number of them have remained "invisible" and are mostly not considered during decision making in farm activities. Comparatively, female vegetable growers in Nakuru was (23%), a figure which is quite low but supports reports by Anonymous (2014) that women in Kenya make up 46% to 65% in agriculture, but often play a subordinate role (Muriithi and Matz, 2014) mostly underpinned by customary laws (Otieno, 2019).

Education level for vegetable growers in Punjab ($Mdn = 5$) differed significantly from that of vegetable growers in Nakuru ($Mdn = 4$). A Mann-Whitney test indicated that this difference was statistically significant, ($U = 3920.00, n_1 = n_2 = 100, z = -2.764, p < .001$). This shows that a higher percentage of vegetable growers in Punjab (66%) had secondary education and above compared to (48%) in Nakuru. The reasons for the lower percentage in Nakuru could be due to most people who have post-primary education moving out to other occupations (Lewin, 2007). The works of Adebayo (2012) and Mohammad et al (2020) have also found similar results that most of the small scale farmers possess higher education level. Vegetable farming experience did not differ significantly, among vegetable growers in Punjab ($Mdn = 1$) and Nakuru ($Mdn = 1$), ($U = 4427.00, n_1 = n_2 = 100, z = -1.705, p > .05$); however, several respondents had low vegetable growing experience. This can be attributed in Punjab to recent changes in farming patterns towards vegetable production as farmers diversify (Singh, 2017); while in Nakuru, it could be attributed to a negative perception of unprofitability in vegetable cultivation due to low farm gate prices; hence fewer farmers diversifying to vegetable production (Abdulai, Nimoh, Darko-Koomson, & Kassoh, 2017).

Operational land holding scores of vegetable growers in Punjab ($Mdn = 2$) differed significantly to that of vegetable growers in Nakuru ($Mdn = 2$), ($U = 3348.50, n_1 = n_2 = 100, z = -5.877, p < .00$); compared to the distribution for land leased, of which there was no significant difference; Punjab ($Mdn = 0$) and Nakuru ($Mdn = 0$), ($U = 4476.50, n_1 = n_2 = 100, z = -1.511, p > .05$). This could be attributed to pressure on land and shrinking land sizes which pushes most to hold marginal farms; a condition far more prevalent in Nakuru than in Punjab. Lack of difference on the farm leased shows that majority of the farmers could be diversifying into vegetable production given their potential as a source of higher income (Mohammad et al., 2020; Joshi et al., 2003; Bashangwa et al., 2020, Mahajan, 2016). Farmers therefore resort to leasing more land to boost productivity.

Annual Income among vegetable growers in Punjab ($Mdn=12$) differed significantly from that in Nakuru ($Mdn=6$) ($U= 1613.00$, $n_1 = n_2 = 100$, $z = -8.529$, $p<.001$)., where majority of the vegetable growers had an income of over 7 lakh compared to Nakuru where the majority earned an income below 4lakh from the vegetable sales. Navjot& Poonam (2014) have reported similar findings of higher income from vegetables in Punjab; while Kealeboga et al., (2017), and Muyanga & Jayne, (2014) reported similar in Kenya. Marketing of vegetables differed between the two countries. Vegetable growers in Punjab ($Mdn=0$) sale of produce to direct consumers, differed significantly compared to that of Nakuru ($Mdn=0$), ($U= 3844.00$, $n_1 = n_2 = 100$, $z = -4.625$, $p<.001$); compared to sale to retailers, ($U= 4232.00$, $n_1 = n_2 = 100$, $z = -2.188$, $p<.05$).Sales to wholesales also differed significantly for Punjab ($Mdn=1$), and Nakuru ($Mdn=0$), ($U= 2742.00$, $n_1 = n_2 = 100$, $z = -6.505$, $p<.001$); compared to sale to exporters in Punjab ($Mdn=0$), and Nakuru ($Mdn=0$), ($U= 4841.00$, $n_1 = n_2 = 100$, $z = -1.082$, $p>.05$); processors in Punjab ($Mdn=0$), and Nakuru ($Mdn=0$), ($U= 4350.00$, $n_1 = n_2 = 100$, $z = -3.717$, $p<.001$); government corporations in Punjab ($Mdn=0$), and Nakuru ($Mdn=0$), ($U= 4650.00$, $n_1 = n_2 = 100$, $z = -2.686$, $p<.001$); and cooperative societies in Punjab ($Mdn=0$), and Nakuru ($Mdn=0$), ($U= 4650.00$, $n_1 = n_2 = 100$, $z = -2.686$, $p<.001$). This shows that there is potential for market expansion to embrace processors and even export.

VEGETABLE GROWERS' PERCEPTIONS OF RISK PERCEPTION

A summary of vegetable growers' perceptions of risks is presented below;

TABLE 3: VEGETABLE GROWERS' PERCEPTIONS OF RISKS

S.NO	Punjab Category	Risk perceived	Ranking	Nakuru Category	Risk Perceived	Ranking
1	Market risks	6.17	1	Market risks	5.41	1
2	Institutional Risks	5.89	2	Weather/ climate change risks	5.12	2
3	Weather/ climate change risks	4.10	3	Production risks	3.85	3
4	Financial risks	3.80	4	Financial risks	3.58	4
5	Production risks	3.65	5	Institutional Risks	3.55	5
6	Human Risks	2.68	6	Human Risks	3.34	6
7	Bio- security threats	1.72	7	Bio- security threats	3.17	7
	$\chi^2_{(6)}=338.733$ $p<.05$			$\chi^2_{(6)}=102.850$ $p<.05$		

Results of the Friedman's analysis indicated that there was a differential rank ordered perception for the seven sources of risks, $\chi^2_{(6)} = 338.733$, $p<.05$ in Punjab and in Nakuru $\chi^2_{(6)} = 102.850$,

$p < .05$. The respondents perceived the most important risk factor both in Punjab and Nakuru as market risk (mean value 6.17 and 5.41 respectively), while the least was bio-security threats (mean value 1.72 and 3.17 respectively). The mean values for the other five risk factors were as follows; 5.89 (institutional risks) in Punjab and 5.12 (weather/climate change risks), in Nakuru; 2.2 (hail) and 2.6 (poor overwintering and spring frosts)

The results indicated that there were significantly more favourable rankings for market risks over all other risks in the two regions, similar to findings by Hardaker et al., (2015) and those from a global review on risk perception study by Duong et al., (2019) which revealed that 55% of the articles frequently mentioned market risks. There was also a highly significant difference in how participants evaluated sources of risks. Bio- security threats, though an emerging risks in agriculture is ranked last, a divergent view from findings by Waage& Mumford (2008) and Duong et al., (2019).

4.4 Influence of demographic characteristics on vegetable growers' risk perception

Results of multiple regression analysis on Table 4 revealed that the variables statistically significantly predicted market risk, $F(9, 90) = 3.358$, $p < .05$, $R^2 = .251$ with one variable (operational landholdings) statistically adding significantly to the prediction, $p < .05$ in Punjab. For Nakuru, the variables also statistically significantly predicted market risk, $F(10, 89) = 5.362$, $p < .05$, $R^2 = .376$, $p < .05$, with two variables (age and land leased) adding statistically significantly to the prediction. The socio personal variables in Punjab did not statistically significantly predict financial risk ($F(9, 90) = 0.625$, $p = 0.773$, $R^2 = 0.059$), whereas in Nakuru, the variables statistically significantly predicted financial risk ($F(10, 89) = 2.139$, $p = .029$, $R^2 = .194$, $p < .05$), with two variables (age, land leased) adding statistically significantly to the prediction.

The variables also did not statistically significantly predict production risk $F(9, 90) = 0.331$, $p = 0.963$, $R^2 = 0.032$ in Punjab, while in Nakuru the variables statistically significantly predicted production risk ($F(10, 89) = 3.963$, $p = .000$, $R^2 = .230$, $p < .05$) with two variables (age and land leased) adding statistically significantly to the prediction. The socio-economic characteristics did not statistically significantly predict institutional risk ($F(9, 90) = 1.070$, $p = 0.392$, $R^2 = 0.097$) compared to Nakuru where the variables statistically significantly predicted institutional risk ($F(10, 89) = 4.150$, $p = .000$, $R^2 = .318$, $p < .05$). Only two variables (age and land leased) added statistically significantly to the prediction.

The socio-economic variables statistically significantly predicted human risk in Punjab ($F(9, 90) = 2.482$, $p = .014$, $R^2 = .199$) and Nakuru ($F(10, 89) = 2.508$, $p = .011$, $R^2 = .220$, $p < .05$) with one variable (age) adding statistically significantly to the prediction in Punjab and two variables (family size and operational land) adding statistically significantly to the prediction in Nakuru. The variables did not statistically significantly predict climate risk ($F(9, 90) = 541$, $p = .841$, $R^2 = 0.051$) in Punjab whereas they significantly predicted climate risk ($F(10, 89) = 2.711$, $p = .006$, $R^2 = .234$, $p < .05$) in Nakuru, with only one variable (land leased for vegetables) adding statistically significantly to the prediction. The socio personal variables did not statistically significantly predict biosecurity risk both in Punjab ($F(9, 90) = .541$, $p = .841$, $R^2 = 0.051$) and in Nakuru ($F(9, 90) = 1.596$, $p = .121$, $R^2 = 0.152$).

Similar findings on age and land significantly predicting perceived risks have been made by Kisaka-Lwayo & Obi (2012) and Nmadu et al., (2012); which significantly differs from those of Borges & Machado (2012) who found that age did not significantly affect farmers' risk perceptions in Brazil.

TABLE 4: RISK PERCEPTION-MULTIPLE REGRESSION ON SOCIO-PERSONAL VARIABLES OF VEGETABLE GROWERS

S. No.	Source of Risk	Punjab			Nakuru		
		R^2	$d.f.$	F, α	R^2	$d.f.$	F, α
1	Market Risks	0.251	(9,90)	3.358, <.05	.376	(10,89)	5.362, <.05
2	Financial risks	0.059	(9,90)	0.625, 0.773	.194	(10,89)	2.139, 0.029
3	Production risks	0.032	(9,90)	0.331, 0.963	.308	(10,89)	3.963, <.05
4	Institutional risks	.097	(9,90)	1.070, 0.392	.318	(10,89)	4.150, <.05
5	Human risks	.199	(9,90)	2.482, 0.014	.220	(10,89)	2.508, .011
6	Climate risks	.051	(9,90)	0.541, 0.841	.234	(10,89)	2.711, .006
7	Biosecurity risks	.098	(9,90)	1.088, .380	.152	(10,89)	1.596, .121

**Multiple Regression*

Comparison Of Vegetable Growers Based On Risk Management Strategies

From the results, majority of vegetable growers in Punjab (77%) and Nakuru (79%) used improved agricultural practices as their risk management strategies, similar to findings by Jin et al., (2015) and Chang & Tsai (2015). Market survey was used by (63%) in Punjab and (62%) vegetable growers in Nakuru. Search for information on diseases, pests and new agricultural technologies proved to be another popular strategy with (17%) vegetable growers in Punjab and Nakuru (27%) engaging in it. Crop diversification, credit facilities as well as crop insurance turned out to be the least used strategies with (4%), (3%) farmers using the first two respectively; while (4%), 15% and (3%) used these strategies in Nakuru.

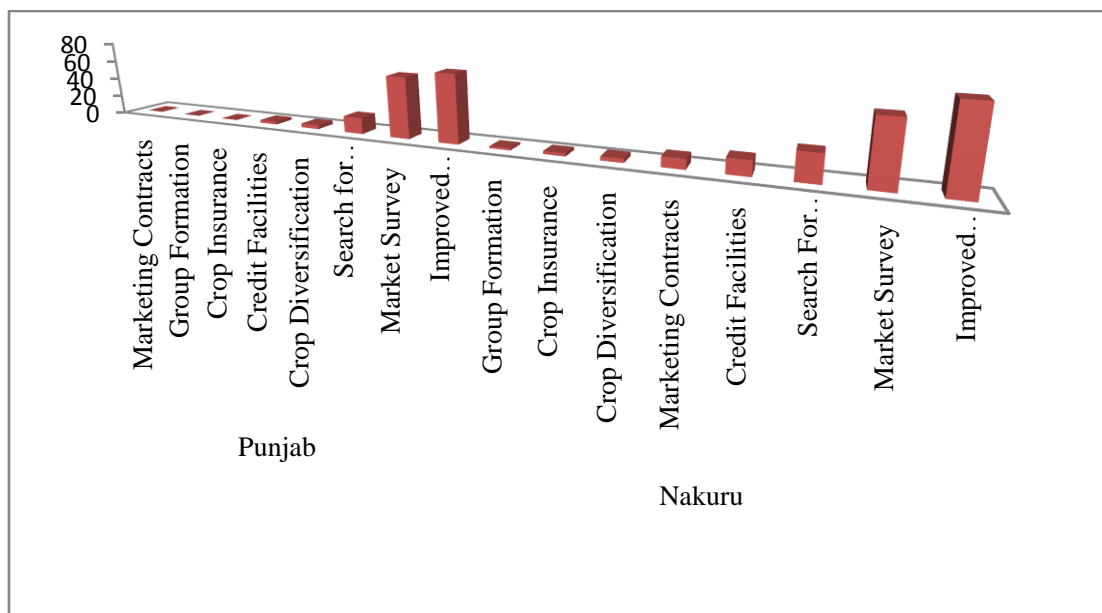


Fig. 1 Distribution of vegetable growers on basis of risk management strategies

BARRIERS TO PERCEIVED RISK MANAGEMENT STRATEGIES

Lack of information on pests and diseases (53%) was the major barrier in Punjab followed, by marketing challenges (50%), lack of access to extension services (31%), lack of access to capital (4%), land fragmentation (1%) and post-harvest challenges (1%). In Nakuru, the majority of vegetable growers experienced barriers from lack of access to capital (57%), lack of information on plants and diseases (47%), lack of access to extension services (27%), marketing challenges (26%), use of conventional farming practices (18%), high production costs (14%), harsh weather (5%), land fragmentation (3%), post-harvest challenges (3%) and labour (2%). Studies which have identified almost similar barriers include Baruwa et al., (2015); Panneerselvam et al., (2011); Harvey et al., (2014), and Ullah, Shivakoti & Ali (2015).

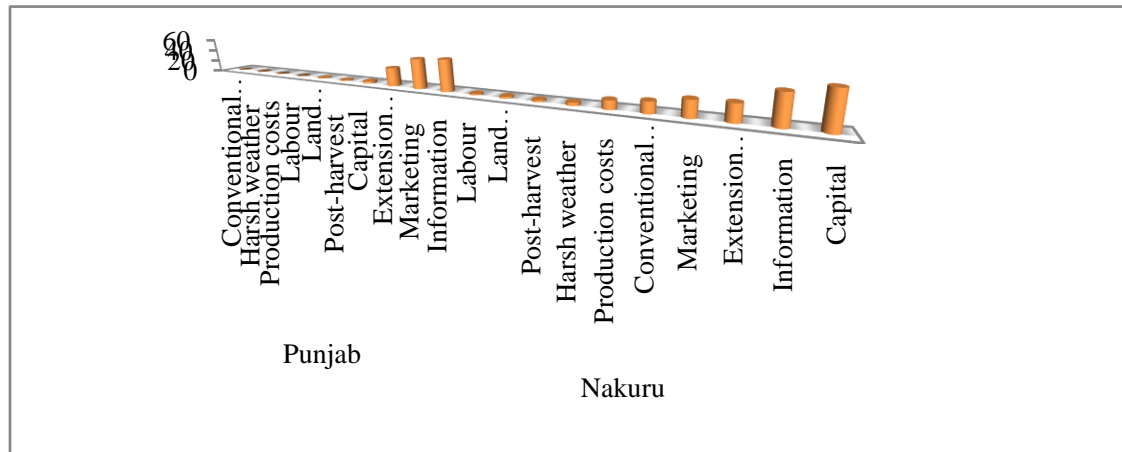


Fig. 2 Distribution of vegetable growers on basis of barriers to risk management

FINDINGS AND RECOMMENDATIONS

Results obtained in this paper have established that vegetable growers from the two regions have almost similar socio-economic characteristics, risk perception and approach to risk management. Vegetable growers still face immense marketing challenges and mostly rely on improved agricultural practices to counter the risks faced. The findings have important implications to policy makers because they reveal the need for new technological innovations to improve agricultural practices; strengthening of marketing services and greater access to extension services. New ideas in risk management strategies such as crop insurance, crop diversification, and marketing contracts are yet to take hold among the vegetable growers. On the basis of this study, it is suggested that it is important to continue supporting current smallholder vegetable growers' ways of managing risk even as the novel ideas through crop insurance, crop diversification and use of market contracts are explored. One way of support could be through strengthening of extension services and access to more information on vegetable cultivation.

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REFERENCES:

- Abdulai, J., Nimoh, F., Darko-Koomson, S & Kassoh, K. F. S., 2017. Performance of vegetable production and marketing in peri-urban Kumasi, Ghana. *Journal of Agricultural Science*, 9(3), p. 202.
- Adebayo, O. O., 2012. Effects of family size on household food security in Osun State, Nigeria. *Asian Journal of Agriculture and Rural Development*, Vol. 2, No. 2, pp. 136-141.
- AGRA., 2017. How stronger market access is helping farmers in Kenya. <https://agra.org/how-stronger-market-access-is-helping-farmers-in-kenya/>. Accessed on 15th July 2021
- Amekawa, Y., Hongsihong, S., Sawarng, N., Yadoung, S & Gebre, G.G., 2021 Producers' perceptions of public good agricultural practices standard and their pesticide use: The Case of Q-GAP for Cabbage Farming in Chiang Mai Province, Thailand. *Sustainability*.13(11), p. 633.
- Anju, D., 2017. Vegetable crops: Risks and Losses Faced by Farmers. *Advances in Research* 12(6), pp. 1-8
- Anonymous., 2014. Levelling the field: Improving opportunities for women farmers in Africa. Washington, DC: World Bank.
- Anonymous., 2016. *Manual on Good Agricultural Practices (GAP)*. Asian Productivity Organization.
- Aseto J., Anggraeni, K & Mburu J., 2020. *Introducing Green Horticulture at Lake Naivasha in Kenya: Local And International Market Analysis Reports*. Nairobi: GOALAN.
- Bala N., 2010. Selective discrimination against women in Indian agriculture - A Review. *Agricultural Reviews*. (31), pp.224 – 228
- Bashangwa, M. B., Mireille, M., Egesa, A. O. Nguetzet, P. M., Vanlauwe, B., Ndimanya, P & Lebailly, P., 2020. Land access in the development of horticultural sustainability: Crops in East Africa. A Case Study of Passion Fruit in Burundi, Kenya, and Rwanda (12), p. 3041.
- Botterill, L., & Mazur, N., 2004. *Risk and risk perception: A literature review*. Kingstrom, ACT: Australian Government Rural Industries Research and Development Corporation.
- Carrer, M., J., Silveira, R. L., Vinholis, M. B., Filho, H., M., 2018. Determinants of agricultural insurance adoption: evidence from farmers in the state of São Paulo, Brazil, *RAUSP*.4, p. 55
- Dercon, S., Hoddinott, J., Woldehanna, T., 2005. Shocks and consumption in 15 Ethiopian villages, 1999–2004. *J. Afr. Econ.*, 14 pp. 559-585
- FAO (2013). Aquastat. http://www.fao.org/nr/water/aquastat/water_use/index.stm
- Flaten, O., Lien, G., Koesling, M., Valle, P.S. and Ebbesvik, M. 2005. Comparing risk perceptions and risk management in organic and conventional dairy farming: empirical results from Norway. *Livestock Production Science*. 95, pp. 11-25.
- Francesco, R., & Hanne K., 2019. *Sustainable food systems through diversification and indigenous vegetables. An Analysis Of the Southern Nakuru County*. Rome: Sustainable Agrifood Systems Strategies (SASS).

Fresh Produce Exporters Association of Kenya (FPEAK)., 2021. *fpeak.org*. Retrieved August 15, 2021, from [fpeak.org: https://fpeak.org/update-on-the-state-of-the-horticulture-industry-in-kenya-2021/](https://fpeak.org/update-on-the-state-of-the-horticulture-industry-in-kenya-2021/)

Gillespie, J & Mishra, A., 2011. Off-farm employment and reasons for entering farming as determinants of production enterprise selection in US agriculture: *Aust. J. Agric. Resour. Econ.* 55, pp. 411–428.

Govil, D. R., 2013. *Dvara Research*. Retrieved August 11, 2021, from [dvara.com: https://www.dvara.com/blog/2013/01/30/why-dont-indian-farmers-grow-more-fruits-and-vegetables/](https://www.dvara.com/blog/2013/01/30/why-dont-indian-farmers-grow-more-fruits-and-vegetables/)

Goodwin, B. K & Mishra, A. K., 2000. An analysis of risk premia in U.S. Farm-level interest rates. *Agricultural Finance Review*. 60, pp. 1-16.

Greiner, R., Patterson, L. and Miller, O., 2008. Motivation, risk perceptions and adoption of conservation practices by farmers. *Agricultural Systems* 99 (2-3), pp. 86-104.

Hardaker, J.B., Lien, G., Anderson, J.R., Hurine, R., 2015. *Coping with Risk in Agriculture: Applied Decision Analysis*, 3rd ed.; CAB International Publishing Company: Wallingford, UK. p. 296.

Harwood, J., Heifner, R., Coble, K., Perry, J & Somwaru, A., 1999. *Managing risk in farming: Concepts, Research, and Analysis*; Department of Agriculture, Economic Research Service, Market and Trade Economics Division and Resource Economics Division: Washington, DC, USA.

Harvey, C.A., Rakotobe, Z.L., Rao, N.S., Dave, R., Razafimahatratra, H., Rabarijohn, R.H., Rajaofara, H & MacKinnon, J.L., 2014. Extreme vulnerability of smallholder farmers to agricultural risks and climate change in Madagascar. *Philos. Trans. R. Soc. Lond., B, Biol. Sci.* p. 369.

Harvey, C.A., Saborio-Rodríguez M., Martínez-Rodríguez M., Viguera R. B., Chain-Guadarrama A., Vignola R., & Alpizar F., 2018. Climate change impacts and adaptation among smallholder farmers in Central America. *Agric & Food Secur* 7, p.57

Heymann, D. L., 2005. Social, behavioural and environmental factors and their impact on infectious disease outbreaks. *J Public Health Policy*. 26, pp.133–139.

Holt, Matthew., & Chavas, Jean-Paul., 2002. The Econometrics of Risk. 10.1007/978-1-4757-3583-3_11.

Huirne, R. B. M., 2003. Strategy and risk in farming. Njas – Wageningen. *J. Life Sci.* 50, p. 249–259.

Ilbery, B., Maye, D., Ingram, J & Little, R., 2013. Risk perception, crop protection and plant disease in the UK wheat sector. *Geoforum* , 50, pp. 129–137.

Jain, R. C. A & Parshad, M., 2006. Working Group on Risk Management in Agriculture for the 11th Five Year Plan (2007–2012). Government of India Planning Commission, New Delhi.

Jankelova, N., Masar, D & Moricova, S., 2017. Risk factors in the agriculture sector. *Agric. Econ. – Czech*, 63, pp. 247-258.

Kisaka-Lwayo, M & Obi, A., 2012. Risk perceptions and management strategies by smallholder farmers in KwaZulu-Natal Province, South Africa. *Int. J. Agric. Manag.*, 1, pp. 28–39.

Komarek, A. M., De Pinto, A & Smith V. H., 2020. A review of types of risks in agriculture: What we know and what we need to know. *Agricultural Systems*, vol. 178, 102738

Legesse, B. & Drake, L., 2005. Determinants of smallholder farmers' perceptions of risk in the Eastern Highlands of Ethiopia. *Journal of Risk Research*, 8(5), pp.383-416.

Lewin, K. M., 2007. *Improving Access, Equity and Transitions in Education: Creating a Research Agenda*. University of Sussex, Falmer, Brighton BN1 9QQ, : CREATE .

Lien, G., Flaten, O., Ebbesvik, M., Koesling, M. & Valle, P.S. 2003. Risk and Risk Management in Organic and Conventional Dairy Farming: Empirical Results from Norway. Paper presented at the International Farm Management Association

Lin, B. B., 2011. Resilience in agriculture through crop diversification: Adaptive management for environmental change. *BioScience*. 61, pp.183–193.

Mahajan, G., 2016. Effect of kodo millet (*Paspalum scrobiculatum*) based intercropping system on yield and economics of kodo millet under rainfed conditions. *New Agriculturist*. 27(1), pp.121-124,

Manik, B. K., & Ghosh P., 2019. The Indian Agro-Sector - vulnerable to Fragile Agro Policies. *International Journal of Engineering & Technology*. 8, pp. 202-205

Mannon, S.E. 2005, Risk takers, risk makers: Small farmers and non-traditional agro-exports in Kenya and Costa Rica. *Hum. Organ.* 64, 16–27.

Marra, M., Pannell, D. J., & Ghadim, A., 2003. The economics of risk, uncertainty and learning in the adoption of new agricultural technologies: Where are we on the learning curve? *Agr Syst*. 75, pp.215–34.

Menapace, L., Colson, G & Raffaelli, R., 2015. Climate change beliefs and perceptions of agricultural risks: An application of the exchangeability method. *Global Environ Chang* 35, pp.70–81.

Mohammad, I., K., Sharad B., & Gaurav M., 2020. Socio-Economic Profile of Vegetable Growers under Horticulture based Module of Farmer FIRST Project in Balaghat (M.P.), India. *International Journal of Current Microbiology and Applied Sciences*, 9, pp.3252-3257.

MunMun, G., & Arindam G., 2014. Analysis of women participation in indian agriculture. *IOSR Journal of Humanities and Social Science*. 19, pp.2279-837.

Munshi, S., 2020. <https://www.weforum.org/agenda/2017/10/indias-women-farmers/>.

Muriithi, B., & Matz, J., 2014. Welfare effects of vegetable commercialization: Evidence from smallholder producers in Kenya. *Food Policy*. 50, pp.80–91.

Musser, W. N & Patrick, G. F., 2002. How much does risk really matter to farmers? In: A Comprehensive Assessment of the Role of Risk in US Agriculture. *Springer*, USA.

Muyanga, M & Jayne, T. S., 2011. Effects of rising rural population density on smallholder agriculture in Kenya. *Food Policy*, vol. 48, pp. 98–113.

Nair, Reena & Barche, Swati. 201). Protected cultivation of vegetables -present status and future prospects in india. Present Status and Future in India. *Indian Journal of Applied Research*. Vol. IV. Issue VI.

Nasim A., Sinha D.K., & Singh K.M., 2018. Productivity and resource use efficiency in wheat: A Stochastic Production Frontier Approach. *Economic Affairs*, Vol. 63, (3), pp. 01-06.

Navjot, S.S., & Poonam, K., 2014. Profitability analysis of vegetable growers vis-a-vis farm size in Punjab, *Journal of Agricultural Sciences*, 5(1-2), pp.11-17

Niles, M. T., Brown, M & Dynes, R., 2016. Farmer's intended and actual adoption of climate change mitigation and adaptation strategies. *Clim Chang* 135, pp. 277–95.

Otieno, O.P., 2019. Women and agriculture in rural Kenya: Role in agricultural production. *International Journal of Humanities and Social Science*. Vol. 1.

Palinkas, Peter & Szekely, Csaba., 2008. Farmers' risk perception and risk management practices in international comparison. *Bulletin of the Szent Istvan University* 47554, Szent Istvan University, Faculty of Economics and Social Sciences.

Pelka, N., 2015. Does weather matter? How rainfall affects credit risk in agricultural microfinance. *Agric. Financ. Rev.* 75, pp.194-212,

Rapholo, M.T & DikoMakia L., 2020. Are smallholder farmers' perceptions of climate variability supported by climatological evidence? Case study of a semi-arid region: In *South Africa International Journal of Climate Change and Strategies Management*, vol. 12, no. 5, pp. 571-585.

Rejesus, R. M., Mutuc-Hensley, M., Mitchell, P, D., Coble, K. H & Knight, T. O., 2013. U.S. Agricultural Producer Perceptions of Climate Change. *Journal of Agricultural and Applied Economics*, pp.701–718.

Singh, Taranjeet., 2017. Issues and Challenges of Indian Agriculture. *International Journal of Research in Engineering, IT and Social Sciences*. 7, pp. 75-78

Singh, D., Prakash, S. & Saroj, P.L., 2006. Impact of perceived characteristic and adoption level of trained trainees in KVK about plant protection measures. *Annals Plant Protection Sciences*. 14 (1), pp. 215- 217.

Singh & Vinay., 2013. Gender participation in Indian agriculture: An ergonomic evaluation of occupational hazard of farm and allied activities. *International Journal of agriculture, Environment and Biotechnology*, pp.157-168.

Sunny, K & Sanjay, K., 2019. Performance of vegetable production in India with special reference to Punjab. *Indian Journal of Agricultural Sciences* 88(7), pp.153-157

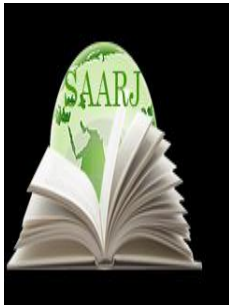
Sulewski, P & Kłoczko-Gajewska, A., 2014. Farmers' risk perception, risk aversion and strategies to cope with production risk: an empirical study from Poland. *Studies in Agricultural Economics*, 116, pp.140-147.

Tudor, K., Spaulding, A., Roy, K & Winter, R., 2014. An analysis of risk management tools utilized by Illinois farmers. *Agricultural Finance Review*. 74. 10.1108/AFR-09-2012-0044.

Ullah, R., Shivakoti, G.P& Ali, G., 2015. Factors effecting farmers' risk attitude and risk perceptions: The case of Khyber Pakhtunkhwa, Pakistan. *Int. J. Disaster Risk Reduct.*

Velandia, M., Jenkins, Amanda & Larson, James & Roberts, Roland & English, Burton & Martin, Steve & Martin, Steven., 2009. Factors Influencing Selection of Information Sources by Cotton Producers Considering Adoption of Precision Agriculture Technologies. *Applied Economics Association*, pp.26-29.

WFP (2015). Kenya Linking Smallholder Farmers to Markets.



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THE EDUCATIONAL DESIGN OF THE MULTIMEDIA LESSON

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ABSTRACT

Pedagogical design-the use of knowledge (principles) about effective educational work (teaching and learning) in the process of design, development, evaluation and use of educational materials. The preparation of such lessons requires even more careful preparation than in the normal mode. Concepts such as the script of the lesson, directing the lesson - in this case, not just newfangled terms, and an important part of the preparation for the training session. Designing a future multimedia lesson, the teacher must consider the sequence of technological operations, forms and ways of presenting information on the big screen.

KEYWORDS: Lesson, Development, Language, Subject, Pedagogical, Design, Technologic, Multimedia.

INTRODUCTION

The lesson, as a direct tool for the implementation of the basic ideas of information and communication technologies, requires the most careful development. It is the lessons that are the litmus test that show the effectiveness of a particular development. This is both the final result and the last stage of design, implementation of ideas laid down by the developers of certain technologies.

The preparation of such lessons requires even more careful preparation than in the normal mode. Concepts such as the script of the lesson, directing the lesson - in this case, not just newfangled terms, and an important part of the preparation for the training session. Designing a future multimedia lesson, the teacher must consider the sequence of technological operations, forms and ways of presenting information on the big screen. It is worth immediately thinking about how the teacher will manage the educational process, how pedagogical communication will be provided at the lesson, constant feedback from students, developing the effect of learning.

Relevance and current status of the topic: A multimedia lesson is a lesson that uses multimedia representation of information using technical means, primarily a computer. In numerous articles devoted to this topic, the expression "lesson with multimedia support" is often found. It is quite obvious that this is the name of a lesson where multimedia is used to enhance the learning effect. In this lesson, the teacher remains one of the main participants in the educational process, and often the main source of information. At any time, the teacher can use hyperlinks to go to the details of the information, "revive" the studied material with the help of animation and so on.

It is obvious that the degree and time of multimedia support for the lesson can be different: from a few minutes to a full cycle. However, a multimedia lesson can also act as a "mini-technology", that is, as a teacher-prepared development with specified educational goals and objectives, focused on quite specific learning outcomes. This lesson has a sufficient set of information component, didactic tools. The role of the teacher who in this case is, first of all, the organizer, the coordinator of cognitive activity of pupils significantly changes at its carrying out. Conducting a lesson in the mode of mini-technology does not mean that the teacher is deprived of the possibility of maneuver and improvisation. It will not be surprising that such a lesson can play with new faces, pass more attractive, interesting, and dynamic. But the lesson is a mini-technology implies a significant reduction of "pedagogical marriage".

When designing a future multimedia lesson, the developer should think about what goals he pursues, what role this lesson plays in the system of lessons on the studied topic or the entire training course. What is the multimedia lesson for?

- To study new material, presentation of new information;
- To consolidate the passed, working out educational skills;
- For repetition, practical application of the acquired knowledge, skills;
- For generalization, systematization of knowledge.

It is necessary to determine at once: thanks to what the training and educating effect of a lesson will be strengthened that carrying out a multimedia lesson did not become just a tribute to newfangled Hobbies. Based on this, the teacher must choose the forms and methods of the lesson, educational technology, teaching techniques.

Experimental Part: In the study of new material. It allows you to illustrate a variety of visual AIDS. The application is particularly beneficial in cases where it is necessary to show the dynamics of any process.

When checking the front independent work. Provides along with oral visual control of the results. When solving problems of educational nature. Helps to execute the drawing, to make the decision plan and to control intermediate and final results of independent work on this plan

A means of emotional relief. During the block lessons or long consultations before exams-it is necessary to include video sequences of experiments or cartoons at the same time the students disappear fatigue, there is interest, they are looking for answers, turn to the teacher with questions, charged with new energy. Multimedia programs look like a video, but with the ability to intervene in the course of action and dialogue.

Analysis of the Results: As a means to making distributing didactic material, codogram and cards. Personal computer in the hands of teachers, in addition to the scanner and printer is a mini-printing office of a teacher.

In educational activities, the use of the computer is possible in three forms, 1) the machine as a simulator, 2) the machine as a tutor, performing certain functions for the teacher, and such that the machine can perform better than a person. 3) a Device that simulates a certain environment and the actions of specialists in it.

Training systems are most appropriate to apply to consolidate previously acquired skills. Tutoring systems are best used provided that the goals and objectives of training are clearly defined. Simulation training modeling is most suitable when the training material is not systematic and its boundaries are not clearly defined.

When using a multimedia presentation, it can be used in a classroom system or use new models of its application.

It is possible to note a method of projects as the most perspective pedagogical technology which allows to open most fully creative abilities of trained, to form ability to be guided in the huge sea of information, focusing attention on the main thing, to take responsibility and to make decisions.

Of course, the method of projects requires the highest qualification of the teacher, creative approach to the school curriculum, and the ability to aggregate knowledge in several subjects and, of course, organizational skills. The use of information technology in the project at school and, of course, in the development of materials for it, was decisive, breathed new life into the well-known design methodology for a long time. The main components of the project method are the research work of schoolchildren and the evaluation of this activity

Of all the tools of cognition, multimedia is the best way to represent knowledge in a variety of ways, including all the modalities of perception. Working with multimedia tools, students have at their disposal a rich Arsenal for self-expression of the studied material. Multimedia implements a more creative approach to the process of assimilation and presentation of knowledge.

The system of training, in which students acquire knowledge and skills in the process of planning and implementation of gradually increasing complexity of practical tasks-projects. One of the personality-oriented technologies, a way of organizing independent activities of students, aimed at solving the problem of the educational project, integrating the problem approach, group methods, reflexive and other techniques.

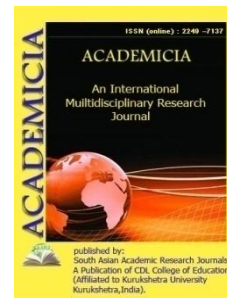
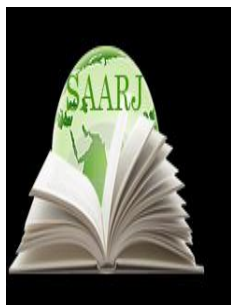
CONCLUSIONS

In our opinion, the most progressive possibilities of multimedia are to use them in the educational process as an interactive multi-channel learning tool. Research, project approach in the system of education, development of their own multimedia / hypermedia projects, constant use of multimedia for educational purposes in all blocks of disciplines of General cultural and subject training, allow to transform the traditional learning process into developing and creative. Information technology allows students to give a unique opportunity to learn a new concept independently of the teacher, to notice a pattern, to put forward their own hypothesis, to feel how

mathematical questions arise. The ability to use the method of projects-an indicator of high qualification of the teacher, his progressive methods of teaching and development of students.

REFERENCES:

1. Diakonova O. O. "Edutainment in teaching foreign languages" / / Foreign languages at school-2013 - № 3-p. 58-61
2. Gradina N. L., Martirosyan Z. H. As "Professor Higgins" helps to study English language // Foreign languages at school - 2002 № 6 - p. 96
3. Kanaeva V. M., Agapova S. G. from the experience of the creative group of teachers on the problem: "Computerization of the educational process at school" / / Foreign languages at school-1992 - № 3-4-p. 86-88
4. Karamysheva T. V. Learning foreign languages using a computer. In questions and answers. - SPb.: Soyuz Publishing House, 2001. - 192 p.
5. Korenkova M. M., I. A. Malinina "the use of multimedia means of teaching English". Department of foreign languages, HSE Nizhny Novgorod.
6. Krivanek O. I. "Multimedia technologies in teaching foreign languages" <http://ito.edu.ru/2008/MariyEl/III/III-0-16.html>
7. Malyukova N., Solomahina I. A. "the Use of multimedia in foreign language teaching" <http://festival.1september.ru/articles/212523/>
8. Gorelov I. N., Sedov K. F. Fundamentals of psycholinguistics. – M., 1997. – P. 172-174



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THE CONCEPT AND APPLICATION OF "ABBREVIATION" IN ENGLISH AND UZBEK

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ABSTRACT

An abbreviation (from Latin brevis, meaning short) is a shortened form of a word or phrase. Usually, but not always, it consists of a letter or group of letters taken from the word or phrase. For example, the word abbreviation can itself be represented by the abbreviation abbr., abbrev. or abbrev. Abbreviations can be simple or complex. Simple abbreviations are formed by dropping the ending or starting syllables of the stem. For example: caps (capital letters), demo (demonstration), intro (introductory sentence) is the first sentence of a newspaper article that should immediately interest the reader ad (advertisement).

KEYWORDS: *Abbreviation, Much Information, Phrase, Initial Abbreviations, Graphic Abbreviations.*

INTRODUCTION

Abbreviations can be simple or complex. Simple abbreviations are formed by dropping the ending or starting syllables of the stem. For example: caps (capital letters), demo (demonstration), intro (introductory sentence) is the first sentence of a newspaper article that should immediately interest the reader ad (advertisement).

Compound abbreviations (compound abbreviations) are formed by the action of abbreviation and base composition and consist of the initial letters or syllables of words and stems or from a combination of them with full stems. For example: CND (Campaign for Nuclear Disarmament); PA system (public address system); Interpol (International police); hi-fi (high fidelity); sci-fic (science fiction); V-Day (Victory Day).

Russian linguist E.M. Dubenets distinguishes two main types of abbreviations: graphic abbreviations and lexical abbreviations.

Graphic abbreviations are the result of abbreviating words and phrases only in written speech, while in oral speech, the corresponding full forms are used. They are used to save space and enhance writing.

The oldest group of graphic abbreviations in English is of Latin origin. Here, contraction occurs when writing Latin words. While orally relevant English equivalents are pronounced in full: e.g. - for example (Latin *exempli gratia*), a.m. - in the morning (*ante meridiem*), No - number (*numero*). In some cases, the initial letters are pronounced, for example, a.m. [ei 'em]. p.m. [pi: 'em] etc.

Some graphic abbreviations of Latin origin have different English equivalents in different contexts, for example p.m. can be pronounced as in the afternoon (*post meridiem*) and after death (*post mortem*).

There are also graphic abbreviations of words and phrases and corresponding English equivalents in full form. There are several such semantic groups of them:

- a) Days of the week, for example, Mon - Monday, Tue - Tuesday, etc.
- b) The names of the months, for example, Apr - April, Aug-August, Sep - September, etc.
- c) County names in the UK, eg Yorks - Yorkshire, Berks - Berkshire, etc.
- d) names of states in the USA, for example, Ala - Alabama, Alas - Alaska, Calif-California, etc .; addresses such as Mr, Mrs, Ms [miz], Dr, etc .;
- e) Military ranks, for example capt - captain, col -colonel, sgt - sergeant, etc .;
- f) Scientific degrees, for example. BA - Bachelor of Arts, DM - Doctor of Medicine. (Sometimes in scientific degrees there are abbreviations of Latin origin, eg MB - *Medicinae Baccalaurus*);
- g) Units of time, length, weight, for example f./ft -foot / feet, sec. - second, in. - inch, mg. - milligram, etc.

The reading of some graphic abbreviations depends on the context, for example m. can be read as: male, married, masculine, meter, mile, and million, minute; l.p. can be read as long-playing, low pressure.

Initial abbreviations stand between graphic and lexical abbreviations.

The initial abbreviations are pronounced differently. Very often they are pronounced as in their language of origin, for example. ANZUS (Australia, New Zealand, United States) are pronounced in Russian as ANZUS; (UFO - UFO).

There are three types of initial abbreviations in English:

- a) letter-reading initials such as UK (United Kingdom), B UP (British United Press), etc .:
- b) Initial abbreviations that read like words, for example, UNESCO (United Nations Economic, Scientific, Cultural Organization), OPEC (Oil Producing European Countries), etc .:
- c) Initial abbreviations that match English words in their sound form. Such initial abbreviations are called acronyms, for example NOW (National Organization of Women), AIDS (Acquired Immunity Deficiency Syndrome).

In English abbreviations, the last letters can be both consonants (math, chimp) and vowels (divi, demo).

English abbreviations may undergo spelling and phonographic changes (mike - microphone, telly - television).

Individual abbreviations may show the ability to further word formation: telephone - phone - phony

Abbreviations can act as components of complex words, for example, labware - laboratory ware.

Abbreviated words can take on grammatical changes, such as plural: dems - democrats.

Abbreviations are widely used in many areas of our life. These are science, technology, technology, bibliography, units of measurement, messages by phone and e-mail. But it is necessary to take into account certain features of the use of abbreviations.

The rapid development of the media in the United States and England at the turn of the XX - XXI centuries. have left their mark on the language structure of headings, making it more flexible and modernized. Quality newspaper headlines reflect the law of saving space.

Newspaper headlines are another great source of English acronyms. The prevalence of abbreviations in newspaper headlines is apparently due to several reasons: economy of space, the desire to influence the reader with the unusual and expressive headlines, the desire to interest and sometimes intrigue the reader. It is interesting that very often the word used in the title in an abbreviated version is given in full in the text. For example, the headline reads: Lift ads ban - ex-Minister. In the text under this heading we find: The Government should lift its ban on advertising in the Morning Star, former Minister told a meeting.

The acronyms most frequently encountered in the English press can be divided into several main groups. The first and largest group includes abbreviations for the names of parties, trade unions, various kinds of organizations and positions: NLRB = National Labor Relations Board = National Labor Relations Board);

In the headlines of English newspapers, in addition to abbreviations of the names of domestic organizations, abbreviations of the names of international organizations are often used, such as, for example: U.N. - United Nations; NATO - North Atlantic Treaty Organization; WFTU - World Federation of Trade Unions.

It should be remembered that many abbreviations often have two or more meanings. For example, OAS can mean the Organization of American States - the Organization of American States - the OAS or the terrorist organization of the French ultra OAS. The abbreviation MP can mean Member of Parliament - a member of the House of Commons; RM - Prime Minister - Prime Minister or Police Magistrate - judge of a police court, etc. translation.

The second group of abbreviations most often found in the headlines of English newspapers are abbreviations of surnames or familiar nicknames of famous political or public figures. Such abbreviations significantly complicate the understanding of headings and, with rare exceptions (FDR - Franklin Delano Roosevelt; GBS - George Bernard Shaw; RLS - Robert Louis Stevenson), are hardly registered in dictionaries.

The third group of abbreviations that are very common in headings are abbreviations for geographic names. They are especially common in American newspapers. Abbreviations of this group in a number of cases make it difficult to understand the title, in particular, when it is difficult to establish whether we are dealing in this case with an abbreviation of a geographical name or with an abbreviation of, say, the name of an organization.

A distinctive feature of abbreviations of geographical names is that in most cases the letters in them are separated by periods, or after the entire abbreviation, a period is put, which, as a rule, is not observed in abbreviated names of organizations. Here are some examples: S. P. - South Pacific, Ga. - Georgia, Conn. - Connecticut, L. A. - Los Angeles, SF - San Francisco.

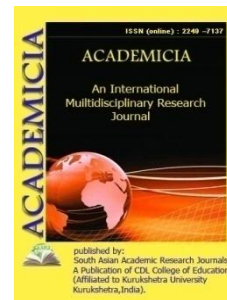
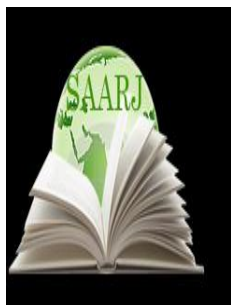
The three main groups discussed above do not exhaust the whole variety of abbreviations found in the headlines of English and American newspapers. In fact, they can also be abbreviated to any words or phrases, sometimes quite unexpected. Such abbreviations can be very difficult to understand and translate the title, since there is practically nothing to be guided by when decoding them and it remains entirely and completely to rely on the fact that the context either contains the decoding, or makes it possible to guess which word could be abbreviated.

Thus, the law of space saving and information compression in modern English and American newspapers leads to the frequent use of abbreviations.

This means that English abbreviations have become firmly established in our life, we actively use them in our speech, but we do not always understand their meaning.

REFERENCES:

1. Амосова Н.Н. Основы английской этимологии. Л., 1963
2. Апресян Ю.Д. Лексическая семантика. - М., 1974
3. Арнольд И.В. Стилистика современного английского языка. - М., 1973
4. Звегинцев В.А. Семасиология. - М., 1957
5. Кубрякова Е.С. Что такое словообразование? - М., 1965
6. Кунин А.В. Фразеология современного английского языка. - М., 1970
7. Маковский М.М. Английская этимология. - М., 1986
8. Телия В.Н. Типы языковых значений. Связанное значение слова в языке -
9. M.Akhmanova O. Lexicology. Theory and Method. - М., 1972 Baugh A.C. and Cable T.A. History of the English Language, London, 1978



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GRAMMAR AND STYLISTIC CHARACTERISTICS OF PAIR WORDS IN MODERN GERMAN AND UZBEK LANGUAGES

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ABSTRACT

The present work provides a quick insight into the problem of phraseology in its theoretical part, briefly dealing with its definition, its main features and the classification of phraseologisms. I pay more attention to the characteristics of the considered word pairs, where I mainly follow the terminology, partial classification and the syntactic and semantic structure.

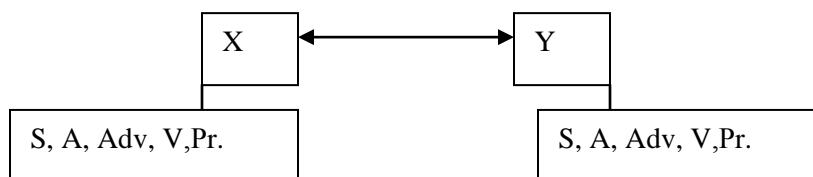
KEYWORDS: *Word Pairs, Phraseology, Linguists, Twin Formulas, Dictionary.*

INTRODUCTION

When classifying a word grammatically, it is important to note first of all the importance of its component, which word group-specific word-forming and modifier suffixes and prepositions it can accept, as well as its function in the sentence. In German, nouns are formed from nouns, adjectives, verbs, adverbs, and rhymes. Although a pair of words belongs to a particular word group, it has grammatical norms specific to that group and comes as a part of speech.

Accordingly, when it comes to the grammatical structure of a pair of words, it is understood that the affixes that are common to both components of a pair of words are not primitive or artificial, but the addition of one or both components of the pair of word components. It is advisable to classify the pairs of words in order to analyze them more accurately. For example: Freund und Feind We define the first component as Freund (X), the second component as Feind (Y). The

conjunction that connects the two words is given by the words und, oder, weder... noch, von... bis. The result is a schematic. It is known that, as mentioned above, a pair of words is formed in a horse word group, and they consist of two horses. Pairs of nouns in general - Substantive (S), adjectives in pairs - Adjective (A), pairs of words in pairs - Adverb (Adv), verbs in pairs - Verb (C). From this comes the following formula for a pair of words.



Word groups play an important role in the grammatical classification of pairs of words in German. Pairs of words are related to words that belong to the same noun phrase.

The word Feuer und Flamme is translated into Uzbek as завқ – шавқ, ўт – олов. Both the word “das Feuer” and the word “die Flamme” mean “ўт”, “олов”, “гулхан”, “оташ” and they differ in a single genus, but both words belong to the horse family.

Pairs consisting of nouns are not only used with a few prepositions, but there are pairs of words that come with all prepositions. For example: with Haut and Harr, with Stock and Stein, with Dach and Fach, with Strich and Faden, with Gift and Galle, with Tau and Tag, with Nacht and Nebel, with Ort and Stelle.

Prepositions always precede a pair of words belonging to the noun phrase. However, in German, the occurrence of prepositions in adjectives, adverbs, and rhymes is rare.

In the Uzbek language, pairs of adjectives consist of antonyms. Many pairs of adjectives are formed through additions. For example: азоб-уқубатли, сабр-тоқатли. – ик, - иқ, - ук, -with the addition of such adjectives as аччиқ-чучук, иссиқ-совуқ, эгри-бугри. In some pairs of adjectives, the pair is added to an additional second component that is common to both components of the word.

If we analyze the content of pairs of words in depth, prepositions and conjunctions play an important role in the formation of pairs of words in German, but in Uzbek there is no preposition, so the formation of pairs of words with the addition of affixes determines the differences between pairs of words.

In German, a pair of words grammatically forms a pair of words from all categories, but this aspect is the same in Uzbek. But now that science and technology are advancing all over the world, the development of languages is no exception. Even some languages are being shortened on the basis of computer language. In the process, both the language and the vocabulary, as well as the pair of words that are part of it, are enriched and expanded.

Even in modern German, because double words are considered expressive language units, they all have a clear meaning and perform a certain stylistic function. They serve to reinforce meaning. For example: zittern und zagen - қалт-қалт титрамоқ, to be in a very frightened state or situation. fix und fertig маст бўлиб таппа-тайёр бўлмоқ. This pair of words describes the condition of a person who is drunk. null und nichtig means to try in vain, in vain, to try to do

something but to no avail, to try in vain. This pair of words also performs a certain stylistic function in the sentence because they are stylistically expressive.

It is also possible that a pair of words comes within its own meaning in a sentence and does not acquire a portable meaning. But not all pairs of words have a figurative meaning. For example: *Leben und Tod* we do not see an amplified and exaggerated meaning in the word life-death pair, because the phraseological meaning is not hidden behind this pair of words. The same phenomenon can be seen in the word *arm und reich* rich-poor couple. These include double words such as *Himmel und Erde*, *Haus und Hof*, *einzig und allein*, *frisch und munter*, *gut und böse*.

It is known that in the Uzbek language, in the colloquial language, in the folklore there are many *lapars*, *termas* and *olans*. A pair of words can be found in each *lapar* or *olan* verse. For example:

Ҳай-ҳай ўлан, жон ўлан,

Ўлан айтинг ёр-ёр.

Келин-куёв пойларига,

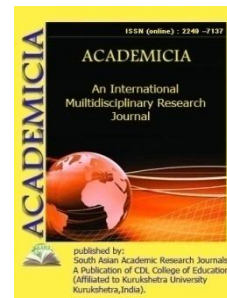
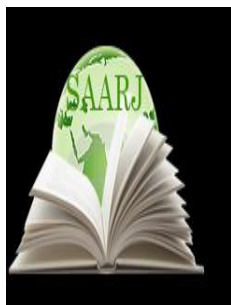
Тилло сочинг ёр-ёр.

The pair of words began to be used in German prose as early as the 15th century. From this period onwards, the emergence of double words was a topical issue. This process in the middle Ages led to the emergence of various phraseologies in German. Many pairs of words are considered ancient. Their origin dates back to the middle Ages, for example: *Hülle und Fülle* in Uzbek means “тўкин-сочин”, “мўл-кўл”. This pair of words existed in the 16th century. At the same time, in this century, the *Kleidung und Nahrung* form of this pair of words appeared, expressing similar meanings of “мўл-кўл”, “икки-бири”. But there is a big difference between the two pairs of words above, one is expressed in a positive sense and the other in a negative sense. For example, the word *Hülle und Fülle* has a positive meaning. Because this double meaning is used to describe qualities such as more fertility, abundance, a prosperous life, a symbol of life.

The word *Kleidung und Nahrung* has a somewhat negative connotation. This pair of words combines meanings such as eating and drinking only for the greedy, and dressing modestly even though it does not fit their body. The word *Krethi und Plethi* is also ancient. In Uzbek it means *қаланғи-қасанғи*. More precisely, the history of the origin of this double word dates back to the I century AD. But today this pair of words is rarely used. It has been speculated that the negative connotation of the word *Krethi und Plethi* occurred centuries later. In fact, in the west, the king's peculiar guards were called *Krether und Plether*. The word *gand und gäbe*, which means “расм-русм”, “урф-одат” in Uzbek, was first used in the 13th century by Rerkhov Ayke's *Sashsenspiegel* and later by Martin Luther. In fact, these two adjectives are derived from the vocabulary used in the daily lives of traders. The meaning of the word *gang* is the price of a commodity in a coin account, i.e. a sign of a constant price. The phrase *Gabe* is derived from the verb *geben*, meaning “нимабераолишимумкин”. But since the original meaning of these two words depends on the price, and so that it does not change, these two words have become “tradition”, “habit”. In modern German, these two words form a pair of words.

REFERENCES:

1. Agricola Erhard, (1968), «Wörter und Wendungen», Leipzig, c.791-793
2. Akhmanova O.S. Dictionary of linguistic terms.–Moscow:Encyclopedia, 1969, 165.
3. Hähnel Ernst, (1995), «Zur Wörtlbildung und Wortbedeutung», Leipzig, c.89-93
4. Imyaminova Shuxrat Salijanovna, (2008), «Nemis va o'zbek tillarida juft so'zlar», Toshkent, 2008. c. 4-18
5. Iskos A., Lenkova A, (1975), «Lesestoffe zur deutschen Lexikologie», Leningrad,c.150-162
6. Reformatskiy A.A. Introduction to Linguistics. –Moscow: Aspect Press, 2004, 128.
7. Rudi Konrad. Lexikon der sprachwissenschaftliche Termini, VEB. Bibliographisches Institut, Leipzig, 1988, 96.
8. The same and other idioms: Annelies Herzog, Arthur Michel, Herbert Riedel. Deutsche idiomatische Wendungen für Ausländer. VEB, Verlag Enzyklopädie, Leipzig, 1976.



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METHODOLOGY OF ORGANIZATIONAL CAPACITY DEVELOPMENT IN GIFTED CHILDREN

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ABSTRACT

The article describes methods for the development of organizational skills in gifted children, the structure of organizational skills, ways of forming organizational skills. A tendency to organizational activities as a property, on the one hand the need for psychological readiness and group activity, on the other hand, prosperity in the process of its implementation. These changes have affected the learning process. Because it is impossible to develop a society in all its aspects without setting up an educational process.

KEYWORDS: *Assimilate The Task, Ability, Ability, Organization, Physically And Mentally, Organizational Ability.*

INTRODUCTION

In the strategy of actions on five priority directions of development of the Republic of Uzbekistan in the item "Priorities of development of the social sphere", the fifth - "Improvement of the state youth policy": support and development of creative and intellectual potential of the young generation to promote the formation of a healthy lifestyle among children and youth, their widespread involvement in physical culture and sports; to support and realize the creative and intellectual potential of the younger generation, to form a healthy lifestyle among children and youth, to involve them in physical culture and sports, to develop the talents and aspirations of children in our country. provides for the implementation of comprehensive work aimed at raising the standard.

After the independence of our republic, many radical changes have taken place in the life of our people. These changes have affected the learning process. Because it is impossible to develop a society in all its aspects without setting up an educational process. Because the development of

society in many respects depends on the level of education, consciousness and upbringing in terms of morality.

A child's success in school depends in many ways on his or her level of preparation for school. The child must first be physically and mentally ready for school. That is, a child's successful schooling depends not only on his mental and physical preparation, but also on his personal and socio-psychological preparation.

Without developing students' talents and thinking, it is impossible to develop their communicative and organizational skills and abilities. Talent is a system of mental development throughout life. Talent is observed in the successful completion of this or that activity. Talent is a specific form of ability that ensures the successful completion of an activity, ensures the compatibility of abilities, and serves to fill gaps in other abilities.

Organizational ability is a set of qualities that help manage group activities as a special ability. Gifted children show significant social activism, responsiveness, organizational skills.

Well-known psychologist LIUmansky (1921-1983) during his many years of experimental research on the development of problems of organizational activity and organizational skills found that identified and described psychological features.

LI Umansky included the following components in the structure of organizational (special) skills:

Psychological selectivity is the ability to reflect psychology most fully and deeply in an organized group in the process of solving a common group problem that includes interpersonal relationships and the psychological characteristics of the group as a whole. The practical psychological direction of the mind, that is, the acquisition of practical psychology, the readiness to apply information about psychological phenomena to the practice of solving group problems.

Psychological tact is the ability to maintain a sense of proportion in relationships with others, to act in accordance with them and their psychological characteristics. To this must be added sensitivity, a sense of objectivity, compassion for others.

Social energy is the ability of an organizer to infect and charge his energy to the stewards, to create in them feelings and willful actions.

Strictness and criticism is the ability to identify and express the conditions established by the task of the group, as well as the established norms (including the norms of the group) that are important for joint activities. A tendency to organizational activities as a property, on the one hand the need for psychological readiness and group activity, on the other hand, prosperity in the process of its implementation.

Each of the above features is a specific syndrome, manifested in a number of symptoms.

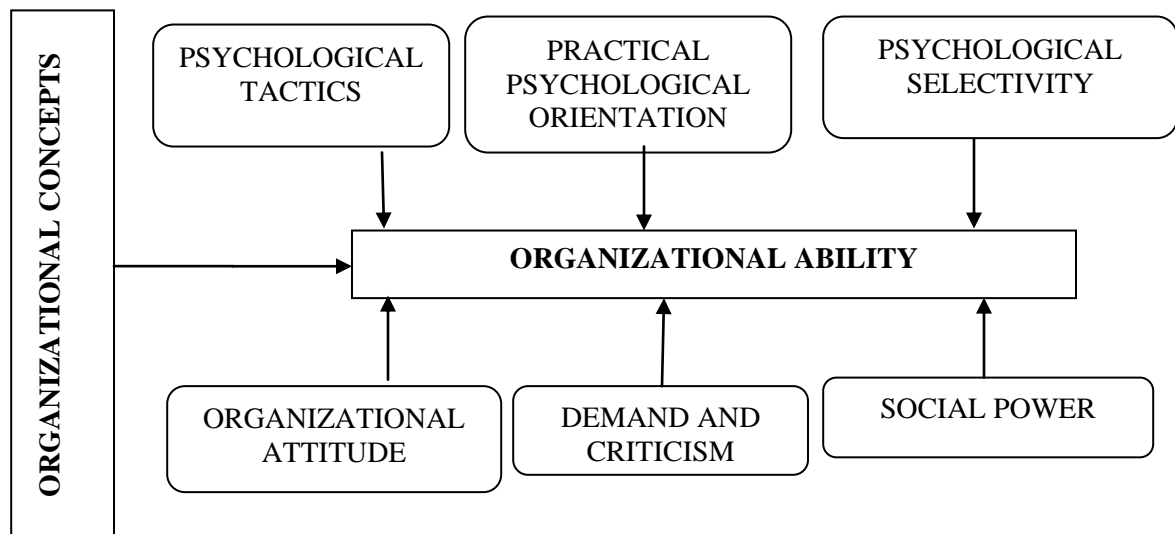
It is important to distinguish between the concepts of "manager" and "organizer" in defining the organizational skills of gifted children, because according to L.I. Umansky, every organizer is a leader, but not every leader is an organizer. The object of the organizer's work is to influence a particular social community - to influence a small group that he or she is motivated to unite to solve a specific group task in a particular social situation in a collaborative setting.

Structure of organizational activity:

1. Assimilate the task
2. Selection of small organizers and organizers
3. Introduce the organization to the task. Group decision making
4. Identify material resources, time and space conditions.
5. Planning based on optimal data.
6. Distribution of responsibilities. Determining the form of organization.
8. Internal coordination and communication.
9. Work with small organizers.
10. Final analysis of the task and performance evaluation (individual and collective)

2.2.1. picture

Structure of organizational skills



Gifted children are characterized by higher organizational skills than normal children. Educators and psychologists need to identify gifted children in school and carry out developmental work with them. Organizational features to be formed in gifted children - the ability to organize activities; communication skills, practical intelligence, ability to infect and activate others, critical thinking, politeness, initiative, assertiveness towards oneself and others, self-control, perseverance. There are a variety of methods for developing organizational skills in gifted children, the best of which are psychological trainings.

Exercises to develop organizational skills in gifted children:

Organizational skills are not a separate thing, they include advanced general skills and are necessary for a particular type of activity. Therefore, the following general exercises can be suggested to develop them.

Be confident

We recommend doing this exercise with someone and in front of an audience. The bottom line is that you and your partner are hiding some shapes (toys, anything) behind you. The challenge is to convince your audience that you have a clear goal and that you will achieve it. The winner is the one who can convince the audience.

Time distribution

Make a to-do list for the evening in the evening, learn to get up early, make a schedule, and stick to it. Teach yourself to be tidy at work, at your computer desk, in your closet at home. Configure and save this mode.

Factors affecting the organizational ability of gifted children.

1. Authority. This is a key quality that an organizer should have. It is necessary to ensure that the tasks are performed without hesitation. Typically, other members of the group follow the example of more organizers. A trustworthy person who can behave in dealing with teammates is the best motivator.
2. Conflict resolution. Properly selected methods of influencing different partners in the structure of organizational skills alleviate acute situations, have a positive effect on the psychological climate and communication culture.
3. Perseverance. Organizational skills cannot be imagined without control and determination. Partners, it is very important to immediately suppress the laziness in the group, and the talented, organized student himself is simply obliged to set an example for them. Peers should be politely explained that disobedience to their teammates can lead to punishment.
4. Incentives. Often the services of different activity partners are not taken into account. Either way, no matter how you celebrate your success in person or in public, you should also pay attention to the success of your partners. Otherwise, those in the group lose motivation to work at full capacity. By praising the team members, the whole team strives to excel, perform tasks better, and not break discipline. Incentives don't have to be material, some value personal praise and a diploma more.
5. Delegation of powers. It is not effective for one person to take full responsibility. In this case, confusion occurs and the quality of the tasks performed is not as expected. The smartest option is group activity.
6. Response to criticism. A person who is calm about criticism does not take everything personally. Listen to others, evaluate their thoughts, ideas, possible corrections. According to experts, this can lead the group to great success.
7. Get rid of excess. The skills of the organizers include the ability to clean up the excess. It is important to keep the situation under control while avoiding excessive freedoms. The organizer should also value the time of himself and others.

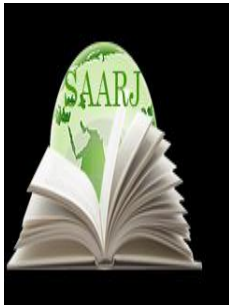
The following recommendations are suggested for the development of organizational skills in gifted children:

- practicing emotions in front of a mirror - helps to properly convey or hide emotions - depending on the specific situation;

- written work planning - time allocation allows you to develop the habit of implementing plans, as well as eliminates delays;
- Singing - an exercise to adequately convey emotions, when a person asks himself questions and answers them, says words;
- Improving communication skills by initiating personal conversations with acquaintances.

REFERENCES:

1. Baratov Sh.R. Basics of psychological service in education. - Tashkent: BuxDU, 1999. - What? 77-85.
2. Bodalev A.A., Stolin V.V. General psychodiagnostics. - St. Petersburg, 2000. - 440 p.
3. Golubeva E.A. Abilities and individuality. - M.: Prometheus, 1993– - 114 p.
4. Davletshin M.G. The basics of young periods and pedagogical psychology. - Tashkent: TDPU, 2006. – 43 p.
5. Umansky L.I. Psychology of organizational activity of schoolchildren. Moscow, Prosveshchenie, 1980. - 160 p.
6. Sharafutdinova, Khadichaxon Gulyamutdinovna. "Destruction of family relations psychoprophylaxis family-neighborhood-educational institution cooperation." *ACADEMICIA: An International Multidisciplinary Research Journal* 10.11 (2020): 1000-1007.
7. Gabbazova, Dilfuza Ruzikulovna. "Analysis Of Factors Of Mental Development." *Scientific Horizons* 11-1 (2018): 350-355.
8. Babamuratova, Zarnigor, and Dilfuza Ruzikulovna Shabbazova. "The Views Of The Great Thinkers Of The East On The Upbringing And Perfection Of Man." Editorial Board: Editor-in-Chief (founder) IP Any Maxim Vladimirovich, Candidate of Economic Sciences (2019): 19.



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A REVIEW ON NETWORKING AND INNOVATION

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ABSTRACT

The significance of corporate networking for innovativeness has been highlighted in recent competitiveness research. Until recently, there was a lack of understanding of the mechanics of this connection. This article provides a comprehensive assessment of evidence that links a firm's networking behavior to its ability to innovate. Risk sharing, gaining access to new markets and technologies, speeding products to market, pooling complementary skills, safeguarding property rights when complete or contingent contracts are not possible, and acting as a key vehicle for obtaining access to external knowledge are among the main benefits of networking identified in the literature. The data also shows that companies that do not collaborate and do not officially or informally share information restrict their knowledge base in the long run, reducing their capacity to engage into exchange partnerships. National innovation systems, in terms of the way they influence networking activity, play a significant role in the spread of innovations on an institutional level. The data presented in the article suggests that network connections between suppliers, consumers, and intermediaries such as professional and trade organizations have a significant impact on innovation and productivity. Inter-firm conflict, displacement, lack of scale, external disruption, and a lack of infrastructure are all reasons why networks fail. There are many gaps in the literature that need to be addressed, according to the study. For example, further research on the link between networking and other types of innovation, such as process and organizational innovation, is required. In the same way, we need a deeper knowledge of network dynamics and configurations, as well as the involvement of third parties like professional and trade organizations. Our research emphasizes the importance of multidisciplinary research in these fields.

KEYWORDS: Innovation, Networking, Business Networking

1. INTRODUCTION

The systematic study that yielded the results reported in this article was driven by a desire to determine the degree to which UK businesses participate in networking activities in order to improve their creative potential. The review's specific goals are to:

- Determine the nature of the connection between networking and innovation.
- Compare and contrast the extent and effect of networking activity in the UK with that of competitor nations' companies.
- Examine instances and research on business-to-business network failure.
- Develop insights that will guide policies targeted at promoting business-to-business networking, which will lead to increased creative capacity and productivity.
- For the Economic and Social Research Council's (ESRC) study priorities board, identify topics for future research.

Inter-organizational networking is essential for the development of creative capacity in companies, according to the Porter Report. The study is less clear on the degree to which UK businesses participate in networking and how this engagement translates into creative results. Porter's research, for example, finds that the UK underperforms major rivals in this area but offers no data to back up the assertion. The review's goal is to thoroughly examine the facts in light of the Department of Trade and Industry's (DTI) mandate: Is it possible for UK companies to effectively network with other businesses in order to promote innovation? Following consultation, it was decided that the study should focus on business-to-business networking; the degree to which networking leads to creative results; and include some instances of network failure in the construction and maintenance. The authors provide a subset of the systematic review's results in this article, as well as the overall research base that has looked at the connection between innovation and networking across nations and industries. The approach we use to perform this particular review is outlined in the next section[1]–[4].

1.1. The Evidence Base

A subset of the systematic review findings on the connection between networking and companies' tendency to innovate is provided in this article. The nature of the entire evidence base utilized for the research is described in detail here. The technique provided was used to conduct the systematic review. Using the search strings generated, 628 articles were discovered in the first stage of the review by scanning the citation indexes of ABI Proquest, Science Direct, and Web of Science.

The findings indicate that networking and creativity are researched in a variety of social science disciplines. Economic and regional geography, organizational behavior, sociology, operations management, political economy, entrepreneurship and small company, technology management, marketing, and strategic management are some of the topics covered. The major journals that contributed to the review show which areas of research have the most to say about the topic. Research Policy, Journal of Business Venturing, Regional Studies, Technovation, and International Journal of Technology Management were the top five journals in terms of coverage of this subject in the review. Aside from these publications, the review included papers from

additional 47. It's worth noting that major US management publications were underrepresented among the 325 papers identified before the articles were graded.

The American Journal of Management, for example, only published one article, the American Management Review only published one, and the Administrative Science Quarterly only published two. It's probably not a good idea to speculate on why this happens. One explanation for the under-representation is that the bulk of management studies have focused on organizational behavior, entrepreneurship, or supply chain management. Organization Studies contains nine papers, the Journal of Business Venturing has 33, and Management Science has five, while the mainstream British Journal of Management has just one.

The character of the articles examined for this research is shown by doing a keyword analysis. Innovations, Research and Development, Small Business, Alliances, Regions, Technology Change, Statistical Analysis, Business Networking, Organization Theory, and Product Development are the top 10 terms in the study (in order of significance).

The papers that are evaluated are also analyzed in terms of the nations that are mentioned in the research. According to this study, 36 articles contain empirical data based on the United Kingdom, 35 on the United States, 42 on other European nations (Germany has the most other European countries included in the review, with 14 studies), 11 on Asian countries (Japan 11), and three on other countries (Australia, Brazil and Israel). The number of research focused on the United Kingdom is very high, indicating that UK scholars have contributed significantly to the field. However, despite being filtered to a lower number using quality criteria, the overall amount of articles focused on the UK remains rather low in terms of total numbers (36 out of 127 papers).

A thematic analysis was created after the NVIVO analysis of the A-list citations (stage 8). Table 3 summarizes the findings of the theme analysis. A significant percentage of the papers examined in the thematic review focused on company level (micro) variables, such as how networks are managed and function in reality (57.7 percent). The macro or networking architecture that may support networking activity is examined in a lesser percentage of the evidence (42.3 percent). When the year of publication is taken into account, it becomes apparent that this research topic and evidence base are relatively new. For example, our search identified 93 articles on the topic from 1999 to 2003, but just four papers from 1981 to 1986. The number of citations on networking and innovation increased between 1981 and 2003, according to the study. The low number of papers published between 1981 and 1986 may be attributed to a lack of coverage in citation databases. However, the statistics may also indicate that this is a relatively young field of study, with little published work over this time span.

In conclusion, a few important conclusions may be stated about the total sample of evidence utilized in this study. To begin with, the study's evidence base is dominated by a focus on technology and emerging technology sectors. Second, the evidence is mostly focused on the United Kingdom, the United States, and Germany, with a little bias toward the years 1995–2003. Finally, due to the small number of studies that have been conducted, the study to date lacks considerable depth. The study is also fragmented since it spans a vast number of authors, publications, and social science fields. The primary conclusion derived from the sample utilized in this systematic literature analysis is that if the evidence base is to be enhanced and extended,

the topic area may need some priority by a 'critical mass' of academics over a lengthy period of time.

The following is our analysis of the general connection between innovation and networking, which is based on a subset of empirical data obtained from the systematic literature review. This connection is discussed in more detail in the next section. We then show a diagram that depicts this connection. This diagram serves as a framework for the study that follows, in which we look at the roles of the many parties that make up the networking interface and infrastructure. We wrap off our investigation by looking at evidence of network limits in innovation processes and network breakdown. To wrap up the article, we discuss several key topics for future research and briefly discuss policy implications based on the current evidence base[5]–[8].

1.2. Overview of the Innovation and Networking Relationship:

The work in this research takes into account the DTI's focus on effective exploitation of innovative ideas. Product, process, and organizational innovations all have a role in the successful commercialization of a novel concept. As a result, the research uses the DTI's wide definition: Innovation is defined as the effective conversion of ideas into new goods, processes, services, or business practices. It is a key process for attaining the two complimentary corporate objectives of performance and growth, which will help narrow the productivity gap.

As a result, the research believes that innovation encompasses both the creation and use of new goods, processes, services, and business practices. Companies see a growing need to cooperate with other firms, both officially and informally, as products become more modular and information is dispersed across organizations. Indeed, the center of innovation is increasingly the network in which a business is embedded, rather than the person or the organization. Many scientific and technical achievements are the result of many contributions from many players operating in networks, and the standards required for a technology to operate across marketplaces are becoming more reliant on networks of companies.

The biotechnology industry in the United Kingdom is an excellent example of the beneficial connection between networking and innovation. Collaboration is generally recognized as a crucial element of the biotechnology sector when it comes to invention. The sector is supported by a constantly developing, complex knowledge base, and the skills and capabilities required to bring a scientific discovery in biotechnology to market are dispersed among a variety of big and small companies. While the biotech business exemplifies the significance of networking for innovation, the study emphasizes the need to network as a precondition for innovation across the majority of industries. Firms in a wide variety of sectors have been shown to benefit substantially from networking behavior in terms of innovation output and competitiveness. Service industries¹, primary industries², manufacturing industries³, and high-tech industries⁴ are examples of industries where networking has had an effect on innovation.

1.3. Network Formation and Configuration Overview:

The first is concerned with companies' resource needs, and how they are encouraged to establish network connections with other firms in order to get access to technical and/or commercial resources that they lack. The availability of chances to establish connections is not seen as a restriction from this viewpoint. The second contends that chances to establish connections likely to mirror previous inter-firm relationship patterns. As a result, a company's capacity to form

network connections with other companies is determined by its current relationships and network capability.

Social institutions have an impact on the relative ease with which business-to-business networks develop. These institutions may create the cultural circumstances and infrastructure for networking, as well as serve as brokers and intermediates in network creation, according to empirical data. The development of the infrastructure needed to support the creation of business-to-business networks is shaped by institutions such as the legal system, banking and finance system, labor market structure, education system, and political system.

In terms of which kinds of companies benefit from networking, it has been discovered that networking is helpful not just too established firms but also to entrepreneurs. Because interpersonal and inter-organizational connections allow actors to get access to a range of resources owned by other players, networking may improve the success rate of entrepreneurial efforts. Network relationships, for example, are believed to offer emotional support for entrepreneurs who take risks, and this, in turn, is expected to increase the desire to stay in company.

Several additional studies have shown that successful entrepreneurs utilize networks to acquire ideas and collect information and advice on a regular basis. Other ways to get into important talent and market knowledge include connections with venture capitalists and professional service groups. Alliances allow businesses to get access to resources, which is especially useful when time is of the importance. Small company owners may use networks to connect to R&D that is contracted out by bigger companies, to participate in collaborative R&D ventures, and to establish marketing and manufacturing connections[9], [10].

1.4. Networking Infrastructure and Networking Interface Interrelationships:

Recent research on 'innovation systems' has shown that when there is a knowledge flow across systems, innovation happens more effectively (for example, between different industries, between regions or between science and industry). The significance of variety of connections in networks has been demonstrated to have an effect on innovativeness based on this research. The importance of varied partners for empirical research on innovation, as well as the findings of this study, are reinforced by technology networks in the Spanish automotive industry and work on tiny high-tech companies in the United Kingdom. These studies indicate that numerous players both within and outside the company impact innovation, and that the most significant partners are from the business sector - consumers come first (33.5 percent of companies), followed by suppliers (21.9 percent of firms). Firms' willingness to collaborate outside of these "direct" connections is similarly restricted, according to studies on partnering. Only 8.9% of businesses, for example, collaborate with colleges. Research in Germany, on the other hand, reveals substantial national variations in terms of engagement with research institutions and universities, as well as the significance of scientific partners in certain industries.

According to studies, tying marketing and technical efforts together early in the innovation process allows goods to be created with a complete understanding of the customer's requirements. Furthermore, putting too much focus on technical quality or marketing may lead to over-engineered or over-priced inventions. Customers' network connections are considered essential because:

- Dialogue between important business customers and suppliers enables companies to not only learn about current requirements, but also to identify future ones ahead of the competition.
- Customers who are involved in the early phases of product development will help to create ideas.
- Involving customers in the innovation process lowers the chance of failure.
- The inventor learns from the consumer about the product's probable commercial potential.

2. DISCUSSION

The overwhelming majority of the data examined is very favorable in terms of the usefulness of B2B networks and their effect on the innovation process. However, no comprehensive study of this topic would be complete without a focus on why networks fail or the reasons that hinder successful networking behavior. Networks seem to have issues for a number of reasons. These issues may emerge as a result of relocation, or they could be caused by inter-firm dispute, a lack of size, external disturbance, or a lack of infrastructure.

Networks may last a long time and continue to develop. As a result, they go through times of disagreement amongst partners, which may and often does lead to the network's collapse. Although networks may face internal conflict, they can also face displacement and conflict from other networks. For example, investigates how small and medium-sized businesses in a Japanese area of traditional ceramics manufacture have adapted to high-technology uses. He shows how, in new Japanese sectors, external connections to networks have put the survival of creative networks in an old industrial area in jeopardy.

Every network has rules of engagement that limit the behavior of the participants. The network's governance mechanisms and the infrastructure (especially industrial culture) in which the network is embedded control these regulations. For example, the pharmaceutical business has an industrial culture that encourages more open and networked innovation, while the defense industry has moved toward tighter and more concentrated networks due to the sensitivity of the technology. Although the influence of networking on innovation performance seems to be clear, some research indicate that big companies can innovate more successfully. Shows that failure in Silicon Valley is related to networks of small businesses failing to capitalize on the revenues that may be earned when ideas reach maturity. After the original invention has been created, networks of small businesses have been proven to be unable to get the resources and scale to properly market the innovation. As a result, they are unable to maximize profits from the opportunity. A study of high-tech firms in the deep south of the United States found that clustering of related industries is facilitated by a lack of appropriately configured laboratory and office space at the intermediate stage of business growth, which necessitates information sharing and cooperative behavior. The study's businesses' growth was severely hampered by a lack of essential networking mediation entities.

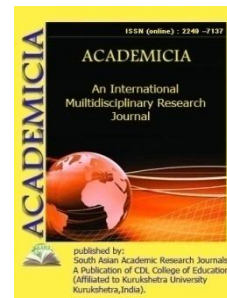
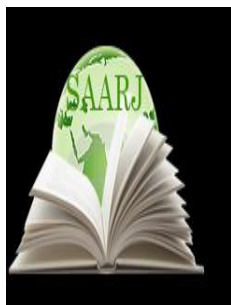
3. CONCLUSION

This assessment of the evidence base on the connection between networking and innovation identifies many areas in which further study is needed. The connection between networking and various kinds of creativity is the first apparent gap in the research (e.g. process and organizational innovation). Too far, product innovations have been the primary focus of research

across disciplines. While process and organizational innovation are more challenging to analyze by their very nature, the kinds of networking activity that occurs throughout the creation, dissemination, and implementation of process and organizational innovation need significant consideration. Then it may be able to compare networking activity and configurations across these various kinds of innovation and draw meaningful conclusions about the differences. More broadly, network dynamics and network configurations are likely to be the most important topic for future study. According to the data, there is a lot of uncertainty and dispute in the literature about the best network topologies for effective innovation. While networking configurations are obviously influenced by variables such as industry and kind of innovation (radical vs. gradual; product vs. process), much more study is needed in this area. Recognizing that networks are fundamentally dynamic, a longitudinal approach to study may be beneficial.

REFERENCES

1. R. Taddeo, A. Simboli, G. Ioppolo, and A. Morgante, "Industrial symbiosis, networking and innovation: The potential role of innovation poles," *Sustain.*, 2017, doi: 10.3390/su9020169.
2. I. Booyens, T. G. B. Hart, and K. H. Ramoroka, "Local Innovation Networking Dynamics: Evidence from South Africa," *Eur. J. Dev. Res.*, 2018, doi: 10.1057/s41287-017-0123-2.
3. E. Lambrecht, N. Taragola, B. Kühne, M. Crivits, and X. Gellynck, "Networking and innovation within the ornamental plant sector," *Agric. Food Econ.*, 2015, doi: 10.1186/s40100-014-0022-1.
4. L. Pittaway, M. Robertson, K. Munir, D. Denyer, and A. Neely, "Networking and innovation: A systematic review of the evidence," *International Journal of Management Reviews*. 2004, doi: 10.1111/j.1460-8545.2004.00101.x.
5. J. M. Lewis, L. M. Ricard, and E. H. Klijn, "How innovation drivers, networking and leadership shape public sector innovation capacity," *Int. Rev. Adm. Sci.*, 2018, doi: 10.1177/0020852317694085.
6. A. Basile, "Networking System and Innovation Outputs: The Role of Science and Technology Parks," *Int. J. Bus. Manag.*, 2011, doi: 10.5539/ijbm.v6n5p3.
7. T. Schøtt and K. W. Jensen, "Firms' innovation benefiting from networking and institutional support: A global analysis of national and firm effects," *Res. Policy*, 2016, doi: 10.1016/j.respol.2016.03.006.
8. V. Scuotto, M. Del Giudice, and E. G. Carayannis, "The effect of social networking sites and absorptive capacity on SMES' innovation performance," *J. Technol. Transf.*, 2017, doi: 10.1007/s10961-016-9517-0.
9. T. Gajdošík, Z. Gajdošíková, V. Maráková, and K. Borseková, "Innovations and networking fostering tourist destination development in Slovakia," *Quaest. Geogr.*, 2017, doi: 10.1515/quageo-2017-0039.
10. Tajudin, "External Networking on Innovation in Malaysia's Construction Industry," *Jkr J.*, 2017.



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ENVIRONMENTAL POLLUTION BY CHEMICAL SUBSTANCES USED IN THE SHALE GAS EXTRACTION: A REVIEW

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ABSTRACT

Various fluids for hydraulic fracturing are used to obtain shale gas. Several hundred distinct chemical compounds may be found in them. Many of them may be harmful to the environment and human health. Despite the fact that chemical additives make up just 2% of the fluid volume, the huge quantity of fluid utilized and the fact that the majority of these chemicals are extremely toxic make them a potentially significant environmental hazard. To minimize their negative environmental impact, product safety data sheets must be used to identify all chemicals and specify their toxicity levels. Their usage should likewise be minimized to the greatest extent feasible, or they should be replaced with less hazardous alternatives. The following research looks at the most common chemical additions used in shale gas extraction fracturing fluids. It focuses on their characteristics and toxicity, as well as the difficulties in determining the presence of microelements and microelements in samples with such complex matrices. There are other hazards associated with their application and movement to soils, surface water, ground water, and creatures.

KEYWORDS: *Fracturing fluid; Shale gas; Chemical substances; Environmental threats*

1. INTRODUCTION

The globe is in the midst of an energy crisis. As a result, new energy sources are being actively explored. Shale gas is one possibility that has been considered all around the globe, including in Europe. According to the US Energy Information Administration, Europe's unconfirmed theoretically recoverable shale gas quantities total 13.3 10¹² m³, with Poland and France accounting for the majority (4.19 10¹² and 3.87 10¹² m³, respectively). Ukraine (3.62 10¹² m³), Romania (1.44 10¹² m³), Denmark (0.91 10¹² m³), and the Netherlands and the United

Kingdom (both 0.73 1012 m³) are believed to hold the next biggest deposits. The European Commission issued a nonbinding proposal in January 2014 entitled "Minimum guidelines for the exploration and production of hydrocarbons (such as shale gas) utilizing high volume hydraulic fracturing." The member states have been asked to put these proposals into action within six months after their publication, and the commission will assess their efficacy in July 2015[1]. This declaration focuses on three specific issues that need attention from a European standpoint.

The first is the issue of the EU's high population density in comparison to many of the places examined so far, including the United States, Canada, and Australia. European nations' average population density varies from just under 100 to over 600 persons per square kilometer, compared to little over 3 in Canada and Australia and 32 in the United States, respectively. As a result, fracking operations will inevitably interact more intimately with other activities. Furthermore, since the EU has the world's most extensive and legally enforceable greenhouse gas reduction and climate change mitigation measures, the net impacts of fracking on achieving Europe's climate change goals are significant. Finally, since the European public has previously demonstrated a high level of sensitivity to the subject of fracking, the impact on the public and communities is also a major concern[2].

In terms of financial benefits, the environmental risks associated with shale gas must be considered, since it necessitates the new gas extraction technique. For fracturing fluids, the applied technique requires huge quantities of water and chemical substances. One borehole is expected to use 20,000 m³ of water, 850 tons of proppants, and 210 tons of chemical solutions. A total of 100 kilograms of sand and 2 tons of water are required to extract 1,000 m³ of shale gas. As a result, a large portion of the debate is dedicated not just to economic, political, and technical problems, but also to environmental concerns. Shale gas has been utilized in the United States for 40 years, with 50,000 boreholes drilled. However, Europe is far from starting from scratch when it comes to fracking. Since the 1950s and the 1980s, hydraulic fracturing and horizontal drilling have been used throughout Europe. Horizontal drilling and multitrack stimulations were successfully carried out in northern Germany in the early 1990s[3]. Throughout recent decades, more over 1,000 horizontal wells have been drilled in Europe, including thousands of hydraulic fracturing operations. So far, no severe events related to shale gas extraction have been reported in the literature. However, one must consider the long-term consequences of this technique of extraction, as well as the fast rise in its use in recent years.

Approximately 90% of Poland's energy originates from the burning of hard and brown coal, which is in violation of EU environmental regulations. The EU recommendations on the risks posed by shale gas production were released in 2011. According to the agreement, all interested parties must be provided with information on the chemical compositions of the additives used in fracturing fluids. It's also crucial to figure out how hazardous they are and keep track of the pollution they create[4]. Furthermore, the environmental risk posed by the use of hydraulic fracturing must be evaluated. As a result, the issue is viewed as one of properly controlling current regulations rather than creating new ones. New regulations for shale gas production are presently being established in Europe and Poland.

They should go into effect shortly. Hydraulic fracturing is a technique for improving borehole efficiency. Fracturing fluid is injected into the borehole at high pressure to create, maintain, or expand cracks in the rock. To extract shale gas, petroleum, or uranium, this method is utilized[5]. In 1947, the technique was used for the first time in gas extraction in the United States. The fluid

is evacuated from the borehole once the procedure is finished to allow for gas extraction. After the hydraulic cracks are created, the fluid is evacuated by lowering the pressure in the borehole. During the flow back phase, a portion of the fluid is returned to the system. to the surface. It is collected and either recycled or disposed of as industrial trash. Regrettably, only 40% of the fracture fluid is returned to the surface. The remaining portion is buried[6].

The use of hydraulic fracturing is fraught with controversy. Shale gas production requires huge quantities of water, chemicals, and proppants for hydraulic fracturing, in addition to land for well pads and associated infrastructure to exploit the resource. The use of hydraulic fracturing in oil and gas operations resulted in a huge rise in sand mining (the United States used some 28.7 million tons in 2011). Sand requires a high quartz content (98%) and round grains with a comparable size range (100–500 m) in significant numbers, which can only be obtained from quarries or nearshore or coastal sources in Europe[7]. It's also worth noting that the mining and extraction lobby continues to exert control on study into the method's potential dangers, despite the fact that the entire composition of the applied fluids remains unknown. In 2011, France became the first country to enact a law prohibiting the use of hydraulic fracturing for gas and petroleum production.

There are two methods to make the fracturing fluid. During the fracturing process, the components are chosen and combined in continuous mixing. The components are chosen ahead of time in batch mixing, and the ready-made combination is utilized for the process[8]. At each step of preparation, the fluid should be carefully secured and kept in tight tanks to avoid leaks or secondary contamination. After fracturing, the fluid that returns to the ground surface is routed into the treatment system, where it is treated to a high degree of treatment (up to 98 percent) before being put in the tanks[9]. The fluid that has been treated may be reused. Specialized businesses should collect sewage sludge and transfer it to locations where it may be neutralized in line with current laws. Figure 1 depicts the hydraulic fracturing flowchart.

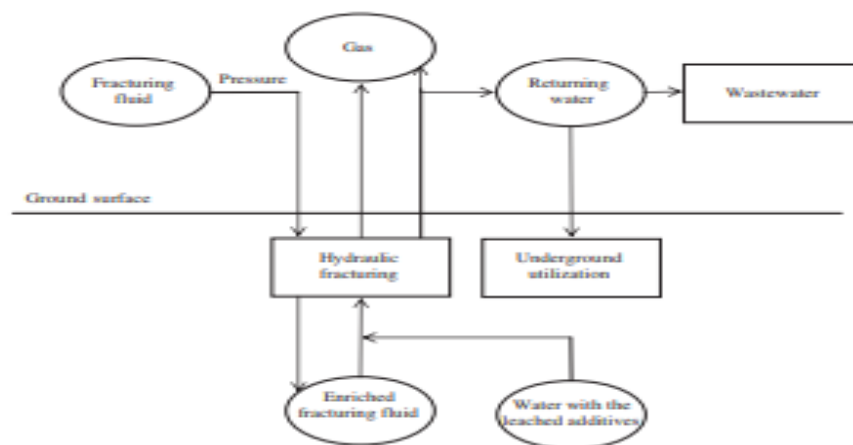


Figure 1: Flowchart Representing the Shale Gas Extraction

Special double-walled tanks, trays, or protective foil put on the ground underneath the tanks prevent fracturing fluid leakages into the surface. Furthermore, each fracturing operation is preceded by borehole cementation condition tests (acoustic and pressure tests), which are utilized to identify any potential borehole pipe leaks. All chemical compounds utilized in the production of shale gas should be documented and recorded correctly. Only authorized and competent

personnel, as well as emergency services, should have access to them. The registration, assessment, and authorisation of chemicals (REACH) system regulates and supervises the chemical compounds used in the EU. The law addresses the safety of utilizing specific compounds by requiring their registration and evaluation.

TABLE 1: TYPES OF CHEMICALS ADDITIVES AND THEIR FUNCTIONS IN THE FLUIDS

Additive type	Function	Examples
Biocides	Preventing the growth of bacteria and other living organisms	Terpene hydrocarbons; glutaraldehyde; 1,2-benzothiazol-3-one; 2-methoxy-4-isothiazolin-3-one; 5-chloro-2-methoxy-2H-isothiazol-3-one
Crosslinkers	Helping gel formation, increasing viscosity	Complexes of transition metals; boron, titanium and zirconium salts; triethanolamine
Buffers	pH control	Inorganic acids and bases (e.g. HCl, HF, NaOH, KOH) and their salts (e.g. Na ₂ CO ₃ , NaHCO ₃ , (NH ₄) ₂ SO ₄ , K ₂ CO ₃)
Sediment inhibitors	Preventing the precipitation of the mineral sediments	Dodecylbenzenesulfonate acid; citric acid; acetic acid; thioglycolic acid
Corrosion inhibitors	Piping and equipment protection	Phosphonic acid salts; formamide; methanol; isopropyl alcohol; acetic acid; acetaldehyde
Surface tension reducers	Reducing the surface tension	Amines; glycol ethers; phenol derivatives; dodecyl sulphate laurate; ethanol; naphthalene; 2-Butoxyethanol
Friction reducers	Causing the laminar flow instead of the turbulent flow	Polyacrylamides; petroleum derivatives; benzene; toluene; ethers
Viscosity reducers	Agents facilitating the fluid recovery	Sulphates; peroxides (e.g. ammonium persulphate, calcium peroxide); KBrO ₃
Gelling agents	Helping gel formation, increasing viscosity	Guar gum; hydroxyethyl cellulose; xanthan gum; methanol; terpenes; ethylene glycol

A typical fracturing fluid includes about 95 percent water and 3–4% sand. Chemical additives make up the remaining portion. The water utilized in the process may come from both above and below ground sources. It is only required at the start of the extraction process. The necessary quantity varies depending on the drilling depth, however it is typically 20,000 m³ per borehole. The purpose of the sand is to keep the cracks from sealing up once the pressure is reduced. It's utilized to keep the time it takes to pump water as short as feasible. The chemicals added to the fracturing fluid are identical to those that have been used for years in conventional wells and vertical boreholes. The quantity of chemicals utilized in directional drilling, on the other hand, is considerably greater than in vertical drilling. Chemical additives used in fracturing fluids may have different compositions depending on the technique employed and the condition of the rock. Despite the fact that chemical additives make up just 2% of the fracturing fluid mix, their characteristics and potential for contamination cause a lot of worry. The most common kinds of chemicals detected in fracturing fluids are listed in Table 1. It also includes various applications and examples[10]. Fracturing fluid compositions are determined by the application as well as the manufacturer.

Table 2 shows typical information on the contents of chosen hazardous chemicals and their concentrations in different manufacturers' fluids. In a newly published study, the physical, chemical, and biological properties of chemicals employed in hydraulic fracturing were detailed in depth. These additives' physical and chemical properties were evaluated using a publicly accessible chemical information database. Organic compounds account for 55 of the chemicals, with 27 of them being regarded easily or intrinsically biodegradable. Seventeen compounds have a high theoretical chemical oxygen demand and are utilized at levels that pose treatment difficulties. According to the Globally Harmonized System of Classification and Labeling of

Compounds, the majority of the assessed chemicals are non-toxic or have minimal toxicity, with just three being categorized as Category 2 oral toxins. However, toxicity data for tens of them could not be found, indicating flaws in the present state of knowledge and emphasizing the need for additional investigation to fully comprehend possible problems connected with the use of chemical additives in such applications.

The fluid manufacturers, as shown in Table 2, employ various marketing names for the same chemicals. When researchers attempt to figure out the actual chemical composition or the CAS number of a substance, they become confused. There have been calls for shale gas extraction companies to disclose the entire composition and amount of their fracturing fluids. Because some of the chemicals used today or in the past have proven harmful or poisonous, the topic has become a hot topic in the public discussion. In certain American states, the display of chemical compositions is mandated by law. The FracFocus website in the United States and Canada provides individual fracturing fluid compositions and other data for specific boreholes. Unfortunately, the data is often criticized for being incomplete and biased. Furthermore, manufacturers often resort to the trade secret in order to avoid disclosing all relevant information. Information on the composition of fracturing fluids used in certain nations is very restricted throughout Europe.

For example, data about the Cuatrillo field in the United Kingdom is accessible. Since 2013, the European Internet platform has been run by the International Association of Oil and Gas Producers. The composition of the fracturing fluids used in shale gas drilling may therefore be determined. All of the chemicals utilized in unconventional production are extensively used in industry, and data gaps in terms of toxicity, biodegradability, physical constants, and usage concentrations should be filled in order to provide accurate and informed environmental and health evaluations.

In Poland, there are no separate regulations on the use of chemical substances in the mining and extraction industry. The data of the Polish Ministry of Environment (October 2013) indicated that 49 exploration boreholes had been made in the areas with the concessions for the search and recognition of the unconventional hydrocarbon deposits. The hydraulic fracturing procedure was performed in 25 boreholes.

TABLE 2: TYPES AND CONCENTRATIONS OF THE SELECTED HAZARDOUS SUBSTANCES IN THE SELECTED FRACTURING FLUIDS

Commercial name	Hazardous substance	Mass content (%)	Concentration in the fracturing fluid (mg/L)
<i>Manufacturer—BJS</i>			
HCl	Hydrochloric acid	8	83.68
CI-14	Propyl alcohol	5	0.23
Ferrotrol	Citric acid	70	18.50
XLW-32	Methanol	90	176.79
GW-3LDF	Petroleum distillates	60	356.24
BF-7L	Potassium carbonate	100	63.53
GBW-15L	Sodium chloride	14	17.09
FRW-14	Light petroleum distillates	40	374.20
Alpha 125	Glutaraldehyde	30	70.43
<i>Manufacturer—Fmctech</i>			
HCl	Hydrochloric acid	8	89.26
40 HTL	Methanol	10	1.06
NE 100	Methanol	5	0.26
B9	KOH	20	22.86
BXL-2	KOH	10	12.98
ICI-150	Glutaraldehyde	50	124.66
FRW-50	Petroleum	20	171.21
<i>Manufacturer—Universal</i>			
HCl	Hydrochloric acid	8	89.26
Unilink 8.5	Ethylene glycol	40	123.19
Bioclear 200	2,2-dibromo-3-nitrylopropionamide	20	55.16
CGR 20	Polyethylene glycol	60	165.48
<i>Manufacturer—Halliburton</i>			
HAI-OS	Methanol	60	5.64
FE-1A	Acetic acid	60	6.53
HCl	Hydrochloric acid	8	89.26
K-34	Sodium carbonate	100	141.13
BC 140	Monoethylamine	30	58.15
FR-46	Diammonium sulphate	30	330.95
Aldacide G	Glutaraldehyde	30	70.43
<i>Manufacturer—Superior</i>			
AI-2	Glycol ethers	30	1.54
IC-100L	Citric acid	100	8.14
OB-Fe	Polypropylene glycol	40	2.39
Super Pen 2000	Iron sulphate	30	1.79
Super OW-3	Isopropyl alcohol	40	0.95
Super 100NE	Isopropyl alcohol	30	0.82
HCl	Hydrochloric acid	8	89.26
Bioclear 200	2,2-dibromo-3-nitrylopropionamide	20	55.16
SAS-2	Light petroleum distillates	30	270.06

(There are two horizontal boreholes and eight vertical boreholes.) The Polish Exploration and Production Industry Organization aspires to meet the public's need for information. As a result, it urges its members to disclose the fracturing fluid composition used in Polish exploratory boreholes.

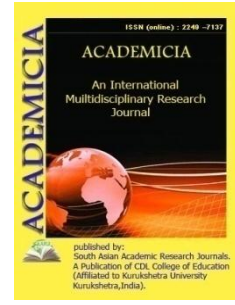
2. CONCLUSION

Shale gas extraction techniques and the usage of fracturing fluids containing many toxic chemicals may damage humans, animals, the water and soil environment, and air quality. Borehole drilling and monitoring of shale rock fracture and aquifers define the safe functioning of the water–soil ecosystem. Fracturing fluid composition, on the other hand, should be improved with non-toxic chemical components. In this way, the negative effects of fracturing fluids may be reduced. The use of fracturing fluids is linked with substantial environmental concerns. They are a result of both the composition and the application range. Regrettably, the majority of fluid manufacturers do not offer complete chemical composition information. Furthermore, they make no mention of the fluids' toxicological properties. If such data were available, it would be possible to focus on monitoring the most important substances. Toxicological features, maximum allowed dosages, and long-term impacts on humans and the environment may all be defined by researchers. The fluid returns to the surface in large amounts. Chemicals that may react in a number of ways are included. Ironically, shale gas production has resulted in the placement of local "environmental bombs." The extraction of natural gas from the environment requires the release of large amounts of hazardous substances into the ecosystem.

On the one hand, shale gas is a renewable energy source, yet hydraulic fracturing technique used to obtain it presents a major environmental danger. Living beings are poisoned by several widely used substances. As a consequence, it's crucial to know what these fluids are made of. However, evaluating risk and potential issues, particularly long-term hazards, is challenging without full cooperation from fracturing fluid producers and consumers. Such tight collaboration is needed not just for the environment, but also for present and future generations. This will also allow for the development of new or current technological techniques for their effective treatment.

REFERENCES

1. X. J. Yang, H. Hu, T. Tan, and J. Li, "China's renewable energy goals by 2050," *Environmental Development*. 2016, doi: 10.1016/j.envdev.2016.10.001.
2. A. C. Johnson and J. P. Sumpter, "Putting pharmaceuticals into the wider context of challenges to fish populations in rivers," *Philos. Trans. R. Soc. B Biol. Sci.*, 2014, doi: 10.1098/rstb.2013.0581.
3. M. Felix and S. H. Gheewala, "Environmental assessment of electricity production in Tanzania," *Energy Sustain. Dev.*, 2012, doi: 10.1016/j.esd.2012.07.006.
4. N. Kabisch and D. Haase, "Green spaces of European cities revisited for 1990-2006," *Landsc. Urban Plan.*, 2013, doi: 10.1016/j.landurbplan.2012.10.017.
5. H. Saeedi Pash, T. Ebadi, A. Pourahmadi, and Y. Rahmani Parhizkar, "Analysis of Most Important Indices in Environmental Impacts Assessment of Ports," *Civ. Eng. J.*, 2017, doi: 10.28991/cej-030921.
6. A. Khamkhash, V. Srivastava, T. Ghosh, G. Akdogan, R. Ganguli, and S. Aggarwal, "Mining-related selenium contamination in Alaska, and the state of current knowledge," *Minerals*, 2017, doi: 10.3390/min7030046.
7. K. min Zhang and Z. guo Wen, "Review and challenges of policies of environmental protection and sustainable development in China," *J. Environ. Manage.*, 2008, doi: 10.1016/j.jenvman.2007.06.019.
8. Y. Tao, F. Li, J. C. Crittenden, Z. Lu, and X. Sun, "Environmental Impacts of China's Urbanization from 2000 to 2010 and Management Implications," *Environ. Manage.*, 2016, doi: 10.1007/s00267-015-0614-x.
9. Y. Chen, G. Z. Jin, N. Kumar, and G. Shi, "Gaming in air pollution data lessons from China," *B.E. J. Econ. Anal. Policy*, 2012, doi: 10.1515/1935-1682.3227.
10. G. H. Pyke and P. R. Ehrlich, "Biological collections and ecological/environmental research: A review, some observations and a look to the future," *Biol. Rev.*, 2010, doi: 10.1111/j.1469-185X.2009.00098.x.



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A REVIEW ON NETWORKING AND INNOVATION: THE POTENTIAL ROLE OF INNOVATION POLES

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ABSTRACT

There is considerable discussion in the literature about how to make Industrial Symbiosis (IS) effective, as well as the variables that may influence its implementation, such as networking and creativity. They've found little room for study thus far, preferring to focus on other technical and economic problems including the nature of the processes involved, regulatory difficulties, economic feasibility, and stakeholder engagement. They may, however, become important in certain situations, particularly when examined collectively and in their synergistic interplay. The Innovation Poles (IPs), which are government-sponsored consortia created within EU programs with the goal of stimulating innovation within networks of organizations and promoting competitiveness in specific industries or value chains at a local or regional level, are an interesting context to consider in this regard. In this article, we first describe how these issues have been handled in IS research so far, and then we examine the key characteristics of the IP model in order to determine if and how it may help to the growth and spread of IS. The study's knowledge base was built on a review of the literature through desktop analysis and direct investigation, with an emphasis on Italian patents. The findings indicate the beneficial role that the IP model may play, both in terms of its institutional activity of knowledge creation and distribution and, more importantly, as an applicative framework for IS.

KEYWORDS: *Clusters; Industrial Ecology, Industrial Symbiosis, Innovation, Innovation Poles, Networks.*

1. INTRODUCTION

Industrial Ecology (IE) is concerned with the effect of industry and technology on the biophysical environment, as well as the societal and economic changes that accompany them. To emphasize the possible reduction of environmental burdens, local, regional, and worldwide uses and flows of materials and energy in goods, processes, industrial sectors, and economies are examined. Industrial Symbiosis (IS) is a strategy within IE that encourages communities of businesses to collaborate to improve their economic and environmental performance. There is still a lot of discussion in the literature regarding how to make the IS effective and what variables influence its implementation, such as technical and organizational features, regulatory problems, company and stakeholder participation, and economic viability. The importance of networking and innovation is also acknowledged. Companies' networks are seen to be one of the most potential settings for IS because of their physical closeness and learned propensity for cooperation among the organizations concerned, particularly in the operational forms of industrial clusters or districts. Innovation is often seen as an important element of IS development, for example, in terms of offering new supporting technologies. Despite the fact that these topics are often addressed together, particularly in organizational studies, this seldom occurs in the context of IS development[1]–[4].

The Innovation Poles concept is an intriguing approach to explore in order to close this gap (IPs). They are government-sponsored consortia formed under EU initiatives with the goal of promoting local or regional competitiveness in particular sectors or value chains by encouraging innovation within networks of companies. Moving on from the fundamental characteristics of industrial networking and innovation, we look at the role that IPs may play in the creation and diffusion of IS in this article. The Italian territory is utilized as a source of regulatory and technical information on the IP model, which has spread rapidly and widely in this nation[5]–[8]. The study's findings will aid in the exploration of new spaces and possibilities for the development of IS in existing contexts, an area of research in which the authors have been involved for years, and they have conducted research on various forms of territorial agglomerations of companies, such as clusters, local supply networks, districts, and environmentally equipped industrial areas[9], [10].

The next sections detail the study methodologies utilized, and the existing areas for creativity and networking within the IS studies are explained to explain why these variables are deemed important. The idea of IP and its major characteristics are defined and explored in the second half of the essay to emphasize its potential and limits, as well as the roles that this model may play in relation to IS. At the end of the process, conclusions are made[2].

1.1. Networking and Innovation:

Industrial networks are hybrid patterns of economic activity coordination that incorporate the benefits of conventional governance methods such as vertical integration and market exchanges; they may take many different shapes and function at varied geographical scales. Innovation, according to the literature, refers to changes made by businesses to their goods, processes, and organizational structures in order to enhance their own operational or market performance. Organizational studies show that these two ideas are inextricably linked, and that their interplay may result in system changes. Many writers believe that businesses that are part of networks are more creative than companies that are not; this is due to the existence of relationships that allow for learning and information exchange. Geographical closeness is often important in creating and enabling information transfers among network members, which increases the probability of

innovation creation. Furthermore, it is a great tool for companies to communicate with one another. Economic geographers have also contributed to this discussion, pointing out that, in addition to physical closeness, cognitive and organizational dimensions are important factors in interactive learning and innovation within industrial networks.

1.2. Industrial Symbiosis:

IS networks are referred to as "complex adaptive systems" because they may emerge in a variety of ways and develop over time because to their resilience. An IS may include a variety of solutions (e.g., supply chain synergies, shared utility synergies, local use of by-products, energy, or wastes); it can depend on new or existing organizations; and it can develop in a planned, assisted, or spontaneous manner. Exchange connections are often facilitated by social relationships that are based on trust and cultural factors. Some of the participants (individuals or organizations) have a critical role (as external facilitators) in determining the IS's effectiveness. Participants gradually incorporate certain kinds of interaction, as well as other cultural aspects and values, over time, increasing their understanding of the program's original goals. IS has the potential to enhance the socioeconomic and environmental performance of the communities of businesses engaged, as well as the territory where it is created, in the long run. Despite its obvious promise, IS has had trouble spreading operationally. We can see from the dissemination rates that nations where it was able to design their development from the ground up (e.g., China) grew more quicker; in others, where development is based on existing industrial settings, cultural issues and resistance to change may emerge.

1.3. Industrial Ecology, Industrial Symbiosis and Innovation:

The book "Industrial Ecology and Spaces for Innovation" highlighted the possibilities for collaboration between innovation and IE research. According to the authors, innovation studies should examine how innovations alter socio-economic systems (including changes that affect the natural environment), while IE should shape socio-economic systems "metaphorically" as ecological systems (through a set of concepts and techniques that includes technological and organizational innovations). They also recognize that the two areas have a lot in common and that innovation is critical to attaining sustainable production and consumption, despite the fact that at the time, research on innovation were not being conducted in a systematic way in the IE community.

During the 2000s, the integration process has progressively developed, thanks to certain important contributions, such as the IHDP-IT Science Plan, which specified some realistic trajectories of technical and organizational change in terms of the environment, dubbed "Industrial transformation." In terms of methodology, significant progress has been made in the co-evolution of the perspectives of innovation studies (from individual initiatives to innovations within companies and sectors, up to systems of innovation) and IE studies (from individual initiatives to innovations within companies and sectors, up to systems of innovation) (from products, to processes, supply chains and whole economic systems). The incorporation of elements of policy and governance of socio-economic development under common research topics resulted from this holistic and systemic approach that currently defines the two fields of study. Some writers have recently concentrated their attention on figuring out how technology innovation might help with IE. SWIT (Sustainable Wealth Creation based on Innovation Systems and Enabling Technologies) is a comprehensive framework and model that incorporates the

utilization of suitable technologies and their integration into innovative supply chains. Other writers stress the importance of open innovation and business model innovation in putting recycling at the forefront of strategic business management[8].

There are just a few scholarly papers that explicitly examine the connection between innovation studies and information systems, and they all take various approaches to the subject. From an innovation standpoint, researchers developed a conceptual framework for evaluating sustainable supply network strategies. He stresses the importance of the "focal" business and suggests several methods. External orientation, transparency, learning capacity, leadership, autonomy, and results orientation are among the characteristics that characterize the strength of the business, according to him. Trust, clear plans, and an efficient information system all help to facilitate the exchange of these methods throughout the network. Other research examines the application of cutting-edge ICT techniques and tools in the context of IS, including modeling, mapping, and optimization of symbiotic networks.

1.4. Industrial Networking and Symbiosis:

Many scholars have emphasized the significance of industrial network studies in connection to eco-industrial systems. In the implementation of sustainable development methods within local and regional networks, the interconnections of economic, social, and environmental factors. He emphasized the need of multidimensional methods that include economic geography and regional economics research into certain "untreated interdependencies" (based on trust, cooperation norms, and routines) that constitute the foundation of local unique assets. The relationship between IS and the so-called "agglomeration economies," or positive externalities resulting from co-located businesses. It is discussed how various kinds of IS are adapted to different industrial setups. During the same time period, the significance of the linkages between the techno-sphere and the social system aspects in the study of IS was investigated by the IS program in Rotterdam. Several research on the emergence of IS in existing settings have focused on networking, both social and material. Some have explored the importance of tacit and explicit knowledge, as well as ICT technologies, in enhancing cooperation, while others have concentrated on embeddedness, which is linked to the notion of trust or closeness, in the application of Social Network Analysis (SNA). Several writers have recognized the potential of information systems (IS) to provide new possibilities and add value to local production systems, which is best shown by the industrial clusters or districts concept. In this way, networking may be seen not just as a precondition or an enabler of IS, but also as a result. Studies performed inside long-standing IS, such as symbiotic networks, have shown that they are capable of self-modifying, resulting in new areas for cooperation and relationships among the businesses involved[1].

1.5. Innovation Systems and Other Territorial Innovation Models:

The topics of innovation and networking are closely linked to the ideas of Innovation Systems (or System of Innovation) and, even more so, Regional Systems of Innovation in research on local and regional economies. Innovation Systems are a collection of interconnected components (local actors, institutions, business networks, and technical variables) that work together to generate, exchange, and distribute innovation, knowledge, and technological development in a given region. They can have various spatial scales (national, regional, and local) or spheres of interest (sectoral dynamics, technological, or organizational), and they can include individuals

from various contexts (public or private bodies, companies, research centers) or formalization levels (national, regional, and local) (spontaneous, planned). Their innovation activity may be assessed in a variety of ways, including the number of registered patents, the number of active initiatives, and R&D expenditures. Different variations of the idea of Innovation System may be found in the literature. They are sometimes referred to as Territorial Innovation Models by certain writers (TIM). A variety of new ideas have emerged as the conventional model of industrial districts or clusters has evolved into territorial organizations with significant scientific and technical implications. One that has gained popularity in recent decades is the Regional System of Innovation (RSI). The spatial size is the distinguishing characteristic of these systems. They are the result of the interplay of a number of variables linked to regional industrial growth (economy, technology, districts, research, learning, knowledge, and governance). Companies, institutions, infrastructure, knowledge, and a policy aimed at regional innovation are usually their building elements, and they are characterized by interactive learning (cross-fertilization), knowledge creation, proximity (geographical closeness), and social embeddedness (in terms of role of social relations)[7].

Other operational models based on networks of businesses, a territory, and innovation activities, such as Technological Districts and Science/Technology Parks, have expanded throughout EU areas in recent decades. Technological Districts are conglomerations of expertise in certain high-tech industries that have been designated as priority for a specific region. They are methods for transferring and connecting information about the circumstances that occur in a certain area. The Science/Technology Parks (STP) are a technical offshoot of the IDs, with the main goal of promoting the culture of innovation and competitiveness of businesses and organizations that produce knowledge. STPs facilitate the development of creative businesses by encouraging the flow of knowledge and technology among universities, R&D institutions, companies, and markets.

3. DISCUSSION

The research shows that partnerships (assured by the network) and changes (i.e., innovations) have been important in IS studies; it also shows that these two components have been positioned based on EU territorial innovation models, and therefore IPs. For these reasons, we think that IPs are attractive settings in which to study IS. A variety of factors have surfaced in favor of this, which are discussed.

It's worth noting that the environmental variable has been identified as a significant factor in almost 15 instances among Italian IPs. Some of them are in regions that have already begun to develop territorial solutions for environmental sustainability (for example, Tuscany's CLOSED project (Closed Loop System with Eco-Industrial Districts); Piedmont's development of the Environment Park Scientific and Technological Park; and Emilia Romagna's promotion of the so-called Ecologically Equipped Industries). However, there are no clear allusions to the idea of IS in relation to IP initiatives.

Specialization by industry: By definition, IPs are made up of businesses and entities that are part of the same supply chain or industry, implying a degree of homogeneity in terms of the processes, resources, and products produced in the network (as emerging in the Italian context). This feature, when viewed in light of the potential for IS growth, identifies both good and negative topics for consideration. Internal homogeneity means that resources beneficial to IS

(such as by-products and trash) are available in greater quantities and from a greater number of businesses, which may assist overcome certain "scaling" constraints. Other beneficial aspects include the ability to share expertise and the creation of shared management solutions for two or more businesses. On the other hand, because the involved organizations in the IS have similar flows, a high level of internal homogeneity in the network can reduce the chances of input/output matching; indeed, in some cases, a certain level of diversity among the involved firms is essential to allow symbiotic exchanges. Some of the barriers to sectoral homogeneity may be overcome by encouraging inter-IP synergy. In this scenario, the involvement of a coordinating organization (or knowledge-sharing among IP managers) would be required to enable the start of contacts between the businesses concerned.

Spatial scale: Scientific research and practical examples indicate that businesses in an IS do not have to be co-located. Long-distance transfers, however, may result in additional costs and environmental effects since IS is built on exchanges of low-value-added flows (e.g., trash). As a consequence, proximity, in general, favors high IS exchange efficiency; nevertheless, some findings indicate that, when dealing with recovery and recycling problems, it is impossible to assign any specific geographical scale a priori, since economic transaction motives often dominate. Other research suggests that a "local" scale may compensate for certain trade-offs (such as those between "technical and organizational skills" and "degree of personal affectedness"). IPs may have a varied geographic size, according on the data gathered. They may overlap existing industrial clusters or districts (as in some cases in the Tuscany region), or they may involve companies from the same region or even beyond regional boundaries (as in some cases in the Abruzzo region), and then operate transversely to existing industrial sites (as in some cases in the Tuscany region).

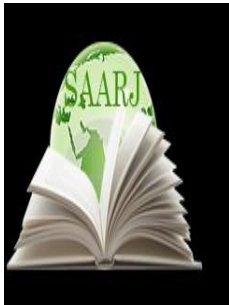
3. CONCLUSION

The potential synergies and critical issues between the two models of local development of Industrial Symbiosis (IS) networks and Innovation Poles (IPs) have been investigated in this article, which moves from the common features of industrial networking and innovation to the potential synergies and critical issues between the two models of local development of Industrial Symbiosis (IS) networks and Innovation Poles (IPs). The study's knowledge base was built on a review of the literature and firsthand investigation. The Italian territory has been utilized as a source of regulatory and technical information on the IP model, which has seen fast and widespread adoption in this nation. To begin, it was discovered that networking and innovation are two important elements in IS research; it was also verified that they have been underutilized as a common foundation for IS development, but are at the heart of EU territorial innovation models, including IPs. The positive role that IPs can play in the development and diffusion of IS in a given territory can be attributed to their institutional activity of knowledge and innovation production and dissemination, and, more importantly (if considered as applicative contexts for IS), to their promotion of the establishment of symbiotic relationships among their members. Some factors, such as sectoral specialization, geographical scales, the presence of social connections and trust, the involvement of stakeholders, and regulatory problems, have emerged as important in this regard. There were also a number of policy and management implications for local development that were discussed. To begin with, the potential advantages to the area from the spread of the IS model are many, and this should be carefully examined by regions and local officials. Second, since IPs were not designed with this goal in mind, important synergies

between the IP model and other methods and instruments for local sustainable development may emerge. Concerning the study's limitations, it should be noted that they are related to the study's scope (the sample is limited to Italian IPs) and the availability of data, as the IP model is still understudied, and examples of its practical application are too recent to provide a meaningful picture of how they work. Our future efforts will be focused on identifying new operational scenarios in which we may further develop and test our findings.

REFERENCES:

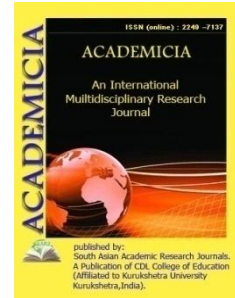
1. R. Taddeo, A. Simboli, G. Ioppolo, and A. Morgante, "Industrial symbiosis, networking and innovation: The potential role of innovation poles," *Sustain.*, 2017, doi: 10.3390/su9020169.
2. I. Booyens, T. G. B. Hart, and K. H. Ramoroka, "Local Innovation Networking Dynamics: Evidence from South Africa," *Eur. J. Dev. Res.*, 2018, doi: 10.1057/s41287-017-0123-2.
3. E. Lambrecht, N. Taragola, B. Kühne, M. Crivits, and X. Gellynck, "Networking and innovation within the ornamental plant sector," *Agric. Food Econ.*, 2015, doi: 10.1186/s40100-014-0022-1.
4. L. Pittaway, M. Robertson, K. Munir, D. Denyer, and A. Neely, "Networking and innovation: A systematic review of the evidence," *International Journal of Management Reviews*. 2004, doi: 10.1111/j.1460-8545.2004.00101.x.
5. J. M. Lewis, L. M. Ricard, and E. H. Klijn, "How innovation drivers, networking and leadership shape public sector innovation capacity," *Int. Rev. Adm. Sci.*, 2018, doi: 10.1177/0020852317694085.
6. A. Basile, "Networking System and Innovation Outputs: The Role of Science and Technology Parks," *Int. J. Bus. Manag.*, 2011, doi: 10.5539/ijbm.v6n5p3.
7. T. Schøtt and K. W. Jensen, "Firms' innovation benefiting from networking and institutional support: A global analysis of national and firm effects," *Res. Policy*, 2016, doi: 10.1016/j.respol.2016.03.006.
8. V. Scuotto, M. Del Giudice, and E. G. Carayannis, "The effect of social networking sites and absorptive capacity on SMES' innovation performance," *J. Technol. Transf.*, 2017, doi: 10.1007/s10961-016-9517-0.
9. T. Gajdošík, Z. Gajdošíková, V. Maráková, and K. Borseková, "Innovations and networking fostering tourist destination development in Slovakia," *Quaest. Geogr.*, 2017, doi: 10.1515/quageo-2017-0039.
10. Tajudin, "External Networking on Innovation in Malaysia's Construction Industry," *Jkr J.*, 2017.



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YOGA THERAPY DURING CANCER TREATMENT: A REVIEW

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ABSTRACT

Purpose To guide the future science and medical practice, reviews of yoga studies that differentiate the outcomes of trials performed during (vs after) cancer therapy are required. As a result, we carried out a review of non-randomized studies as well as randomized trials of yoga treatments for children and adults receiving cancer therapy. Methods Research sources and reference lists were used to find studies. The following were the criteria for inclusion: (1) children or adults receiving cancer treatment, (2) yoga or an element of yoga as just an intervention, and (3) participant journal publication in English until October 2015. (1) samples receiving just hormone treatment, (2) therapies using only meditation, and (3) yoga given as part of a larger cancer recovery or insight meditation stress reduction program were all excluded. The majority of findings point to an improvement in psychological outcomes (e.g., depression, distress, anxiety). Yoga was also shown to improve quality of life in many trials, but further research is required to determine domain-specific effectiveness (e.g., physical, social, cancer-specific). In terms of physical and biological results, evidence is mounting that yoga improves sleep and tiredness; however, further study is required to confirm early findings for other therapeutic outcomes and stress/immunity biomarkers. Conclusions Evidence supports advising yoga to people receiving cancer treatment for improving psychosocial outcomes, with the potential to help improve physical symptoms. The evidence for yoga's effectiveness in pediatric oncology is inadequate. We provide recommendations for improving yoga research methods in order to improve clinical practice guidelines.

KEYWORDS: Depression, Effective, Psychological outcomes, Stress, Yoga

INTRODUCTION

Each year, more than 14 million people worldwide are diagnosed with cancer, and more than 8.2 million people die from it. High BMI, cigarette use, physical inactivity, poor diets, and excessive alcohol consumption are all behavioral risk factors that contribute to cancer genesis, development, and prognosis. Furthermore, through altering biology and affecting behaviors, persistent stress and depression may have impacts on cancer. Cancer diagnosis and treatment may also produce biological complications such as pain, sleep problems, tiredness, nausea/vomiting, and chemotherapy-induced immunodeficiency, among other things. Some of the effects of cancer are transitory, but many of them last a long time, forcing patients to deal with them on a long-term basis. Furthermore, these side effects make patients more susceptible to other diseases. People may employ mind-body activities like yoga, which is one of the most popular supplementary modalities amongst men and women having cancer in the United States.[1]

Telomere shortening, higher inflammatory cytokines, and reduced cell-mediated immunity are all linked to an increased cancer risk and worse cancer-related outcomes. Although stress does not cause cancer directly, it may promote it via endocrine pathways (e.g., sympathetic nervous system, hypothalamic-pituitary-adrenal axis) that raise inflammation, enhance angiogenesis, decrease anoikis, and diminish chemotherapeutic effectiveness. Yoga and other biobehavioral treatments have the potential to enhance cancer outcomes by reducing stress and interrupting its impact on cancer biology. Previous studies of the potential for yoga to help cancer survivors did not distinguish between individuals who were undergoing current cancer treatment and those who were post-treatment survivors. Efforts to compare the effectiveness of yoga during cancer therapy with post-treatment survival have shown mixed results. As a result, further study is needed to assess the function of yoga throughout various stages of cancer survival. As a result, the emphasis of this study is on individuals who are undergoing cancer therapy. Methods To find out whether yoga can help individuals who are undergoing cancer treatment.[2]

DISCUSSION

To find yoga studies for cancer patients, researchers used search keywords such as yoga, cancer, and over within headings terms (e.g., neoplasm) in CINAHL, MEDLINE, PsycINFO, and PubMed. Additional relevant studies were found using the reference lists of the highlighted publications. The following were the criteria for inclusion: (1) children or adults receiving cancer treatment, (2) yoga or a component of yoga as an intervention, and (3) peer-reviewed publications published in English through October 2015. The following samples were excluded: (1) hormone therapy-only samples, (2) meditation-only treatments, and (3) yoga given as part of a broader cancer rehabilitation or mindfulness-based stress management program.[3]

In pediatric samples, no RCTs of yogi during cancer therapy have been reported. Only single pilot trials in pediatric oncology have been reported. A total of 10 children with various cancer diagnoses were involved in the study. Parents/caregivers were included as yoga practitioners and/or proxy responders in all studies.

1. Non-randomized trials of yoga during cancer therapy in children:

1.1 Characteristics of the intervention:

Two pediatric research utilized particular yoga techniques, whereas the other two did not. All four featured a variety of yoga exercises, including a mix of movements, respiration, calm, and meditation. None, on the other hand, offered comprehensive class sequencing or treatment fidelity information. The dose ranged from a single 45-minute session to 60-minute sessions spaced out over 3–12 weeks, with one to 3 days per week. Three treatments were delivered as group courses, whereas one research did not identify the delivery method. None of them said they gave guidance for at-home practice. All of the teachers in the trials were certified to teach yoga, but only two of them had specialized cancer or therapeutic yoga training.

1.2 Feasibility:

Three of the four pediatric trials looked at the feasibility, attrition, and adherence of the treatment. The percentage of people that were recruited varied from 42 to 55 percent. The majority of children and adolescents (90 percent of children and 100 percent of adolescents) completed the single-session research. In a three-week program, ten of eleven participants fulfilled the a priori criteria for feasibility (60 percent of sessions attended), with a median of nine sessions. In the 12-week program, 55 percent of participants attended yoga sessions, with 73 percent completing the evaluations; cause of non-included vacation and sickness. Participants dropped out of multi-session trials for a variety of reasons, including time/scheduling problems, a dislike for yoga, or a belief that it was "not fast enough". Two pediatric investigations indicated that no adverse effects linked to yoga happened.

1.3 Outcomes

One study found statistically significant improvements in physical function, while the other found clinically significant changes in all QOL variables as evaluated by children and parents/caregivers. Additionally, statistically significant improvements in mobility, flexibility, and physical activity among children and statistically significant reductions in state anxiety amongst adolescents and parents who participated in yoga were found. These conclusions were backed up by qualitative evidence. Yoga was regarded as calming and beneficial for controlling stress/anxiety by participants in pediatric research. They also reported better energy, sleep, and happiness, as well as decreased nausea and pain medication usage.[4]

2. Randomized controlled trials of adult yoga during cancer therapy

2.1 Characteristics of the Intervention:

Three of the studies describing yoga style were based on generic yoga traditions, whereas the other six utilized a particular style of yoga. The majority of adult RCTs incorporated yoga elements such as postures, breathing, and meditation. Three studies did not include yoga moves; two focused exclusively on breathing, while the third included breathing, concentration, and the goal to handle uncertainty and anxiety.

2.2 Possibilities:

Defections averaged 20% prior to or shortly after randomization (i.e., before starting yoga sessions) in three trials, although one study showed 56 percent attrition among individuals

allocated to yoga immediately after randomization. Attrition was higher between yoga participants in the two studies, among matched controls in three studies, and roughly equal across groups in four studies with adequate data to compare. Two trials reported 100 percent completion. Although only two trials assessed participant satisfaction with the yoga treatments, subjective benefits and pleasure were usually high. Except for three studies the majority showed high levels of adherence (>70 percent of participants completing the bulk of courses). When home practice rates were reported, they were mixed. In a study of pranayama, participants spent an average of 3.2 hours per week practicing at home. In trials that included movement, up to 19 percent did not practice at home, whereas more than half did so at least three times per week.

2.3 Outcomes:

Several of the 13 RCTs found that yoga participants' mental health, including positive and negative affect, distress, depression, and anxiety, improved significantly. Yoga practitioners reported substantially improved emotional, mental, social, physical, and overall quality of life when compared to controls. Despite the fact that outcomes like self-esteem, spiritual well-being, or cognitive function were seldom assessed, yoga participants reported positive improvements in these areas. In two trials, including the sole study with an active control group, yoga practitioners had better self health than controls in terms of physical and biological outcomes. In many studies, treatment-related side symptoms such as sleep, tiredness, pain, appetite loss, nausea and vomiting, related discomfort, and toxicity improved among yoga participants. Yoga participants had superior post-operative outcomes than control participants, including less drain retention, faster suture removal, and shorter hospitalization.[5]

3. Non-randomized trials of adult yoga during cancer therapy:

3.1 Demographics of participants:

Nine adult non-randomized studies recruited a total of 155 (average $n = 17$) individuals, the majority of whom were Caucasian (78%) and female (81%). Various cancer kinds (e.g., lymphoma, gynecologic, breast, and lung) were represented, as well as all stages (0–IV). When indicated, chemotherapy ($n = 61$) and radiation ($n = 40$) were given while engaging in yoga treatments.

3.2 Characteristics of Intervention:

Seven therapies used a particular yoga style or a mix of yoga styles. The majority covered various aspects of yoga, such as movement, breathing, meditation, and/or yogic philosophy, while two studies solely included movements or breathing. Facilitated group talks were also used in two research. Three of the nine articles detailed particular class sequences, while five said that movements were tailored to the requirements of the person. Using an instruction manual and analyzing recorded sessions, one research guaranteed treatment fidelity.

3.3 Feasibility:

Five studies found that recruitment rates varied from 16 percent (by sending letters) to 74 percent (by approaching them in person). Recruitment issues hindered the completion of another

research. For reasons such as travel distance, loss in interest, scheduling problems, , seven studies reported attrition rates ranging from 8% (selected from a continuing yoga class) to 43% (selected from women undergoing treatment).

3.4 Outcomes:

Quality of life (QOL) and emotional, physical, and spiritual health were among the outcomes reported in the nine non-randomized adult studies. Because these studies usually lack comparison groups and sufficient power to identify statistically significant changes, the results offer early evidence on yoga's benefits that should be investigated further in properly powered trials. Effect sizes (clinical significance markers; e.g., Cohen's d 0.2 small, 0.5 medium, 0.8 large) and qualitative data are particularly useful in this early stage of research. Anxiety, sadness, mood, negative affect, relaxation, and general mental health all saw statistically and/or clinically significant improvements which were backed up by qualitative comments. Improvements in cognition, benefit discovery, spiritual well-being, social support, self-efficacy, and coping were among the other qualitative results. Physical health increased substantially in terms of physical QOL, tiredness, vigor, most-bothersome symptom, and activation of immune-related genes. Increased strength, release of stress, physical invigoration, and application of yoga in various circumstances (e.g., while attempting to sleep, during medical tests) were also mentioned in qualitative reports. Furthermore, yoga had a moderate impact size and a dose-response effect on sleep.[6]

Only four single-arm pilot trials of yoga have been conducted among children receiving cancer treatment. have been published. The feasibility, safety, and potential effectiveness of yoga in pediatric cancer are all supported by preliminary results from these non-randomized studies. However, unless further thorough studies are performed, its efficacy cannot be established (e.g., RCTs, larger sample sizes). The benefits of yoga on people receiving cancer therapy have been studied in nine non-randomized research and 13 randomized controlled trials. The effectiveness of yoga in improving psychological outcomes such as sadness, distress, and anxiety has been shown in both non-randomized and randomized studies. Several studies, especially RCTs, found that yoga participants had better QOL, but further research is required to determine the effectiveness of yoga for various kinds of QOL (e.g., mental, social, physical, cancer-specific), as well as spiritual well-being.[7]

Researchers reported fewer physical and biological outcomes, but it's unclear whether this is due to a failure to assess these outcomes or a refusal to disclose null results. Sleep and tiredness were the most frequently assessed non-psychological outcomes in both nonrandomized studies and RCTs, resulting in a growing body of data that yoga improves sleep and weariness among cancer patients. Additional research is required to confirm early results for additional treatment effects (e.g., nausea, surgical results, and cognitive function) and stress and immune biomarkers. Multiple limitations of past study samples and methodologies restrict the findings.[8]

The overwhelming majority of research,for example,have relied only on self-reported data. Furthermore, with a few exceptions, breast cancer patients make up the majority of the samples. Regardless of the fact that yoga may be mild enough for people with advanced illness and possibly influence critical outcomes, individuals with Stage IV illness of any kind are seldom included in yoga studies (e.g., distress, QOL). Variability in intervention procedures further limits generalizability. The majority of trials included multiple aspects of yoga (e.g., movement,

breathing, meditation), but intervention delivery (e.g., group vs. individual; instructor-delivered vs. home practice) and yoga dosage (i.e., frequency, length) varied significantly, as did retention and adherence rates. As a result, the quantity of yoga practice required to produce benefits is unclear. Yoga participants improved on endpoints such as psychological distress, tiredness, and immunity in several trials, whereas the waitlist control group deteriorated.[9]

Only two studies included an effective control group. As a consequence, non-specific, but possibly beneficial, components of yoga treatments cannot be separated from Bioactive elements (e.g., movement, breathing) (e.g., social support, attention). Participation, results, and generalizability may all be affected by recruitment techniques and other research design features. When sampling from individuals who are already enrolled in yoga courses, for example, enrolment and retention rates may be particularly high. Although these variables may affect participants' adherence and efficacy of treatments, researchers have seldom published details of their yoga instructors' training and experience particularly with individuals with cancer. The lack of information regarding studies' treatment fidelity attempts adds to the difficulty of understanding and implementing the findings. Despite these drawbacks, research has shown that yoga is likely to help adult cancer patients who are undergoing active therapy. Furthermore, no studies have shown any negative effects from practicing yoga during therapy. As a result, there is enough data to suggest yoga to people receiving cancer therapy, particularly breast cancer patients.[10]

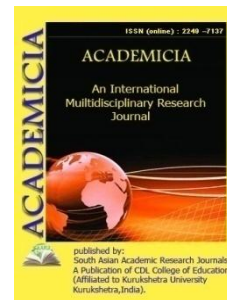
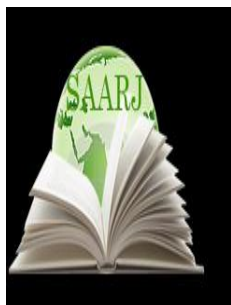
CONCLUSION

Yoga may be recommended to people receiving cancer therapy, especially women with breast cancer, based on current data. Existing research suggests that yoga may enhance or mitigate treatment-related changes in mental health, tiredness, sleep quality, and other elements of quality of life. With further study, support for additional advantages may become evident. Some cancer patients may be motivated to practice yoga because of treatment-related symptoms and stress and the obstacles to practicing yoga during cancer therapy may be fewer than for other kinds of exercise. Some studies have shown a link between regular yoga practice and better results.

As a result, it is suggested that obstacles be reduced by providing flexible class times and formats, integrating new technology, and involving family members. Notably, no adverse events were recorded in any of the studies included in our study. As a result, when compared to higher-impact types of exercise, yoga may be particularly safe and attractive to cancer patients. Finally, studies have shown that yoga treatments may enhance psychological distress, quality of life, physical function, and certain biological results in people undergoing cancer therapy. Yoga's potential to help individuals with cancer, on the other hand, may not have been completely realized yet. Theoretically, yoga encompasses more than the components included in most studies (i.e., movement, breathing, meditation). Its overall attitude and approach may have an impact on healthy living in general (i.e., food choices, exercise, life purpose, relationships). According to preliminary research, holistic lifestyle therapies have a lot of promise for combining with biological cancer treatments. Cancer survivors who have a normal BMI, are physically active, consume a mainly plant-based diet, refrain from cigarettes, avoid hazardous alcohol consumption, and are not depressed survive longer after diagnosis. Future study may look at whether a complete yoga approach helps individuals manage the adverse effects of cancer therapies, improve clinical results, and perhaps prolong and enhance survival.

REFERENCES

1. D. S.C., A. E.L., S. S.J., C. A., and C. L., "Review of yoga therapy during cancer treatment," *Support. Care Cancer*, 2017.
2. R. M.R. *et al.*, "Anxiolytic effects of a yoga program in early breast cancer patients undergoing conventional treatment: A randomized controlled trial," *Complementary Therapies in Medicine*. 2009.
3. M. R. Rao *et al.*, "Anxiolytic effects of a yoga program in early breast cancer patients undergoing conventional treatment: A randomized controlled trial," *Complement. Ther. Med.*, 2009, doi: 10.1016/j.ctim.2008.05.005.
4. B. S. Ajaikumar *et al.*, "Antidepressant effects of a yoga program in breast cancer patients undergoing conventional treatment: A randomized controlled trial," *J. Clin. Oncol.*, 2008, doi: 10.1200/jco.2008.26.15_suppl.9556.
5. R. M. Rao *et al.*, "Effects of a yoga program on mood states, quality of life, and toxicity in breast cancer patients receiving conventional treatment: A randomized controlled trial," *Indian J. Palliat. Care*, 2017, doi: 10.4103/IJPC.IJPC_92_17.
6. R. M. Rao *et al.*, "Effects of an integrated yoga program on self-reported depression scores in breast cancer patients undergoing conventional treatment: A randomized controlled trial," *Indian J. Palliat. Care*, 2015, doi: 10.4103/0973-1075.156486.
7. H. Greenlee *et al.*, "Clinical practice guidelines on the evidence-based use of integrative therapies during and after breast cancer treatment," *CA. Cancer J. Clin.*, 2017, doi: 10.3322/caac.21397.
8. S. C. Danhauer, E. L. Addington, S. J. Sohl, A. Chaoul, and L. Cohen, "Support Care Cancer," *Support Care Cancer.*, 2017.
9. H. S. Vadiraja, R. M. Rao, N. R. Hongasandra, R. Nagarathna, M. Rekha, and N. Vanitha, "Effects of yoga on symptom management in breast cancer patients: A randomized controlled trial," *International Journal of Yoga*. 2009.
10. A. Ram *et al.*, "Development and validation of a need-based integrated yoga program for cancer patients: A retrospective study," *J. Stem Cells*, 2012, doi: jsc.2013.7.4.269.



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ARTISTIC PSYCHOLOGY ON THE EXAMPLE OF THE WORK “SPRING DOES NOT RETURN”

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ABSTRACT

This article provides scientific information about the psychology encountered in artistic works. Artistic psychologisms in the work of acute Hoshimov “Spring does not return” are studied scientifically. Opinions are based on evidence.

KEYWORDS: *Work, Psychology, creative, contemplation, man, Society, Life, event, phenomenon, law, period, innovator, form, environment.*

INTRODUCTION

The work of art is a product of creative thinking, in which the life of Man and society, his path of destiny and destiny are found. In each artistic work, events that occur in our lives or may occur in our lives are transmitted by the author to the reader-reader on the basis of the laws of artistry, the legislation of this artistry is polished at different times and continues to be regularly formed between tradition and innovation. The problems raised in the works of art, the issues addressed to the attention of the reader and hukmiga – the theme and content of the work of art are closely related to the social environment of the period in which the work was created.

About a certain period and its representatives, interesting and important events can be said without interruption, but simply the description of events takes the description of events to the level of the work of art, when the creator uses various artistic means of painting, in order to increase the level of the work of art. In the deep and complete disclosure of the character of the artistic image in the work, the author used not only artistic image tools, but also psychological image tools. In the game, the author refers to the deep penetration into the inner world of the hero, a detailed description of the spiritual world of the image, the image of the soul senses – “Artistic psychology”.

The term psychology is associated with such terms as psychological analysis, psychological image, psychological image, psychological novel, psychological story and psychology. A. B. To the taste of Yesin, artistic psychology is a very complete, detailed and in-depth expression of the work by the use of specific artistic means of the imaginary world of personage, thoughts, reasoning. One of the first on the topic of psyche in the science of Russian literature was research N.G. Chernyshevsky says that psychological analysis can be diverse, and if one author tries to reveal the sides of the character, the other-shows the influence of society and life on the formation of the character; the third – describes the relationship of behavior with emotions; the fourth – describes the analysis of passions. If the concept of psychologism in Russian literature came into existence almost two hundred years ago, then this problem was solved by scientists of the world of Science A.A. Potebney, D.N. Ovsyaniko-Kulikovsky brought, in Literary Studies M.M. Lucky for you, JI.Eat it. Ginzburg, A.B. Yesin, D.S. Likhachev, and in the science of psychology, L.S. Vigotsky, I.V. Strakhoviy, G.G. Granik, O.V. It was studied in depth by Soboleva.

Describing the history of the development of psychology in literature, the literary scientist L.Eat it.Ginzburg writes that “at a time when psychological news came down in the existing literary genres, there were already concomitant genres of artistic literature – rasoil, in the diaries, memoirs and autobiographical genres, psychology settled.” The term psychologism in its place has different definitions. In the encyclopaedic Dictionary of Russian literary terms “Psychology (in literature)-the inner world of Heroes: a deep and detailed picture of their fantasies, dreams, sufferings”. L.Eat it.While Ginzburg “... in-depth study of the conflicts of the world of entertainment”, A.B. Yesin refers to the fact that psychology has a wide and narrow meaning – in a broad sense it is understood that the character of all kinds of art that glorifies and characterizes human life, and in a narrow sense it is called the image of life and processes in the inner world of man.

In the dictionary of terms of literary studies compiled by scientists of Uzbek literature, the term artistic psychology is defined as “one of the important means of creating a full-fledged human image in an artistic work; the disclosure of the spirituality of the personage, the psychological justification of his actions and speech, the set of methods and means that serve these purposes”. In Uzbek literary studies, the issue of artistic psychology entered the scientific field in the middle of the last century, and in our National Literary Studies this term was synthesized and got its names such as spirituality (psychologism), the image of spirituality (psychological image), the interpretation of spirituality (psychological interpretation), the analysis of spirituality (psychological analysis).

Psychologism of the term” spirit ” (Greek. it is permissible to use the term psyche – soul; logos – learn) as a synonym, the reason for which is explained in the Explanatory Dictionary of the Uzbek language in 5 volumes – “soul”, and in the spirit – “state of Soul”. Although this explanation is certainly imperfect for the literary terminology, but both terms in meaning give one meaning. From the second half of the 20th century, Uzbek literary scientists conducted research on the issue of artistic psychology and psychological analysis. In Particular, A.Rasulov's character "molodeji v sovetskikh povestiyakh sovetskikh sovremennikh uzbekskikh", N.Shodiev's "skill of psychological analysis in the works of Abdulla Qahhar", N.Problem psychologicheskogo analysis v uzbekskoy proze “Yuldashev ” (Vnutrenny monologue v romanakh A.Kadiri, Eybeka, A.Kaxxara, A.Yakubova) candidate's dissertations, X.Umurov's

doctoral dissertation "the problem of mental analysis in Uzbek novels", A. "Psychology in the novels of Adil Yagubov" by kholmurodov , P. In the candidate dissertation and monograph of "principles of describing the hero's spirit in the current Uzbek stories" by kenjaeva, M. Bobokhonov's dissertation "artistic psychology in the current Uzbek storytelling", M. Sheralieva's "irony in the present Uzbek prose" social and psychological factors, role in the poetic system)", Yu. Eshmatova's artistic interpretation of the female psyche in the Uzbek narrative of the period of Independence, Sh. Artistic psychology in the current Uzbek novels "botrova ("balance" of Ulugbek Hamdam, "rebellion and obedience", On the example of the novels "Sabo and Samandar"), having studied various aspects of artistic psychology and psychological analysis in their dissertations, written in order to obtain the scientific degree of the doctor of Philosophy (PhD) in philological Sciences, M. Kılıcheva's "problem of literary influence in the interpretation of psychological states in English and Uzbek literature (on the example of the motive of loneliness)", N. Qobilova conducted a comparative study on the themes of artistic psychology and psyche in their dissertations on the subject of philology (PhD) in order to obtain the academic degree of the doctor of philology (PhD) on the theme of "artistic psychology in the creativity of Jack London and Abdulla Kahhor".

Although the concepts of psychology and spirituality began to be recognized in the middle of the 20th century in the scientific periods of Uzbek literary studies, the interpretation and analysis of personality spirituality was also the leader in the work of representatives of eastern classical literature.

Utkir Hoshimov is a great creator. His works are translated into many languages of the world, improvised. Uzbek readers read with interest the works of Utkir Hoshimov. His story "Spring does not return" is known and popular to all of us. Today's article is about the essence of artistic psychologisms in the work "Spring does not return".

In the story "Spring does not return", the writer artistically analyzes the history of the decline, the spiritual crisis of a talented but selfless young man, whose talent is not appreciated, deprived of great goals. It was this artistic analysis that won the hearts and minds of many with its emotional richness and sincerity. From the beginning to the end of the story, the author's very delicate and delicate observations, the writer's heartbeat, colorful experiences, pleasures, longings, in short, a breath of different emotions are blowing. Here is a small excerpt from the end of the story, depicting the landscape after the death of the protagonist Alimardon:

"Why? the sun had set very hard that evening. It hung at the foot of the horizon and slowly sank to the ground.

A few days later, spring came and spread ... The generous spring covered Alimardon's grave like many others. The only tulip in the grass caught the morning dew. Sooner or later, it spilled, unaware that it was neither fragrant nor fruitful ... "

It is almost as if these last lines are written on paper with countless sorrows and tears. On the day of the hero's funeral, on that sad night, the sun sets, the horizon hangs for a long time, and then the hopeless alfalfa slowly sinks to the ground. The generous blue that adorns the whole place with light and color, the hero's heart is covered with grass, the tulip burning on the hero's grave, the melancholy image full of the details of his life, about the life of a man who lived an early life. the treasure sounds like the last cries of the song.

Hoshimov has a strong sense of humor. Even in the depiction of the spiritual crisis, tragedy, and destruction of the deceived person, he retains this feeling. In particular, he feels very free in the image of the heart and nature of good, noble, spiritually mature people. The writer's positive protagonists are childlike, delicate, emotional, and very influential people. Probably, this is one of the factors that captivated many Uzbek readers of the heroes of Utkir Hoshimov's works. The reader, who was brought up in the spirit of cruel, crude paintings of the cruel truth of life, has a little bit of very elegant, emotional expressions, simple, romantic, very emotional, touching heroes in the works of Utkir Hoshimov. It may seem more biblical, but the writer's way of thinking and expression does not have to be the same for everyone. However, it is inappropriate to discriminate, reject, or criticize the author's style because it contradicts another style. The more diverse the artistic thinking and expression in literature, the better.

In the works of Utkir Hoshimov, the lyro-romantic direction, which is accompanied by a sense of elegance in the interpretation of the character, is expressed in a special way, which is the richness of our national prose. So, Utkir Hoshimov, a well-known representative of the Uzbek literature of the new era, is a writer who has won the respect of the people with his multifaceted and meaningful works. Each work of the artist is recognized as a separate event in Uzbek literature. In particular, the work "Spring does not return" has won the love of readers in all respects. The work was republished, and a film was made based on the work.

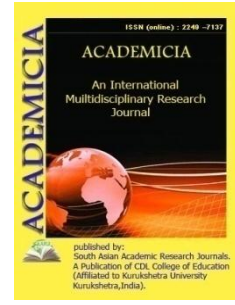
So, it has become a favorite book of our people. As with other works by Utkir Hoshimov, literary criticism has commented on this story. Utkir Hoshimov's "Spring Will Not Return" is noteworthy for its echoes. In this sense, we can say that this topic is one of the new directions of our modern literature, our literary-critical views. The analysis of the work in the spirit of independence on the basis of new literary views is a requirement of time and science.

LITERATURE:

1. Izzet Sultan. Theory of literature. - T., "Teacher", 2005.
2. Babayev T. Fundamentals of literary studies. - T., "Uzbekistan", 2002.
3. Baltayev X. Depth. - T., "Uzbekistan", 2007.
4. Zhurayev T. The flow of consciousness. Modern. - Fergana "Fergana", 2009.
5. Utkir Hoshimov. An unfamiliar island: thoughts, conversations, Hangouts, travel, inscriptions on the Laurel border. - T., "Young guard", 1990.



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THE ROLE OF PARENTS IN THE UPBRINGING OF CHILDREN

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ABSTRACT

The article describes the impact of family and relationships on the upbringing of children, as well as the role of parents in the upbringing of children. Sometimes there are three cases of indifference towards the child even in well-off peaceful families. For example: the birth of an unexpected child, the mother is beautiful, but the daughter is khunuk, which irritates the mother. They want their children to be the people they want to be. However, conflict situations between parents in the family, conflict situations between parents lead to the opposite. The conflict situation is especially relevant when it comes to a different approach to Child Care by parents.

KEYWORDS: Family, Child, Parent, Upbringing, Attitude, Behavior.

INTRODUCTION

The family can be a factor of positive or, conversely, negative influence on the upbringing of the child. Positive influence on the child's personality is such that no one in the family, except for the closest people to the child - father, mother, grandmother, grandmother, brother, sister, sees the child as good as they are and does not care about him. At the same time, it is also possible that the family has a negative impact on the formation of the personality of the child, on the upbringing of them. Family-this is a specific team he has the main place in the upbringing of the child.

Taking into account the specific educational importance of the family, it is possible to increase the positive influence of the family on the child and reduce its negative influence. For this, it is necessary to clearly define the socio-psychological one of the internal family, which has educational significance.

Family is the highest product of human thinking. After all, this small place not only benefits our lives, but also plays an important role in the development of the country, in the development of society.

The main thing in raising a child is to achieve a heartfelt intimacy and moral bond between parents and the child. Parents should never abandon the upbringing process to their own condition, especially a child who begins to grow up. Because the child learns exactly the first life experience in the family, observes and learns how to behave in different situations.

What the child learns in the family should be reinforced with concrete, life-giving examples; the child should see that what the adults say is practically the same. For example: if a child hears that it is impossible to lie every day by his parents, then the leki will be cracked in the upbringing of the child if the parents do not follow this rule themselves without noticing it. Parents will see their own successors in their children. They want their children to be the people they want to be. However, conflict situations between parents in the family, conflict situations between parents lead to the opposite. The conflict situation is especially relevant when it comes to a different approach to Child Care by parents. In order to solve conflict situations in such cases, it is necessary to observe: - the second task of parents is to come to a common decision, - to convince each other, - to take into account the opinion of the second party before making a decision by the father or mother; the second task of parents-the child should not see the parents in their

Children very quickly absorb the thoughts they say and use them in their own way. Therefore, it is necessary for parents to think not only that they look at themselves in the first place in decision-making, but also to bring benefits to their children.

In order for the relationship between parents and children in the family to be positive, in the communication between adults and children it is necessary to follow the following: the parent must first of all take his child in the same way, in this case: the parent must look at the problems with the eyes of the children and feel them in their

The fact is that even parents love their children in spite of nothing. The child, in any case, will receive. If the child is in harmony with his parents' feelings and desires, that is, if he is well-read, good-natured, he will approach himself, but if the child does not respond to the parents' students, then in this case, the parents will take the children away from them and change them to the bad side of the relationship. And this brings out significant difficulties, the child does not trust his parents with their kindness.

In some families, the child is not accepted by parents at all. They are indifferent to the child and push him away from themselves for example: a family given to drinking. Sometimes there are three cases of indifference towards the child even in well-off peaceful families. For example: the birth of an unexpected child, the mother is beautiful, but the daughter is khunuk, which irritates the mother.

Errors in the upbringing of a child in the family are different districts. One of the most common among them is the reputation of parents in addition to Khad, their desire for khukmron. Every step of the child is controlled, independence in his behavior is eliminated. The child loses confidence in his own strength and opportunities. Internal desires and aspirations are guided by demands for obedience without formation.

Another type of error in family education is due to the fact that children have a husband, there is no demand for them. Parents in this case sometimes do a lot of their work on their own, without giving enough assessment to the possibilities of the child. As a result, the child does not develop

a sense of independence, diligence to work, responsibility for the assigned work. The child can not choose his work, can not bring it to the end, grow up servile.

Another of the most important difficulties is that the parents do not understand that in the upbringing everything is causative and conditional, education is a long process, in this process there is a number of interrelated joints, tools and methods, the normal passage of the process due to the fall of a joint in them does not understand the violation of the result of Parents do not take into account the importance of this situation, often make a claim that the child "suddenly" broke up. One type of mistake in the upbringing of children is the absence of a single student in upbringing by a mother or father, grandmother, grandmother, etc. In such families, children tend to adapt to the dependent opinions of adults. And this is hypocrisy in the child. it causes the formation of flattery and similar negative qualities.

In the formation of the personality of the child in the family, it is important that the relationship between the heads of the family and the children is good, respect for the elderly of the household, attention, the relationship of the children in the family is properly brought up, along with the upbringing of the children of the parents, the right order and

It is also important in the upbringing of the child that the parents have a relationship with each other, be able to behave themselves, all the rules of behavior in the family should be followed. Respect for adults, praise of the little ones, kindness to each other, especially honoring women should become a habit, a rule.

It is an important task of the father to teach children to respect the mother, to be kind to her. Usually the boy tries to be like his father, and the girls like his mother, to absorb the good qualities in them. Both father and mother make their own contributions to the upbringing of the child. As a rule, if the mother is caring, loving, submissive, the father is concerned for strength, courage, firmness, cares for the child's mental and physical development, the mother – walks, treats, feels satiety, tenderness.

Because both the father and the mother are equally responsible for the mental, moral physical perfection of the child, their sudden goal is aimed at raising a child. A healthy family environment is of great importance in the formation of the personality of the child in the family. Mutual respect, trust and loyalty between parents in the family have a direct impact on children's cheerful, cheerful growth, normal upbringing, the creation of a healthy environment in the apartment.

The fact that the family members can put their respect in place, they can burn souls for each other, be in a good relationship serves for the formation of similar characteristics in the child. In the family there is always sincerity and upliftment, which positively affects the mood of the family members, if the spirit prevails. On the contrary, if there is injustice, rudeness, hellish, badness, domination, then there will be no honesty.

Parents are obliged not to reproach each other in front of their children, not to bring down their reputation, to resolve family disputes at a time when they do not have it. Children are not born bad or good-natured, Fe'l-tempered. In the process of its growth, the family environment plays a decisive role, the influence of relations on the parents, people, the environment. Harmony in the family, harmony, mutual respect and help, sweetness, diligence and correctness will positively affect the child.

The Thinker Joseph khoshib in his book "knowledge of the fire", referring to the upbringing of the child, writes: "the more educated the child, the smarter his parents' face was so light." He pays special attention to the responsibility of the father in the upbringing of the child. "Whoever has a son-daughter erka, he writes to him that the same person himself cries as a mungli. There is no sin in the child if the father makes the child bebearer in his smallness all the jafo in the father himself; if the behavior of the son-daughter is naughty, then this naughty deed will be done by the father. When the father controls his children and teaches them various funerals, when they grow up, he rejoices that I have a son-daughter; it is necessary to teach the boy-girl skill and knowledge, so that with this skill their feats are beautiful."

The issue of raising children in the family also occupies a worthy place in the heritage of the great thinker poet Alisher Navoi. In his opinion, the maturity of society, its fate and the future are tied to the fullness of youth, accordingly, the upbringing of children in the family is a noble task facing parents, he says.

In the family, great responsibility for the upbringing of a child falls primarily on the parent. In the upbringing of the child, along with the parent, the teacher is also responsible when he begins to go to school. And for this, the teacher himself must be well educated. In this place it is necessary to say one thing separately that the main impulsive force in the upbringing of children is the mother. The father is engaged in the economic affairs of the family, while meeting and providing for the material needs of the family in most peoples. This is a well-known fact from the history of Uzbek families and a tradition that has become a legacy from our ancestors. Accordingly, more mothers with the child will be together. It is not surprising that in Uzbeks "comes out with a soul that enters with milk". High moral virtues enter the child's spirit with more Mother's milk.

It can be seen that the norms of morality-respect for adults, compassion for the little ones, honesty, diligence, diligence, etc. – begin with the family. These mentioned pedagogical philosophical concepts are closely related to the worldview of the head of the family.

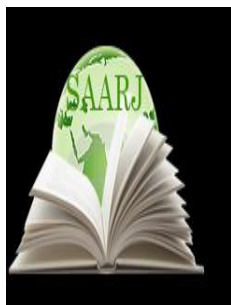
We also provide the following recommendations for effective organization of child care in the family;

- To ensure the psychological literacy of parents in the creation of a positive psychological atmosphere in the family;
- To teach young people the art of communication, treatment, listening in the case of different treatment situations in the family,
- In strengthening mutual parental and child relations in the family, various family "puzzles" consist in recommending games such as, say, verse, summoning the content of Proverbs.

USED LITERATURE:

1. Mirziyoyev Sh.M. We will build our great future together with our brave and noble people. Tashkent-2017.

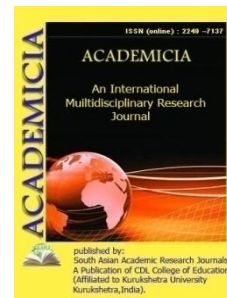
2. Vigotsky L.S. Hysteria razvitiya visshix psichicheskix function / / Vigotsky L.S. Patience.hair. M., 1983. T. 3. S. 5-328.
3. Zlokazov K. V. Destructiveness and identity of personality // Scientific yearbook of the Institute of Philosophy and Law of the Ural Branch of the Russian Academy of Sciences. 2014. № 1.
4. Piz A., Piz B. The language of relationships: man-woman. - M.2005.
5. Bern E. Introduction to psychiatry and psychoanalysis for the uninitiated. St. Petersburg: MFIN, 1992. p.36
6. Aaron Beck, Arthur Freeman. Cognitive Therapy of Personality Disorders, 1990
7. Sharafutdinova, Khadichaxon Gulyamutdinovna. "Destruction of family relations psychoprophylaxis family-neighborhood-educational institution cooperation." *ACADEMICIA: An International Multidisciplinary Research Journal* 10.11 (2020): 1000-1007.
8. Sharafutdinova H.G., Normuminova D.E. Overcoming anxiety with the help of cognitive behavioral psychotherapy, "Pedagogical education and Science", 2020. No. 1, pp.124-128
9. Kadirov U. Some feedback on the socio-psychological structure of the individual. // Educational problems, 2012 Year, - №2.
10. Zarnigor, Babamuratova, and Shabbazova Difuza Ruzikulovna. "Views Of The Great Thinkers Of The East About Education And Perfection Of Human." *European Journal of Research and Reflection in Educational Sciences Vol 7.12* (2019).



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A REVIEW ON ENZYMOLOGY, USES AND BIOTECHNOLOGY OF PHYTASE

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ABSTRACT

In addition to auxiliary enzymes, fungal proteins, as well as organic acids, phytase generated by filamentous fungus on chosen feed components increases feed digestibility and access to phytin in plant cells. Phytases are phosphohydrolases that start the process of removing phosphate from phytate one step at a time. These enzymes have long been used in animal feed to enhance phosphorus nutrition or decrease phosphorus contamination from animal manure. The use of phytases to improve human nutrition of important trace elements found in plant-derived foods is being investigated. This study focuses on the growing biotechnology utilized to create novel effective phytases with enhanced characteristics, as well as the fundamental biology and use of phytases.

KEYWORDS: *Biotechnology, Environmental Pollution, Mineral Nutrition, Phytase, Phytic Acid.*

1. INTRODUCTION

Phytase is necessary for increasing the nutritional content of feed as well as promoting animal development and health. It hydrolyzes phytate substrates to generate phosphorous in a free form that animals may ingest, reducing the need for inorganic phosphorus supplements. Furthermore, adding phytase to feed reduces the amount of phosphorus excreted in manure, resulting in a reduced environmental effect from livestock production. Phytase for feed is generated via

microbial strain fermentation and is mostly utilized in swine and poultry diets. Phytase is worth \$300–350 million and accounts for approximately 40% of the entire feed enzyme market. The market price for phytase varies significantly, and the substance is available in various concentrations. The market price for a product standardized at 5000 FTU/g may range from \$1 to \$5 per kilogram [1].

The cheapest phytase products are those made in China for the domestic market. However, comparing one product to another cannot be done only on the basis of FTU activity since other factors will influence the enzyme's performance. Four essential criteria distinguish one phytase from another without delving into complicated technical issues. Cereal and legume seeds acquire a significant quantity of phytic acid during ripening (myo-inositol 1,2,3,4,5,6-hexakis dihydrogen phosphate). As a consequence, the majority of these seeds and co-products contain 1–2% phytic acid, which accounts for more than 60% of their physico-chemical parameters. A significant part, if not all, of phytic acid in seeds is probably in the form of phytate salts. Although phytate is the primary source of energy and phosphorus for seed germination, simple-stomached animals have limited access to the bound phosphorus. To fulfill the nutritional demand for phosphorus, inorganic phosphorus, a non-renewable and costly mineral, is added in swine, poultry, and fish diets. Meanwhile, in places where extensive animal husbandry is practiced, unutilized phytate phosphorus from plant feeds is excreted, creating an environmental contaminant. Excess phosphorus in the soil washes into lakes and the sea, producing eutrophication and promoting the development of aquatic species that may generate neurotoxins that are harmful to people. Furthermore, positively charged divalent cations bind with negatively charged phytic acid. As a result, the bonded metals are poorly absorbed in the small intestine. This is due in part to widespread human nutritional deficits in calcium, iron, and zinc in developing nations where plant-based diets are the norm. Overall, problems in animal feeding, environmental protection, and human health have spurred the rapid development of phytase research and innovation [2].

1.1 Phytase Characteristics:

The quantity of inorganic phosphate generated per minute from a certain substrate at a specific pH and temperature is used to determine phytase activity. Phytase activity or function is influenced by the enzyme's intrinsic characteristics as well as the action circumstances, much like other enzymes. The following characteristics of phytase are important in practice:

The substrate specificity as well as affinity of several phytases have been extensively studied. Plant phytases and certain fungal enzymes, such as the one from *A. fumigatus*, seem to have a wider substrate specificity or are responsible for breaking down the lower inositol phosphates, while microbial phytases appear to have a strong affinity for phytic acid. Although most phytases may degrade phytic acid to inositol monophosphate ester *Bacillus* sp. phytases hydrolyze every second phosphate preferentially over the neighboring ones, degrading the phytic acid molecule to inositol triphosphate [3].

Phytase converts inositol, phosphate, as well as other divalent minerals from phytate. Phytate is a dihydrogen phosphate of myo-inositol-1,2,3,4,5,6-hexakis that includes 14–28 percent phosphorus as well as 12–20 percent calcium. Phytate also chelates iron and zinc trace elements (1 to 2%) between phosphate groups within a single phytate molecule or between two phytate molecules. Phytase is the sole enzyme that can start phosphate hydrolysis in the inositol ring of

phytate at carbon 1, 3, or 6. Calcium, iron, zinc, or other metals are released when phytase removes the phosphate group.

1.2 Phytase nomenclature:

Phytases are inositol phosphate esters and inorganic phosphate phosphohydrolases that catalyze the stepwise phosphate splitting of phytic acid (IP6) or phytate to lower inositol phosphate esters (IP5-IP1) (Figure 1). Plants and microorganisms, including bacteria, yeast, and fungus, have been shown to contain phytase genes and proteins. *Aspergillus niger* PhyA, which is encoded by a 1.4 kb DNA fragment and has a molecular mass of 80 kDa and 10 Nglycosylation sites, will be the first and possibly best described phytase.

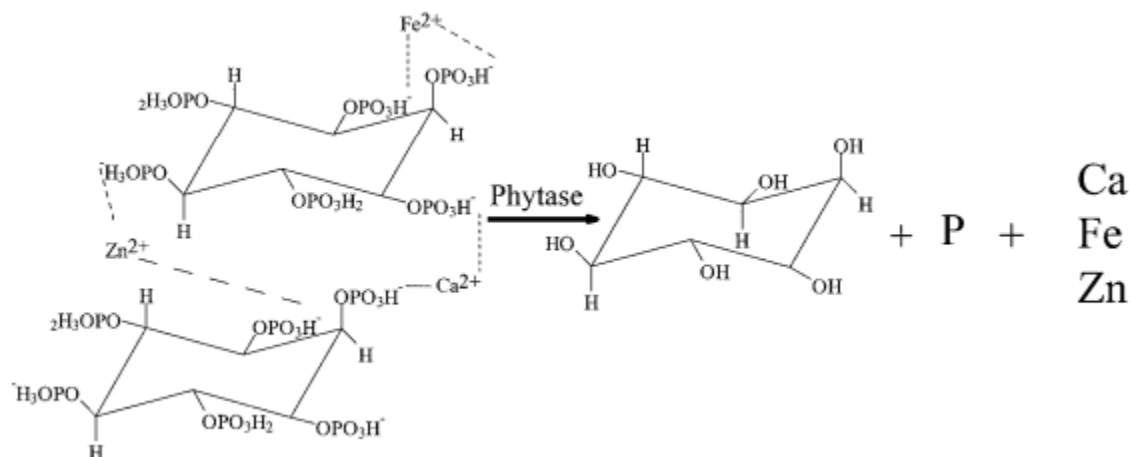


Figure 1: Phytase hydrolyzes phytate to produce inositol, phosphate, or other divalent chemicals[4].

1.3 Optimal pH and temperature:

The pH optimal range for most isolated phytases is 4.5–6. Phytases from *Bacillus* sp., on the other hand, exhibit pH opticalities that are neutral or alkaline. The pH profile of *A. Niger* phytase (phyA) shows two pH maxima at 2.5 and 5.5, with a drop in activity between these two sites (Han & Lei 1999). To maintain a high specific activity at the stomach pH, mutagenesis was used to eliminate the decrease in activity in the pH range 3–5. Most plant and microbial phytases prefer temperatures between 45 and 60 degrees Celsius. These relatively high optimum temperatures prevent phytases from fully activating at swine or chicken stomach temperatures (37–40 °C), resulting in even worse phytase efficacy in fish.

1.4 Thermostability:

Because commercial feeds are often pelleted, a process that involves high temperatures (60–80 °C) and steam, all feed enzymes must be heat stable to prevent significant activity loss. The capacity of any particular phytase, like other proteins, to withstand heat denaturation, such as in hyperthermophile animals, and/or to refold properly into the native-like, fully active conformation following heat denaturation determines its thermostability. Environmental factors such as buffer specificity may have an impact on the latter assumption.

1.5 Resistance to proteolysis:

A high resistance to hydrolytic degradation by digestive proteinases in the digestive system is required for an efficient phytase. Pepsin and trypsin sensitivity differs between fungal and bacterial phytases, and the latter seems to be more resistant to proteolytic destruction than the former. Site-directed mutagenesis may be used to block or modify the protease-sensitive sites of phytases, which are usually found in exposed loops on the surface of the molecules[5].

1.6 Phytase's current and future uses:

Phytase has traditionally been utilized primarily, if not exclusively, as a feed additive in diets for pigs, poultry, and to a lesser degree, fish. Phytase may replace about 1 g inorganic phosphorus supplementation and decrease total phosphorus excretion by 30–50%, according to many laboratory studies and field trials

1.7 Phytase biotechnology:

If the demand for phytase arose from increased environmental awareness of phosphorus contamination caused by animal manure, biotechnology has accelerated its development to the present level. Phytase was first discovered to hydrolyze phytate phosphorus in chick diets 30 years ago. Due to the poor activity output and expected high cost of the traditional phytase fermentation method, commercialization has been impossible for many years. Large quantities of the enzyme may be generated for animal feed at cheap prices thanks to the advent of heterologous microbial expression methods.

1.7.1 Expression of microbes:

systems Submerged or solid-state fermentation of filamentous fungus overexpressing phytase (i.e., *Aspergillus* species) provides high quantities of phytase at cheap cost. Recently, there has been a lot of study on the usage of methylotrophic yeast. *Stretptomyceslividans* and *Lactobacillus plantarum* have both been shown to produce phytase. Combining phytase with the beneficial probiotic lactic acid bacteria is possible with the latter expression method. In soybean or alfalfa seeds, a fungal phytase has been effectively expressed.

The most significant sources of phytase are bacteria and fungus. phytase sources from microbes. For commercial phytase synthesis, *A. niger*, *Aspergillus ficuum*, *Aspergillus fumigatus*, and *S. cerevisiae* are frequently utilized yeast strains. the hydrolysis of dietary phytate by exogenous microbial phytase. They discovered that chicks fed maize–soybean meal diets containing *Aspergillus* preparations had better phosphorus utilization. Phytase produced from *S. cerevisiae* is particularly important for bread making. Similar to cell-bound phytase from *Pichia anomala* and *Candida krusei*, cell-bound phytase from *Pichia anomala* and *Candida krusei* has potential uses in food processing since it is stable at high temperatures and acidity[6].

1.7.2 Plants and animals that are transgenic:

To enhance rice iron bioavailability to humans, transgenic rice has been created to over-express alleles encoding for phytase from *Aspergillus fumigatus*, ferritin from *Phaseolus vulgaris*, and a cysteine rich metallothionein-like protein. The plant was crossed with a rice line that produces -carotene, which was recently created. Meanwhile, overexpressing phytase in the salivary glands of mice and pigs has resulted in transgenic mice and pigs[7].

1.8 Protein engineering is a technique for modifying proteins:

Although phytases have different characteristics, no one wild-type enzyme is optimal or suitable for use in the field. An 'ideal' phytase, in theory, should be catalytically efficient, proteolysis-resistant, thermostable, and inexpensive. In fact, this good's phytase may never be discovered or produced. However, genetic modifications have been effective in improving single or several phytase characteristics[8].

1.9 Phytase-related issues:

Phytase has several advantages, but it also has certain drawbacks that need further study. Phytate, a powerful chelator of iron and zinc, may function as an antioxidant in plant meals, reducing free radical production caused by these metals. Indeed, pigs given phytase for four months were more susceptible to high-iron-induced lipid peroxidation in the colon than control pigs. Low-phytic acid grain, on the other hand, may have a negative impact on human health, particularly in those who have large iron reserves as a result of high dietary intakes of readily accessible iron from animal products or high dietary intakes of fruits that substantially increase non-heme iron absorption. As a result, extreme care should be used while spreading the low-phytic acid grain approach beyond animal production. The second question is whether supplementary phytases hydrolyze phytate-phosphorus from digesta faster than the animals can absorb it, releasing more free phosphorus into the environment than when the animals are not given phytase. By upgrading local exhaust systems and wearing all protective gear and masks with P2 filters, hypersensitivity symptoms may be prevented[9], [10].

2. DISCUSSION

Phytase is necessary for increasing the nutritional content of feed as well as promoting animal development and health. It hydrolyzes phytate substrates to release phosphorous in a free form that animals may ingest, reducing the need for inorganic phosphorus supplements. Furthermore, adding phytase to feed reduces the amount of phosphorus excreted in manure, resulting in a reduced environmental effect from livestock production. Phytase for feed is generated via microbial strain fermentation and is mostly utilized in swine and poultry diets. These enzymes have long been used in animal feed to enhance phosphorus nutrition and decrease phosphorus contamination from animal manure. The use of phytases to improve human nutrition of important trace elements found in plant-derived foods is being investigated. This study focuses on the growing biotechnology utilized to create novel effective phytases with enhanced characteristics, as well as the fundamental biology and use of phytases.

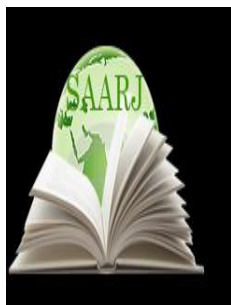
3. CONCLUSION

As phytase becomes more widely utilized throughout the globe, research and technology linked to the enzyme have rapidly developed into a new fascinating area. Supplemental phytases clearly enhance dietary phytate-phosphorus utilization in food-producing animals and decrease phosphorus pollution from animal waste in places where extensive animal production is practiced. The potential of phytase in enhancing human nutrition and health, as well as creating particular phytic acid or inositol-derived products, is gaining traction and will continue to grow as a new phytase path. Biotechnology has shown to be a very successful technique for creating and enhancing phytase enzymes and their delivery systems, and it will continue to be so.

REFERENCES

1. Jay W. Grate and H. Abraham, "Solubility interactions coatings for chemical and the design

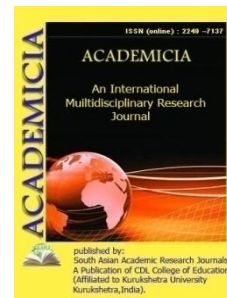
- of chemically sensors and arrays,” *Sensors Actuators B Chem.*, 1991.
2. C. S. Nunes, “General perspectives of enzymes, environment preservation, and scarce natural resources-conclusions,” in *Enzymes in Human and Animal Nutrition: Principles and Perspectives*, 2018.
 3. Drakakaki G. *et al.*, “Endosperm-specific co-expression of recombinant soybean ferritin and *Aspergillus* phytase in maize results in significant increases in the levels of bioavailable iron,” *Plant Mol. Biol.*, 2005.
 4. X. G. Lei and J. M. Porres, “Phytase enzymology, applications, and biotechnology,” *Biotechnology Letters*. 2003, doi: 10.1023/A:1026224101580.
 5. X. Wang, M. Yao, M. Song, Y. Fu, F. Hu, and A. Liang, “Improving the thermostability of *Escherichia coli* phytase AppA by multipoint mutation,” *Gaojishu Tongxin/Chinese High Technol. Lett.*, 2014, doi: 10.3772/j.issn.1002-0470.2014.12.012.
 6. L. B. Selinger, C. W. Forsberg, and K. J. Cheng, “The rumen: A unique source of enzymes for enhancing livestock production,” *Anaerobe*. 1996, doi: 10.1006/anae.1996.0036.
 7. T. Xiong, Q. P. Zhao, R. Liu, M. Sen Jiang, and H. F. Dong, “Enzymology of snails under treatment of molluscicides,” *Chinese J. Schistosomiasis Control*, 2018, doi: 10.16250/j.32.1374.2017153.
 8. A. Boyce and G. Walsh, “A series of enzymology-based experiments designed to mimic an applied research project,” *Biochem. Mol. Biol. Educ.*, 2005, doi: 10.1002/bmb.2005.49403306420.
 9. A. Boyce, A. Casey, and G. Walsh, “A phytase enzyme-based biochemistry practical particularly suited to students undertaking courses in biotechnology and environmental science,” *Biochem. Mol. Biol. Educ.*, 2004, doi: 10.1002/bmb.2004.494032050392.
 10. X. Wang, M. Yao, B. Yang, Y. Fu, F. Hu, and A. Liang, “Enzymology and thermal stability of phytase appA mutants,” *RSC Adv.*, 2015, doi: 10.1039/c5ra02199e.



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REVIEW ON ENVIRONMENTALLY FRIENDLY FERTILIZERS

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ABSTRACT

Fertilizer is essential for maintaining soil fertility, boosting yields, and enhancing the quality of harvest. However, a substantial amount of fertilizer is wasted, raising agricultural costs, squandering energy, and damaging the environment, all of which pose difficulties to modern agriculture's long-term viability. Environmentally friendly fertilizers (EFFs) have indeed been created to satisfy the needs of increasing yields without harming the environment. EFFs are fertilizers that slow or even stop the flow of nutrients into the soil, thus reducing pollution caused by nutrient loss. The majority of EFFs are used as coated fertilizers. In this article, we look at current research on the materials in use in EFFs and their environmental impact. The following are the main results discussed in this review: 1) EFF coatings may act as a physical barrier to limit urea contact in water and soil, lowering the rate of urea hydrolysis and reducing nitrogen oxide (NO_x) and nitrogen dioxide (N₂) emissions. 2) EFFs may boost the amount of organic matter in the soil. 3) hydrogel/superabsorbent coated EFFs may buffer soil acidity or alkalinity, resulting in an optimum pH for plants; and 4) hydrogel/superabsorbent coated EFFs can improve soil water retention and holding capacity. Finally, EFFs play an essential role in improving nutrient efficiency and decreasing pollution in the environment.

KEYWORDS: Agriculture, Environmentally friendly, Nutrient releases, Sustainability, Soil.

INTRODUCTION

Over the last century, increased fertilizer, water, and pesticide inputs, as well as new technology, have resulted in enormous advancements in contemporary agriculture. Crop output per unit of land has significantly risen, allowing for more population and economic growth. However, although these advancements have been substantial, the environmental consequences have often gone unmeasured. Overuse of pesticides and fertilizers has resulted in water algal blooms and toxicity, groundwater pollution, air pollution, soil quality deterioration, and even ecosystem disruption, raising concerns about contemporary agriculture's sustainability[1].

Increasing agricultural output without harming the environment may be accomplished through improving fertilizer and water efficiency, reducing pesticide usage, and using integrated agricultural systems management. The focus of this review is on studies on the environmental consequences of improving fertilizer efficiency. Fertilizer applications are necessary for intensive high-yield agriculture. Higher fertilizer inputs are required for increased food production. These inputs have aided in keeping global agricultural production in line with human population increase, as well as improving rural economic development. In traditional agriculture, however, misuse of fertilizer, which is sprayed in surplus of plant need, is a very well inefficiency that presents a danger to the environment. Fertilizer efficiency must be significantly improved to prevent harmful environmental effects[2].

Improved recommended fertilizer methods, such as split or concentrated application, highly precise fertilization, fustigation-fertilization via irrigation, and use of environmentally friendly fertilizers (EFFs) are among the techniques used to increase fertilizer use efficiency and reduce negative environmental impacts. EFFs are a cost-effective method to increase nutrient efficiency, decrease fertilizer leaching and evaporation losses, and reduce environmental risks. They minimize pollution caused by nutrient losses by delaying or even regulating nutrient delivery into the soil. EEF is another name for them. EFFs are often designed in such a manner that nutrients are coated with ecologically beneficial compounds that can be decomposed in soil and turned into carbon. Due to the compound fertilizer's delayed release characteristic, it has water-holding and water-retention capabilities in soil. Using chitosan as a covering material may save manufacturing costs while also making the fertilizer more eco-friendly. The chitin was coated just on fertilizer cores with epoxy dissolved in acetone, which may be a possible drawback of this system. Because of the organic solvent emissions, this technique may pollute the environment[3].

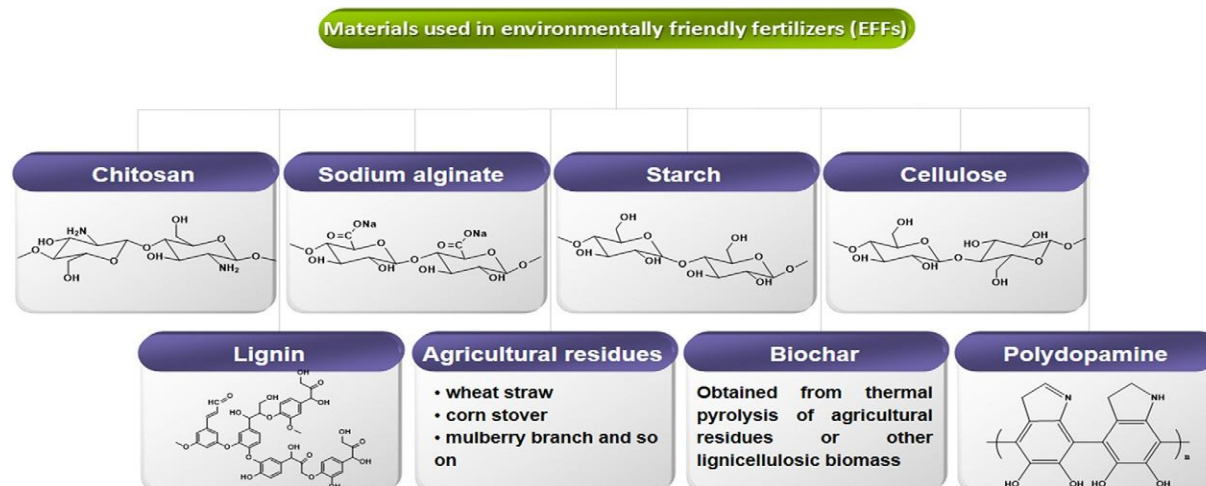


Figure1. The structures or sources of natural materials that are most used in EFFs are as follows: chitosan, sodium alginate, starch and its derivatives, cellulose and its derivatives, lignin, agricultural residues, biochar, polydopamine[1]

DISCUSSION

1. EFFs and natural materials:

To reduce nutrient release and improve fertilizer efficiency, several materials have been utilized as coatings. Environmentally friendly coating materials, the majority of which are derived from natural resources, have been developed as part of the development of EFFs. Due to their environmentally benign source, these natural materials have a number of benefits over synthetic polymers, including cheap cost, easy availability, and biodegradability. The positive and negative characteristics of the natural materials most often utilized in EFFs.

1.1 Chitosan is a kind of chitin:

Chitosan is a polysaccharide made by the (partial) n - deacetylation, which is a key component of the shells of crustaceans including crabs and shrimp. Chitosan is plentiful in this naturally renewing resource. It is also non-toxic and biodegradable. Chitosan has been widely utilized in a variety of industries, including agriculture, because to these characteristics. Because it is naturally occurring and biodegradable, it should not create pollution; as a result, it has been extensively used in EFFs. It has been created a nanocomposite films nitrogen, phosphorus, and potassium combination fertilizer. The inner coating of water-soluble nitrogen, phosphorus, and potassium fertilizer granule cores was chitosan, while the outside coating was strands acid-co-acrylamide) (P(AA-co-AM) hydrogel polymer. Nitrogen (N) 8.06 percent, phosphorus (P) 8.14 percent, and potassium (K) 7.98 percent made up the nutritional content. On the 30th day, the percentages revealed for N, P, and K were 79, 62, and 69 percent, respectively. On the 30th day, the percentages for N, P, and K were 79, 62, and 69 percent, respectively. The compound fertilizer has waterholding and water-retention characteristics in soil, in addition to its delayed release behavior. Using chitosan as a covering material may save manufacturing costs while also making the fertilizer more eco-friendly. The chitosan were coated on the fertilizer cores using epoxy dissolved in acetone, which may be a shortcoming of this method. Because of the organic solvent emissions, this technique may pollute the environment[4].

1.2 Sodium alginate:

Sodium alginate (SA) is a brown seaweed-derived linear polymer with 1–4 linked -L-guluronic and -D-mannuronic acid moieties of various compositions. With the introduction of Ca^{2+} in an aqueous solution, it may be ionic crosslinked. It is extensively utilized as a controlled release fertilizer formulation because to its moderate gelation characteristic. However, in the absence of monovalent cations, the sodium alginate network has a low mechanical strength and is readily destructible. In addition, sodium alginate hydrogels do not always show controlled-release behavior, and instead show a burst supply of nutrients followed by a gradual of the remaining resources[5].

1.3 Starch and compounds of starch:

Starch is a polysaccharide made up of several simple sugars or sugar (glucose) molecules linked together by -1,4- and/or -1,6-glycosidic linkages. It is the most common storage polysaccharide in plants and the primary carbohydrate source in the human diet. Because of the vast variety of hydroxy groups accessible, there are many possibilities for starch derivatives. Starch and its derivatives have been extensively utilized in EFFs because to its ease of modification, environmental friendliness, and cost.

1.4 Biochar:

Biochar is a carbon-rich substance produced from the pyrolysis process of agricultural wastes or other cellulosic biomass at a relatively high temperature. Because of its positive environmental effects, such as increased agricultural profitability, reduced eutrophication risk, carbon sequestration from the atmosphere and restoration of degraded land, biochar has been used as a biofertilizer or a supporting document for the controlled release of fertilizer. A recent research used a polymer matrix made up of cotton stalks (CSs), acrylic acid (AA), 2-acrylamide-2-methylpropanesulfonic acid (AMPS), and bentonite (bent) to create biochar-based slow-release nitrogen fertilizers (BSRFs) in NH_4^+ -loaded biochar (N-BC). These fertilizers had an increased nitrogen efficiency (64.27%), low nitrogen migrate-to-surface-loss (7.4%), and low nitrogen-leaching-loss percentages (10.3 percent). Furthermore, they successfully decreased nitrogen release (69.8% nitrogen released after 30 days) and, as a result, efficiently improved cotton plant development[6].

2. The environmental impact of EFFs:

Water contamination, air pollution, soil quality deterioration, and other undesirable consequences occur from fertilizer loss. EFFs help to reduce pollution by lowering nitrogen oxide (NO_x) and nitrogen dioxide (N_2) emissions, raising soil organic matter levels, changing soil pH to an optimum pH, and enhancing soil water retention and holding capacity.

3. Obstacles and prospects:

The expense of EFFs is the most significant impediment to their use. The following factors contribute to the high cost: coating ingredients are considerably costlier than fertilizer; the manufacturing process is complex; a size separation equipment is used to produce a flawless coating; and labor costs rise.

As a result, compared to traditional chemical fertilizers, EFFs have been and continue to be a tiny market. The deterioration of the materials on EFFs is another issue. Pure biodegradable

organic polymers are vulnerable to microorganisms and enzymes, and thus are unable to properly regulate fertilizer release over time. There are two issues regarding the degradability of natural thermoplastic polymer blends or copolymers. The first is the maximum percentage ratio of synthetic polymer in blends or copolymers that may be used. Second, in asserting the degradability content of blends or copolymers, what is the permissible upper limit of degradability (percentage). EFFs should, in theory, be able to satisfy the crop nutrient requirement for the whole season with a single application. Plants need more nutrients throughout the growth phase, while they do not require any nutrients during the early stages of plant development or during maturity. However, the majority of EFFs do not directly react to plant nutrient needs[7].

Furthermore, no appropriate research of EFF release behavior under a variety of environmental circumstances, such as varying temperatures, ambient moisture, soil types, soil pH, soil bioactivity, and so on, has been conducted. The release behavior of fertilizers coated with hydrogels/super absorbents is particularly sensitive to water in the environment. During irrigation or rain, hydrogels/super absorbents expand, allowing nutrients to be released. Hydrogels/super absorbents dry up during irrigation or rain intervals, delaying nutrient delivery. This may not be in accordance with crop development cycles or nutritional requirements. What is apparent, however, is that the environmental advantages of EFFs are worth further investigation, particularly for high-value crops[8].

Furthermore, governments may find the environmental advantages helpful in calculating cost-sharing to encourage farmers to adopt EFFs in their agricultural production systems. In light of the aforementioned difficulties, the authors make the following recommendations: Although different natural materials have been used as coatings to slow the release of nutrients and improve fertilizer effectiveness, they must be processed and produced in an environmentally friendly and cost-effective manner[9]. Plants need more nutrients throughout their growth phase, however most EFFs release nutrients quickly during the early stages of plant development. The insufficient hydrophobicity of these natural-materials-based coating compounds is always the source of this imbalance. To synchronize nutrient release with crop development timelines or nutrient requirements, novel biodegradable and renewable coating materials with extreme hydrophobicity should be researched and developed[10].

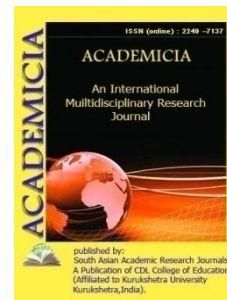
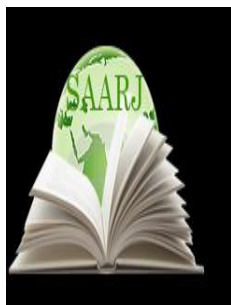
CONCLUSION

Fertilizer losses not only lower nutrient efficiency, resulting in lower plant yields, but they also have negative environmental consequences. Efforts to address these issues have resulted in a wide range of solutions. Eco friendly fertilizers (EFFs) in particular are an efficient method to increase nutrient-use efficiency, decrease fertilizer leaching and volatilization losses, and reduce environmental risks by delaying or even regulating nutrient release into soil. However, there are still certain obstacles to overcome. The following factors should be taken into account. To begin, coating material should be biodegradable and inexpensive. In order to promote large-scale fertilizer production, the preparation procedure should also be easy and cost-effective. Degradable natural fibres, which have sparked interest in covered fertilizers, may be considered in the development of new kinds of EFFs in this regard. Second, good EFFs should be able to satisfy crop nutrient needs throughout the season with only one application. A better knowledge of the impact of different environmental factors including temperature, ambient moisture, soil type, soil pH, and soil bioactivity will open up new avenues for more efficient EFFs. However,

although the use of EFFs has not been connected to the development of sustainable modern agriculture, it has been linked to advancements in the sustainability of water and pesticide usage, energy input, manufacturing, and other economic sectors that have a major effect on the environment.

REFERENCES

1. T. Thomidis, N. Karagiannidis, and C. Karagiannidis, "Effect of New Environmentally Friendly Fertilizers in a Commercial Vineyard," *J. Agric. Sci.*, 2015, doi: 10.5539/jas.v8n1p132.
2. K. Tanaka, "Functional Biodiversity Indicators and their Evaluation Methods in Japanese Farmlands," *Challenges Agro-Environmental Res. Monsoon Asia*, 2016.
3. J. Leifeld, "How sustainable is organic farming?," *Agric. Ecosyst. Environ.*, 2012, doi: 10.1016/j.agee.2012.01.020.
4. D. Kempa, "Environmental services coupled to food products and brands: Food companies interests and on-farm accounting," *J. Environ. Manage.*, 2013, doi: 10.1016/j.jenvman.2012.06.006.
5. M. Fernández-Delgado Juárez, S. Waldhuber, A. Knapp, C. Partl, M. Gómez-Brandón, and H. Insam, "Wood ash effects on chemical and microbiological properties of digestate- and manure-amended soils," *Biol. Fertil. Soils*, 2013, doi: 10.1007/s00374-012-0747-5.
6. A. Balasus, W. A. Bischoff, A. Schwarz, V. Scholz, and J. Kern, "Nitrogen fluxes during the initial stage of willows and poplars in short-rotation coppices," *J. Plant Nutr. Soil Sci.*, 2012, doi: 10.1002/jpln.201100346.
7. Q. Song *et al.*, "Effect of straw retention on carbon footprint under different cropping sequences in Northeast China," *Environ. Sci. Pollut. Res.*, 2012, doi: 10.1007/s11356-021-14316-4.
8. Y. Sugihara, H. Ueno, T. Hirata, M. Komatsuzaki, and H. Araki, "Contribution of N derived from a hairy vetch incorporated in the previous year to tomato N uptake under hairy vetch-tomato rotational cropping system," *Hortic. J.*, 2016, doi: 10.2503/hortj.MI-073.
9. E. Pelzer *et al.*, "Pea-wheat intercrops in low-input conditions combine high economic performances and low environmental impacts," *Eur. J. Agron.*, 2012, doi: 10.1016/j.eja.2012.01.010.
10. S. K. Tanveer, X. Wen, X. L. Lu, J. Zhang, and Y. Liao, "Tillage, Mulch and N Fertilizer Affect Emissions of CO₂ under the Rain Fed Condition," *PLoS One*, 2013, doi: 10.1371/journal.pone.0072140.



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AN OVERVIEW ON BUILDING ENERGY USAGE INFORMATION

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ABSTRACT

Concerns about supply shortages, depletion of energy supplies, and severe environmental consequences have already arisen as a result of the world's fast increasing energy use (global warming, climate change, ozone layer depletion etc.). Buildings' contribution to global power usage, both residential and business, has continuously risen, reaching estimates of 20 to 40 percent in industrialized nations, and has surpassed the contributions of other key sectors such as industry and transportation. The growing trend in energy consumption will continue in the future, thanks to population growth, rising demand for building services including comfort levels, and an increase in time spent within buildings. As a result, building energy efficiency is now a top priority for energy policy at the regional, national, and worldwide levels. The rise in energy consumption of HVAC systems is especially notable among building services (50 percent of building consumption or 20 percent of total consumption in the USA). This study examines the existing data on building energy usage, especially as it relates to HVAC systems. Many questions emerge, such as: Is the information required available? What are the most common kinds of structures? What end uses should be taken into account throughout the breakdown? Specially for commercial structures, comparisons across various nations are given. The case of offices is investigated in more depth.

KEYWORDS: *Building energy use, HVAC consumption, Air conditioning consumption.*

1. INTRODUCTION

Global energy use Concerns about supply shortages, depletion of energy supplies, and severe environmental consequences have already arisen as a result of the world's fast increasing energy use (ozone layer depletion, global warming, climate change, etc.). The International Energy Agency has compiled alarming statistics on global energy usage patterns. Primary energy has

increased by 49% and CO₂ emissions by 43% during the past two decades (1984–2004), with an average annual growth of 2% and 1.8 percent, respectively. According to current forecasts, this upward tendency will continue. Energy consumption in developing economies will increase at a 3.2 percent annual pace, surpassing that of developed countries (North America, Western Europe, Japan, Australia, and New Zealand) at a 1.1 percent annual rate by 2020. China's example is remarkable, since it took just 20 years to double its energy consumption at a 3.7 percent annual growth rate. The study of the evolution of the major global energy indicators between 1973 and 2004 yielded some interesting results[1].

- The pace of population growth is much lower than the rate of GDP growth, resulting in significant increases in per capita personal income and global wealth.
- Primary energy consumption is increasing at a faster pace than population, resulting in a 15.7 percent rise in per capita value over the past 30 years.
- CO₂ emissions have increased at a slower pace than energy consumption, which has increased by 5% during the same time span.
- Electrical energy consumption has increased dramatically (by more than two-thirds), resulting in a percentage increase in total energy consumption.
- Energy resource efficiency, as measured by the relationship between final and primary energy, has decreased by 7%, owing mostly to rising electricity use.
- Final and primary energy intensities have decreased as a consequence of GDP growth outpacing the rate of increase in energy consumption, resulting in an overall improvement in global energy efficiency.

1.2. Building energy usage:

The final energy consumption is typically broken down into three categories: industrial, transportation, and 'other,' which includes agricultural, the service sector, and residential. This makes gathering statistics on building energy usage very challenging. Energy consumption in structures other than homes, for example, accounts for a small portion of the services provided by the 'other' important sector. Given its importance in industrialized nations (buildings account for 20–40% of total final energy consumption), we think it should be included separately as the third major sector, with domestic and nondomestic buildings separated at the very least[2].

Building energy consumption has surpassed that of transportation and industry as a result of population growth, improved building services and comfort levels, and an increase in time spent within buildings. Buildings have had a major impact on the ratio of industry (down nine points) and the growth of 'other' (up six points). The phrase "other sectors" is vague and causes a lot of misunderstanding. Many international, national, and regional sources contain a variety of end applications in this notion, making comparisons difficult. Finally, we consider the development and significance of building energy use[3].

Building energy consumption in the UK has risen at a pace of 0.5 percent each year, somewhat less than the European average of 1.5 percent. Building energy usage in Spain, on the other hand, is growing at a pace of 4.2 percent per year, far above the European (1.8 percent) and North American (1.8 percent) rates. Economic development, the rise of the construction industry, and the proliferation of building services, particularly heating, ventilation, and air conditioning

(HVAC) systems, are all factors. (2) Buildings used 37 percent of final energy in the EU in 2004, more than industry (28 percent) and transportation combined (33 percent). The percentage of energy used in buildings in the UK (39%) is somewhat higher than the European average. This is due in part to the move away from heavy industries and toward activity in the service sector. In comparison, the proportion for Spanish buildings is just 24%, 14 points lower than the European norm, and is projected to increase sharply as economic development brings the country closer to the European average[4]. Many types of buildings (schools, restaurants, hotels, health facilities, museums, and so on) with a wide range of purposes as well as energy services (HVAC, water heating (DHW), lighting, refrigeration, food preparation, and so on) are included in the service sector, which covers all commercial and public buildings. Size of the economy raises the demand for services (health, culture, leisure, education and so on) as well as energy usage. Since the 1950s, energy consumption in the service sector has increased from 11% to 18% in the United States[5].

1.3. HVAC (heating, ventilation, as well as air conditioning) is a term that refers to (HVAC):

Energy efficiency or savings techniques have become a key goal for most nations' energy policies due to the growth of energy use and CO₂ emissions in the built environment. The European Energy Performance of Buildings Directive is a good example (EPBD). The escalation of energy consumption in HVAC systems, which has now become practically necessary in tandem with the expansion of demand for thermal comfort, which was formerly regarded a luxury, has been particularly significant. Heating, ventilation, as well as air conditioning are the most common energy end uses in both the residential as well as non-residential sectors. When compared to other end users, its dominance is apparent. It uses approximately half as much energy as DHW and is more than twice as efficient. IDAE estimates HVAC energy consumption in non-domestic buildings to be approximately 48 percent, which is still lower than the 57 percent in the United States and comparable to other sources[5].

In Europe, data provided by governments at the national, regional, and municipal levels is inadequate for effectively planning future building energy regulations and coordinating actions to meet each of the end uses. Governments should fund sector-specific analyses, such as those produced by the EIA for residential and commercial buildings, so that a comprehensive data set of the building stock and energy parameters (consumption, expenditures, fuels, end uses, and so on) can be used to plan for the future. In most industrialized nations, HVAC usage accounts for half of all energy consumption in buildings and a fifth of total national energy consumption. Furthermore, projections show a huge increase in energy consumption and conditioned area in the EU over the next 15 years, with an increase of about 50%.

1.4. Non-domestic structures:

The kind of usage and activities in non-domestic buildings have a significant effect on the quality and amount of energy services required. Few sources, however, provide data by typology, and there is no uniform categorization, making analysis very difficult. Following a review of various sources, the following basic conclusions may be drawn: (1) In recent years, energy consumption in this sector in the United Kingdom has stabilized, with increases in floor space and service levels being compensated by efficiency gains. Commercial energy consumption is growing faster than other sectors in the rest of Europe, owing mostly to the growth of HVAC systems in new buildings. In the UK, new service sector construction rates are

usually about 2%, while in Spain, the average annual rate of growth since 2000 has been 6.1 percent, with projections indicating that this will continue to rise. In 2003, this sector accounted for 11% of total energy consumption, which was comparable to the United States (18%) and the European Union (EU) (11 percent). Despite having the fastest growth rate, energy regulations have tended to concentrate on the residential and industrial sectors, leaving the service sector out[6].

- The most power typologies are office and retail, which account for more than half of all non-domestic building energy use. Hospitals and schools, as well as hotels and restaurants.
- With a weight of close to 50%, HVAC is the most important end use, followed by lights (15%) and appliances (10%). The distribution of energy end uses (Fig. 5) and their energy intensity are both influenced by the kind of building. This necessitates the creation of separate research per building type.

1.5. Buildings that house offices:

Office buildings, together with retail, have the highest consumption and CO₂ emissions in the business sector. In the United States, offices account up 17% of total non-domestic space and approximately 18% of total energy use, or 3.2 percent of total consumption. They account for a third of business sector energy consumption and almost 2.7 percent of overall energy consumption in Spain, and 17 percent of energy consumption and 2% of total energy usage in the United Kingdom. As a result, it's a good idea to start with office buildings while doing a commercial study. Other factors that support this type of energy surveys include[7].

A significant rise in the overall constructed area of office buildings as a result of economic success, with numerous new commercial projects in the outskirts of major cities. In Spain, 9.3 million square meters were constructed between 1990 and 2000, with no accurate data on the overall developed area. The per capita area in the United States is about 4 m², which is much higher than the European number of 2 m². Between 2000 and 2005, the overall floor space of offices in the United Kingdom grew by around 4%.

The quantity of artificial lighting needed, as well as the usage of IT equipment and the use of air conditioning, has constantly risen. More than 90% of businesses in Spain utilize IT technology, and almost all new offices are air-conditioned. Even in milder climates, such as the United Kingdom, more than half of new workplaces are air-conditioned. It's a typology that's very consistent throughout the building portfolio, both in terms of envelope as well as building services, with three major energy end uses, HVAC, lighting, or appliances, accounting for about 85% of total energy consumption[8].

LITERATURE REVIEW

Hye Sun et al. studied about The Korean government has set a goal of decreasing greenhouse gas emissions by 37% by 2030 compared to business-as-usual (BAU) levels. Because the construction industry is so essential for reducing greenhouse gas emissions, numerous measures to decrease building energy are being reinforced. As a result, a nationwide research effort is underway to install systems for continuous monitoring of energy consumption by end use in sample buildings, as well as to develop a reference power intensity (EUI) database as well as benchmarking system for comparison analysis. The research also discovered methods for measuring such usage and converting the findings into EUI data. As examples, forty complexes

with a total of 200 units were chosen. The sample building installation will take place in stages over the next four years, beginning in 2015, and systems have already been installed in ten complexes and 50 units. After 2020, a reference EUI database for residential buildings will be accessible, as will a benchmarking tool based on the database, and equivalent systems for office towers are now being developed[9].

Kang et al. studied about The growing need for sustainable smart buildings necessitates the development of an efficient decision-making approach for managing building energy consumption. Data-mining techniques that utilize different data types will be required in the future for decision-making assistance in BIM-based power management. A rule-set-based Building information modelling data-mining approach for data integration as well as function extension support is proposed here, which takes functional variability and extensibility into account. Its efficiency was shown by the construction and implementation of a building-energy-management scenario, as well as the analysis of the outcomes. Based on the results of the work effectiveness study, we discovered that the suggested approach increased the efficacy by 14.4 to 20.5 times. Users may obtain intuitive BIM-based decision-making information and adapt the flexible process for different use cases using the suggested approach[10].

DISCUSSION

As a result of the world's rapidly growing energy consumption, concerns about supply problems, depletion of energy sources, and severe environmental repercussions have already emerged. Buildings' contribution to world energy consumption, whether residential or commercial, has steadily increased, reaching estimates of 20 to 42 percent in developed countries and surpassing other important sectors such as plants and vehicles. Because of population expansion, increasing demand for building services or comfort levels, as well as an increase in time spent inside buildings, the rising trend in energy consumption will continue in the future.

As a consequence, energy efficiency in buildings is now a major concern for regional, national, and global energy policy. As the growth of carbon dioxide emissions on the built environment has led to the creation of new building standards and certification systems that now include minimum requirements, energy efficiency measures have become a priority for energy policy. As the need for thermal comfort has solidified, HVAC systems (and their associated energy consumption) have become an unavoidable asset, accounting for almost half of the energy consumed in buildings and around 10–20 percent of total energy consumption in developed countries. The increasing trend in construction energy use will continue in the next years, as long as resource use and environmental depletion or global downturn do not intervene. To attain a sustainable energy future, private initiative, in conjunction with government action, will be needed to encourage energy efficiency, new energy production technologies, limiting energy use, and raising public knowledge about energy usage.

CONCLUSION

Building energy consumption accounts for 20–40% of overall energy consumption in industrialized nations, and is higher than that of industry and transportation in the EU and the US. However, the information provided is obviously inadequate and not proportionate to the significance of the issue. It is not regarded as a separate sector, and there is a scarcity of reliable data, making it difficult to comprehend the underlying changes that influence energy use in this industry. It is critical to make complete building energy data accessible in order to conduct

appropriate analyses and effectively plan future energy strategies. In this regard, the EIA's research on the energy use of residential and commercial buildings in the United States are a useful resource.

Energy efficiency measures have been a priority for energy policies as the proliferation of energy consumption and CO₂ emissions on the built environment has led to the development of new building standards and certification systems that now contain minimum criteria. HVAC systems (and their related energy consumption) have become an inescapable asset as the demand for thermal comfort has consolidated, accounting for almost half of the energy used in buildings and approximately 10–20 percent of total energy consumption in industrialized nations. Due to the growth of built area as well as related energy requirements, the rising trend in building energy consumption will continue in the future years, as long as resource and environmental depletion or economic recession do not prevent it. To attain sustainable energy economy, private initiative, in combination with government action, will be required to promote energy efficiency, new technologies for energy generation, restricting energy consumption, or increasing societal awareness about the rational use of energy.

REFERENCES

1. K. A. Agyeman, S. Han, and S. Han, "Real-time recognition non-intrusive electrical appliance monitoring algorithm for a residential building energy management system," *Energies*, 2015, doi: 10.3390/en8099029.
2. Z. Ma, R. Yan, K. Li, and N. Nord, "Building energy performance assessment using volatility change based symbolic transformation and hierarchical clustering," *Energy Build.*, 2018, doi: 10.1016/j.enbuild.2018.02.015.
3. B. Dave, A. Buda, A. Nurminen, and K. Främling, "A framework for integrating BIM and IoT through open standards," *Autom. Constr.*, 2018, doi: 10.1016/j.autcon.2018.07.022.
4. T. Ahmad, H. Chen, Y. Guo, and J. Wang, "A comprehensive overview on the data driven and large scale based approaches for forecasting of building energy demand: A review," *Energy and Buildings*. 2018, doi: 10.1016/j.enbuild.2018.01.017.
5. M. V. Shoubi, M. V. Shoubi, A. Bagchi, and A. S. Barough, "Reducing the operational energy demand in buildings using building information modeling tools and sustainability approaches," *Ain Shams Eng. J.*, 2015, doi: 10.1016/j.asej.2014.09.006.
6. C. J. Chen, S. Y. Chen, S. H. Li, and H. T. Chiu, "Green BIM-based building energy performance analysis," *Comput. Aided. Des. Appl.*, 2017, doi: 10.1080/16864360.2016.1273582.
7. M. Mangold, M. österbring, C. Overland, T. Johansson, and H. Wallbaum, "Building ownership, renovation investments, and energy performance-A study of multi-family dwellings in Gothenburg," *Sustain.*, 2018, doi: 10.3390/su10051684.
8. E. Fuentes, L. Arce, and J. Salom, "A review of domestic hot water consumption profiles for application in systems and buildings energy performance analysis," *Renewable and Sustainable Energy Reviews*. 2018, doi: 10.1016/j.rser.2017.05.229.
9. H. S. Jin, B. H. Choi, J. K. Kang, S. I. Kim, J. H. Lim, and S. Y. Song, "Measurement and

Normalization Methods to Provide Detailed Information on Energy Consumption by Usage in Apartment Buildings,” 2016, doi: 10.1016/j.egypro.2016.09.161.

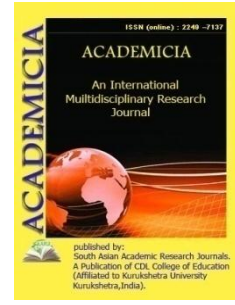
- 10.** T. W. Kang and H. S. Choi, “BIM-based Data Mining Method considering Data Integration and Function Extension,” *KSCE J. Civ. Eng.*, 2018, doi: 10.1007/s12205-017-0561-6.



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A BRIEF REVIEW ON THE INTELLIGENT BRAKING SYSTEM

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ABSTRACT

Using the built-in system architecture, the braking mechanism was developed and integrated to the vehicle to guarantee the safety of the driving phase. The majority of crashes occur as a result of the driver's failure to apply the brakes in a timely manner. However, throughout this project's development, the braking mechanism is specified such that the brake should be applied depending on the ultrasonic sensor and the vehicle's speed. Cars are now equipped with active protection systems to minimize the danger of accidents, which are common in metropolitan areas. The most popular types are Antilock Braking Systems (ABS), Traction Control, and Stability Control. Various kinds of sensors are employed in these gadgets to constantly monitor the vehicle's surroundings and react in an emergency scenario. An ultrasonic wave emitter on the vehicle's front side is used in the intelligent braking system. Furthermore, the receiver is mounted on the vehicle's front end and receives a reflecting ultrasonic pulse. The distance between the problems and the vehicle is determined by the reflected wave (detected pulse), while the car's speed is determined by the RPM counter. The microcontroller assists the identification pulse information in shifting the foot lever to apply the brake to the automobile, which is unexpected for safety reasons.

KEYWORDS: ABS, brake, Hydraulic Brake, Intelligent, Microcontroller, Sensor,

INTRODUCTION

Commercial vehicles' braking systems have traditionally been given top attention in terms of safety considerations, particularly active safety. These cars' improper braking may result in severe accidents. Longer stopping distances and better brake energy performance, particularly in the case of vehicle combinations[1]. The conventional braking medium (compressed air) is also handled at a higher speed and with more precision thanks to new technological capabilities. In

commercial vehicles, IBS is used to offer quick braking response and release for any single wheel. Electronic control is also utilized to provide a rapid amount. The purpose of a braking system is to slow and stop the vehicle's movement. Various components within the braking system must convert the vehicle's moving energy into heat in order to do this. Friction is used to accomplish this. Friction is the resistance to movement that two things exert against one another. A vehicle's control is affected by two types of friction: kinetic or moving friction and static or stationary friction. The degree of friction or resistance to movement is determined by the materials in contact, the smoothness of their rubbing surfaces, and the pressure that holds them together.

In a word, a car brake works by generating friction and turning kinetic energy into heat energy by applying a static surface to a moving surface of a vehicle. The following are the high-level mechanisms. Rough-texture brake pads or brake shoes are pushed against the spinning components of the vehicle, whether disc or drum, when the brakes on a moving car are applied. The vehicle's kinetic energy or momentum is subsequently transformed into heat energy by the rubbing surfaces' kinetic friction, and the automobile or truck slows down. Static friction holds a vehicle in place when it comes to a halt. Any movement is resisted by the friction between brake surfaces, as well as the friction between tires and roadways. Brakes are released to counteract the static friction that keeps the vehicle from moving. The car moves because the heat energy of the in-engine combustion is transformed into kinetic energy via the transmission and drive system. Figure 1 shows the sketch of the intelligent braking system.

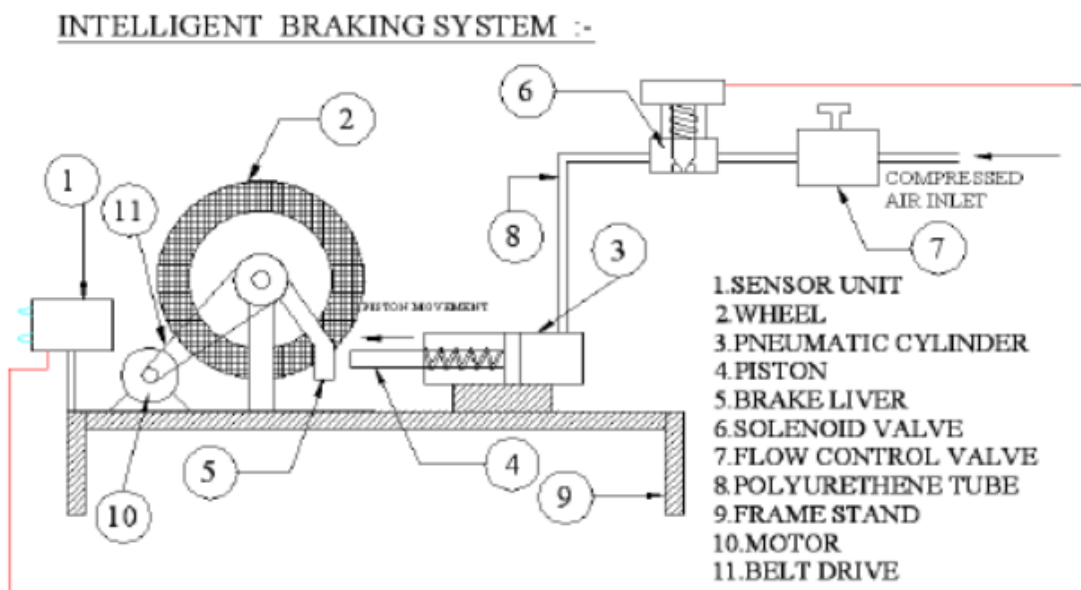


Figure 1: The Sketch of the Intelligent Braking System[2].

By adopting better brake system control, the braking distance will be drastically reduced. Such a complex task put on the management of the braking mechanism cannot be sustained by the driving force's capability and must be carried out independently of it. It would be much simpler to complete the job if the ABS braking powers could be better controlled. The braking force management method described here is based on intelligent regulation of braking force

application between the propelled vehicle's front and rear axles, as well as between the towing/trailer combination and the tractor/semi-trailer combination [3].

Intelligent braking systems have a wide range of potential uses, particularly in emerging nations, where car and intelligent highway research smart is gaining traction. When coupled with additional subsystems such as automated traction control, intelligent throttle control, auto cruise control, and so on, the system would result in smart vehicle handling. The rider will be the leading force at the end of the day, safety will be prioritized, and the trip will be designed in terms of its slow duration, cost, productivity, and luxurious capacity [4]. The impact of such design and manufacturing would be comparable with the needs of a society up to this point, which likewise strives to a quality drive to meet those needs. Technological advancements, particularly in the area of smart sensors and actuators[5]The creation of a digital signal processor boosts the microcontroller's power and usefulness. The value of the inter-vehicle distance from the infrared laser sensor and the speed of the following car from the speedometer are sent into the DSP for processing, resulting in the DSP functioning well to the actual situation[6].

1.1 Need for the Proposed Framework:

Accidents are caused by either a technical failure within the vehicle or a driving mistake. Drivers often lose control of their vehicles, and irresponsible driving may result in an accident. When it comes to drivers, they become frightened when they see the vehicle going into a collision, and they don't use the brakes. This is how the majority of injuries occur [7]. The gadget was created to prevent such accidents. Keeps track of all types of cars approaching from behind. It will keep track of the distance between the two vehicles. If two vehicles are dangerously close together, the system's microcontroller may activate the brakes to bring the vehicle to a halt [8].

1.2 Current System

In addition to Volvo's Laser-assisted braking, Honda's idea of ABS enables the rider to have a stress-free stopping experience on slick and wet terrain by providing dispersed braking and avoiding skidding and wheel locking. This system can anticipate a collision up to 50 mph and immediately activate the brakes. ABS can only activate assistance if the rider actively sets the time and controls the space measurements[9].

1.3 Characteristics of Brakes:

Several qualities are often used to characterize brakes, including:

The greatest decelerating effect that may be achieved is known as the peak force. The peak force is often higher than the traction limit of the tires, resulting in a wheel skid.

1.3.1 Continuous power dissipation:

When brakes are used, they get hot and may fail if the temperature rises too high. Continuous power dissipation is the maximum amount of power (energy per unit time) that may be dissipated via the brake without failure. The temperature and speed of ambient cooling air, for example, have a significant impact on continuous power dissipation. Brake fade occurs when a brake becomes less efficient as it warms up. Some designs are prone to fading by nature, while others are quite resistant. Furthermore, factors such as chilling have a significant impact on the fade.

1.3.2 Smoothness:

Skids may be caused by a brake that is grabby, pulses, chatters, or otherwise applies variable braking force. Railroad wheels, for example, have limited traction, and friction brakes without an anti-skid system often cause skids, increasing maintenance costs and giving passengers a "thud thump" sensation.

When a modest human application force results in a braking force that is greater than usual for other brakes in the same class, the brakes are characterized as "strong." This concept of "powerful" has nothing to do with continuous power dissipation, and it may be perplexing since a brake might be "powerful" and brake forcefully with a moderate brake application, yet have a lower (worse) peak force than a less "powerful" brake.

1.3.3 Pedal feel:

The subjective impression of braking power output as a function of pedal travel is referred to as brake pedal feel. The fluid displacement of the brake and other variables affect pedal travel. Off-brake drag varies based on the design of the system to accommodate overall system compliance and deformation that occurs during braking, as well as the capacity to withdraw friction material from the rubbing surface in the off-brake state.

1.3.4 Durability:

Friction brakes have worn surfaces that need to be replaced on a regular basis. The brake shoes or pads, as well as the braking disc or drum, are all wear surfaces. There may be compromises; for example, a wear surface with a high peak force may wear rapidly.

1.3.5 Weight:

Brakes are often considered "added weight" since they provide no other use. Furthermore, brakes are often placed atop wheels, and unsprung weight may adversely affect traction in certain situations. The term "weight" may refer to the brake itself or to extra support structures. Brakes typically make a small noise when applied, but they often make loud squeals or grinding sounds.

LITERATURE REVIEW

If implemented, the Intelligent Braking Device may avoid numerous accidents and preserve human lives and property. Because the implementation of such a complicated system is often made mandatory, similar to the use of seat belts, injuries are frequently prevented to some extent. After being integrated into a single system, our Intelligent Braking Technology provides a glimpse into the long-term protection of cars, and the way in which these particular devices are more complex is also utilized to prevent accidents and safeguard car occupants [10].

DISCUSSION

Arduino is an open-source platform for the creation of electrical projects. Arduino is made comprised of a microcontroller and some software, known as an IDE (Integrated Programming Environment), which is used to create and upload code to the device's physical screen. To load fresh programming onto the Arduino, you won't need a separate piece of hardware (called a programmer) - all you'll need is a USB connection. The Arduino IDE, on the other hand, utilizes a simplified form of C++, making it easier to learn about the program.

In a nutshell, a car brake generates friction and converts kinetic energy into heat energy by applying a static surface to a vehicle's moving surface. The high-level mechanisms are listed below. When the brakes of a moving automobile are applied, rough-texture brake pads or brake shoes are pressed against the spinning components of the vehicle, whether disc or drum. The rubbing surfaces' kinetic friction converts the vehicle's kinetic energy or momentum into heat energy, and the vehicle slows down. Static friction keeps a vehicle in place when it comes to a stop. Friction between brake surfaces, as well as friction between tires and roads, oppose any movement. To overcome the static friction that prevents the vehicle from moving, the brakes are removed. The transmission and drive system convert the heat energy of the in-engine combustion into kinetic energy, which allows the vehicle to move. The intelligent braking system is shown in Figure 1 as a drawing.

To monitor and identify the existence of an entity, ultrasound spectrum and identification of high-frequency sound wave devices are used. These devices either compute or monitor the reflection of sound waves on surfaces. When artifacts move between the transmitter and the receiver, the sound beam is disrupted. A transducer is used by the ultrasonic sensor to produce electrical output signals in response to the received ultrasonic wave. For a span of 75 meters between vehicles, the horizontal opening angle must be at least 8 degrees.

The hydraulic braking system follows Pascal's law, which states that "all pressure forces operating inside the system are acting in the same general direction." This law states that when friction is added to a fluid, it will move in a similar manner. The instructions also cover all four wheels with constant braking. The braking cylinder will feel the force at the connecting rod that enables the piston to move when the foot pedal is pressed. The fluid within the brake cylinder cavity rushes into the brake caliper, causing the pistons inside the caliper to experience fluid friction, allowing them to push the brake pad against the caliper. A braking force is applied to a rotating disc.

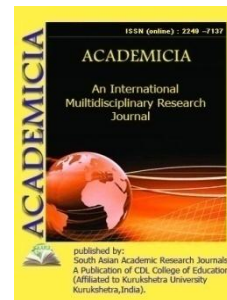
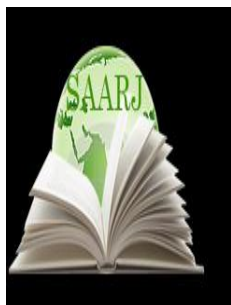
CONCLUSION

If implemented, the Intelligent Braking Device may avoid numerous accidents and preserve human lives and property. Because the implementation of such a complicated system is often made mandatory, similar to the use of seat belts, injuries are frequently prevented to some extent. Our Intelligent Braking Technology provides a glimpse into the long-term protection of cars, and the way in which these more complex devices are integrated into a single system is also utilized to prevent accidents and safeguard automobile occupants. The development of sophisticated technology has surpassed the long run of vehicle safety; the approach to safety is changing. The Intelligent Braking System's approach to safety is a major departure from the conventional method, yet it is essential to achieve meaningful advantages.

REFERENCES

1. M. A. Hannan, F. A. Azidin, and A. Mohamed, "Hybrid electric vehicles and their challenges: A review," *Renewable and Sustainable Energy Reviews*. 2014, doi: 10.1016/j.rser.2013.08.097.
2. D. W. Harless and G. E. Hoffer, "The antilock braking system anomaly: A drinking driver problem?," *Accid. Anal. Prev.*, 2002, doi: 10.1016/S0001-4575(01)00030-6.
3. N. Ghaviha, J. Campillo, M. Bohlin, and E. Dahlquist, "Review of Application of Energy

- Storage Devices in Railway Transportation,” 2017, doi: 10.1016/j.egypro.2017.03.980.
4. H. Inoue, P. Raksincharoensak, and S. Inoue, “Intelligent driving system for safer automobiles,” *J. Inf. Process.*, 2017, doi: 10.2197/ipsjjip.25.32.
 5. B. Singh and A. Gupta, “Recent trends in intelligent transportation systems: a review,” *J. Transp. Lit.*, 2015, doi: 10.1590/2238-1031.jtl.v9n2a6.
 6. A. A. Aly, E.-S. Zeidan, A. Hamed, and F. Salem, “An Antilock-Braking Systems (ABS) Control: A Technical Review,” *Intell. Control Autom.*, 2011, doi: 10.4236/ica.2011.23023.
 7. A. Zear, P. K. Singh, and Y. Singh, “Intelligent transport system: A progressive review,” *Indian J. Sci. Technol.*, 2016, doi: 10.17485/ijst/2016/v9i32/100713.
 8. S. J. Clegg, “A Review of Regenerative Braking Systems,” *Inst. Transp. Stud. Univ. Leeds*, 1996.
 9. R. Risse, “Lösungen für Anhängfahrzeuge für den Ökonomischen Transport und Erhöhung der Verkehrssicherheit,” *VDI Berichte*, 2009.
 10. S. P. Hire, A. A. Ansari, S. S. Darekar, P. K. Patil, and B. S. Vikhe, “Review Paper on – Intelligent Braking System,” no. May, pp. 468–471, 2010.



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ESSENTIAL PROBLEMS OF TEACHING ENGLISH LEXICOLOGY

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ABSTRACT

This article highlights essential problems of teaching English lexicology as well as its specific aspects. Traditionally, the teaching of vocabulary above elementary levels was mostly incidental, limited to presenting new items as they appeared in reading or sometimes listening texts. We do not control this process consciously but there seems to be some important clues to consider. First, retention in short-term memory is not effective if the number of chunks of information exceeds seven. We could not talk about vocabulary teaching nowadays without mentioning Lewis, whose controversial, thought-provoking ideas have been shaking the ELT world since its publication.

KEYWORDS: *Oxford Dictionary, Language, Verb, Adjective, And Noun, Concrete, Abstract, And Structural, Lexicalized Grammar, Topic, The Teacher, Multi-Word Verbs, Idioms, Strong And Weak Collocations.*

INTRODUCTION

Learning the words of a foreign language is not an easy business since every word has its form, meaning, and usage and each of these aspects of the word may have its difficulties. Indeed, some words are difficult in form (daughter, busy, bury, woman, women) and easy in usage; other words are easy in form (enter, get, happen) and difficult in usage. Consequently, words may be classified according to the difficulties pupils find in assimilation. In methodology some attempts have been made to approach the problem. The analysis of the words within the foreign language allows us to distinguish the following groups of words: concrete, abstract, and structural.

Words denoting concrete things (book, street, sky), actions (walk, dance, read), and qualities (long, big, good) are easier to learn than words denoting abstract notions (world, home, believe, promise, honest). Structural words are the most difficult for Russian-speaking pupils.

In teaching pupils a foreign language the teacher should bear this in mind when preparing for the vocabulary work during the lesson.

Advanced learners can generally communicate well, having learnt all the basic structures of the language. However, they need to broaden their vocabulary to express themselves more clearly and appropriately in a wide range of situations. Students might even have a receptive knowledge of a wider range of vocabulary, which means they can recognize the item and recognize its meaning. Nevertheless, their productive use of a wide range of vocabulary is normally limited, and this is one of the areas that need greater attention. At this stage we are concerned not only with students understanding the meaning of words, but also being able to use them appropriately, taking into account factors such as oral / written use of the language; degree of formality, style and others. Traditionally, the teaching of vocabulary above elementary levels was mostly incidental, limited to presenting new items as they appeared in reading or sometimes listening texts. This indirect teaching of vocabulary assumes that vocabulary expansion will happen through the practice of other language skills, which has been proved not enough to ensure vocabulary expansion. Nowadays it is widely accepted that vocabulary teaching should be part of the syllabus, and taught in a well-planned and regular basis. Some authors, led by Lewis (1993) argue that vocabulary should be at the centre of language teaching, because 'language consists of grammaticalised lexis, not lexicalized grammar.' There are several aspects of lexis that need to be taken into account when teaching vocabulary.¹

Boundaries between conceptual meanings: knowing not only what lexis refers to, but also where the boundaries are that separate it from words of related meaning (e.g. cup, mug, and bowl).

- Polysemy: distinguishing between the various meaning of a single word form with several and closely related meanings (head: of a person, of a pin, of an organization).
- Homonymy: distinguishing between the various meaning of a single word form which has several meanings which are NOT closely related (e.g. a file: used to put papers in or a tool).
- Homophony: understanding words that have the same pronunciation but different spellings and meanings (e.g. flour, flower).
- Synonymy: distinguishing between the different shades of meaning that synonymous words have (e.g. extends, increase, expand).
- Affective meaning: distinguishing between the attitudinal and emotional factors (denotation and connotation), which depend on the speakers attitude or the situation. Socio-cultural associations of lexical items is another important factor.
- Style, register, dialect: Being able to distinguish between different levels of formality, the effect of different contexts and topics, as well as differences in geographical variation.
- Translation: awareness of certain differences and similarities between the native and the foreign language (e.g. false cognates).
- Chunks of language: multi-word verbs, idioms, strong and weak collocations, lexical phrases.
- Grammar of vocabulary: learning the rules that enable students to build up different forms of the word or even different words from that word (e.g. sleep, slept, sleeping; able, unable; disability).

- Pronunciation: ability to recognize and reproduce items in speech.

The implication of the aspects just mentioned in teaching is that the goals of vocabulary teaching must be more than simply covering a certain number of words on a word list. We must use teaching techniques that can help realize this global concept of what it means to know a lexical item. And we must also go beyond that, giving learner opportunities to use the items learnt and also helping them to use effective written storage systems. Understanding how our memory works might help us create more effective ways to teach vocabulary. Research in the area, cited by Gairn's offers us some insights into this process. It seems that learning new items involve storing them first in our short-term memory, and afterwards in long-term memory. We do not control this process consciously but there seems to be some important clues to consider. First, retention in short-term memory is not effective if the number of chunks of information exceeds seven. Therefore, this suggests that in a given class we should not aim at teaching more than this number. However, our long-term memory can hold any amount of information. Research also suggests that our 'mental lexicon' is highly organized and efficient, and that semantic related items are stored together. Word frequency is another factor that affects storage, as the most frequently used items are easier to retrieve. We can use this information to attempt to facilitate the learning process, by grouping items of vocabulary in semantic fields, such as topics (e.g. types of fruit).

Oxford dictionary suggests memory strategies to aid learning, and these can be divided into:

- creating mental linkages: grouping, associating, placing new words into a context;
- applying images and sounds: using imagery, semantic mapping, using keywords and representing sounds in memory;
- reviewing well, in a structured way;
- employing action: physical response or sensation, using mechanical techniques.

The techniques just mentioned can be used to greater advantage if we can diagnose learning style preferences (visual, aural, kinesthetic, tactile) and make students aware of different memory strategies. Meaningful tasks however seem to offer the best answer to vocabulary learning, as they rely on students' experiences and reality to facilitate learning. More meaningful tasks also require learners to analyze and process language more deeply, which should help them retain information in long-term memory. Forgetting seems to be an inevitable process, unless learners regularly use items they have learnt. Therefore, recycling is vital, and ideally it should happen one or two days after the initial input. After that, weekly or monthly tests can check on previously taught items. The way students store the items learned can also contribute to their success or failure in retrieving them when needed. Most learners simply list the items learnt in chronological order, indicating meaning with translation. This system is far from helpful, as items are de-contextualized, encouraging students to over generalize usage of them. It does not allow for additions and refinements nor indicates pronunciation. Teachers can encourage learners to use other methods, using topics and categories to organize a notebook, binder or index cards. Meaning should be stored using English as much as possible, and also giving indication for pronunciation. Diagrams and word trees can also be used within this topic/categories organization. The class as a whole can keep a vocabulary box with cards, which can be used for revision/recycling regularly. Organizing this kind of storage system is time-

consuming and might not appeal to every learner. Therefore adapting their chronological lists to include headings for topics and a more complete definition of meaning would already be a step forward. In my opinion the most important aspect of vocabulary teaching for advanced learners is to foster learner independence so that learners will be able to deal with new lexis and expand their vocabulary beyond the end of the course. Therefore guided discovery, contextual guesswork and using dictionaries should be the main ways to deal with discovering meaning. Guided discovery involve asking questions or offering examples that guide students to guess meanings correctly. In this way learners get involved in a process of semantic processing that helps learning and retention. Contextual guesswork means making use of the context in which the word appears to derive an idea of its meaning, or in some cases, guess from the word itself, as in words of Latin origin. Knowledge of word formation, e.g. prefixes and suffixes, can also help guide students to discover meaning. Teachers can help students with specific techniques and practice in contextual guesswork, for example, the understanding of discourse markers and identifying the function of the word in the sentence (e.g. verb, adjective, and noun). The latter is also very useful when using dictionaries.

Students should start using EFL dictionaries as early as possible, from Intermediate upwards. With adequate training, dictionaries are an invaluable tool for learners, giving them independence from the teacher. As well as understanding meaning, students are able to check pronunciation, the grammar of the word (e.g. verb patterns, verb forms, plurality, comparatives, etc.), different spelling (American versus British), style and register, as well as examples that illustrate usage.

Another strategy for advanced learners is to turn their receptive vocabulary items into productive ones. In order to do that, we need to refine their understanding of the item, exploring boundaries between conceptual meaning, polysemy, synonymy, style, register, possible collocations, etc., so that students are able to use the item accurately. We must take into account that a lexical item is most likely to be learned when a learner feels a personal need to know it, or when there is a need to express something to accomplish the learner's own purposes. Therefore, it means that the decision to incorporate a word in ones productive vocabulary is entirely personal and varies according to each student's motivation and needs. Logically, production will depend on motivation, and this is what teachers should aim at promoting, based on their awareness of students needs and preferences. Task-based learning should help teachers to provide authentic, meaningful tasks in which students engage to achieve a concrete output, using appropriate language for the context. We could not talk about vocabulary teaching nowadays without mentioning Lewis, whose controversial, thought-provoking ideas have been shaking the ELT world since its publication. We do not intend to offer a complete review of his work, but rather mention some of his contributions that in our opinion can be readily used in the classroom.

His most important contribution was to highlight the importance of vocabulary as being basic to communication. We do agree that if learners do not recognize the meaning of keywords they will be unable to participate in the conversation, even if they know the morphology and syntax. On the other hand, we believe that grammar is equally important in teaching, and therefore in our opinion, it is not the case to substitute grammar teaching with vocabulary teaching, but that both should be present in teaching a foreign language.

Lewis himself insists that his lexical approach is not simply a shift of emphasis from grammar to vocabulary teaching, as 'language consists not of traditional grammar and vocabulary, but often

of multi-word prefabricated chunks'. Chunks include collocations, fixed and semi-fixed expressions and idioms, and according to him, occupy a crucial role in facilitating language production, being the key to fluency.

An explanation for native speakers' fluency is that vocabulary is not stored only as individual words, but also as parts of phrases and larger chunks, which can be retrieved from memory as a whole, reducing processing difficulties. On the other hand, learners who only learn individual words will need a lot more time and effort to express themselves.

Consequently, it is essential to make students aware of chunks, giving them opportunities to identify, organize and record these. Identifying chunks is not always easy, and at least in the beginning, students need a lot of guidance.

Hill explains that most learners with 'good vocabularies' have problems with fluency because their 'collocational competence' is very limited, and that, especially from Intermediate level, we should aim at increasing their collocational competence with the vocabulary they have already got. For Advance learners he also suggests building on what they already know, using better strategies and increasing the number of items they meet outside the classroom.

The idea of what it is to 'know' a word is also enriched with the collocational component. According to Lewis 'being able to use a word involves mastering its collocational range and restrictions on that range'. I can say that using all the opportunities to teach chunks rather than isolated words is a feasible idea that has been working well in my classes, and which is fortunately coming up in new course books we are using. However, both teachers and learners need awareness raising activities to be able to identify multi-word chunks.

Apart from identifying chunks, it is important to establish clear ways of organizing and recording vocabulary. According to Lewis, 'language should be recorded together which characteristically occurs together', which means not in a linear, alphabetical order, but in collocation tables, mind-maps, word trees, for example. He also suggests the recording of whole sentences, to help contextualization, and that storage of items is highly personal, depending on each student's needs.

We have already mentioned the use of dictionaries as a way to discover meaning and foster learner independence. Lewis extends the use of dictionaries to focus on word grammar and collocation range, although most dictionaries are rather limited in these.

Lewis also defends the use of 'real' or 'authentic' material from the early stages of learning, because 'acquisition is facilitated by material which is only partly understood'. Although he does not supply evidence for this, I agree that students need to be given tasks they can accomplish without understanding everything from a given text, because this is what they will need as users of the language. He also suggests that it is better to work intensively with short extracts of authentic material, so they are not too daunting for students and can be explored for collocations.

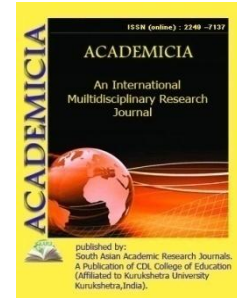
LITERATURE:

1. Anderson John. The Grammar of Names.- Oxford: Oxford University press,-2007.
2. Anderson Wee. Proper Names and the Theory of Metaphor.- Oxford: Cambridge University Press, 2006.

3. Mc Arthur. The Oxford Companion to the English language. –Oxford: Oxford University Press, 1996. 473-p.
4. Zandvoort R. W. A Handbook of English Grammar,- London: Longman,1958. 345-p.
5. Macmillan English Dictionary. Text Bloomsbury Publishing Plc-2002. Deputy Editors Sue Engineer. Senior Editors Robert Allen. Managing Editor Michael Mayor. 1700 pp.



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**CREATION OF THE LEGAL BASIS OF STATE AWARDS IN
 INDEPENDENT UZBEKISTAN**

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ABSTRACT

The state awards of the Independent Republic of Uzbekistan consist of the title "Hero of Uzbekistan", honorary titles, orders, medals and honorary titles. In this article, information on the creation of the legal basis of state awards, the procedure for awarding citizens, some benefits to those who are awarded are covered.

KEYWORDS: Law, State Award, Honorary Title, Orden, Medal, Honorary Title, Hero Of Uzbekistan, Independence, Glory, Friendship, Courage, Health, Honorary Coach, Courage, Future Creator, Fame, Healthy Life.

INTRODUCTION

After the independence of the Republic of Uzbekistan, large-scale changes in all spheres began to be carried out. In particular, the system of state awards was formed and its legal basis was created. It is worthwhile to emphasize the Constitution of the Republic of Uzbekistan, which is considered to be our main body as a preliminary legal basis. In particular, Article 78 of the Constitution provides for the Joint Powers of the legislative chamber and Senate of the Oliy Majlis of the Republic of Uzbekistan, which includes the issue of "Establishment of State Awards and titles", Article 93 stipulates that the president of the Republic of Uzbekistan shall award "the orders, medals and labels of the Republic of Uzbekistan and shall [1].

On December 22, 1995, the law "on state awards" was adopted. This law became the first normative-legal basis for the system of state awards of this direction. On April 11, 2018, the law on amendments and additions to the law "on state awards" was adopted. This law paved the way for further improvement of work in the field of state awards. The law consists of general rules, the system of state awards, the provision of state awards, the awarding of awards with them and the use of state awards, the closing rules. The state awards include the title of "hero of

Uzbekistan"; honorary titles of the Republic of Uzbekistan; orders of the Republic of Uzbekistan; medals of the Republic of Uzbekistan; honorary titles of the Republic of Uzbekistan.

In this law, special attention was paid to the issues of awarding the state awards, and the presentation on awarding the state awards was made to the president of the Republic of Uzbekistan by the chairman of the Senate of the Oliy Majlis of the Republic of Uzbekistan, the Speaker of the legislative chamber, the Prime Minister of the Republic of Uzbekistan, the Constitutional, governors of Regions and cities of Tashkent, heads of state and economic management bodies, other republican institutions, non-profit organizations shall be introduced by Republican bodies. Awarding of State Awards is carried out by the president of the Republic of Uzbekistan. Awarding the president of the Republic of Uzbekistan with state awards is carried out on the initiative of the chambers of the Oliy Majlis of the Republic of Uzbekistan. Awarding of the state awards of the Republic can be carried out even after the death of a person. Persons awarded with state awards are simultaneously given a certificate of the established sample[2].

The highest award of our country was the title of Hero of Uzbekistan, established on May 5, 1994. This title is awarded to the citizens of the Republic of Uzbekistan for their services in connection with the heroic courage before the state and the people. The person awarded the title of "Hero of Uzbekistan" will be awarded the medal "Golden Star". Persons awarded with the title of "Hero of Uzbekistan" receive a reward from the master who is paid monthly in the amount of the base calculation in addition to the monthly salary or Pension [3].

In the process of reforms in this field, on 26 April 1996, the law "On the establishment of honorary titles of the Republic of Uzbekistan" was adopted. The honorary titles of the Republic of Uzbekistan were established in order to promote the services of citizens in labor, productive state, social and creative activities and they include: "the art figure of the Republic of Uzbekistan", "The scientist of the Republic of Uzbekistan", "The pride of Uzbekistan", "People's artist of The Republic of Uzbekistan", "People's writer of the Republic of Uzbekistan",

"People's artist of, "People's memory of the Republic of Uzbekistan", "employee of services in the field of utilities, household and trade of the Republic of Uzbekistan", "communication officer serving in the Republic of Uzbekistan", "artist serving in the Republic of Uzbekistan", "geologist serving in the Republic of Uzbekistan", "coach of youth serving in the Republic of Uzbekistan", "journalist serving in the Republic of Uzbekistan", "irrigator serving in the, "Employee of Culture who served in the Republic of Uzbekistan", "architect who served in the Republic of Uzbekistan", "Pakhtakor who served in the Republic of Uzbekistan", "stair who served in the Republic of Uzbekistan", "industrial worker who served in the Republic of Uzbekistan", "health worker who served in the Republic of Uzbekistan", "sports teacher who served in the Republic of Uzbekistan", "sportsman who served in the Republic, "Employee of public education who served in the Republic of Uzbekistan", "rancher who served in the Republic of Uzbekistan", "lawyer who served in the Republic of Uzbekistan", "agricultural employee who served in the Republic of Uzbekistan", "builder who served in the Republic of Uzbekistan". Persons awarded the honorary titles of the Republic of Uzbekistan shall be awarded a badge of the established pattern and a certificate on it[4].

On May 5, 1994, the law on the order of "Independence" of the Republic of Uzbekistan was adopted. In accordance with the regulations on the order of "independence", citizens of the Republic of Uzbekistan and order will be rewarded for their great contributions to the restoration

and strengthening of an independent legal state, ensuring peace and development in the Republic, and will receive a lump-sum monetary reward of seventy-five times the amount of the base calculation[5].

On 26 April 1996, the law of the Republic of Uzbekistan "Amir Temur" order was adopted. With Orden, citizens of the Republic of Uzbekistan will be rewarded for their great services in the strengthening of statehood, for their great contributions to the development of architecture, science, literature and art, including military skills. The order of Amir Temur will also be awarded for making a special contribution to the strengthening of cooperation, peace and friendship between nations. Persons awarded with this orden will receive a one-time cash prize in the amount of seventy times the amount of the base calculation[6].

On August 30, 2000, the law on the order of the Republic of Uzbekistan "Jalaliddin Manguberdi" was adopted. With the order of Jalaliddin Manguberli, military servicemen who showed high military skills, heroism and courage in the protection of the country's independence, the borders of Vatan, the soil of the native land, as well as in the preservation of it in the field of sight, made a huge contribution to the strengthening of the defense power of our state will be awarded. The order of Jalaliddin Manguberdi is the highest military award of the Republic of Uzbekistan. Persons awarded with this order receive a one-time cash prize in the amount of sixty-five times the amount of the base calculation [7].

On August 29, 1996, the law on the order of the Republic of Uzbekistan "For Great Services" was adopted. Orden and citizens of the Republic of Uzbekistan and foreign countries will be awarded for their great services in the development of Science and technology, economy and culture, development of state cooperation and significant contribution to the implementation of domestic and foreign policy aimed at increasing the international reputation of Uzbekistan, and will receive a monetary reward or a memorable gift equal to this amount of money[8].

On August 28, 1998, the law of the Republic of Uzbekistan on the order of "El-yurt hurmati" was adopted. With Orden, citizens of the Republic of Uzbekistan who have made a great contribution to the strengthening of the country's independence, its economic power, National spirituality and culture, who are worthy of public self-esteem with their hard work, scientific, Public Work, Labor and patriotism will be rewarded and receive a one-time monetary reward in the amount of fifty times [9].

On August 29, 2003, the law on the order of the Republic of Uzbekistan "for selfless services" was adopted. With Orden, citizens and military servicemen who have made a great contribution to the economic and cultural development of the country, the strengthening of defense power and national security, peace and stability in society, solidarity of the nation, improving the welfare of the people, giving their talent, knowledge and experience to the prosperity of our motherland and showing the example of self-sacrifice will be Persons awarded with the order "for selfless services" receive a one-time cash prize of forty-five times the amount of the base calculation[10].

On August 30, 1995, the law of the Republic of Uzbekistan "On the order of Labor Glory" was adopted. With Orden, citizens of the Republic of Uzbekistan will be rewarded for their great work, which will serve to increase the economy and culture in Uzbekistan, increase the well-being of the people, maintain peace and stability, and will receive a one-time monetary reward of forty times the amount of the base calculation[11].

On May 7, 1993, the law of the Republic of Uzbekistan on the order "for the healthy generation" was adopted. People with Orden are rewarded for their exceptional services in the protection of motherhood and childhood, providing the best material conditions and moral environment for the perfection of a healthy generation. The order "for a healthy generation" will consist of two levels: Level I and Level II. Level I orden is considered a higher level. The award is first made in the form of an award of the II degree, with an order of the I degree after at least three years have passed. Persons awarded with Level I orders receive a one-time cash prize of twenty-five times the amount of the base calculation, persons awarded with Level II orders receive a one-time cash prize of twenty-five times the amount of the base calculation[12].

On August 30, 1995, the law "On the order of glory of the Republic of Uzbekistan" was adopted. Orden and citizens of the Republic of Uzbekistan shall be rewarded for the dedication and courage shown in the defense of The Motherland, for their great services in strengthening the defense power and national security in Uzbekistan, increasing the combat readiness of the armed forces and ensuring law enforcement. The order of Glory will consist of two levels: Level I and Level II. Persons awarded with Tier I orders will receive a one-time cash prize of twenty times the number of persons awarded with Tier II orders in the amount of forty times the amount of the base calculation[13].

On May 5, 1994, the law on the order of friendship of the Republic of Uzbekistan was adopted. Orden and the citizens of the Republic of Uzbekistan shall be rewarded for their great achievements in the work of strengthening friendship, mutual solidarity and harmony among representatives of all nationalities and nationalities living in Uzbekistan, for the development of friendship and cooperation of the people of Uzbekistan with the peoples of other countries, and shall receive a lump sum cash reward[14].

On September 11, 2012, the law on the order of courage of the Republic of Uzbekistan was adopted. Military servicemen and other citizens of the Republic of Uzbekistan, who have devoted themselves to the protection of the motherland and service of the native land, who have shown courage and courage, will be rewarded with Orden and will receive a monetary reward in the amount of fifteen times the amount of the base calculation[15].

On May 26, 2020, the law on the order of "Health" of the Republic of Uzbekistan was adopted. Citizens of the Republic of Uzbekistan with Orden will be rewarded for their special services in the development of the health system, improvement of Public Health and strengthening of international cooperation in this field. Orden is level I and II. Persons awarded with Tier I orders receive a one-time cash prize of twenty-five times the amount of the base calculation, persons awarded with Tier II orders receive a one-time cash prize of thirty times the amount of the base calculation[16].

On June 9, 2020, the law on the order of "Honorary coach" of the Republic of Uzbekistan was adopted. Orden has made a worthy contribution to the formation of active civil position and ideological immunity, initiative, self-sacrifice and moral qualities in the representatives of the younger generation, as well as with his deep knowledge and rich life experience, as well as comprehensive support of young people and families who have fallen into a difficult situation, to provide employment and to teach entrepreneurship., for this purpose, citizens of the Republic of Uzbekistan, who show a personal example, will be rewarded for creating favorable conditions.

Persons awarded with the order of "honorary coach" will receive a one-time prize of forty times the amount of the base calculation[17].

On May 5, 1994, the law on the medal "Courage" of the Republic of Uzbekistan was adopted. With the Medal, military servicemen of the Republic of Uzbekistan, employees of the State Security Service, National Guard and internal affairs bodies will be awarded for their courage and courage in ensuring the national security of the Republic, maintaining public order and combating crime, fulfilling military duty or duty. With the medal "courage" citizens of the Republic of Uzbekistan or persons who are not citizens of the Republic of Uzbekistan can be rewarded for their courage shown in the maintenance of public order during natural disasters, fires and other emergency situations, in the preservation of people's lives, State and public property. Persons awarded with medals receive a one-time cash prize in the amount of ten times the amount of the base calculation[18].

On July 6, 2007, the law on the medal "For loyal services" of the Republic of Uzbekistan was adopted. Citizens of the Republic of Uzbekistan who demonstrate their high professional skills, commitment to military and patriotic duty with medals will be rewarded for their great services in strengthening the country's defense capabilities and national security, increasing the combat capabilities of the Armed Forces of the Republic of Uzbekistan and ensuring law enforcement in Uzbekistan, and will receive a lump sum [19].

On December 28, 2017, the law of the Republic of Uzbekistan on the Medal "The future builder" was adopted. Citizens of the Republic of Uzbekistan who have demonstrated the qualities of patriotism, self-sacrifice and hard work with the Medal, serve with loyalty to the interests of the people, increase the prestige of our homeland in the international arena and make a worthy contribution to the glory, serve their peers with activity and initiative in the socio-political life of the country, the prize money paid in one lump sum in the amount will receive[20]. On May 5, 1994, the law on the medal "Shohrat" of the Republic of Uzbekistan was adopted. Citizens of the Republic of Uzbekistan, as well as non-citizens of the Republic of Uzbekistan who have achieved great success with their honest efforts in the development of the economy, science and culture of the Republic, in the spirit of educating the younger generation in the spirit of patriotism and loyalty to the ideas of national independence and social development[21].

On May 26, 2020, the law of the Republic of Uzbekistan on the medal "Healthy life" was adopted. With medals, doctors of health institutions, dietologists, physical education instructors, representatives of the mass media covering health issues, bloggers, exemplary families, athletes, heads of organizations and departments of all levels, heads of sports schools, secondary schools and preschool institutions, sports trainers, other specialists of the field of physical education and sports, representatives of the defense system, judges and sports organizations, governors of all levels and, heads of physical education and sports organizations, sponsors, heads of enterprises and organizations attached to the sports federation (associations) will be awarded and will receive a one-time cash prize of ten times the amount of the base calculation[22].

On December 17, 2009, the law on the honorary title of the Republic of Uzbekistan was adopted. In accordance with the regulations on the honorary title of the Republic of Uzbekistan, citizens of the Republic of Uzbekistan will be rewarded for their labor and combat services, productive state, social and creative activities. Also in some cases, enterprises, institutions, organizations, public associations, creative communities and military units, administrative and territorial units

of the Republic of Uzbekistan can be awarded. Persons awarded with the honorary title of the Republic of Uzbekistan receive a monetary award or a memorable gift of the same value, which is given once in the amount of five times the amount of the base calculation[23].

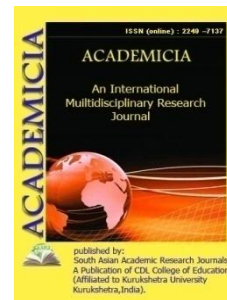
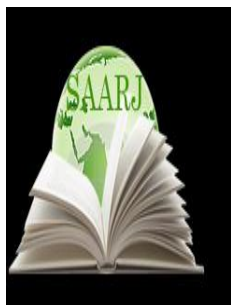
CONCLUSION

In conclusion, we can say that from the first years of independence to the present, a lot of work has been carried out on the worthy awarding of citizens of their services to the state and the people. The system of State Awards has been formed, its legal basis has been created, the importance of state awards in the formation of feelings of inviolability and patriotism in our citizens is increasing. With the state awards, representatives of many spheres of our society are awarded, so the benefits and incentives set out in the laws are also used. It would not be an exaggeration to say that our state pays attention to the selfless and energetic citizens of our society through the high Awards, which are now called New Uzbekistan.

LITERATURE

1. Constitution of the Republic of Uzbekistan.
2. April 11, 2018 Law on Amendments and Additions to the Law "On State Awards". // People's word. April 12, 2018. №72
3. May 5, 1994 Law on the establishment of the title "Hero of Uzbekistan" and the highest award - the medal "Golden Star". <https://lex.uz>.
4. Law of April 26, 1996 "On the establishment of honorary titles of the Republic of Uzbekistan". <https://lex.uz>.
5. May 5, 1994 Law of the Republic of Uzbekistan "On Independence". <https://lex.uz>.
6. April 26, 1996 Law of the Republic of Uzbekistan on the Order "Amir Temur". <https://lex.uz>.
7. August 30, 2000 Law of the Republic of Uzbekistan on the Order "Jaloliddin Manguberdi". <https://lex.uz>.
8. August 29, 1996 Law of the Republic of Uzbekistan on the Order of Merit. <https://lex.uz>.
9. August 28, 1998 Law of the Republic of Uzbekistan on the Order "El-Yurt Hurmati". <https://lex.uz>.
10. August 29, 2003 Law of the Republic of Uzbekistan on the Order "For Valorous Services". <https://lex.uz>.
11. August 30, 1995 Law of the Republic of Uzbekistan "On Labor Glory". <https://lex.uz>.
12. May 7, 1993 Law of the Republic of Uzbekistan on the Order "For a Healthy Generation". <https://lex.uz>.
13. August 30, 1995 Law of the Republic of Uzbekistan "On the Order of Glory" <https://lex.uz>.
14. May 5, 1994 Law on the Order of Friendship of the Republic of Uzbekistan <https://lex.uz>.
15. September 11, 2012 Law of the Republic of Uzbekistan on the Order of Courage. // People's word. September 12, 2012. №179

16. May 26, 2020 Law of the Republic of Uzbekistan "On Health". Collection of Legislative Acts of the Republic of Uzbekistan, 2020, №21, Article 218, pages 4-9.
17. June 9, 2020 Law of the Republic of Uzbekistan on the Order "Honorary Coach". Collection of Legislative Acts of the Republic of Uzbekistan, 2020, №23, Article 244, pages 4-7.
18. May 5, 1994 Law of the Republic of Uzbekistan on the Medal of Courage. <https://lex.uz>.
19. July 6, 2007 Law of the Republic of Uzbekistan on the Medal for Meritorious Service. Collection of Legislative Acts of the Republic of Uzbekistan, 2007, №27-28, Article 279
20. December 28, 2017 Law of the Republic of Uzbekistan on the Medal "Builder of the Future". // People's word. December 29, 2017. №263
21. May 5, 1994 Law of the Republic of Uzbekistan on the Medal of Glory. <https://lex.uz>.
22. May 26, 2020 Law of the Republic of Uzbekistan "On Healthy Life". Collection of Legislative Acts of the Republic of Uzbekistan, 2020, №21, Article 219, pp. 10-13.
23. December 17, 2009 Law on the Certificate of Honor of the Republic of Uzbekistan. Collection of Legislative Acts of the Republic of Uzbekistan, 2009, №50-51, Article 534.



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PRODUCTION OF HYDROGEN USING ALUMINUM AND ALUMINUM ALLOYS: A REVIEW

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ABSTRACT

Due to depletion of fossil fuels and the pollution caused by their burning, there is a pressing need for renewable, clean fuel alternatives for our future energy source. Scientists have been paying close attention to hydrogen, a regenerative and ecologically benign fuel with a high calorific value. The hydrogen economy idea proposes that, rather than fossil fuels, hydrogen fuel would be used to provide the majority of future global energy needs. Hydrogen production should be properly developed initially in order for the technology to be deployed in a sustainable, clean, and cost-effective way for a smooth transition to the hydrogen economy. The hydrogen industry has been recognized as a viable replacement for the non-sustainable fossil fuel economy. The development of ecologically safe and cost-effective hydrogen manufacturing techniques, which are critical for the hydrogen economy, is now ongoing. Using aluminum and its alloys to convert water or hydrocarbons to gas is one of the most promising methods to generate hydrogen. This article provides a review of aluminum-based hydrogen generation techniques, as well as their limits and commercialization difficulties. A recently developed idea for hydrogen and electromagnetic energy co - generation is also addressed.

KEYWORDS: *Aluminum, Aluminum Alloys, Alcohols, Hydrogen Production, Electricity Generation.*

INTRODUCTION

Aluminum and its alloys are regarded as one of the most appropriate metals suited for future hydrogen generation for specific metal reactants that may cause hydrogen developing chemical processes, and there is a tendency to use them as an energy source, particularly in recent years. Furthermore, metal usage has been found as an efficient, user-friendly, and safe method for both

hydrogen generation and energy storage. The goal of this article is to provide an overview of the current techniques for generating hydrogen utilizing aluminum and its alloys, as well as their limits and commercialization difficulties. These techniques are divided into two categories: aluminum–water reactions and aluminum–alcohol reactions, which convert water and hydrocarbons into hydrogen, respectively. In addition, a relatively new potential idea, hydrogen and electrical energy cogeneration, will be addressed in the next section[1][2].

1. Production and storage of hydrogen are now at a standstill:

Despite the fact that hydrogen is the most common element in the cosmos, it is seldom found on Earth. As a result, hydrogen must be extracted from either water or hydrocarbons, both are plentiful on the planet. Biological mechanisms, electrochemical water electrolysis, and chemical techniques are now used to produce hydrogen.[3] Chemical techniques control the industry for commercial hydrogen generation, owing to the poor conversion efficiency of biological systems and the high cost of hydrogen production. Steam or partial oxidation reforming of natural gas, coal gasification, biomass reforming, water photolysis, and other methods may all be used to physically extract hydrogen from its sources. Currently, steam/partial oxidation reforming of natural gas and coal gasification produce about 95 percent hydrogen. Despite the fact that these methods are mature and then have the lowest prices, they cannot be utilized as a long-term plan for the hydrogen fuel cell since the raw materials required are all derived from fossil fuels, which are neither renewable nor clean. Although biomass reforming, a plentiful and renewable resource, may be considered a sustainable method to generate hydrogen, its carbon dioxide (CO₂) neutrality remains a point of contention. Furthermore, the poor hydrogen production and energy content of biomass severely limit this method. Furthermore, the conversion of syngas to hydrogen through the water–gas shift process will need extra energy. Another drawback of biomass use is the high expense of producing, collecting, and transporting biomass. Water photolysis, a potential advanced chemical technique, is still under research, and technical challenges keep it from reaching commercial applications.[4]

2. Aluminum and its alloys are used to make hydrogen:

Aluminum and its alloys have a variety of mechanical, electrical, and thermal characteristics that make them useful. They're extensively utilized in a variety of industries, including transportation, construction, electrical engineering, and packaging. Because of its high energy density of 29 MJ/kg, there has been a growing worry in recent years about utilizing aluminum-based materials as an energy storage or converter medium. Aluminum is considered a "viable metal" since it is the most plentiful crustal metal on the planet and can be completely recycled. Its use corresponds to today's subject of creating sustainable energy. Aluminum's low weight is another benefit. Aluminum is the lightest of all widely used metals, with a density of 2700 kg/m³. Its various alloys have densities ranging from 2600 to 2800 kg/m³. A feature like this may enable a system's overall weight be reduced significantly. Aluminum's usage in batteries is a good illustration of how it's used in the energy sector. The potential for the discharge reaction of pure aluminum in a highly alkaline electrolyte (pH 14) may be as low as 2.33 V compared to the typical hydrogen electrode. Aluminum also has a high electrochemical equivalency of 2.98 Ah/g due to its trivalence and low weight.[5]

Aluminum is a good anode metal for hundreds of years because of all of these characteristics. Li and Bjerrum looked examined a number of different aluminum batteries in depth. The

aluminum–air battery, which consists of an aluminum anode, a gas permeation cathode, and an aqueous alkaline (sometimes neutral) electrolyte, was said to be the sole battery system that could provide an electric vehicle with a range and resupply time similar to internal-combustion-engine vehicles.

DISCUSSION

3. Production of hydrogen from aluminum–water interactions:

3.1 Aluminum–water reaction with alkali aid:

In highly alkaline conditions, hydrogen ions (OH) may dissolve the oxide layer on the aluminum surface, producing AlO_2 . As a consequence, even at ambient temperature, aluminium alloys dissolve easily in a highly alkaline, resulting in hydrogen generation. Sodium hydroxide (NaOH) is the most frequently encountered alkali, and it undergoes the following sequence of reactions

This hydrogen production process is thought to include the two stages indicated in the equations above. The NaOH that was depleted for hydrogen production will be replenished by the $\text{NaAl}(\text{OH})_4$ breakdown. As a result, if the reaction is correctly regulated, only water is used during the operation. The total reaction despite the fact that this is a well-known parasitic reaction that is undesired in alkaline–aluminum–air batteries, it does offer a small supply of hydrogen. This process has been used to create a variety of hydrogen production devices. However, generating hydrogen via this reaction has the drawback of being highly corrosive, making it unsuitable for hydrogen generation in cars or home power systems.[6]

Other hydroxides were employed as the reactive base for hydrogen generation in addition to NaOH. By raising temperature and basic concentration at same time in potassium hydroxide (KOH) solution, a synergistic impact on hydrogen liberation performance was discovered. Unfortunately, due to its interaction with CO_2 in the air, KOH was consumed, slowing down the reaction rate. A recent research evaluated the performance of three distinct hydroxides in hydrogen generation: NaOH, KOH, and $\text{CaOH}(\text{OH})_2$. Aluminum consumption in NaOH solution was observed to be faster.[7]

4. In a neutral state, the interaction between aluminum and water:

4.1 without using alkalis, aluminum may react directly with water:

According to the preceding equation, the predicted hydrogen output of this reaction for a molar ratio combination of aluminum and water is only 3.7 weight percent, although it is still greater than other metals like Mg and Zn (3.3 wt. percent and 2.4 wt. percent, respectively). If the water generated by the driven fuel cell is fully recovered again for aforementioned process, the potential hydrogen yield rises to 5.6 wt.%, nearing the 6.0 wt.% goal established by the US Department of Energy for hydrogen storage devices.

This technique is found more safer than alkali-assisted reactions, although surface passivation in aqueous electrolyte is much easier to achieve, and metal activity with water is very low. As a result, increasing aluminum activity in water may be a critical job in this situation. The chemical activity of a freshly exposed metal surface is greater. Cutting, drilling, or grinding aluminum and its alloys in water, with the fresh surface of the metal exposed in water, resulted in the emission of hydrogen gas. Grinding produced the greatest amount of hydrogen per unit volume of metal removed. However, owing to the fast passivation of the metal surface, the reaction ceased soon

after the machining stopped. Metal particles of tiny diameters, which enhance the particular exposed surface area of metals, are preferable for continuous hydrogen production. High-energy ball milling, a technique in which materials are broken into tiny particles by ball-powder impacts, is one method to create fine metal powders. Ball milling size reduction is highly dependent on the mechanical characteristics of metals.[8]

4.2 At high temperatures, an aluminum–water interaction occurs:

Apart from the above-mentioned aluminum corrosion processes in water under moderate circumstances, a combination of aluminum and water vapor may react (burn) at high pressure and temperature, resulting in the reaction:

Because of its potential use in propulsion systems, this response has gotten a lot of attention. Nano-scale aluminium with strong chemical activity, similar to alkaline metals, was used to promote this reaction. Water-soluble polymers, such as polyacrylamide, were also added to the water to prevent water evaporation during the combustion process and enable the reaction to proceed in a layer-by-layer fashion. Recent research found that this extremely exothermic combustion process (heat release of 15.4 MJ/kg) may boost hydrogen generation from NaBH_4 hydrolysis without using precious metal catalysts. In contrast to the realistic hydrogen production of 5 wt. percent for hydrolyzing NaBH_4 alone, burning of $\text{NaBH}_4/\text{Al}/\text{H}_2\text{O}$ mixtures yielded a hydrogen generation efficiency of percent and a hydrogen yield of 7 wt. percent.[9]

5. Cogeneration of hydrogen and electrical energy is a concept:

Aluminum, as previously stated, has long been a popular material for battery anodes. The aluminum–air battery was shown to be the best option for powering cars among a range of aluminum batteries. However, one serious issue with aluminum–air cells is that a parasitic reaction, occurs at the anode in conjunction with the current-generating reaction, significantly reducing the batteries' coulombic efficiency. The following two elements are the focus of efforts to inhibit this unwanted reaction: (i) high purity aluminum or aluminum alloys doped with these elements, and (ii) corrosion inhibitors added to the electrolyte. Both of the aforementioned methods, however, substantially raise the battery prices. Instead of inhibiting this reaction, Zhuk et al. suggested that it be used to produce hydrogen in a positive way. Calculations based on actual experimental results confirmed the viability of this concept. When the energy stored in the liberated hydrogen is taken into account, the fuel efficiency of commercially available aluminum alloys, which are more vulnerable to parasitic corrosion, is similar to that of special anode alloys in a combined system.[10]

The replacement of the oxygen diffusion anode in the aluminum-air batteries with a hydrogen-evolution cathode is an alternate approach for the co - generation of electricity generation and hydrogen. The neutral NaCl solution has been used as the electrolyte in recent experiments on this approach. The cathodic process generates the majority of the hydrogen in this approach, with the self-corrosion reaction just at anode contributing a little amount. Figure 1 depicts the structure of a combined system developed by Zhang et al. A reactor, an electrolyte reservoir, and mechanisms for electrolyte flow and hydrogen flow rate control make up the system architecture. To meet certain electrical output requirements, a number of aluminum alloys cell units that may be mechanically charged are linked in series or in parallel inside the main reactor.[11]

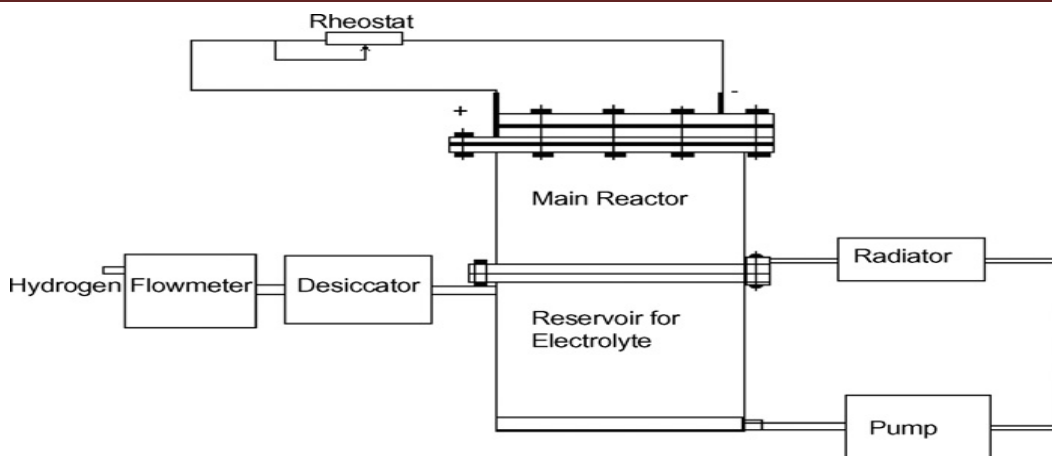


Figure 1: Structure of Aluminum water Hydrogen generator[1]

When the system is in stand-by mode, the electrolyte is stored in the reservoir underneath the main reactor. The electrolyte will be injected into the primary reactor from the reservoir to start the reaction by touching the electrodes, and the free space in the reservoirs will be utilized for hydrogen collection while the reactor is in operation. Excess electrolyte in the main reactor will flow back into the reservoir via a top-of-the-reactor exit. This kind of electrolyte circulation also aids in the removal of precipitated $\text{Al}(\text{OH})_3$ as well as the heat produced during the reaction. The rate of hydrogen production is controlled by changing the battery's discharging density using an auxiliary rheostat. A maximum open-circuit voltage of 19.8 V and a maximum short-circuit current of 7.8 A were reported in a series of experiments on a system with the configuration shown in Figure 1 utilizing Ni nets as the cathodes. The system provided a steady power supply at a voltage of 0.45 V and a current of 7.5 A throughout the 180-minute testing period, while the hydrogen production rate remained at 1.0 L/min and above. Because the cathode activity determines the hydrogen production characteristics as well as the battery capacity of a combined system, considerable effort has gone into developing novel cathode materials with strong electro-catalytic activity at cheap prices.[12]

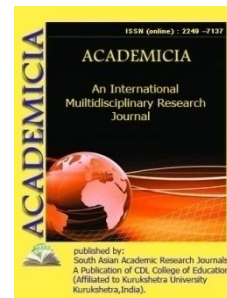
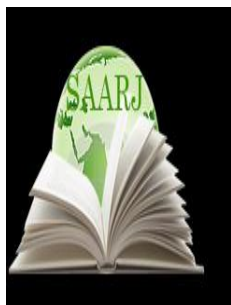
CONCLUSION

Aluminum alloys are very helpful in the generation of hydrogen. Aluminum's strong activity allows it to extract hydrogen from a variety of sources, including water or hydrocarbons. Aluminum–water interactions in either alkaline or neutral circumstances are the most often used reactions, whereas metal combustion and metal–alcohol reactions have received less attention. Despite significant attempts to address this issue, metal surface passivation remains a serious stumbling block. Although a theoretical hydrogen conversion yield may be achieved using difficult treatments such ball milling and specific metal doping, further study is required to improve cost efficiency and fully use the energy contained in aluminum-based materials. Systems for co - generation of hydrogen with electrical energy were suggested, inspired by aluminum batteries. Its viability, on the other hand, has to be investigated further. Aluminium alloys will play a significant part in hydrogen generation as a result of continuous research and development.

REFERENCES

1. H. Z. Wang, D. Y. C. Leung, M. K. H. Leung, and M. Ni, “A review on hydrogen production

- using aluminum and aluminum alloys,” *Renewable and Sustainable Energy Reviews*. 2009, doi: 10.1016/j.rser.2008.02.009.
2. L. Soler, J. Macanás, M. Muñoz, and J. Casado, “Aluminum and aluminum alloys as sources of hydrogen for fuel cell applications,” *J. Power Sources*, 2007, doi: 10.1016/j.jpowsour.2007.01.080.
 3. A. Tiwari, A. Keshav, and A. B. Soni, “Hydrogen generation through aluminum, aluminum alloys in aqueous solution,” *Int. J. ChemTech Res.*, 2013.
 4. J. Lu, W. Yu, S. Tan, L. Wang, X. Yang, and J. Liu, “Controlled hydrogen generation using interaction of artificial seawater with aluminum plates activated by liquid Ga-In alloy,” *RSC Adv.*, 2017, doi: 10.1039/c7ra01839h.
 5. H. Wang *et al.*, “Investigation on hydrogen production using multicomponent aluminum alloys at mild conditions and its mechanism,” *Int. J. Hydrogen Energy*, 2013, doi: 10.1016/j.ijhydene.2012.11.034.
 6. M. Urbonavicius, S. Varnagiris, and D. Milcius, “Generation of Hydrogen through the Reaction between Plasma-Modified Aluminum and Water,” *Energy Technol.*, 2017, doi: 10.1002/ente.201700344.
 7. A. Z. Zhuk, A. E. Sheindlin, B. V. Kleymenov, E. I. Shkolnikov, and M. Y. Lopatin, “Use of low-cost aluminum in electric energy production,” *J. Power Sources*, 2006, doi: 10.1016/j.jpowsour.2005.11.097.
 8. L. Soler, J. Macanás, M. Muñoz, and J. Casado, “Synergistic hydrogen generation from aluminum, aluminum alloys and sodium borohydride in aqueous solutions,” *Int. J. Hydrogen Energy*, 2007, doi: 10.1016/j.ijhydene.2007.06.019.
 9. K. Mahmoodi and B. Alinejad, “Enhancement of hydrogen generation rate in reaction of aluminum with water,” *Int. J. Hydrogen Energy*, 2010, doi: 10.1016/j.ijhydene.2010.03.016.
 10. M. Q. Fan, L. X. Sun, and F. Xu, “Experiment assessment of hydrogen production from activated aluminum alloys in portable generator for fuel cell applications,” *Energy*, 2010, doi: 10.1016/j.energy.2010.03.023.
 11. A. A. El-Meligi, “Hydrogen production by aluminum corrosion in hydrochloric acid and using inhibitors to control hydrogen evolution,” *Int. J. Hydrogen Energy*, 2011, doi: 10.1016/j.ijhydene.2011.05.111.
 12. A. A. Sansone and R. P. Taleyarkhan, “Intensification of Chemically Assisted Melt-Water Explosive Interactions,” *J. Heat Transfer*, 2017, doi: 10.1115/1.4035353.



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A STUDY OF IDENTITY THEFT: INTENTIONS, CONNECTED FRAUDS, METHODS AND AVOIDANCE

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ABSTRACT

This article provides a conceptual overview of the main crimes that result in ID fraud and millions of dollars in damages for businesses and individuals across the globe each year. The article examines the unique successful approaches for the long-term development of preventive measures that have been made available to individuals and businesses. Furthermore, the article analyzes the research and highlights the most efficient methods for individuals and businesses to protect themselves against identity theft, since victims may face a long process of repairing the harm to their reputation, credit rating, and employment. Identity theft is when someone obtains someone else's private information without their permission in order to abuse it. It will be shown how criminals use both technology-based and social engineering methods to obtain personal information. Finally, people and organizations will be given many effective preventive methods for protecting critical data and information against identity theft. Typically, criminals use human factors to get over security measures. As a result, the proposal places a strong emphasis on raising people's understanding via public and corporate training.

KEYWORDS: *Identity, Theft, Fraud, Prevention, Personal Information.*

1. INTRODUCTION

To avoid fraud as a consequence of identity theft, businesses and individuals should be careful in safeguarding their identities. How certain are they that they will not be one of the million people targeted by identity thieves in 2010? According to the Federal Trade Commission, 9.9 million Americans (22 percent higher than in 2007) were victims of identity theft in 2008, and "ID theft costs consumers approximately \$50 billion annually"[1]. Despite efforts to enforce the law, the number of new identity theft victims increases on a daily basis all over the world. The

preparatory stages of acquiring, holding, and trafficking in identity information for future use in current crimes such as personation, fraud, or abuse of debit card or credit card data are referred to as ID theft.

Credit card numbers, CW2 numbers (on the back of credit cards), Credit reports, Social Security (SIN) numbers, Driver's license numbers, ATM numbers, Telephone calling cards, Mortgage details, Date of birth, Passwords and PINs, Home addresses, and Phone numbers are the top twelve types of private personal information stolen by identity thieves.

ID theft is one of the main issues that costs individuals and companies billions of dollars each year all around the world. The main sources of ID theft include social and technical reasons, according to an analysis of four key variables: political, economic, social, and technology. Social engineering is a thieving method in which criminals take advantage of people's online habits, such as on Facebook, to steal personal information. This study looks at the many kinds of scams that are common as a result of identity theft. ID fraud, financial fraud, tax fraud, medical fraud, resume fraud, mortgage fraud, and organized crimes such as money laundering, terrorism, and illegal immigration are all scams that arise from ID theft. In addition, the different methods used by thieves to target people and organizations are explored. Physical and technical methods are the two main categories of techniques. Traditional methods such as mail theft and insider theft are examples of physical tactics. It is critical for managers to understand that, despite modern technology-based methods, insiders are responsible for more than 70% of ID theft.

ID theft, by definition, is typically linked with fraud and results in financial damages for victims, both people and businesses. Because victims may face a long process of clearing up the damage, such as their reputation, credit rating, and employment, it is critical to learn effective methods to safeguard individuals and businesses from ID theft. As a result, it is essential to examine the major potential variables, such as political, economic, social, and technical, and how they may promote or reduce ID theft. ID theft tactics, ID fraud, and methods of ID fraud prevention will also be addressed, since individuals and businesses need to know how to avoid fraud as a consequence of ID theft.

1.1. Analysis of Political, Economic, Social, And Technical (Pest) Factors

It is essential to scan and evaluate external or micro-environmental variables in order to take effective measures to prevent and reduce ID theft in a society. One of the major frameworks for evaluating how political, economic, social, and technical variables influence ID theft is the PEST analysis. Factors such as politics and economics, as well as identity theft ID theft has substantially increased in emerging countries due to a lack of political and economic stability, particularly in developed countries. Every year, millions of individuals from poor nations move to wealthy ones to escape poverty or political unrest[2]. More than ten million undocumented Mexicans, South and Latin Americans, and Asian immigrants reside in the United States, according to statistics. As can be observed, adverse political and economic circumstances drive individuals to immigrate illegally, resulting in identity theft and fraud.

1.2. Factors Such as Politics and Economics, as Well as Identity Theft

ID theft has substantially increased in emerging countries due to a lack of political and economic stability, particularly in developed countries. Every year, millions of individuals from poor nations move to wealthy ones to escape poverty and political unrest. The cost of illegal immigration is borne by American society in the form of identity theft, when illegal immigrants steal identities such as social security numbers or driver's licenses in order to work[3]. For example, in March 2007, the United States District Court for the Southern District of New York sentenced 20 undocumented Mexican immigrants to prison for identity theft, document fraud, and abusing Social Security numbers. As can be observed, adverse political and economic circumstances drive individuals to immigrate illegally, resulting in identity theft and fraud.

1.3. Identity Theft and Social Considerations

ID theft is influenced by the social environment and variables such as habits and social network communication. In a society, particularly in the .com sector, people's understanding of how to utilize social networks and their role in preserving privacy is critical. Companies, organizations, and individuals use a variety of security measures to safeguard their privacy, sensitive data, and personal information. Social engineering, on the other hand, is "alive and well" and "probably remains the most successful hacking method" for obtaining personal and sensitive data. Social engineering, according to Applegate, is a "methodology that enables an attacker to circumvent technological restrictions by targeting the human aspect in an organization"[4]. Social engineers remain a powerful danger to people's cultural attitudes and behaviors in social networking, as communication via social networks such as Facebook, Twitter, and Skype grows. According to a study conducted by the point for credit union research and guidance in the United States, Canada, the United Kingdom, France, Germany, and Spain in 2008[5],

- 25% of Germans and 60% of Americans have given their account passwords with a family member or acquaintance. As a consequence of this societal mindset, 3% of Germans have had their identities stolen.
- Half of all Americans use family member names, significant dates, nicknames, or their pet's name as passwords for internet accounts.
- Approximately 40% of customers in all six countries show personal information on their social media profiles, and some of them use the same information as their passwords.
- In France, more than a quarter of customers utilize their social network posted date of birth as their internet passwords.

As a result, attackers have unfettered access to this information on users' profiles. Attackers use this information to get more information without raising suspicion in preparation for a final assault, such as identity theft and fraud. A social engineer, for example, gets a financial manager's information on a social network, allowing the attacker to learn the manager's first and last name, occupation, and date of birth.

1.4. Factors Such as Technology and Identity Theft

People and institutions are threatened by technological forces. People's behavior in managing their private information, such as credit cards and social insurance numbers, has altered as new technologies, such as PDAs, mobile phones, USB, Wireless, and laptops, have entered the World Wide Web arena[6]. When individuals utilize their private information, such as banking account information, they are not completely secure no matter where they are online or at work. Fraudsters now see the Internet as a new frontier, simple to access, and a wealth of personal information from which to steal people's identities.

Mostay estimates that individuals and organizations lose approximately \$40 billion per year in internet activity due to identity theft and communication fraud[7]. Furthermore, almost 80% of financial institutions use wireless technology, such as smart phones, in their operations, while only 75% of devices use mobile security. As a result, when individuals utilize new technology like Wi-Fi or online banking, it's critical that they alter their habits. One of the most common blunders is storing the online banking login and password in the browser. Individuals and technology managers must alter their attitudes and actions as a result of the new technology boom, and explore cautious measures while utilizing new technology[8]. People and individuals may be protected against identity theft by utilizing proper security measures, such as avoiding storing account information on computers, employing anti-spyware programs, and using wireless safeguards. As a result, new technological risks and their impact on identity theft vary depending on the behaviors and measures taken by people and management.

1.5.the creation of new accounts

With personal information and identification such as a victim's name, address, and social security number, fraudsters can open new bank accounts, credit accounts (credit cards, lines of credit, or loans), in-store accounts, cell phone accounts, and student loan accounts using the victim's real information; they will then change their billing address to hide their activities from the victim. In such situations, fraudsters have more time and chances to conduct fraud, and victims are usually unaware until collection agencies approach them or their credit applications are denied.

1.6.Shopping on the Internet

Fraudsters use victims' personal information and ID to buy online in a distant region, typically Africa, and ask for goods to be delivered to a trusted third party. They then request that purchases be repackaged and sent to the fraudsters. This kind of fraud became more prevalent in Canada in 2003, when an Albertan bought goods online using a stolen ID and credit card information, then requested that his order be sent to North Dakota, where it was repackaged and re-shipped to Edmonton.

1.7.Medical Espionage

When someone takes vital information or identification, such as a victim's health card, they use it to claim or receive medical services in the victim's name. One of the potential outcomes of medical fraud is deceiving health-care professionals, putting a patient's life in jeopardy. According to statistics, about 500,000 Americans have been victims of medical fraud. Although there is no data for Canada, the Ontario Ministry of Health and Long-Term Care says that medical fraud (health care fraud) is the most common result of identity theft in the province [9].

1.8.Tax Evasion

ID thieves utilize their victims' identities, such as job data or social security numbers, to file their taxes and collect their refunds. According to the United States District Court for the District of Arizona (2010), between 2005 and 2008, a gang of fraudsters submitted income tax returns using stolen IDs and received approximately \$4 million in tax refunds[10].

2. DISCUSSION

Businesses and organizations must have a strategic strategy in place to safeguard critical information since they store people's identities and private information in their databases. Institutions, such as financial or governmental organizations, must ensure that red flags can be recognized by their security systems in the initial phase to have an effective and secure system. As a result, identity theft prevention programs should be made available, and they should have the following key components:

- First and foremost, reasonable rules and processes for detecting "red flags."
- Secondly, look for the red flags that have been recognized.
- Thirdly, after detecting red signals, take necessary action.
- Lastly, the preventive program should be evaluated and updated on a regular basis.

Furthermore, Collins claims that, contrary to popular belief, the bulk of ID theft occurs in the workplace rather than online. Collins claims that workers or people impersonating employees are responsible for more than 70% of ID theft in businesses; as a result, Collins advises businesses to use the following preventive measures:

- To ensure that businesses have a suitable and effective personnel selection strategy in place to ensure that honest people are hired.
- To carry out a risk assessment.
- To use an e-business risk assessment tool to spot ID theft red flags.
- To make it mandatory to shred any papers containing personal information and sensitive information about people and businesses before discarding them.
- Educate and educate staff on how to spot fraudulent applications.
- To improve the organization's ethical culture.
- To recognize and encourage workers who promote organizational honesty.

Senior Virus Research Engineer at McAfee, recommends the following preventive measures to businesses to minimize ID theft:

- Appoint someone to be in charge of the organization's security system.
- To reduce hazardous behavior such as sending and receiving email without discretion and downloading applications by providing training, outlining user duties, and documenting the information system and network's regulations.
- Create a secure network and implement secure hardware and software.
- Adopting manageable solutions for workers who are in charge of system support.

- Document all actions such as diagnosing, installing, testing, and restoring the organization's network.
- To formalize corporate network use, such as adding or removing users.
- Identify, detect, block, and report questionable online activity using preventive security technologies.
- To install dependable security systems on all terminals (servers and workstations) that link to the business network, such as anti-virus, anti-Trojan, and anti-spyware.
- To keep all security software up to date on a regular basis.
- To evaluate, update, reconfigure, and manage the company's security system.
- To disregard any free remote security system audits that may be available.
- To safeguard the organization's data backup devices.
- To avoid storing sensitive information and data on portable computers such as laptops.
- To evaluate, monitor, and manage the wireless network and devices of the company.
- Limit physical access to computers to safeguard the organization's information system.
- To reduce the danger of critical data being copied or stolen by monitoring staff turnover and job mobility.
- To manage information flow outside of the corporation's computer network, such as interviews, questionnaire answers, conference presentations, and private or public information exchanges.

3. CONCLUSION

Identity theft is becoming a significant crime all around the world, posing a danger to both individuals and businesses. Thieves, fraudsters, and criminals employ a variety of methods to acquire private information from individuals. Fraudsters' motivation, skill, and dedication are reflected in the diversity of methods they use to get personal information and the quantity of money they make. Facts indicate that thieves change their methods depending on their motivation; as a result, the costs of ID theft vary for people and organizations. As previously stated, societal and technical elements are important motivators for criminals. These two causes are intertwined and contribute to an increase in identity theft. Furthermore, fraudsters are motivated by new technology and a lack of public awareness about how to safeguard personal information.

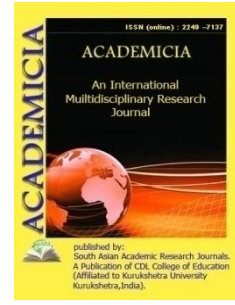
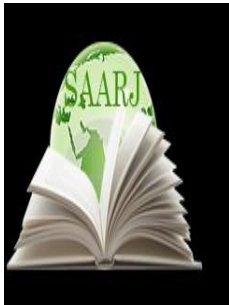
As a result, identity thieves are expected to use new methods to acquire personal information, especially in the internet context. As a result, it is critical to improve people's understanding of how to defend oneself in online networks via media education. In terms of public education expenses, it is important to note that governments and other large businesses should see these costs as investments rather than expenditures in order to create a secure society. Banks, financial institutions, and retail shops, for example, are more susceptible than other small companies or corporations since they gather people's personal information in their databases. As a result, these institutions must have proper strategies, policies, and procedures in place to defend themselves

against widespread identity theft. Security awareness, training, technical control, and an efficient information management plan should all be part of a sound defensive approach.

Identity theft by insiders is a significant issue for companies, according to statistics; thus, organizations should consider implementing a robust and effective internal control to prevent identity theft. Organizations should educate workers on the most common kind of assault, social engineering, and its effects. Managers should also be aware that poor performance and disregard for the impact of possible assaults not only results in significant financial losses, but also tarnishes the company's reputation. Individuals and organizations must recognize that they are susceptible to identity theft; as a result, implementing the most effective security system should be linked to increasing awareness of potential risks, since "knowledge is power."

REFERENCES

1. K. M. Finklea, "Identity theft: Trends and issues," in *Identity Theft: Trends and Prevention Efforts*, 2012, pp. 1–38.
2. O. Muniz, W. Li, and Y. Schleicher, "Migration Conceptual Framework: Why do people move to work in another place or country?," *AAG Center for Global Geography Education*, 2016. .
3. C. Gerken, *Model immigrants and undesirable aliens: The cost of immigration reform in the 1990s*. 2013.
4. S. D. Applegate, "Social engineering: Hacking the wetware!," *Inf. Secur. J.*, vol. 18, no. 1, pp. 40–46, 2009, doi: 10.1080/19393550802623214.
5. M. Alexander, "Methods for Understanding and Reducing Social Engineering Attacks," *SANS Read. Room*, pp. 1–79, 2016.
6. T. Kwon and H. Moon, "Multi-modal techniques for identity theft prevention," in *Lecture Notes in Computer Science*, 2005, vol. 3597, pp. 291–300, doi: 10.1007/11527725_30.
7. A. Litan, "Phishing attack victims likely targets for identity theft," *Gart. First Tak. FT-22*, no. May, pp. 4–6, 2004.
8. N. A. Manap, A. A. Rahim, and H. Taji, "Cyberspace identity theft: The conceptual framework," *Mediterr. J. Soc. Sci.*, vol. 6, no. 4S3, pp. 595–605, 2015, doi: 10.5901/mjss.2015.v6n4s3p595.
9. Z. Geradts, "Identity Theft," in *Encyclopedia of Forensic Sciences: Second Edition*, 2013, pp. 419–422.
10. K. Veena and K. Meena, "Performance evaluation of cyber criminal detection techniques," *Int. J. Simul. Syst. Sci. Technol.*, vol. 19, no. 4, p. 4.1-4.11, 2018, doi: 10.5013/IJSSST.a.19.04.04.



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A BRIEF REVIEW ON THE RUSTIC CUSTOMER'S WHILE SELECTING MOBILE PHONE

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ABSTRACT

Marketers have begun to give attention to the Indian rural market in this age of globalization, not only to serve the requirements of urban consumers with value, but also to serve the needs of rural customers. The Indian mobile sector is the fastest expanding in the world, with more mobile phone connections being added every month. The liberalization of communications regulations and policies has contributed to this development. According to a Gartner study, India will be Asia Pacific's fastest growing telephone market after China. Many marketers see the Indian rural market as a tremendous opportunity because of its size and demand base. Around 840 million people live in rural India, accounting for around 70% of the population, 600,000 villages, and 56% of national revenue. The rural market in India accounts for about half of the country's gross domestic product. The buying patterns of rural consumers are improving somewhat as their discretionary income rises. The fact why India has a large mobile phone market is owing to the country's large rural population. Marketers must develop strategies to capture the expanding rural market by first recognizing the requirements of rural customers, which vary from those of urban consumers in terms of affordability and tastes, and then attempting to offer those goods and services in order to make a profit. Companies must do thorough assessments while marketing to rural India. There are about 700 million mobile phone subscribers in India, with 320 million of them living in rural areas (How smartphones are penetrating deeper in rural India, 25th May 2015, the rural Marketing Journal). In the past four years, the rural market's mobile phone penetration has risen from 22 percent to 38 percent. This study is an effort to bridge the gap by focusing on the mobile phone as a possible market owing to its "critical" requirement in India's rural areas.

KEYWORDS: *Advertisements, Brand, Buying, consumers, Mobile.*

1. INTRODUCTION

The Indian mobile industry is growing fastest in the world and continues to add more mobile phone connections every month. This growth is noticed due to liberalization of telecommunication laws and policies. According to Gartner report, after China, India would be the fastest telephone market in Asia Pacific. Due to growing competition between the mobile phone manufacturers as well as competition between the service provider, the prices of mobile phones and the call rates has dropped respectively enabling many consumers to buy the products and use the services. Subscriber rates are growing further, every month. The consumers are also spending on buying mobile phones with better technology[1]. Mobile phone and technology development has a long history of innovation and advances that have arisen as a result of dynamic changes in customer demands and tastes. Among these advancements, mobile phones have had one of the highest rates of household adoption of any technology in contemporary history. Mobile phones have become an essential component of people's everyday lives and personal communication all around the world[2].

In today's highly competitive mobile phone industry, manufacturers are always battling to discover new competitive advantages and distinguishing features that will convince customers to choose their brand over a competitor's. Various research have been done to discover characteristics that distinguish businesses from their rivals in terms of influencing consumers' purchasing decisions. Consumers of mobile phones all around the globe are heavily affected by the many variables that influence mobile phone purchasing decisions[3]. These variables may be linked to the consumer's traits as well as the functionality of mobile phones. As a result, mobile phone firms have developed a wide range of phones with various brands and functions. Various research studies have been performed to discover variables that influence customers' mobile phone choices. A variety of things were identified as a determining factor affecting purchasing decisions in these investigations[4].

It was predicted that mobile phone subscriber base would grow from over 500 million in 2013 to over 800 million in 2019 (Number of mobile phone users in India from 2013 to 2019,. In India, 13 million new connections were added in the third quarter of 2015, followed by China which added 7 million, US 6 million, Myanmar 5 million and Nigeria added 4 million subscribers, according to Ericsson Mobility Report for 2015. (Business Standard, 18th November 2015). Globally, the subscriptions of smart phones are expected to increase from 3.4 billion in 2015 to 6.4 billion by 2021. India is pegged at 77 percent penetration of mobile phones against global average of 99 per cent[5]. Rural India comprises around 840 million people; around 70% of population, with over 600,000 villages and 56 per cent of national income. The Indian rural market with its vast size and demand base offers greater opportunities to many marketers. It accounts for around 55 per cent of the manufacturing GDP; rural areas were host very closer to 75 per cent of new factories built in the last decade, while the rural factories account for 70 per cent of all new manufacturing jobs[6].

At present due to the change, today's rural consumer is value driven. A product is worth purchasing if it enhances his life in a meaningful way. Rising literacy and exposure to the same commercials as urban consumers has created a demand for typically urban products and services.

Villagers are willing to adopt new products or services if they are clear about the benefits that accrue. Better road infrastructure has led to increased mobility; with people travelling, not just for visiting family or pilgrimages, but more often further afield in search of entertainment in the form of cinema. Figure 1 shows the conceptual framework of the study.

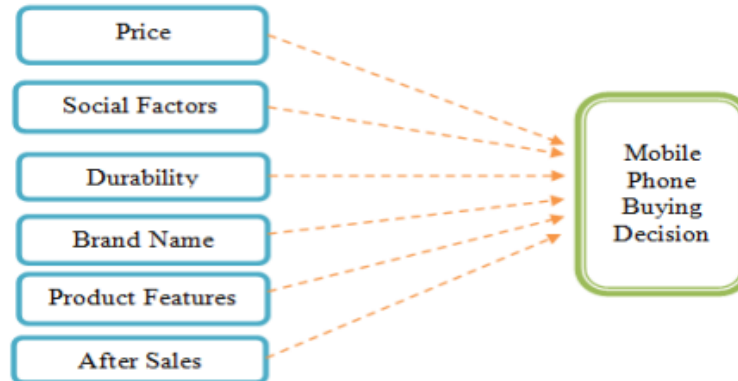


Figure1: Conceptual Framework of the Study[7]

During the period 2009–2012, rural consumption per person increased by 19 percent annually, according to National Sample Survey Organization (NSSO). (Indian Rural Market, November 2013). In incremental terms, spending in rural India during this period, increased by US\$ 69 billion, significantly higher than US\$ 55 billion by urban populations. According to TRAI report of Jan 2016, India is currently the fastest growing subscriber rate, with total subscriber base of 1017.97 million. In 2015, India added over 67 million subscribers while in China; the total subscriber growth was closer to 30 million in 2015.

The graph below shows the respondents' current phone use as well as which brand they would want to switch to in the future. As a result, Nokia mobile phones are used by 67 percent of respondents, with Techno (11.8 percent), Other Chinese brands (9.2%), and Samsung following closely behind (5.3 percent)

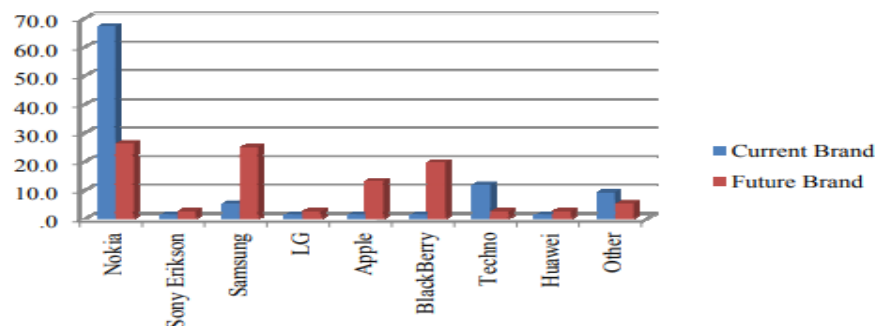


Figure 2: The Respondents' Current Phone Use As Well As Which Brand They Would Want To Switch to in the Future.

Urban Indian subscribers were 582.95 million, and mobile subscription of rural India was of 435.02 million. **Urban mobile subscriber share stands at 57.27% to that of rural subscriber with 42.73%.** Thus, Indian rural market is more of an opportunity to the marketers and hence the need to understand their purchase behavior.

1.1 Applicability in India as whole:

There are over 6, 27,000 villages in India. The rural region is home to about 3/4 of the overall population. The rural population's development is crucial to the nation's development. In terms of price sensitivity, brand knowledge, and purchasing decision making, the villages are comparable to some degree, if not all to the same extent. As a result, a (customized) sales strategy developed for these areas may be used to a few additional villages that are comparable in composition in most respects.

1.2 List of variables under study:

Independent variable: Age, Income, Gender, Key Opinion Leader, Brand preference, and advertising.

Dependent Variable: Rural Consumer Behavior

2. REVIEW OF LITERATURE

In India, research has been conducted to understand urban and rural consumers on factors like function, quality, style, price and brand in different states of India, but not in Karnataka. The discussions on research conducted at national and international context and the gaps which inspired for this research are as follows:

Md. Abbas Ali, Venkat Ram Raj Thumiki and Naseer Khan, (2012), in their study on Factors Influencing Purchase of FMCG by Rural Consumers in South India, commented that as the trust in retailers is more by rural consumers, retailers focused strategy should be considered as a strategy for the marketers in addition to low-price strategy without compromising on quality[8]. Since the study was focused on FMCG products, this could serve as a background for other researchers to focus on different products like automobiles, electronic goods, etc.

Aniruddha Akarte, and Dr. Amishi Arora, (2012), Indian telecom market in transitive economy: A comparative study on buying behavior of rural and urban buyers on mobile phones was conducted in Amaravati district in Vidarbha region, focused at understanding buyer behavior of both urban and rural consumers with respect to features like, current trends, quality, function, price, style and brands. This research ignored the role of KOL and educated youth's influence on the buying behavior[9]. Dr. Kavaldeep Dixit and Priyanka Sharma, (2012), in their research on Innovative marketing strategies experimented by MNCs for exploring vast Indian rural Potential, focused on understanding how Procter & Gamble and Unilever have tapped semi-urban and rural areas of India to expand business. This was a secondary research aimed to understand marketing mix better on the basis of 4A's of rural marketing. This study gives good information on SWOT and Marketing Mix to be used to tap rural markets to enhance business opportunities. Since India is expected to be 5th largest consumer economy of the world by 2010, has to be tapped. This research is a general research based on secondary research gives a general view of marketing mix, but is not specific on a particular product[10]. The study considered just one village. Thus, may not be possible to generalize about rural consumers of Karnataka. Accuracy of information on income may not be reliable. There might be bias of respondents, since the awareness on brands, among all the respondents may not be the same. Changes happen dynamically, few products/brands may get outdated very soon. The brands that are available now, may not be available later or new brands may enter the market, and thus the current data on availability of existing brands in future may be a challenge.

3. DISCUSSION

The Indian mobile sector is the fastest expanding in the world, with more mobile phone connections being added every month. The liberalization of communications regulations and policies has contributed to this development. According to a Gartner study, India will be Asia Pacific's fastest growing telephone market after China. Prices of mobile phones and call rates have decreased as a result of increased competition between mobile phone makers and service providers, allowing many more customers to purchase the devices and utilize the services. Every month, the number of subscribers increases. Consumers are also spending money on more technologically advanced mobile phones.

The number of mobile phone users in India was expected to increase from over 500 million in 2013 to over 800 million in 2019 (Number of mobile phone users in India from 2013 to 2019). According to the Ericsson Mobility Report for 2015, India gained 13 million new connections in the third quarter of 2015, followed by China with 7 million, the United States with 6 million, Myanmar with 5 million, and Nigeria with 4 million. (Source: Business Standard, November 18, 2015). Smart phone subscriptions are projected to rise from 3.4 billion in 2015 to 6.4 billion by 2021 globally. India has a 77 percent mobile phone penetration rate, compared to a worldwide average of 99 percent.

Around 840 million people live in rural India, accounting for around 70% of the population, 600,000 villages, and 56% of national revenue. The enormous size and demand base of the Indian rural market provide more possibilities for various marketers. It accounts for approximately 55% of manufacturing GDP, with rural regions hosting close to 75% of new factories constructed in the past decade, and rural factories accounting for 70% of all new manufacturing employment.

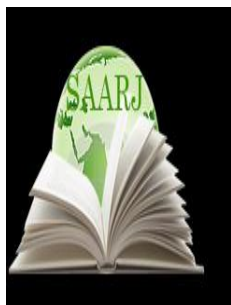
4. CONCLUSION

Karnataka having a population over 6.6 crores is a huge market for almost all products. Thus, essential product being a mobile phone is not to be neglected. By understanding respondents of few more villages in every district, it becomes easier for marketers to know the similarities and differences of rural consumers towards mobile phone. According to Ericsson Mobility Report, November 2015, India is expected to have 180 million smartphones by 2019, contributing to 13.5 percent of global smartphone market on the basis of rising affordability and better availability of data services. According to Microsoft report, India will emerge as a leading player in the virtual world by having 700 M internet users of the 4.7 billion global users by 2025. Due to government favorable policies 4G hitting the market, Indian telecommunication sector is expected to witness fastest growth in the next few years. Due to the fact that 70 percent of India lives in villages, this study would help marketer to devise marketing strategy focused on rural consumers need to enhance mobile sales. Changes happen dynamically. This is true in the case of rural consumers too. This study helps in understanding the 'change' in awareness due to growing literacy rates, television penetration in villages, thus creating TV as a source of awareness, to promote products and increase sales. Books say that KOL play a vital role in purchase decision-making, while the increased TV penetration is found to have more impact on rural consumers. This study will help marketers understand rural consumers better and thus develop marketing programmes focused at increasing sales of mobile phones. Since is almost 70% rural, everyone in the academics, especially in the area of management, should know; rural,

rural consumers and rural market. This research study will be of use for academicians and students in order to understand rural marketing in the context of Karnataka and the factors influencing the rural consumer buyer behavior towards mobile phones better. India being agrarian is thus very crucial for academicians to know the backbone of India, 'Rural India'.

REFERENCES

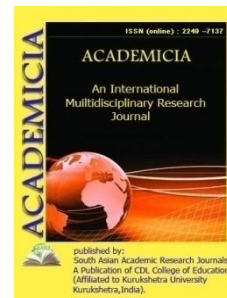
1. F. De Vocht, I. Burstyn, and J. W. Cherrie, "Time trends (1998-2007) in brain cancer incidence rates in relation to mobile phone use in England," *Bioelectromagnetics*, 2011, doi: 10.1002/bem.20648.
2. G. Satta *et al.*, "Estimates of Environmental Exposure to Radiofrequency Electromagnetic Fields and Risk of Lymphoma Subtypes," *Radiat. Res.*, 2018, doi: 10.1667/RR14952.1.
3. "No Change in Brain Tumor Incidence During a Time When Cell Phone Usage Increased," *JNCI J. Natl. Cancer Inst.*, 2009, doi: 10.1093/jnci/djp444.
4. K. Sri Nageswari, "Mobile phone radiation: Physiological & pathophysiological considerations," *Indian Journal of Physiology and Pharmacology*. 2015.
5. N. K. Sri, "Mobile Phone Radiation: Physiological & Pathophysiological Considerations," *Indian J. Physiol. Pharmacol.*, 2017.
6. B. Li, J. Yang, B. Lü, and X. Song, "Temporal and spatial variations of retired mobile phones in China," *Huanjing Kexue Xuebao/Acta Sci. Circumstantiae*, 2015, doi: 10.13671/j.hjkxxb.2015.0436.
7. J. chun Lee, H. T. Song, and J. M. Yoo, "Present status of the recycling of waste electrical and electronic equipment in Korea," *Resources, Conservation and Recycling*. 2007, doi: 10.1016/j.resconrec.2007.01.010.
8. M. A. Ali, V. R. R. Thumiki, and N. A. Khan, "Factors Influencing Purchase of FMCG by Rural Consumers in South India: An Empirical Study," *Int. J. Bus. Res. Dev.*, 2012, doi: 10.24102/ijbrd.v1i1.138.
9. A. Akarte and D. Amishi Arora, "Indian Telecom Market In Transitive Economy: A Comparative Study On Buying Behaviour Of Rural And Urban Buyers On Mobile Phone," *ZENITH Int. J. Bus. Econ. Manag. Res.*, 2012.
10. K. Dixit and P. Sharma, "Innovative Marketing Strategies Experimented By Mncs for Exploring Vast Indian Rural Potential," *Int. J. Manag. Res. Rev.*, 2012.



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OPEN SPACES IN THE PERIPHERY OF MADRID AND ITS METROPOLITAN AREA (SPAIN), SUSTAINABLE URBAN PLANNING AND ENVIRONMENTAL VALUES

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ABSTRACT

This contribution is focused on the valuation of the spaces that remain vacant at the city border, as part of a future urban Green Infrastructure. To that end, they have been identified and characterized. Furthermore, a specific GIS has been developed for Madrid, the largest urban metropolitan area in Spain. This chapter is organized in five parts and the final conclusions. First of all, in the introduction, the general objectives are exposed and the concept and importance of the open spaces in the city are studied. Secondly, the methodology describes the design of the research and the development of the GIS. Afterwards, the urban and territorial contexts, where these pieces have their origin, are characterized. This is a synthetic approach which also includes the recent evolution of the legislation as well as that of the city. Through this evolution it is possible to see how these pieces have been framed into a failed green belt since the middle of the last century. Fourthly, a presentation of these open spaces, their urban regime and their land uses is carried out. Subsequently, their valuation in a potential network of open spaces in the Madrilenian metropolitan area is performed. The basic criteria for this valuation are the land adjacent to each of these open spaces. Finally, in the conclusions, we set out the evidence arising from this research, requiring the need for having accurate tools, such as GIS, in order to reach solid proposals that deal with the challenge of Green Infrastructures. We also believe that

the conservation and integration of open spaces should be a priority in general strategies of urban development for mitigation Climate Change and to reduce the effects of Global Warming.

KEYWORDS: *Periphery, Metropolitan, Sustainable, Urban, Environmental.*

1. INTRODUCTION

The phrase "Open Spaces" was most likely coined about 1833 by the London "Select Committee on Public Walks" (Turner 1992). Over the past several decades, open spaces have evolved into a component of green infrastructure. The European Council defines them as "a network of natural and semi-natural areas and other environmental components that provides a broad variety of ecosystem services." The European Commission has created a Green Infrastructure Strategy (Council of Europe 2013a) that is very important in territorial planning and natural resource protection. This strategy outlines the potential components of a Green Infrastructure: legally protected natural areas, healthy ecosystems and areas with high ecological value outside of protected areas, natural landscape features, restored habitats, artificial features such as eco-ducts or eco-bridges designed to improve wildlife movement, and multi-functional zones where compatible land uses can help to maintain biodiversity (Council of Europe 2013b). Land use changes significantly alter the conditions of the near-surface atmosphere (rise in temperatures) above cities and peri-urban regions, exacerbating the effects of climate change. Mitigation measures are required in urban areas, and adaptation activities have been suggested by the European Environmental Agency (2012) based on data from the Intergovernmental Panel on Climate Change.

Open Spaces and Green Infrastructures are critical to urban adaptation to climate change and the long-term viability of the urban environment.

The city of Madrid has been examined, and the present plan for a Green Infrastructure includes some of the components listed above, such as urban green spaces or protected natural areas designated at the regional level. However, in this chapter, a suggestion is presented so that some of the peripheral areas, whether non-urban or urban territory but without urban development, may become part of a network of open spaces from the city's core to its outskirts [1]. The recognized free areas may be divided into two categories: urban green land and edge open space, which is made up of uninhabited periphery lands. In this second category, there are three sub-categories: Protected Natural Areas, Wasteland (unfinished urbanization projects), and Future Open Urban Land (areas undergoing transition into General Systems such as roads, equipment, and public spaces).

The functions of open spaces are often divided into two categories: those that offer leisure and other societal benefits, such as health, and those whose primary goal is the preservation of natural assets. These two methods are based on the assumption that open spaces with recreational functions are concentrated in urban regions, while those with protection of natural values are concentrated in rural areas. This work proposes a third option in which some of the remaining open spaces within urban and metropolitan space, under specific planning figures, can develop a function of conservation of natural, agricultural, landscape, visual, and aesthetic values, as well as of reduction of urban densities, reducing the recreational and landscaped role with an intensive use, which has become much more common [2].

A model is recognized in many European regions, which is created by a triangle whose vertex is “agricultural landscapes—versus—nature—versus—urban development.” Land use changes in this triangle do not have the same power and dynamic: transitioning from agricultural to urban lands is more simpler and more common than transitioning from natural regions to urban or agricultural lands. This lack of resistance to change in agricultural regions against urbanization is intriguing and necessary for understanding the development of these spaces and their current scarcity. This is what Maruani and Amit-Cohen call a “market failure,” since the market value and speculative value of these areas are much more than the value of the land preserved as open space. In certain instances, the use of restricted zoning has proven to be an effective instrument in the protection of open spaces, leading to the acquisition of property for the continuation of agricultural operations. This is where planning comes into play, enabling us to discover iconic examples in Euro, as well as research that has conducted comparative studies in connection to the management of urban green areas.

Furthermore, the ESDP recommendations (European Spatial Development Perspective) on urban-rural gradient planning are focused on: accelerating agrarian restructuring, diversifying rural economies, mobilizing and increasing natural resource production through the valuation and enhancement of cultural services, and promoting sustainable development [3]. The development of European urbanization has been extensively researched. Various cycles and phases have been identified. In them, new features and buildings encroach on old landscapes, which remain but are fractured and lose character, giving way to functionally identical regions. Transport routes have played an important part in these urbanization processes, with accessibility being the most important element in landscape change, not only because of the influence of the transport route itself, but also because of the indirect impacts it causes. Suburbanization, counter urbanization, and reorganization are the acknowledged stages shows that the transition from urbanization to suburbanization happened in the southern European area in the 1990s. This is when the case of Madrid could be formulated. These dramatic changes in land use posed a danger to the landscapes and their patrimonial values, prompting changes in legal categories (zoning or planning control) and urban planning, leaving the surrounding regions vulnerable.

Cutting-Edge Open Spaces in Madrid and Its Surrounding Area of the city's residents are unprotected, living in the “urban—shadow.” Furthermore, research on the evaluation of the natural potential that these lands have is abundant (Weber et al. 2006; Beer 2005), albeit almost always from an ecological perspective and with large areas, with research on the key role that these pieces can play in landscape quality and agrarian functionality being scarcer [4].

2. DISCUSSION

The places of interest, as well as their buffer zones, are situated in the municipal borough of Madrid (Fig. 1). These zones were established in accordance with the development of the General Plan of Madrid (GPM 1997), with special consideration given to the regions included in the GPM's adjustment to the Land Law of Madrid (9/2001). Most are situated around the municipal boundary (Edge Open Spaces, EOS), as well as neighboring lands that were included in a buffer of 700 m around the polygon's exterior edge. Four methodological methods were used: searching for digital and bibliographical material, doing fieldwork, analyzing and validating theme information to assess its socio-environmental relevance, and lastly implementing all of this information in a Geographical Information System [5].

- Digital and bibliographical data. Data on development were acquired in shapefile and dgn formats from the Planning, Housing, and Infrastructure Area of the Madrid City Council. All of the additional geo-referenced data was created specifically for this study. The major topic areas of the bibliographic information were open spaces, green infrastructures, and city dynamics.
- Work in the field. Using orthophotographies, 22 basic tracks were created in shapefile format. Different theme information was recorded for each track, and they were relocated using DGPS Trimble Nomad 6G (items of interest and terrestrial photography). A second evaluation of the data was Madrid and surrounding towns (2016). Source The Community of Madrid compiled this list. Cutting-Edge Open Spaces in Madrid and Its Surrounding Area was created, and if additional tracks were required to complete the information, they were constructed. The attribute table is related to the form and number of tracks. All tracks were coded in line and point format, with accompanying metadata.
- Using Geographic Information Systems analyze and validate thematic data. Green spaces were defined as valuable social-environmental regions and areas protected by existing legislation, with the latter being spared from development initiatives. Protected areas of the Community of Madrid Network are among the places exempt from urban development. Protected Areas (Regional Parks, Preserved Forest, Geological Points of Interest), Nature 2000 Network (Special Conservation Areas, Special Protection Areas for Birds), and Important Bird Areas (Birdlife International). Rivers and protected meadows are also incorporated through a 100-meter buffer from the thalweg. New forms were digitalized over PNOA orthophotographies: landscapes, driven highways (drawn over 1956 aerial photography of the USAF and PNOA, they also contain legally protected margins) [6].

All variables were saved as shape files (ArcGis 10.x) and kHx files (Google Earth). In alphanumeric format, three complimentary characteristics (landscape categorization, toponymical reference, and environmental value) were evaluated for each shape.

- Information generation via synthesis. To assess urban carrying capacity, landscape units were utilized (UCC). These components provide a synopsis of social-ecological and geographical factors. Their social-environmental values were described as follows: litho logy, geomorphology, topography, drove roads and excluded margins, rivers and excluded margins, protected areas, and vegetation and land uses [7].

The areas were categorized as having a high or medium ecological value or being of interest in the urban environment based on this value. We have established three types of urban carrying capacity based on this classification: high, medium, and low urban capacity (proposed protected areas). Singularity and dispersion criteria were used to categorize synthesis data, using two scales of reference: local and metropolitan [8]. The connection of these places with neighboring zones has been addressed at both sizes, and therefore the significance of these areas in an open spaces network has been examined.

The very comprehensive research allows for a more accurate evaluation of Edge Open Spaces' social-environmental benefits. Without this comprehensive perspective, determining the true value of the EOS and the findings and conclusions of this chapter would be difficult. F. Allende et al. 3 Madrid's Open Spaces Evolution Planning of open spaces surrounding the municipal border of Madrid throughout the Recent Municipal General Plans (1963–1997) is a chronicle of a continuing failure [9]. The legally obligatory urban planning started in the 1950s. The first three

General Plans created a series of green belts that were repeatedly breached. The fourth, which was adopted in 1997 and is still in effect, proposes full urban development for the whole municipal territory. The Spanish housing bubble (1996–2006) encouraged this expansionist strategy of almost limitless urbanization, which was always backed by local authorities. Currently, Madrid has just a tiny representation of underdeveloped edge open areas. The continuity with traditionally protected woods increases the footprint of these tiny regions on the outskirts of the city [10].

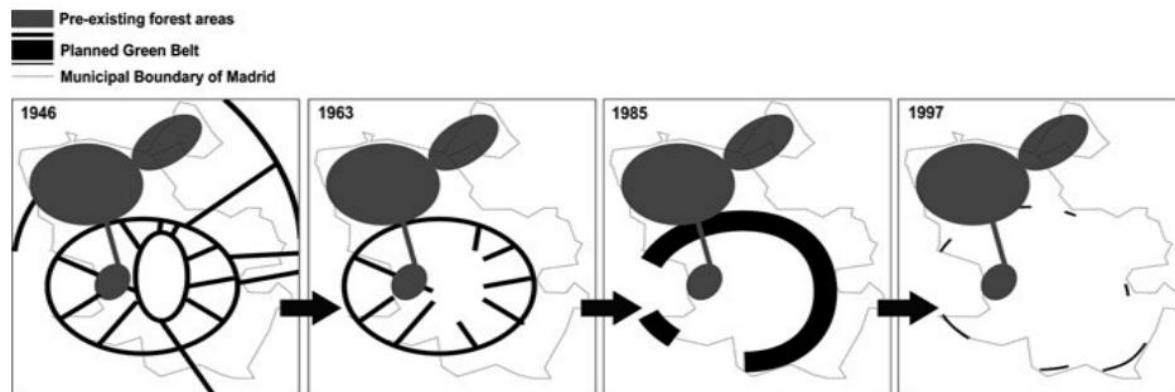


Figure 1: Schematic representations of the structures of the successive Green Belts

Following a definition of the city's recent history, including the genesis and structure of the main important open spaces, we will thoroughly examine the substance of each General Plan and their vision for these places. The demolition of the green compromise for a more livable and greener city will then be debated. The demise of this compromise begins with the partial invasion of planned open areas and ends with the neoliberal urban model's final extinction. Figure 1 discloses the Schematic representations of the structures of the successive Green Belts.

3. CONCLUSION

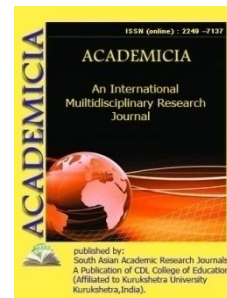
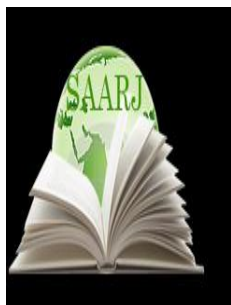
To begin with, there has been a noticeable shift in the ethical and aesthetic approaches that characterized the city model presented by public authorities via their many General Plans. This is inferred not just from the ultraliberal emphasis of the 1997 General Plan, but also from the 2020 Madrid City Future plan. The blueprint that should have guided conservative municipal policy focused on increasing transportation and smart city management, but it overlooked problems connected to green infrastructure. In contrast to previous General Plans, it did not aim to establish a Green City. As a result, there is a stark contrast with other European cities determined to strengthen their green belts, such as Oresund, Copenhagen's metropolitan region, which was named European Green Capital by the European Commission in 2014, as well as Vitoria-Gasteiz in Spain and Hamburg in Germany, which won cities in previous years.

Second, even while acknowledging the limits of the Madrid territorial model of open spaces, the value of what currently exists should be emphasized. In crowded and dynamic cities like Madrid, the ability to rearrange the territory is critical. In this view, intervention over the wastelands is critical, since they are places that are deteriorating due to rural abandonment but still have landscape, aesthetic, ecological, and strategic assets. They may serve as the foundation for the articulation of regional open spaces.

Third, we call on increased political commitment in order to achieve an agreement on a new territorial model in which open spaces play a significant role as environmental services. The significance of these areas for urban planning has previously been highlighted. Nonetheless, these regions continue to be devalued in planning. The percentage of green spaces, the recent changes in their overall size, the number of departments responsible for these areas, and the experience with public involvement all has a role in the effectiveness of this planning. Fourth, protection and integration of open spaces in a network of green infrastructures have been identified as a priority measure for climate change mitigation, and we think that their inclusion in general urban development plans is required. Finally, it has been shown as a critical concept that the design of GIS tools and the technical competence of local governments are critical factors for the creation of an effective information management system. It is doubtful that an appropriate intervention plan can be provided without a thorough examination of the EOS. This is the primary contribution of the study presented here.

REFERENCES

1. A. Cheshmehzangi, "City Enhancement beyond the Notion of 'sustainable City': Introduction to Integrated Assessment for City Enhancement (iACE) Toolkit," in *Energy Procedia*, 2016.
2. A. D'Auria, M. Tregua, and M. C. Vallejo-Martos, "Modern conceptions of cities as smart and sustainable and their commonalities," *Sustain.*, 2018.
3. C. Willmore, J. Longhurst, W. Clayton, H. Tweddell, and A. Walsh, "Young People's Role in Creating Sustainable Cities," in *World Sustainability Series*, 2018.
4. D. L. Chang, J. Sabatini-Marques, E. M. da Costa, P. M. Selig, and T. Yigitcanlar, "Knowledge-based, smart and sustainable cities: A provocation for a conceptual framework," *J. Open Innov. Technol. Mark. Complex.*, 2018.
5. L. Brazil, D. Vivas, M. A. Sarmiento, and O. Longo, "Sustainable cities: Paths taken in Brazil," *WIT Trans. Ecol. Environ.*, 2013.
6. Sustainable City | Fully Charged, "Sustainable City | Fully Charged," *YouTube*, 2017. .
7. S. E. Bibri and J. Krogstie, "Smart sustainable cities of the future: An extensive interdisciplinary literature review," *Sustainable Cities and Society*. 2017.
8. Centre for Liveable Cities, *Liveable & Sustainable Cities: A Framework*. 2014.
9. ITU-T SG20, "Key performance indicators for smart sustainable cities to assess the achievement of sustainable development goals," *Recomm. ITU-T Y.4903/L.1603*, 2017.
10. X. Bai *et al.*, "Defining and advancing a systems approach for sustainable cities," *Current Opinion in Environmental Sustainability*. 2016.



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SPEECH ACTS OF REFUSALS: CHALLENGING THE CHALLENGES

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ABSTRACT

This paper attempts to present information about the role of speech acts in English language teaching and learning. For the sake of the study, pragmatics has been selected as the speech act of refusals which may occur in different scenarios and contexts. There are some authentic activities and samples that may assist the educators to implement into their teaching process. Firstly, the article introduces some background information about speech acts and their categories; secondly, it focuses on the speech act of refusals and their interpretations. Finally, it indicates a detailed activity demo which can be used in various contexts and aspects.

KEYWORDS: *Refusals, Interpretations, Pragmatics, Indicates*

INTRODUCTION

General background

The wide-spread of the English language throughout the world has already made it “global”. This globalism is urging people to speak English for different purposes and reasons. Using the language proficiently does not only rely on mastering linguistic features of the language corpus, but also speakers or producers to be pragmatically competent in order to acclimatize themselves to various needs of different contexts.

It can be denominated that the aspects of speech acts are highly involved in this process and their subfields such as culture of the language, the status and sex of the interlocutors can be utilized efficiently. According to Yuan (2012) pragmatics reveals the following crucial components, for example, users of the target language, context and meaning, social interaction.

Taguchi (2003) points out that pragmatic competence is a specific capability to perform the language properly in terms of negotiators and the settings. Thus, pragmatics builds a robust bond between the linguistic patterns and social factors.

Introduction to the speech act of Refusals

Austin's (1962) speech act concept mainly comprises the compliments, refusals, apologies, requests, complaints and others. Among these speech acts one of the toughest is the speech acts of refusals. Searle (1969) sends them to the list of commissives which commit the language users to a future course of action.

Traditionally, the speech acts of refusals may occur when the speaker simply denies or rejects the suggestion. That may happen with specific utterances, for instance, with "no" which may inform that the request is not accepted. Even these refusals can be presented in a polite or impolite way.

Example 1. Polite refusal

A: Shall we go to the city center?

B: Unfortunately, I have to say "no" as I am seeing off my parents tonight.

Here the respondent is denying the offer, but it is being done in a good manner. Firstly, the respondent reveals his being sorry and then says "no". Moreover, the speaker informs about the reason of not accepting the proposal.

Example 2. Impolite refusal

A: Shall we go to the city center?

B: No.

It is a bit inconvenient when you receive the direct rejection. Thus, the respondent uses the word "no" directly which seems to be impolite, even somehow rude towards the communicator.

It should be highlighted that the significance of refusals mostly derives from the fact that they are so over-sensitive to diverse social aspects, for example, they illustrate the power, gender, age, social distance of the speakers. Apart from this, it is crucial to know about facial expressions/gestures of the speakers as they also play an integral part in the process of interaction. As an illustration it can be cited that some people deny the proposal by wearing a smile in their face, however, the other people may negatively nod and demonstrate their attitude towards the request.

According to the social context refusals can be constructed in different scenarios, such as, refusing invitations (inviting to the cinema, inviting to the picnic, inviting to the party), refusing borrowings (refusing to give a pen, refusing to lend a book, refusing to share a room).

Example 3.

A: I would like to rent a room in a dormitory; I am planning to share it with you as we did last year. Do you agree John?

B: I beg your pardon, but I have already rented a room with Rob.

Even though the respondent to the suggestion is not using the utterance of refusal ("no"), it is still clear from the message that the invitation has been denied.

A sample activity for using to teach learners to the speech acts of refusals in the ESL classroom

Panel discussions for speaking classes

Brief description

It is a kind of activity which can be used in group cooperation. This method helps learners develop their speaking skills, critical thinking and logical perception. A panel discussion is utilized in schools, colleges, lyceums or even in higher education. In a real fact, themes must be adjusted to the levels of the learners; moreover, initial interests of the students should be taken into consideration. Thus, they can be arranged according to face to face interviews in which learners can have an interview with each other (the specific notion is using the pragmatic speech acts of confirming and refusing during the conversation).

This activity is beneficial for enhancing speaking skills and critical thinking of the learners. It assists to overcome barriers of the learners who have challenges in speaking and negotiating.

Target group: B1 level learners (can be successfully used for B2 and C1 level learners)

Time: 40-45 minutes

Objectives

This activity is beneficial for enhancing speaking skills and critical thinking of the learners. It assists to overcome barriers of the learners who have challenges in speaking and negotiating. This method can be used both in small and bigger groups.

Directions for the students

Students will ...

- follow the explanations
- choose the topic
- present topics turn by turn
- ask questions from each other
- keep note-taking skills
- clarify questions and answers
- follow the time limit
- listen to their partners carefully

Teacher's instructions to students

Teachers will ...

- explain rules and process
- demonstrate some questions
- divide learners into groups
- observe the process

- motivate the speakers
- ask learners to stop the procedure
- evaluate the performance of each speaker

The role of the teacher

- facilitator
- observer
- motivator
- assessor

Activity tools and equipment

- board
- cards
- posters

Advantages of this activity

- develops speaking skills
- improves critical thinking
- broaden learner's horizons

Disadvantages of this activity

- time-consuming
- some learners can be in an inactive state

Stages

An instructor represents some topics for discussion and asks learners to choose any of them for this type of presentation. Topics may cover different themes, such as, social issues, teenager problems, book reviews or some cultural identities.

The teacher selects topics and sticks them on the board and students choose themes by voting. Then the teacher invites five or six candidates to present the topical questions in front of their mates.

All of the learners think about the topics. Students, who are “panelists”, revise and think about the topic that they have chosen. Learners who are in the role of interviewers prepare some questions according to each topic.

Here are some sample questions that can be modified during the diverse groups and classes.

Sample situation 1

Imagine a stranger asking you to carry his bag. Choose one option out of three and explain your choice.

A) I will approach him and help

B) I will say “no” and ignore his request

C) I would act as if I hadn’t seen him

Sample situation 2

Your classmate is inviting you to come to the party which she is organizing on her birthday, but you cannot attend as you have to look after your young brother. How would you react?

A) I will directly refuse the invitation

B) I will indirectly refuse the invitation

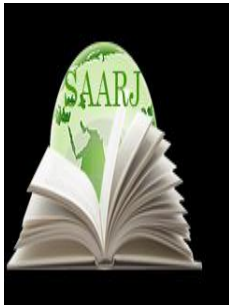
C) I will not go and explain the reason

Summary

As it has been outlined above, speech acts of refusals are diverse and they are varied according to the different aspects which speakers may face with, or feel in depth, such as the factors of gender, social distance, culture and age. These phenomenal features should be taken into account when educators start to perform the process of teaching.

REFERENCES

1. Austin, J. L. (1962). How to Do Things with Words. Oxford: Oxford University Press.
2. Fraser, B. (1990). Perspectives on politeness. Journal of Pragmatics, 14(2), 219-236.
3. Searle, J. R. (1969). Speech Acts: An Essay in the Philosophy of Language. Cambridge: Cambridge University Press.
4. Taguchi, N. (2003). Pragmatic performance in comprehension and production of English as a second language. Dissertation Abstracts International, 65(01).
5. Yuan, Y. (2012). Pragmatics, perceptions and strategies in Chinese college English learning. Doctoral Dissertation, Queensland University of Technology, Australia.
6. Yule, G. (1996). Pragmatics. Oxford: Oxford University Press.
7. Arends, R. I. (2007). Learning to teach, seventh edition. New York: McGraw Hill.
8. Cazden, C. (1988). Classroom discourse. Portsmouth, NH: Heinemann.
9. Dillon, J.T. (1994). Using discussion in the classroom. Philadelphia: OpenUniversityPress.



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ABOUT AUTOMATION OF LOADING AND UNLOADING OF COTTON RAW MATERIALS AT COTTON FACTORY STATIONS

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ABSTRACT

For the result of analyse modern condition of storing and applying cotton row material to the production at the planet cotton sheds based on nessesserty of using new maker of using control of cotton press, using control of apply cotton with the help of closed automatic system. Stricture plan of AD-TPH systemis presented.

KEYWORDS: *Raw Cotton, Riot, Disassembly, Automation, Productivity, Control, Analysis, Technological Indicators.*

INTRODUCTION

Acceleration of the pace of development of the national economy of Uzbekistan today cannot be achieved without the implementation of measures to save material and labor resources. This is primarily due to the rational consumption of electricity by installations of technological equipment of enterprises of the cotton ginning industry. Automation of processes in which work is performed without service personnel, the comparative simplicity of electrical equipment leads to a decrease in energy consumption.

In the organization of long-term storage of cotton at the factory and outside the factory procurement points, two storage methods are used - closed (in barns, warehouses, sheds) and open - at riot sites, and the latter is the main type of storage of raw cotton and makes up about 75% of the total volume storage cotton.

For the mechanization of the processes of disassembling cotton riots and supplying it to production, disassemblers of the RP brands and a pneumatic transport unit of the suction type are used, which require. Their work is accompanied by significant expenditures of manual labor, exceeding the normative ones, which reduces the efficiency and productivity of labor. In addition, the disassembly of raw cotton by RP feeders is carried out with a large uneven supply of cotton to production, the fluctuations of which, with a capacity of from 3 to 18 t/h, is 3-8 t/h. It follows that the share of downtime associated with insufficient supply of raw cotton to production accounts for 15.8 to 57% of the equipment downtime.

The above disadvantages are mainly explained by the imperfection of the technological scheme of the RP machine, which causes difficulty in creating an automatic control system for this machine in order to increase the uniformity and ensure a controlled supply of cotton with the required productivity.

When choosing a technological scheme for a device with a new working body capable of sorting cotton in an automated mode, the following were taken into account:

- the cotton is disassembled by the method of separation from the mass using pegs, as the simplest and most reliable in operation;
- since the bulk density along the height of the laid cotton mass is uneven and varies from 800 to 3000 kg / m, the disassembly of the stored cotton must be carried out with a peg drum with a vertical axis of rotation simultaneously along the entire stacking height;

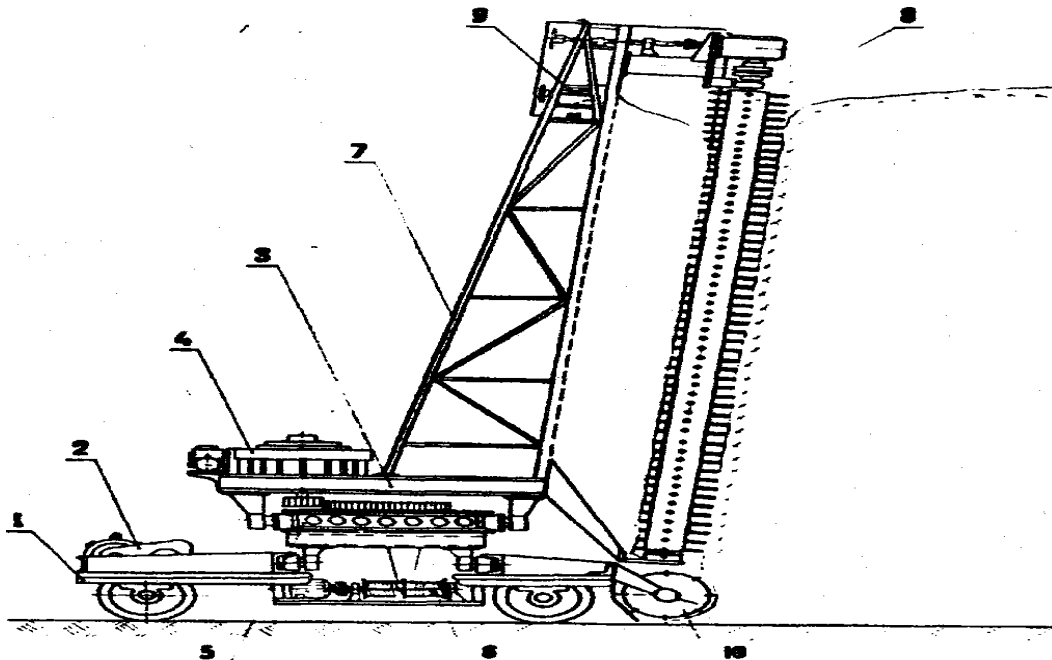


Figure 1. Technological diagram of a raw cotton picker with a peeling auger working body

- a high level of mechanization of disassembly and uniform supply of cotton to production with the use of automated control systems and regulation of productivity in the range of 8 - 20 t / h;

The technological diagram of the developed disassembler (Fig. 1), taking into account the formulated requirements, contains a self-propelled bogie 1 with a drive 2. A platform 5 and a

frame 3 are installed, which can rotate about the longitudinal axis to the left and right by 90° by means of the drive 4 and move along the guides in the horizontal plane with the help of the mechanism 6. The boom 7 is mounted on the frame, carrying the peg drum 8 with the drive 9.

In the lower part of the boom, there is a screw conveyor (auger) 10 with a reverse rotation drive, equipped with pegs along the periphery.

The selected technological scheme provides for cotton sorting simultaneously along the entire height of its storage.

For the selected technology of raw cotton disassembly, a schematic electrical diagram of automated control has been developed, the structural diagram of which is shown in Fig. 2. It provides for the process of disassembling cotton in manual and automatic modes using a semiconductor voltage regulator (TRN) supplied to the terminals of an asynchronous motor (AM).

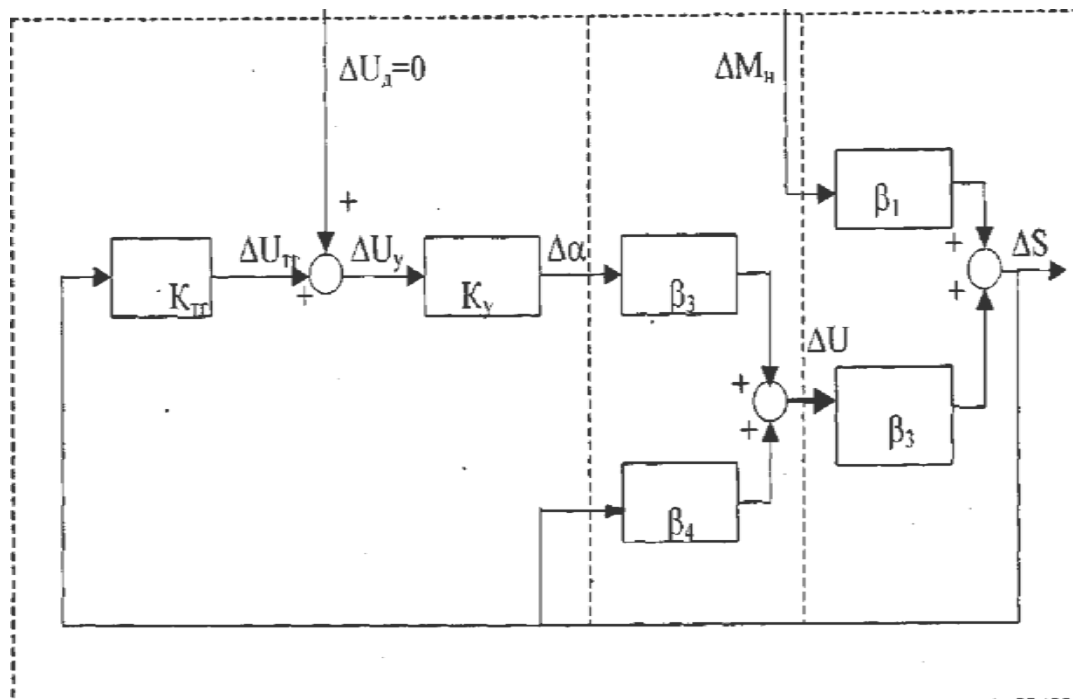
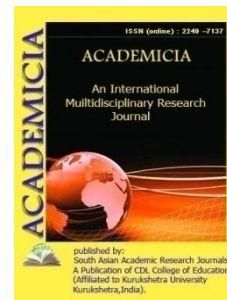
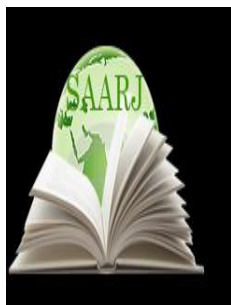


Figure2 Block diagram of the closed-loop system AM-TRN

When the contact of the time relay is closed, the working body is buried in the mass of the cotton being disassembled, which is achieved by moving the undercarriage of the disassembler. As the predetermined value of penetration is reached, the peel drum receives a translational movement relative to the vertical layer of the cotton being taken apart, depending on the required value of the raw cotton supply.

REFERENCES

1. Nuraliev A.N. and others "Manufacturing and testing of machines for disassembling and supplying raw cotton from storage to production": Report of "ЦНИИХИПОМ" on the theme 8.77.08 from 1977.-49 p.
2. Aripov M.O. and others "The choice of mechanization means to ensure the operation of an operational mechanized raw cotton warehouse in an automated mode.": ЦНИИХИПОМ report on the theme 1981271402. From 1983.-102 p.
3. G. Mahmudova, A. Siddiqov, A. Karimov, O. Sarimsaqov "Study of the movement of cotton particles and heavy impurities in the working chamber of a pneumatic cleaner" UNIVERSUM: Технические науки. ISSN: 2311-5122, Website: 7universum.com February-2021
4. Turdiev X.E., Toshmirzaev K.O., Komilov J.N., "Development of a New Cotton Regenerator to Remove Cotton Boats from Cleaner Waste" International Journal of Advanced Research in Science, Engineering and Technology ISSN: 2350-0328, Website: www.ijarset.com, May 2021
5. Toshmirzaev K.O., Ibragimov A.O., Niyazalieva M.M., "Analysis of FLUFF in the process of linting of Seeds" Central Asian Journal of Theoretical and Applied Sciences ISSN: 2660-5317, November 2021
6. Toshmirzaev K.O., Ibragimov A.O., Niyazalieva M.M., "The selection of the control parameter of the raw cotton electric sorter", IT: Methodical Research Journal, ISSN: 2776-0987, November 2021



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REVIEW ON OZONE DEPLETION AND GLOBAL WARMING

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ABSTRACT

Natural refrigerants are presented as the perfect, ecologically benign refrigerants and the final answer to ozone loss and global warming in this article. In refrigerated and air-conditioning systems, HFC refrigerants are presently the most common alternative for CFC and HCFC refrigerants. However, they are just as alien to nature as CFCs and HCFCs, providing a solid foundation about the need to embrace natural refrigerants as a substitute for halocarbon refrigerants. This study also looks at the possibilities of refrigerants and their uses in refrigerated and air-conditioning systems. Both oil used in R12 or poly-ol-ester oils in use in R134a systems are miscible with natural refrigerants, particularly hydrocarbons, and their combinations. They are also fully compatible with in all materials typically used in refrigeration systems, with the exception of ammonia. Finally, the results of this study show that natural refrigerants are the best long-term options in refrigerated and air-conditioning systems.

KEYWORDS: Atmosphere, Carbon, Global warming, Ozone, Refrigerants.

INTRODUCTION

Refrigeration technology is very essential in today's world. It not only offers pleasant and healthy living conditions, but it is also considered necessary for surviving harsh weather and storing food. Food preservation, in particular, is critical to global stability and economic growth. Food conservation is accomplished by delaying metabolic processes to limit bacterial growth. This is readily accomplished by chilling or freezing without the need of additional preservatives. Refrigeration technology provides the technological means to keep food cool along the cold chain, from manufacturing to transit through storage, sale, and storage in a refrigerator at the consumer's house[1].

Air-conditioning systems and industrial operations are examples of other applications. Air-conditioning systems aid in improving human comfort for both residential and commercial reasons, as well as maintaining health and increasing efficiency. However, rapid technological development and economic growth around the world over the last century have resulted in serious environmental issues, forcing us to acknowledge that while technological advancements may improve human comfort, they also pose a risk to the planet through atmospheric depletion and global warming. Ozone layer depletion & climate change are two significant environmental issues that have severe consequences for the refrigeration industry's future growth. Actions to prevent ozone depletion and climate change are now having an impact on the business. Ozone is a kind of oxygen that has three oxygen atoms in its molecule[2].

Ozone is a toxic gas that may be fatal if breathed. The stratosphere, which is approximately 11 kilometers above the earth's surface, is surrounded by an ozone layer. For this life-protecting layer, life on Earth has been protected for thousands of years. It serves as a barrier, shielding the planet from the sun's damaging UV radiation. By absorbing the majority of the sun's damaging ultraviolet B (UV-B) radiation, the ozone layer effectively screens all of the sun's harmful ultraviolet rays (Ultra-Violet A is allowed through while ultraviolet C is captured by oxygen). Because the ozone layer protects the ecosystem and life on Earth from damaging UV-B radiation, any disruption to it may have serious consequences. Increased UV-B radiation may cause eye damage (such as cataracts, lens deformation, and presbyopia), induce skin cancer, slow plant development, disrupt ecosystem balance, and raise illness risk[3].

Nobody imagined that human activities might endanger the ozone layer until the early 1970s. The most significant ozone depletion and greenhouse gas, halocarbons, are entirely due to human activity. Halocarbons are a class of chemicals that are mainly man-made gases that include both carbon and one or more halogens (fluorine, chlorine, iodine, and bromine). They're usually created in a lab for industrial reasons. They were created for the first time in 1928. They've been extensively utilized for a number of applications since then, including propellants in aerosol cans, the production of soft and hard foams, refrigeration and air conditioning, and cleaning solvents. Chlorofluorocarbons (CFCs), hydro chlorofluorocarbons (HCFCs), and hydro fluorocarbons (HFs) are all members of this category (HFCs)[4].

One chlorine atom may destroy 100,000 ozone molecules, according to research. The longer a compound's effect on the ozone layer lasts, the greater its chlorine concentration. Because CFCs contain more chlorine than HCFCs, they have a greater risk for ozone depletion. The effectiveness of ozone destruction is often evaluated using a comparison unit called Ozone - depleting potential (ODP), which would be based on the ODP of trichlorofluoromethane (CFC-11) being given a value of one. CFCs are thought to account for approximately 70% of all man-made ozone damaging compounds in the atmosphere. The creators of these refrigerants could not have predicted how damaging they would be to the ozone layer. They went out of their way to find refrigerants that had remarkable stability, which was enforced as one of the criteria of the perfect refrigerant they were asked to create.

Global warming is a positive thing in and of itself since it allows for the existence of life in all of its forms. Man's actions, it is feared, are increasing the density of greenhouse gases, increasing the quantity of absorbed infrared radiation, and resulting in higher atmospheric temperatures and long-term climatic changes[5]. The quantity of radiant energy absorbed by refrigerants is quantified by the Global Warming Potential index (GWP). GWP is the quantity of infrared light

that a gas may absorb over a 100-year period when compared to carbon dioxide (which has a GWP of 1). Total Equivalent Warming Impact (TEWI) is a more accurate estimate of a refrigerant's impact to global warming (TEWI).

DISCUSSION

1. Refrigerants derived from nature:

Over the 160-year history of refrigeration, over 50 different compounds have been employed as working medium in some capacity. The majority of them will have been rejected as inappropriate for different reasons, but there are still a few options to adapt to varied application circumstances. Natural coolants such as water, ammonia, hydrocarbons, and carbon dioxide are among them. Natural refrigerants are an environmentally friendly alternative to CFC, HCFC, and HFC refrigerants. They are compatible with typical elastomer materials used in refrigerating systems and are soluble in standard mineral oils, in addition to having zero ozone depletion potential (ODP) and minimal or no greenhouse effect (GWP). Natural refrigerants do not react with water because they do not include chloride or fluorine atoms, and therefore do not produce the powerful acids that may cause early system failure. The following table examines the possibility of several of these refrigerants as viable replacements to ozone-depleting refrigerants and greenhouse gases[6].

1.1 Ammonia is used as a refrigerant:

For more than 120 years, ammonium is a very well refrigerant in large-scale industrial applications. Technology know-how is widely distributed, both in developed and developing nations. Thermodynamic and transport characteristics of ammonia are much better to those of CFCs, HCFCs, and HFCs. When compressor speed, pipe size, and heat transfer equipment are chosen based on economic factors, an ammonia plant always has much higher energy efficiency in practice. Tolerance to typical mineral oils, minimal sensitivity to tiny quantities of water in the system, easy leak detection, limitless availability, and cheap pricing are all significant benefits. All of these elements contribute to its long-term popularity and widespread use. The drawbacks of ammonia are mostly related to safety in big systems; however, there are now additional economic disadvantages in small systems. Ammonia's toxicity is generally not a significant issue; the odor is detectable at quantities as low as 5 ppm. At the same time, 50 ppm is the upper limit for daily exposure that should not be exceeded. At 500 ppm, ammonia is intolerable to humans, whereas acute toxicity begins at 2500 ppm and flammability begins at 15 vol. percent. Obviously, almost every danger is obvious in before, making ammonia a highly safe refrigerant in terms of direct risks.

1.2 Refrigerants based on hydrocarbons:

Propane, pentane, and butane are examples of hydrocarbons (HCs), a type of naturally occurring chemicals. Energy efficiency, critical point, solubility, transport, and heat transfer characteristics all make HCs ideal refrigerants. They are a safe and ecologically friendly replacement for CFCs, HCFCs, and HFCs. Hydrocarbons and their mixes have minimal ozone depletion potential and a very modest global warming potential, and they have no refrigeration-related issues. The most serious issue of using hydrocarbon as a refrigerant is that they are flammable. It's worth remembering that billions of tons of hydrocarbon are safely used every year for cooking, heating, powering cars, and as aerosol propellants all across the globe. Procedures and regulations have

been established and implemented in these sectors to guarantee that the product is used safely. It is critical that the refrigeration sector takes the same strategy[7].

1.3 Refrigerant in the form of water vapour (R718):

Water has been considered as a refrigerant, and it is one of the best natural refrigerants due to its non-toxicity, non-flammability, zero-ODP, zero-GWP, and cheap cost. Desiccant, vast applications, cooling, absorbing chiller, adsorption chiller, and compression chiller are all examples of how water may be utilized as a refrigerant. Water's thermo-physical characteristics are compatible with a vapour compression chiller capable of achieving a high COP. According to Lorentzen, open cycle water vapour devices are sometimes employed for direct evaporation cooling in circumstances where the high power consumption is of little significance in comparison to the investment and labor expenses. The amount of vapors to be compressed is huge, comparable to that of an exposed cold air cycle of comparable capacity. Normally, steam ejectors are used. Water has also been suggested as a refrigerant in conventional systems that use turbo- or special rotary compressor. These devices' physical dimensions grow to be very enormous, and cost must be an issue. Water, on the other hand, is an excellent working medium for high-temperature heat pumps. For many years, it has been widely employed in open systems to concentrate liquids via evaporation. The COP rises to 20 or higher in certain situations since the temperature rise is restricted to what is needed for heat transmission. The low lift also allows for the use of simple, low-cost single-stage turbo compressors. Water is the natural option for open or closed cycle heat pumps in a range of manufacturing applications in the range of temperature of 80–100°C[8].

1.4 Refrigerant made of carbon dioxide (R744):

Carbon dioxide (CO₂ or R744) is among the few non-flammable and non-toxic natural refrigerants. It is low-cost, readily accessible, and does not have the same harmful effect on the environment as other refrigerants. CO₂ has a GWP of 1, however since it is a waste material from industrial manufacturing; it has no net global warming effect when utilized as a technical gas. CO₂ is a good natural refrigerant alternative, particularly in situations where ammonia and hydrocarbons' toxicity and flammability are a concern. CO₂ has been favored in a wide range of refrigerators and air conditioners, including automotive, residential, commercial, and industrial. The most pressing concerns are improving energy efficiency and lowering system costs to an appropriate standard. R744 was employed as a refrigerant in ships' refrigerators and other fixed systems in the 1930s and 1940s. When ships traveled through tropical areas, however, refrigerant capacity fell quickly. Because of its decreased capacity at high temperatures and the advent of chlorofluorocarbons (CFCs) and hydro-chlorofluorocarbons (HCFCs), R744 was phased out as a refrigerant (HCFCs)[9].

2. Material and refrigerant compatibility:

2.1 Lubricants:

The use of oil in vapour compression operations is inherent and inevitable since oil is needed to maintain the internal working components of the compressor in order for it to operate properly. The lubricant, on the other hand, creates a seal between the moving components, allowing for effective vapour compression. According to Gibb et al., the advantages of using more efficient energy refrigeration lubricants may result in a 15% decrease in energy usage and indirect

reductions in greenhouse gas CO₂ emissions. Despite its critical role in improving compressor energy efficiency, lubricant oil may migrate from the compressor and into other parts of the system, such as the evaporation, condenser, expansion device, and connecting piping, inevitably altering heat transfer and frictional characteristics.

2.2 Metals and sealing materials are listed in section:

Steel, brass, copper, and sealing materials are among the materials utilized in refrigeration circuits. With ester-based lubricants and HFC refrigerants, certain metals, particularly zinc alloys or solders, exhibit enhanced corrosion. There are no known issues with using hydrocarbons as a refrigerant. All materials typically used in refrigeration systems are completely compatible with natural refrigerants, with the exception of ammonia[10].

3. Natural refrigerant selection guidance:

Refrigerants are chosen for their ability to contribute to system efficiency. Alternative refrigerants are tested for compliance with system and equipment design before being used. A comprehensive study both with refrigerant providers and equipment manufacturers is also required to verify that refrigerants are completely compatible with and appropriate for the application software design [11].

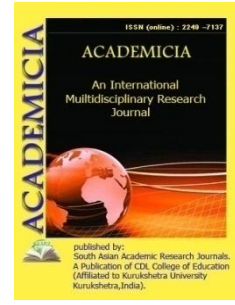
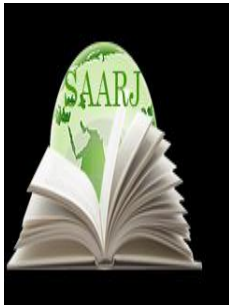
CONCLUSION

Accelerated technological economic growth around the world over the last century have resulted in serious environmental issues, forcing us to acknowledge that while technological advancements may improve human comfort, they also pose a risk to the planet through atmospheric depletion and global warming. For the last several decades, halocarbon refrigerants used in refrigeration and air have been a source of considerable worry. The issue is not with the refrigerants themselves, but rather with their discharge into the environment. Because Earth seems to be the only planet in the universe with a habitable atmosphere, maintaining the ozone layer and decreasing greenhouse gas emissions are two of the many critical measures that must be taken to ensure the survival of life on earth for future generations. The earth's protective ozone layer has been shown to be harmed by CFCs and HCFCs. As a result, the Montreal Protocol and other international accords ban their manufacture. In refrigerator and air-conditioning systems, HFC refrigerants are presently the most common alternative for CFC and HCFC refrigerants. However, they are just as alien to nature as CFCs and HCFCs, so using natural chemicals, which are already circulating in large quantities in the biosphere and are proven to be safe, is apparent and much preferable.

As a result, the issues and causes of ozone emissions and global warming are discussed in this article. It lays a solid foundation for the need to accept natural refrigerants as a viable alternative to halocarbon refrigerants. It also examines the possibilities of different natural refrigerants, as well as their uses in refrigeration and air-conditioning systems. Natural refrigerants, particularly hydrocarbons, and their combinations are flammable with the both mineral oil and poly-ol-ester oils, which are used in CFC and HFC systems, respectively. They are also fully compatible with in all materials typically used in refrigeration systems, with the exception of ammonia. Finally, the results of this study show that natural refrigerants are the best long-term options in refrigeration and air-conditioning systems.

REFERENCES

1. B. O. Bolaji and Z. Huan, "Ozone depletion and global warming: Case for the use of natural refrigerant - A review," *Renewable and Sustainable Energy Reviews*. 2013, doi: 10.1016/j.rser.2012.10.008.
2. Linde Group, "Refrigerants Environmental Data: Ozone Depletion and Global Warming Potential," *Refrig. Environ. Data*, 2015.
3. W. T. Tsai, "Fate of chloromethanes in the atmospheric environment: Implications for human health, ozone formation and depletion, and global warming impacts," *Toxics*. 2017, doi: 10.3390/toxics5040023.
4. P. L. Ward, "Ozone Depletion Explains Global Warming," *Curr. Phys. Chem.*, 2017, doi: 10.2174/1877946806999160629080145.
5. D. L. Hartmann, J. M. Wallace, V. Limpasuvan, D. W. J. Thompson, and J. R. Holton, "Can ozone depletion and global warming interact to produce rapid climate change?," *Proc. Natl. Acad. Sci. U. S. A.*, 2000, doi: 10.1073/pnas.97.4.1412.
6. S. Solomon, J. B. Burkholder, A. R. Ravishankara, and R. R. Garcia, "Ozone depletion and global warming potentials of CF₃I," *J. Geophys. Res.*, 1994, doi: 10.1029/94jd01833.
7. M. E. Davis, F. Bernard, M. R. McGillen, E. L. Fleming, and J. B. Burkholder, "UV and infrared absorption spectra, atmospheric lifetimes, and ozone depletion and global warming potentials for CCl₂FCCl₂F (CFC-112), CCl₃CClF₂ (CFC-112a), CCl₃CF₃ (CFC-113a), and CCl₂FCF₃ (CFC-114a)," *Atmos. Chem. Phys.*, 2016, doi: 10.5194/acp-16-8043-2016.
8. P. Hallock, "Global change and modern coral reefs: New opportunities to understand shallow-water carbonate depositional processes," *Sediment. Geol.*, 2005, doi: 10.1016/j.sedgeo.2004.12.027.
9. A. Hobson, "Global Warming: Lessons from Ozone Depletion," *Phys. Teach.*, 2010, doi: 10.1119/1.3502504.
10. D. K. Papanastasiou, N. R. Carlon, J. A. Neuman, E. L. Fleming, C. H. Jackman, and J. B. Burkholder, "Revised UV absorption spectra, ozone depletion potentials, and global warming potentials for the ozone-depleting substances CF₂Br₂, CF₂ClBr, and CF₂BrCF₂Br," *Geophys. Res. Lett.*, 2013, doi: 10.1002/grl.50121.
11. D. Coulomb, "Refrigeration and cold chain serving the global food industry and creating a better future: two key IIR challenges for improved health and environment," *Trends Food Sci. Technol.*, 2008, doi: 10.1016/j.tifs.2008.03.006.



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SMART PHONE ADDICTION AND MINDFULNESS: A REVIEW

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ABSTRACT

The addictive nature of smart phone technology is especially dangerous for young people. The authors of this study look at the smart phone addiction cycle and health consequences of young and elderly people through the prism of their mindfulness characteristics. The absence of mindfulness, assessed as a thoughtless characteristic, is significantly linked to smart phone addictions, as well as health and quality of life consequences, according to qualitative and quantitative research. Younger and older customers have different levels of mindlessness and smart phone-related health consequences. Mindlessness had a larger detrimental effect on quality of life in younger people than in older ones. To counteract addiction, the paper recommends promoting mindfulness training and using marketplace applications. Smart phone addiction is on the rise, and this article adds to a better knowledge of the issue as well as social solutions for its resolution. This is the first empirical study to look at the link between a thoughtless characteristic and smart phone habits, as well as the health consequences.

KEYWORDS: Behaviour, Internet, Mindfulness, Smart Phone, Technology.

1. INTRODUCTION

The evidence that the Internet is addictive is growing, with an increasing number of people being treated for Internet Addiction Disorder. According to estimates, addiction prevalence rates in the United States and Europe may reach 8.2 percent. Other research suggests that youth are especially susceptible, citing longitudinal studies of Hong Kong high-school students with prevalence rates as high as 26.7 percent. It is no surprise that market analysts have said that the Internet is driving us insane. The Internet not only keeps us hooked to our screens, but it also has an impact on our intellect and capacity to focus. According to neuroscience studies, while utilizing information technology such as a smart phone, dopamine is produced in the brain, causing a habitual feedback loop. The mobile smart phone increases the habitual feedback loop

by providing people with internet access 24 hours a day, seven days a week. Many people have admitted to sleeping with their smartphones. People experience health effects as a result of increasing screen time through smart phones, including stress, anxiety, phantom ring syndrome, FOMO, neck issues, hand problems, withdrawal from social situations, and others. Addiction and other negative health effects have an impact on one's quality of life; therefore, it is important to look at the individual characteristics and behaviours that influence this connection[1]–[5].

This study aims to learn more about how young people are trapped in an online addiction cycle, as well as how this expresses itself in specific use and health behaviours. The degree to which users use their phones mindlessly, or their level of awareness, is thought to explain the differences in addictive behavior between young and older smart phone users. Mindfulness has been used to help people break thoughtless behaviours. It is described as "the awareness that emerges from paying attention on purpose, in the present moment and nonjudgmentally". It has been proposed as a strategy for counteracting the negative impacts of other addictive behaviours, including smart phone addiction, in addition to helping people overcome stress-related illnesses like mindless eating. The purpose of this study is to see whether a degree of mindlessness (a lack of mindfulness) may assist explain variations in smart phone addiction.

To summarize, the primary goals of this study are to get a better knowledge of how the mindlessness characteristic affects how individuals become trapped in a smart phone addiction loop, and how this vicious cycle leads to specific smart phone use and health effects. In order to accomplish so, an online poll of customers between the ages of 18 and 70 was performed, comparing young and elderly smart phone users. 35 interviews with young people were performed to further enrich our empirical study, which, when combined with the literature analysis, defined the empirical model[6]. The results indicate that mindlessness has an effect on smart phone addiction behaviours in general, as well as in various ways depending on age, with younger customers being more affected. There are also variations in health outcomes depending on how the smart phone is utilized.

The remaining parts of the article are:

- Background
- Grounded research framework
- Conceptual model, premises and hypotheses
- Empirical study
- Results
- Discussion and implications.

1.1 Usage of Smart/Cell Phones:

Smart phones (also known as mobile phones) are increasingly being used for a variety of tasks ranging from communication (phone calls and texting), to social networking and web browsing, to task-oriented activities such as online banking. According to Simmons market research, people of all generations use mobile phones for a variety of purposes, with the younger generation utilizing them more often. Aside from the many applications, the frequency of usage indicates a significant risk of addiction. According to Gallup data, 72 percent of people claim to check their smartphones at least once each hour. Young people aged 18 to 29 check their phones every few minutes, compared to 12 percent of those aged 30-49, 6% of those aged 50-65, and 3% of those aged 65 and above.

In the fields of health, medicine, psychology, business, and law, mindfulness has been researched. Mindlessness is the root of consumption-induced issues, who state that modern consumers "sleepwalk through a cloud of urges, habits, addictions, compulsions, and decision biases". They also point out that mindfulness practice is an antidote to empowering people to change their purchasing habits. Mindfulness entails paying attention to things as they are rather than reacting to them. As a result, it has been demonstrated to enhance people's ability to self-regulate. It has also been said to assist counteract the automaticity and responsiveness of the marketplace. Indeed, "disengaging people from automatic thoughts, routines, and harmful behavior patterns" is a key advantage of mindfulness. Mindfulness has been utilized in the medical sector to help people overcome addictions.

Mindfulness methods are five times more successful than conventional smoking cessation programs. Mindfulness training may aid in the overcoming of habitual patterns by enabling the practitioner to substitute healthier self-regulatory actions for unpleasant thought and body experiences. Given this degree of effectiveness, it is no surprise that mindfulness has been proposed as a strategy for overcoming other addictions, such as Internet addiction, which may have a similar psychological mechanism to nicotine addiction. While mindfulness has been proposed as a possible cure to smartphone addiction, there is little evidence of its effectiveness. Instead, most of the mindfulness advice has been on

- Utilizing smartphone applications to overcome addiction issues
- embarking on a digital detox
- Altering existing habits.

Smart phones may be used in a variety of ways to help people practice mindfulness, promote healthy behaviours, alter tech habits, remain on target, and express appreciation. Digital detox programs are becoming more popular, including both formal getaways and website restrictions. Mindfulness has also been proposed as a method for controlling phone use, such as by turning off the phone periods, turning off alerts, limiting the amount of applications, and so on.

It is necessary to develop the mindfulness characteristic in order to change one's smartphone use habits. However, there is no scientific evidence that the mindfulness characteristic may help people overcome their harmful smartphone addiction. The process of behavior modification is aided in part by the brain's ability to remodel itself via neuroplasticity, enabling the person to better self-regulate. Both mindfulness and smart phone usage impact the brain through neuroplasticity, and the existence of a mindfulness characteristic may be able to counteract the detrimental consequences of smart phone use. Despite the theoretical connection between mindfulness and smart phone addiction based on neuroplasticity, there has been little actual research on the subject[7]–[10].

An online poll was performed with a total of 403 Amazon Mechanical Turk online panelists to explore our conceptual model. Those who did not pass the attention check questions were not included in the following analyses, leaving us with 339 survey respondents who could be used.

1.2 Measurement

1.2.1 Mindlessness:

Brown and Ryan designed and validated a 15-item Mindfulness Attention Awareness Scale (MAAS) to assess mindlessness (2003). Individual variations in mindfulness characteristic are

measured by MAAS. On a six-point Likert scale (1=almost never, 6=almost often), participants were asked to evaluate how frequently they participate in each everyday experience (e.g., “I find it difficult to remain focused on what's occurring in the present”, “I find myself doing things without paying attention”). The elements are arranged in such a way that they quantify mindlessness, or the lack of awareness. Despite the fact that MASS was designed as a single-factor scale with acceptable psychometric characteristics, exploratory factor analysis employing maximum likelihood estimation indicates that this is not the case. Instead, a two-factor solution was discovered, accounting for 49% of the overall variation. The items whose factor loadings are below raise concerns about poor indicator reliability as well as weak convergent validity. The notion of assessing smart phone addiction is a relative one. When it comes to smart phone addiction, is not yet classified as an addiction in the Diagnostic and Statistical Manual of Mental Disorders. It does follow symptoms comparable to gambling in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), according to psychGuides.com.

- In order to get the intended impact, the smart phone must be used more often.
- Repeated efforts to use smart phones less frequently fail.
- Preoccupation with the usage of smart phones
- Uses a smart phone to cope with negative emotions such as worry or sadness.
- Excessive usage leads to a loss of sense of time.
- Excessive smartphone usage has jeopardized a relationship or a career.
- Requirement for the most recent phone or application.
- Withdrawal if the phone or network is down.

Interviewees mentioned many of these symptoms, and survey findings revealed that young people had statistically significantly greater levels of smart phone obsession than older ones. The study findings show that thoughtless conduct has a negative effect on smart phone usage and health consequences in both younger and older people. Mindlessness was shown to enhance bad health experiences, psychological health problems, and a substantially worse quality of life by dramatically increasing the hours spent on undesirable behaviours such as utilizing social media. According to the qualitative study, mindless behavior is triggered by contextual cues that drive smart phone users into a habitual habit and obsession with their phones. Increased usage leads to physical health concerns as well as psychological ones such as social anxiety and a sense of not being included or measuring up to others' virtual lives. Time spent on negative activities on a smartphone deprives consumers of better, real-world social connections, which may enhance one's health and quality of life.

The findings indicate that younger people are especially susceptible to the technologies' addictive nature. Given that, younger people were more careless in general; this has an impact on their future phone use. Indeed, younger people were more preoccupied with their phones, experienced more psychological health problems, and used their phones in ways that are more inappropriate. While changing cultural conventions, such as switching from phoning to texting, may make it harder to change habits, initiatives to increase young consumers' levels of mindfulness may be feasible.

2. DISCUSSION

It is necessary to assess indicator reliability (factor loadings), criterion related (composite reliability), convergent validity (AVE), and discriminant validity for reflective components (preoccupation, mindfulness, and quality of life, in our model). Factor loadings, composite reliability, and AVE all exceeded the suggested criteria. The author has used criteria to determine if the aforementioned notions conceptually vary from one another (i.e., discriminant validity). Each reflective construct's AVE is greater than its squared correlation with the other two constructs, as seen in Table 6, showing acceptable discriminant validity. Because of the aforementioned analyses of the measurement model assessment, we can confidently state that the model satisfies validity and reliability requirements and is appropriate for structural model analyses. Hair and his colleagues' (2012) criteria for evaluating the inner model were utilized for structural model assessment.

The amount of explained variation of the endogenous constructs in the model is the primary criteria for inner model assessment. The R² value shows a model's explanatory capacity, and acceptable R² values vary depending on the study setting. The following are the R² values for each endogenous variable in the model: obsession, quality of life a total of 196 hours were spent on pleasant activities. A total of 191 hours were spent on unpleasant activities. I have had a bad health encounter. The problems with mental health, as well as the usage of a cell phone in an improper manner. We next investigated the hypotheses, which was more directly related to the study goal.

Technology, ironically, may also be a part of the answer. Young individuals who want to start practicing mindfulness may utilize online programs and applications to incorporate it into their hectic schedules. Marketplace applications like Buddafy, Headspace, and Simple Habits provide systematic methods to learning mindfulness abilities like meditation. Consumers may keep track of their mindful development using applications like Insight Timer. Such assistance is required since mindfulness must be practiced in order to reap its advantages. Finally, various forms of social reinforcement may aid in the retraining of customers to be more aware and less reliant on their phones. National disconnect days, as well as designating specific times of day or public spaces as no-tech zones, may all be part of the answer. Again, public service announcement (PSA) marketing may play a part here.

In conclusion, this study provided a qualitative and quantitative look at young people's smart phone usage. The findings show that thoughtless conduct is a major contributor to the addiction. One approach that may help you overcome this issue is to practice mindfulness. There are limits to this study, like with any research, that must be addressed when interpreting the results and planning future research. The qualitative study focused only on college students, but it may be extended to include other young people or even young smart phone users, as the age of the first smart phone continues to decrease, currently standing at 10.3 years. In addition, the nationwide survey conducted via Amazon Mechanical Turk should be repeated and extended to include other people and cultures.

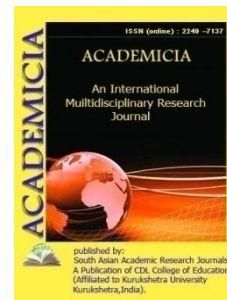
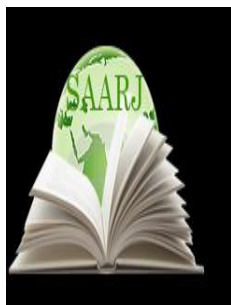
3. CONCLUSION

The author has concluded about the smart phone addiction and mindfulness. The authors of this research examine the smart phone drug cycle and its health implications in young and old individuals through the lens of their mindfulness features. That according qualitative and

quantitative study, the lack of mindfulness, defined as a thoughtless feature, is substantially related to smart phone obsessions, as well as economic and quality of life repercussions. Mindlessness and smart phone-related health effects vary between younger and older consumers. Younger individuals had a more negative impact on their quality of life than older persons. The study suggests encouraging mindfulness training and utilizing marketplace apps to combat addiction. The prevalence of smart phone addiction is increasing, and this essay contributes to a deeper understanding of the problem as well as societal alternatives for its resolution. The Online not only keeps us glued to our screens, but it also affects our intelligence and ability to concentrate. Dopamine is generated in the brain when using telecommunications such as a smart phone, according to neuroscience research, resulting in a habitual feedback loop. By giving individuals with internet access 24 hours a day, seven days a week, the mobile smart phone enhances the habitual feedback loop. Many individuals confess to sleeping with their phones in their hands. Stress, anxiety, phantom ring syndrome, FOMO, neck difficulties, hand problems, withdrawal from social settings, and other health consequences are common because of increased screen time through smart phones.

REFERENCES

1. J. Ye *et al.*, "A telemedicine wound care model using 4G with smart phones or smart glasses: A pilot study," *Med. (United States)*, 2016, doi: 10.1097/MD.00000000000004198.
2. N. Chauhan and J. Shah, "Smart Phone Based Audiometry in City Traffic Police," *Indian J. Otolaryngol. Head Neck Surg.*, 2018, doi: 10.1007/s12070-018-1327-2.
3. Y. H. Hong, B. H. Teh, and C. H. Soh, "Acceptance of smart phone by younger consumers in Malaysia," *Asian Soc. Sci.*, 2014, doi: 10.5539/ass.v10n6p34.
4. I. Uddin, A. Baig, and A. A. Minhas, "A controlled environment model for dealing with smart phone addiction," *Int. J. Adv. Comput. Sci. Appl.*, 2018, doi: 10.14569/ijacsa.2018.090973.
5. E. Zvornicanin, J. Zvornicanin, and B. Hadziefendic, "The use of smart phones in ophthalmology," *Acta Informatica Medica*. 2014, doi: 10.5455/aim.2014.22.206-209.
6. K. Kim, G. R. Milne, and S. Bahl, "Smart phone addiction and mindfulness: an intergenerational comparison," *Int. J. Pharm. Healthc. Mark.*, 2018, doi: 10.1108/IJPHM-08-2016-0044.
7. Q. Wei *et al.*, "Detection and spatial mapping of mercury contamination in water samples using a smart-phone," *ACS Nano*, 2014, doi: 10.1021/nn406571t.
8. B. Janković, M. Nikolić, J. Vukonjanski, and E. Terek, "The impact of Facebook and smart phone usage on the leisure activities and college adjustment of students in Serbia," *Comput. Human Behav.*, 2016, doi: 10.1016/j.chb.2015.09.022.
9. N. Chan, J. Charette, D. O. Dumestre, and F. O. G. Fraulin, "Should 'smart phones' be used for patient photography?," *Can. J. Plast. Surg.*, 2016, doi: 10.1177/229255031602400109.
10. Y. F. Chang, C. S. Chen, and H. Zhou, "Smart phone for mobile commerce," *Comput. Stand. Interfaces*, 2009, doi: 10.1016/j.csi.2008.09.016.



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A REVIEW ON TRANSGENIC ANIMALS PRODUCE HUMAN ANTIBODIES

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ABSTRACT

Laboratory mice offer a convenient supply of monoclonal antibodies with a wide range of affinity or specificity (mAbs). The intrinsic immunogenicity of rodent antibodies has hampered the development of these molecules as medicinal treatments. The use of transgenic mice producing repertoires of human antibody genetic codes has been investigated as a method of producing low immunogenicity mAbs for in vivo treatment. Over a dozen pharmaceutical as well as biotechnology firms have already used this technique to create novel therapeutic mAbs, and there are now at least 33 medicines in clinical testing—including many in pivotal trials—that include variable sections expressed by human sequences from transgenic mice. The preliminary results from these studies provide a peek into the safety and effectiveness concerns that these compounds may face. Nonetheless, real product approval is needed to properly verify this technology as a medication discovery tool, which is the greatest hurdle thus far. It may be feasible to expand this technique beyond rodents in the future by using transgenic farm animals to create and synthesize human sequence polyclonal sera directly.

KEYWORDS: Antibodies, Biotechnology, Transgenic Animals, Therapeutic Mabs.

INTRODUCTION

Transgenic animals are commonly used as models in biomedical research in the lab. Genetically engineered animals, mostly mice, account for almost 95% of those utilized. They are essential tools for studying human illness, since they are utilized to better understand gene function in the context of disease susceptibility, progression, and treatment response. MABs were one of the first medicinal compounds to be authorized by the FDA thanks to contemporary biotechnology. However, it took 8 years for the US Food and Drug Administration to approve the next therapeutic mAb following the launch of muromonab-CD3, a murine mAb targeting CD3 that was authorized in 1986 for treating severe organ transplant rejection (FDA). The immunogenicity of mouse antibodies in healthy patients was one factor contributing to the gap, which could also lead to rapid clearance, reduced efficacy and an elevated chance of infusion reactions, which can range from relatively harmless fevers and rashes to cardiopulmonary and anaphylactic-like adverse events[1]. Biotechnology or pharmaceutical firms have addressed this issue by developing reduced immunogenicity antibody molecules utilizing molecular biology techniques. In vitro, mouse antibodies were reengineered to exchange framework amino acids with human sequences^{5,6}. Novel, laboratory-derived antibodies have also been discovered by screening libraries of human and synthetic immunoglobulin sequences.

The FDA has already authorized 17 therapeutic monoclonal antibodies (mAbs) (Figure 1). Except for three, they've all been modified to be less immunogenic and include at least some human DNA. Human sequencing mAbs may provide a possible answer to the immunogenicity issue that has plagued rodent-derived antibodies. Early efforts to mine genuine human antibody repertoires through cancer or highly contagious patients, however, mainly yielded IgM antibodies with poor affinity or specificity. Although recent advancements have solved many of the technical challenges involved with producing human mAbs directly from human B cells, the human immune system's natural tolerance for human antigens, as well as the fact that human patients cannot be exposed to the same kinds of vaccination schemes used to generate rodent antibodies. Our capacity to reach human B cell-derived antibodies is limited to the wide range of sites that rodent antibodies can access. In this review, they describe the present state of medicines produced from transgenic mice containing human immunoglobulin repertoires, an alternate method for producing low immunogenicity therapeutic mAbs. Because the immunogenicity of rodent antibodies was the main reason for creating transgenic mice platforms, this study focuses on immunogenicity evidence for human sequence antibodies in the clinic. Transgenic technology is frequently addressed in relation to the development of polyclonal antibody-based medicines[2].

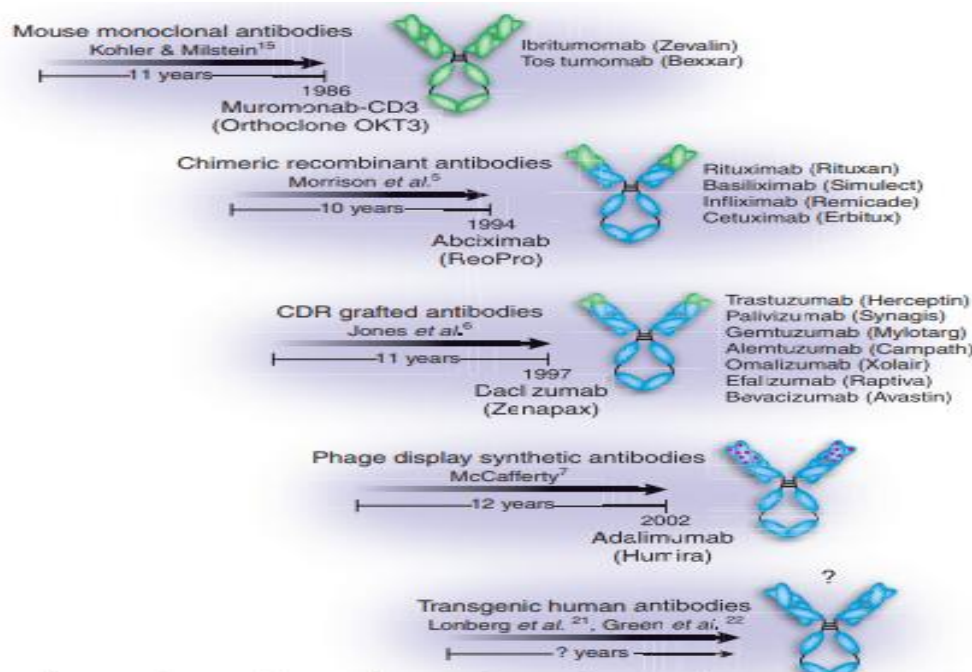


Figure 1: Evolution of therapeutic antibody technology and progress to the clinic[3].

1.1. Mammalian immunoglobulin gene in transgenic mice:

Alt et al.¹⁶ proposed that transgenic technology might be used to generate novel human sequence mAbs from un-rearranged, germline-configuration transgenes twenty years ago. Although this was "conceptually absurd," the writers decided that it might "be achieved in the not-too-distant future." The production of a repertoire of human heavy chains, as well as the development of a transgene-encoded immunological response in mice¹⁷, were first reported in 1989. The race to create a mouse with diverse human heavy- and light-chain skills and abilities able to make a contribution to a true secondary immune system of high-affinity human mAbs, in the surroundings of disrupted mouse heavy- and light-chain genes, was fueled by this report and the invention of methods for introducing specific modifications into the mouse germ line^[4].

The constant region was incorporated in the light-chain transgene. yeast protoplast fusion to deliver minilocus transgenes based on the yeast artificial chromosome (YAC). The heavy chain in this instance comprised 5 VH, all 25 D, as well as all 6 JH gene segments, as well as and constant-region gene segments. This design was VDJ joined and expressed both IgM and IgD antibodies. The light-chain YAC construct contained two functioning V and all five J segments, as well as C. the endogenous -lightchain locus, which contributes just 5% of the B-cell repertoire in normal laboratory mouse strains. A subset of B cells with functional -light-chain expression produces hybrid B-cell receptors and released antibodies with human heavy- as well as mouse-light chains. Despite the existence of this subpopulation, hybridoma cell lines secreting completely human monoclonal IgM22 or IgG21 mAbs that recognized the target antigens for which the mice had been vaccinated were isolated^[5].

Given that each of these two mice strains only retained a portion of the normal human V repertoire, the effective isolation of human mAbs selectively directed against a particular antigen was unexpected. This begs the issue of why mammals seem to have been chosen for their vast

germline V repertoires. For the production of different antibody sequences at the six composed regions (CDRs), which allow direct interaction with specific antigens, large germline repertoires may be needed. The expressed antibody repertoire, on the other hand, is a result of three sources of diversity: combinatorial, junctional, and somatic, with the germ line providing just one of them (combinatorial).

The capacity to produce antibodies against a wide range of targets utilizing minilocus transgenes with a small fraction of complete human combinatorial diversity may represent the relative significance of these three sources of variation. Although the germ line fully encodes naïve B-cell CDR1 and CDR2 sequences, junctional variability, which is preserved in minilocus transgenes, generates most of the heavy-chain CDR3 repertoire. CDR3 sequences seem to be crucial for antigen recognition by unmutated B-cell receptors, and they may account for the majority of the main repertoire. Primary repertoire B cells with low affinity for the immunogen may subsequently undergo affinity maturation through T cells, which has been demonstrated to produce high-affinity antibodies from a small V-gene repertoire[6].

1.2.Human mAb immunogenicity in transgenic mice:

A study of the existing clinical data mentioned above allows us to question if the transgenic mice platforms have really addressed the immunogenicity issue that prompted their creation in the first place. Despite the fact that transgenic mouse–derived human mAbs have yet to complete a phase 3 clinical trial, giving data equivalent to that available for authorized medicines, the first findings are promising.

The lack of severe infusion responses and minimal interpatient variability of drug exposure further testify to this molecule's low immunogenicity. Because mAb is likely to be linked not only to the molecule's intrinsic characteristics but also to the patient's immunological state, data from studies including patients with inflammation or autoimmune illnesses may be useful. None of the 85 patients in the zanolimumab psoriasis study, who each got four doses over a month, showed a significant immune response to the human mAb63[7].

Trials using CTLA-4 mAbs have produced some of the most dramatic results from individuals with increased immune responses. Human immunoglobulin–producing transgenic mice may be beneficial over other technologies merely because of inherent variations in the drug discovery processes required by the various systems, in addition to offering a platform for the identification of low immunogenicity therapeutic mAbs. For generating low immunogenicity mAbs in vitro, a procedure similar to that employed for small-molecule drug development is required: lead identification followed by a potentially long period of lead optimization. In transgenic mice, however, the lead optimization step can be skipped entirely but since B-cell development as well as affinity maturation can produce in vivo optimized antibodies. This enables a process in which each potential candidate is tested in a series of increasingly sophisticated in vitro and in vivo assays before being selected as a lead in essentially the same molecular form as it will be used in humans[8].

Selections for genetically engineered mouse platforms are based on information from preoptimized leads; however, selection decisions for lead optimization–based processes must rely on data from unoptimized leads, that aren't always relevant to the characteristics of the finished optimized compound. Furthermore, because clonal antibody–secreting cell lines are directly generated by the hybridoma fusion methods commonly used to generate drug candidates

from transgenic animals, the process is well suited for screening protocols that use a variety of cell-free, in vitro cell-based, and/or in vivo assays.

1.3. Large animals' polyclonal antibodies:

In many respects, therapeutic mAbs on the market now are far superior than the polyclonal serum treatments pioneered by Kitasato, Behring, and Ehrlich over a century ago for the treatment of diphtheria and tetanus. Although MAbs have proved to be a reliable source of well-characterized, low-immunogenicity, and highly effective medicines, polyclonal human serum-derived and even animal serum-derived antibodies still have a role in the clinic. In certain instances, polyclonal antibodies may be preferred to mAbs for passive immunotherapy, much as the natural human immune system prefers polyclonal antibodies to mAbs when reacting to infections. Polyclonal antibodies have several advantages, including increased potency in immune complex formation, utility in combating infectious diseases caused by multiple strains of pathogens or that require neutralization of multiple epitopes for effective treatment, and the ability to neutralize snake and insect venoms with multiple toxic components. Cows, chickens, and rabbits are examples of nonrodent transgenic animals that may be used in the biological manufacture of human polyclonal antibodies. In the scientific literature, some work toward this aim has already been published[9].

Artificial chromosomes containing the complete human germline heavy-chain and -light-chain loci were implanted into transgenic calves. Human heavy- and light-chain antibody transcripts were rearranged properly in the calves. To produce homozygous heavy-chain knockout mutant calves, the same group utilized successive gene targeting in fibroblast cells along with nuclear transfer cloning. Combining these methods with light-chain knockouts may result in a novel transgenic platform for generating human-sequence polyclonal antibodies from animals. The capacity to hyperimmunize the animals against particular pathogens or human disease-associated proteins, as well as better lot uniformity and decreased danger of human pathogen contamination, are all possible benefits of this approach[10].

2. DISCUSSION

Mice have also been genetically engineered to generate human antibodies spontaneously, which may be used as treatments. Between 2006 to 2011, seven of the eleven monoclonal antibody medicines authorized by the FDA were generated from transgenic mice. The use of transgenic farm animals to generate vast amounts of complicated human proteins for the therapy of human illness is also being investigated. Currently, therapeutic proteins are generated in mammalian cell-based reactors, but this method is costly. The cost of constructing a new cell-based manufacturing plant for one therapeutic protein, for example, was projected to be above \$500 million in 2008.

Monoclonal antibodies with a broad range of affinity or specificity are readily available from laboratory mice (mAbs). Rodent antibodies have been hindered in their development as medical therapies due to their inherent immunogenicity. The use of transgenic mice expressing human antibody gene repertoires as a means of generating low immunogenicity mAbs for in vivo therapy has been explored. Over a dozen pharmaceutical and biotechnology companies have previously utilized this method to develop new therapeutic mAbs, as well as at least 33 medications are now in clinical studies, with several in pivotal trials, that contain variable portions produced by human sequences from transgenic mice. Nonetheless, in pivotal trials, each

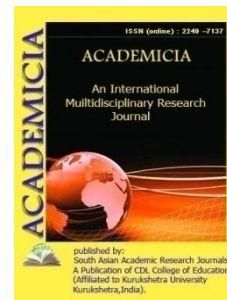
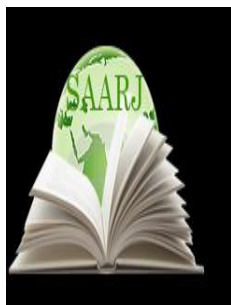
of these mAb-based therapies will need to demonstrate meaningful patient benefit. It's possible that one of these chemicals will be the first novel biologic produced in a transgenic mouse if it proves to be helpful to humans. This method has the potential to generate large transgenic farm animals that may be used to make therapeutic monoclonal antibodies antibody in the future.

3. CONCLUSION

High-affinity humans sequence mAbs against a broad range of potential therapeutic targets have been generated using transgenic mice that produce human antibody repertoires. The first results from clinical trials of 33 transgenic-derived human mAbs show a variety of medicines that are both active and well tolerated. Nonetheless, each of these mAb-based medicines will need to show real patient benefit in pivotal studies. If one of these compounds proves to be beneficial to patients, it may be the first new biologic developed in a transgenic mouse. This technique has the potential to create huge transgenic farm animal that can be utilized directly to produce therapeutic human-sequence polyclonal antibodies in the future.

REFERENCES

1. S. B. Manesh, R. O. Samani, and S. B. Manesh, "Ethical issues of transplanting organs from transgenic animals into human beings," *Cell J.*, 2014.
2. G. Chala, "A Review on: Antibody Engineering for Development of Therapeutic Antibodies," *Int. J. Immunol.*, 2015, doi: 10.11648/j.iji.20150303.11.
3. N. Lonberg, "Human antibodies from transgenic animals," *Nature Biotechnology*. 2005, doi: 10.1038/nbt1135.
4. P. Mehta, A. Sharma, and R. Kaushik, "Transgenesis in farm animals-A review," *Agric. Rev.*, 2017, doi: 10.18805/ag.v38i02.7944.
5. R. Chang, X. Liu, S. Li, and X. J. Li, "Transgenic animal models for study of the pathogenesis of huntington's disease and therapy," *Drug Design, Development and Therapy*. 2015, doi: 10.2147/DDDT.S58470.
6. K. E. Harris *et al.*, "Sequence-based discovery demonstrates that fixed light chain human transgenic rats produce a diverse repertoire of antigen-specific antibodies," *Front. Immunol.*, 2018, doi: 10.3389/fimmu.2018.00889.
7. M. V. Shepelev, S. V. Kalinichenko, A. V. Deykin, and I. V. Korobko, "Production of recombinant proteins in the milk of transgenic animals: Current state and prospects," *Acta Naturae*. 2018, doi: 10.32607/20758251-2018-10-3-40-47.
8. L. M. Houdebine, "Production of pharmaceutical proteins by transgenic animals," *Rev. Sci. Tech.*, 2018, doi: 10.20506/rst.37.1.2746.
9. L. M. Houdebine, "Production of pharmaceutical proteins by transgenic animals," *Comp. Immunol. Microbiol. Infect. Dis.*, 2009, doi: 10.1016/j.cimid.2007.11.005.
10. M. Brüggemann *et al.*, "Human Antibody Production in Transgenic Animals," *Archivum Immunologiae et Therapiae Experimentalis*. 2015, doi: 10.1007/s00005-014-0322-x.



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DETECTION AND SPATIAL MAPPING OF MERCURY CONTAMINATION IN WATER SAMPLES USING A SMART-PHONE

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ABSTRACT

The majority of bulky and expensive analytical equipment are used to detect environmental pollution such as trace-level hazardous heavy metal ions. However, there is a significant worldwide need for portable, quick, specific, robust, and cost-effective detection methods that can be utilized in resource-constrained and field environments. We present a smart-phone-based hand-held platform that enables for the measurement of mercury (II) ions in water samples with a sensitivity of parts per billion (ppb). We developed an integrated upto-mechanical connection to a smart phone's built-in camera module to digitally measure mercury content utilizing a magnetic gold powder (Au NP) and aptameric based colorimetric transmission assay applied in disposable test tubes for this purpose. We quantified mercury(II) cu(ii in water samples using a two-colourradiometric method using light-emitting diodes (LEDs) at 523 and 625 nm and a custom-developed smart application to process each acquired transmission image on the same phone to actually accomplish a limit of detection of 3.5 ppb with this 40-gram smart-phone attachment.

KEYWORDS: *Detection, Light, Measurement, Smartphones, Techniques.*

1. INTRODUCTION

The development of detection techniques for real-time and long-term monitoring of mercury contamination in environmental and biological samples has been a major priority since the discovery of mercury's severe neurotoxic effects in the 1960s^{1,3}. The organic form of mercury, methylmercury (MeHg), which is known to accumulate in the food chain⁴ and pass the blood brain barrier after human consumption, has been primarily blamed for various neurological consequences of mercury poisoning^[1]. While these discoveries have raised awareness of the

dangers of organic mercury pollution, inorganic mercury, namely mercury (II) ions (Hg^{2+}), should not be overlooked. In reality, owing to bacteria-assisted biotransformation processes, mercury (II) ions constitute the main mercury pollution in the aquatic system and the “precursor” form of methylmercury. Furthermore, since it accumulates mainly in the kidney's proximal tubule cells, inorganic mercury is known to be more nephrotoxic than its organic counterpart[2].

As a result, detecting and quantifying mercury(II) ion pollution in water systems is critical, and this information may be utilized to help prevent mercury ions from entering the food chain. To meet this requirement, spectroscopic techniques such as atomic absorption spectroscopy (AAS), inductively coupled plasma mass spectrometry (ICP-MS), and atomic fluorescence spectrometry (AFS). These methods, on the other hand, require time-consuming sample preparation, costly and cumbersome equipment, and professionally trained people to conduct the tests. As a result, they are not well adapted for on-site mercury detection, and they may not even be accessible in poor nations. Recent developments in microfabrication and nanoscience, on the other hand, have allowed the creation of portable detection assays that are integrated with lab-on-a-chip systems, showing tremendous promise for application in resource-constrained settings. Figure 1 shows the Design of the ratio metric optical reader on a smart-phone[3].



Figure 1: The above figure shows the Design of the ratio metric optical reader on a smart-phone.

However, owing to their relatively large equipment, higher prices, and lack of wireless connection, which is critical for distributed sensing and spatiotemporal mapping of contamination in distant places and field settings, these current systems that use NPs are still restricted. The detection of subppm quantities of mercury (II) ions has recently been shown

utilizing dye-embedded polymer sheets as colorimetric substrates that are digitized using, for example, smart-phone cameras as an alternative to Au NP-based plasmonic methods. We created a mercury contamination map using our smart-phone-based detection technology by assessing water samples from municipal tap water sources, rivers, lakes, and beaches in California (USA). This sensitive and accurate heavy metal detection platform running on cellphones could be quite useful for shared sensing, tracking, and sharing of increased pollution personal data as a function of both space and time, thanks to its cost-effective design, size, and wireless data connectivity[4]–[6].

However, because of inevitable changes in ambient light conditions and human operation and/or alignment during the picture capture process, this current method does not take use of the phone's processing/computational capacity, and thus has limited detection sensitivity and repeatability. To provide a field-portable, cost-effective, and wirelessly connected platform for sensitively quantifying heavy metal ion concentration in water samples, we present a battery-powered mobile sensing device that consists of a lightweight (37 g) up-to-mechanical attachment to a smartphone, as well as a custom-developed Android application for quantification, reporting, and sharing detection results. This lab-on-a-phone gadget uses dual-wavelength illumination using light-emitting diodes (LEDs) at 523 and 625 nm to measure mercury-induced modest transmission variations in a colorimetric assay using citrate-stabilized plasmonic Au NPs and aptamers (Apt) combined in disposable test tubes. We demonstrated sensitive detection of mercury contamination in water samples with a limit of detection (LOD) of 3.5 ppb, which is the same order of magnitude as the maximum contaminant level (MCL).

Mercury (II) recommended for drinking water, i.e., 2 and 6 ppb, as established by the shift in the plasmonic resonance wavelength of dispersed and aggregated Au NPs in response to mercury (II) ions. We also showed geographic mapping of mercury(II) pollution in California using our cellphones-based colorimetric detection technology by analyzing water samples taken at more than 50 sites, including tap water sources as well as natural sources such as rivers, lakes, and beaches. This heavy metal detection system for smartphones may be a useful supplement to existing mobile-phone-based imaging, sensing, and diagnostics devices²⁵⁴², and it has a lot of promise for distributed sensing, spatiotemporal mapping, and mercury pollution monitoring across the world. Indeed, by the end of 2013, global cellphones subscribers had surpassed 7 billion, and smartphone penetration is on the rise, with estimates of more than 60 percent, 45 percent, and 25 percent in North America, Europe, and Africa, respectively, by the end of 2015. As a result, using mobile phones for bioanalytical measurement science, as well as reporting and sharing results, provides widely scalable, cost-effective, and yet rather powerful/competitive solutions to implement various tests and measurements even in resource-constrained and field settings, which is a major motivation for this research[7]–[9].

1.1 The Smart-Phone-Based Mercury Reader's Optical Design:

Using a colorimetric nanoparticle and aptamer assay, we developed an optical imaging interface that is mechanically connected to the current camera module of a smartphone to measure mercury content. This attachment includes two button cells (3 V) that are utilized to power two LEDs.

These LEDs are spaced far enough apart (26.5 mm) from the rectangular test tubes (which hold the sample and control solutions) and are diffused by optical diffusers to guarantee uniform

lighting of both tubes (Figure 1a). These LEDs' emission wavelengths were chosen to be 523 and 625 nm, respectively, to match the change in the extinction wavelengths of dispersed and aggregated Au NPs. The green LED lit the bottom half of each cuvette while the red LED illuminated the top half in order to gather multispectral information from a particular water sample (Figure 1a). To prevent crosstalk between the green and red lights, the optical pathways of the two LEDs were separated by an opaque clapboard before reaching the cuvettes (Figure 1a, inset) and went via two rectangular apertures (6.6 mm, one for each hue) in front of each cuvette. The transmitted light from the sample and control cuvettes was then gathered via two additional rectangular apertures of the same size and photographed using a plano-convex lens ($f = 28$ mm) on the smart-digital phone's camera. The demagnification factor of this external lens was selected to be 7 so that the two 6.6-mm wide sample cuvettes could be photographed concurrently inside the active region of the smart-phone CMOS imager chip[10].

Plasmonic Colorimetric Assay and Mercury-(II) Ion Concentration Measurement Spherical Au NPs have previously been investigated as new mercury (II) ion sensing probes. The Au NP-based colorimetric detection test is based on the distinctive color shift of Au NPs from red to purple or blue following aggregation, which is caused by mercury (II) ion binding events. Most Au NP-based probes, on the other hand, require a surface modification step to bind mercury (II)-specific ligands to Au NPs, and the LOD varies depending on the capturing ligand used. We use a different strategy here, relying on the thymine-rich aptamer sequence's strong affinity for mercury (II) ions and citrate-stabilized Au NPs as colorimetric signal transducers to achieve high detection sensitivity. The use of Au NPs in this technique eliminates the requirement for surface functionalization stages, making it much easier to employ in the field. The probe solution is made up of 0.64 nM Au NPs (50 nm diameter) and 3 mM aptamer in 20 mM Tris-HCl buffer (pH 8.0) in a conventional mercury detection experiment. The probe solution is then mixed with 4 liters of water sample solution and incubated for 510 minutes (see Methods section for details). Even in a high-salt environment like 10 mM NaCl, aptamer creates a protective coating on the surface of Au NPs, preventing them from aggregating. The presence of mercury(II) ions, on the other hand, will strip away this aptamer layer, resulting in the creation of more stable T-Hg²⁺-T complexes. As a consequence, in the presence of NaCl, unprotected Au NPs may undergo a unique color change from red to blue (Figure 2a), which can be detected using our dual-wavelength smart-phonebased colorimetric reader to measure mercury concentration.

1.2 A smart tool for mercury testing based on Android.

We developed a bespoke Android app that enables mobile assessment and sharing of mercury quantification findings. The user may hold the smartphone horizontally after connecting the colorimetric mercury measuring equipment to the smart-phone camera unit and then conduct mercury tests using this smart application. The user may start a new test, build a device-specific calibration curve, examine previously performed tests, exchange test results, and study the operating instructions from the application's main menu. By photographing, for example, chemical control samples at established quantities, the user may calibrate the application for attachment-specific changes. Various devices/attachments may save and reuse these calibration curves. After recording a colorimetric transmission picture of the sample, the user may see it on the screen before digitally analyzing/processing. For processing/testing, the app may alternatively utilize an image file already saved on the phone's memory. Following the image-processing procedures described in the preceding section, the transmission signal ratios between

the sample and control areas will be automatically computed on the phone after clicking the "Process" button. The computed signal ratio is converted into the mercury concentration level of the sample (in ppb) using a previously saved calibration curve, and the findings are then shown on the phone's screen. On the Android phone (Samsung Galaxy S II), it took 7 seconds to calculate the mercury concentration. The final test results may be stored on the phone's memory with a time stamp and the test's GPS coordinates, and they can also be shared with a secure server for spatiotemporal mapping using a Google Maps-based interface, for example. The findings may also be seen as a function of time per place using the same Android application's graph-based interface.

Calibration and Specificity Tests are two types of tests. Each normalized G/R ratio calculated from a recorded RGB picture correlates to a particular mercury concentration measurement in our cellphone-based mercury detection technology (ppb). The default calibration curve in the Android app was created by measuring the normalized G/R ratios of a series of known concentration mercury(II) solutions with concentrations ranging from 0 to 5 M. (see Figure 4). As the concentration of mercury(II) ions climbed beyond 10 nM, the values of these normalized G/R ratios increased, reaching saturation at >1000 nM. (Figure 4). The aggregation of Au NPs, which is induced by the mercury(II) ion concentration, is mostly responsible for the signal rise in the 101000 nM range. This Au NP aggregation process increases the extinction at red wavelengths (e.g., 625 nm) while decreasing the extinction at green wavelengths (e.g., 523 nm), as shown by our UV is spectroscopic measurements. This Plasmon-resonance-based phase shift occurred quickly after approximately 5 minutes (Supporting Information, Figure S2), showing that the NP/aptamer-based colorimetric test has a fast reaction time, making it suitable for application in field settings. The transmission signal of the red channel dropped because of these plasmonic changes caused by NP aggregation, while the transmission signal of the green channel rose.

2. DISCUSSION

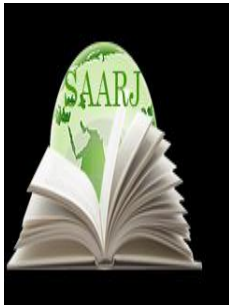
The author has discussed about the detection and spatial mapping of mercury contamination in water samples using a smart-phone. However, there is a considerable global need for portable, fast, specific, robust, and cost-effective techniques that can be used in resource-limited and field settings. We demonstrate a smart-phone-based hand-held platform for measuring mercury (II) ions in wastewater sample with an accuracy of parts per billion (ppb). Using a magnetic gold powder (Au NP) and aptameric-based colorimetric transmission assay used in disposable test tubes, we created an integrated upto-mechanical link to a smart phone's built-in camera module to digitally detect mercury level. As an alternative to Au NP-based plasmonic techniques, the detection of subppm amounts of mercury (II) ions has recently been shown using dye-embedded polymer sheets as spectrofluorometric boards that are digitized using, for illustration, smart-phone cameras. We assessed water samples from potable water sources, rivers, lakes, and beaches in California to produce a mercury toxicity map using our smart-phone-based detection technique (USA). Because of its cost-effective design, location, and wireless data connection, this sensitive and precise heavy metal detection platform operating on smartphones may be very helpful for shared sensing, monitoring, and sharing of increasing pollution private information as a function of both place and time.

3. CONCLUSION

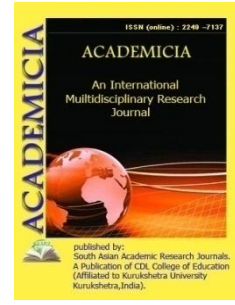
In conclusion, the author presented a sensitive and cost-effective smart-phone-based mercury(II) ion sensor platform that employs a battery-powered opto-mechanical reader connected to a smart-existing phone's camera module to digitally quantify mercury concentration using a plasmonic Au NP and aptamer-based colorimetric assay. On the same phone, we used a two-colour ratio metric detection technique with LEDs at 523 and 625 nm, as well as a custom-developed Android application for fast digital image processing of the recorded transmission pictures. This mobile device has a mercury(II) ion LOD of 3.5 ppb, which is on the same order of magnitude as the maximum allowed amount of mercury(II) ions in drinking water specified by the US EPA (2 ppb) and WHO (2 ppb) (6 ppb). Furthermore, we created a geospatial mercury(II) pollution map by analyzing over 50 samples obtained in California from a variety of sources, including tap, river, lake, and ocean water samples. The sensitive heavy metal detecting gadget incorporated into cellphones cost-effective design, mobility, and internet connection may be very helpful for widespread sensing, tracking, and sharing of water pollution information as a function of both location and time, according to a new study.

REFERENCES

1. J. Ye *et al.*, "A telemedicine wound care model using 4G with smart phones or smart glasses: A pilot study," *Med. (United States)*, 2016, doi: 10.1097/MD.00000000000004198.
2. N. Chauhan and J. Shah, "Smart Phone Based Audiometry in City Traffic Police," *Indian J. Otolaryngol. Head Neck Surg.*, 2018, doi: 10.1007/s12070-018-1327-2.
3. Y. H. Hong, B. H. Teh, and C. H. Soh, "Acceptance of smart phone by younger consumers in Malaysia," *Asian Soc. Sci.*, 2014, doi: 10.5539/ass.v10n6p34.
4. I. Uddin, A. Baig, and A. A. Minhas, "A controlled environment model for dealing with smart phone addiction," *Int. J. Adv. Comput. Sci. Appl.*, 2018, doi: 10.14569/ijacsa.2018.090973.
5. E. Zvornicanin, J. Zvornicanin, and B. Hadziefendic, "The use of smart phones in ophthalmology," *Acta Informatica Medica*. 2014, doi: 10.5455/aim.2014.22.206-209.
6. K. Kim, G. R. Milne, and S. Bahl, "Smart phone addiction and mindfulness: an intergenerational comparison," *Int. J. Pharm. Healthc. Mark.*, 2018, doi: 10.1108/IJPHM-08-2016-0044.
7. Q. Wei *et al.*, "Detection and spatial mapping of mercury contamination in water samples using a smart-phone," *ACS Nano*, 2014, doi: 10.1021/nn406571t.
8. B. Janković, M. Nikolić, J. Vukonjanski, and E. Terek, "The impact of Facebook and smart phone usage on the leisure activities and college adjustment of students in Serbia," *Comput. Human Behav.*, 2016, doi: 10.1016/j.chb.2015.09.022.
9. N. Chan, J. Charette, D. O. Dumestre, and F. O. G. Fraulin, "Should 'smart phones' be used for patient photography?," *Can. J. Plast. Surg.*, 2016, doi: 10.1177/229255031602400109.
10. Y. F. Chang, C. S. Chen, and H. Zhou, "Smart phone for mobile commerce," *Comput. Stand. Interfaces*, 2009, doi: 10.1016/j.csi.2008.09.016.



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ANALYSIS OF THE BASIC PRINCIPLES OF ENERGY SAVING REGIMES IN ASYNCHRONOUS ELECTRIC POWERS

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ABSTRACT

The role of science and technology in achieving energy efficiency in all areas of production is invaluable. That is, the use of energy-saving technologies and processes in production must be the result of scientific research. In particular, the efficient use of electricity, first of all, the use of energy-saving motors in electric drives, load adjustment, adjustment of active and reactive power consumption depending on the load level, reducing power loss, optimal management and finding solutions to dozens of other pressing issues research and design activities.

KEYWORDS: *Efficiency, Current, Electricity, Electric Drive, Voltage, Power Coefficient.*

INTRODUCTION

In accordance with the Resolution of the President of the Republic of Uzbekistan PQ-3379 "On measures to ensure the rational use of energy resources" Consistent modernization and technological re-equipment of electricity and gas supply in the country, the basics of energy saving measures are being taken to improve the mechanisms of mutual settlements for energy and natural gas.

At the same time, the lack of a differentiated approach to determining the value of energy resources delivered to different categories of consumers leads to their irrational use and does not encourage the introduction of energy-saving technologies and alternative energy sources.

Current norms and regulations in the field of urban planning do not meet modern requirements for energy efficiency of facilities. Insufficient attention to the use of energy-saving materials and

technologies in the construction and reconstruction of buildings and structures also leads to excessive consumption of energy resources.

It is known that about 60-70% of the electricity generated worldwide is consumed by electric drives of various mechanisms and equipment. Almost 50% of the world's electricity is generated by AC and DC electric drives. Therefore, it is important to ensure energy efficiency through automated electric drives and training competitively qualified personnel in this field. There are several basic ways to save energy with an automated electric drive:

- Correct selection of the motor power of the electric drive by improving the motor selection method depending on the real change in the load of the production mechanism, because if the motor power is less than the load capacity, the motor inefficiently changes energy and the power dissipated in the transmission line is greatly increased.
- Replacement of automated electric motors of production mechanisms with energy-saving electric motors with increased efficiency and power factor due to the increase in the active mass (copper and iron);
- The transition from non-adjustable electric drives to speed-adjustable electric drives will save resources (water, heat, etc.) not only in the automated electric drive system, but also in the production mechanism.
- Development and creation of special technical solutions that ensure minimum energy consumption in non-adjustable electric drives when the load is variable, as well as in controlled automated electric drives due to changes in the coordinates of the electric drive in accordance with the requirements of the technological process. The choice and implementation of one of the above ways to save energy depends on the specific conditions created by the technological mechanism, each of which has its own advantages and disadvantages. Given the energy crisis and rising energy prices, a way to save a significant portion of the energy required by improving power management is of particular importance. The most promising way is the fourth way, which will save 30-40% of energy by improving the automated control algorithm. Therefore, the main attention should be paid to the theoretical issues and computational methods of energy-saving automated electric drive due to the radical improvement of the control algorithm and the development of new automated electric drive systems that provide the least energy consumption due to the most convenient (optimal) control. It is known that the largest consumers of electricity in all countries are mainly AC electric drives, especially asynchronous motor drives, which convert almost half of the electricity produced worldwide into mechanical energy. Operation of the main part of these motors with low load or at values much smaller than the nominal leads to a significant reduction in the Efficiency and $\cos\varphi$ of the electric drive. This has a significant impact on the overuse of electricity and heat in the world. Therefore, the object of analysis is mainly an automated electric drive with an asynchronous motor. But it is also important to consider the optimal way to control DC electric drives.

We consider the analysis of the characteristics of an induction motor for a load characterized by a constant static moment $M_S = M_N = \text{const}$ at normal and optimal (energy-saving) currents, operating in frequency-adjustable electric drive systems. Based on the above method, the operating and tuning characteristics were calculated for a 4A series asynchronous motor with a power range of 0.6 -15 kW, operating on frequency-adjustable electric drives, and for $k = 1$ harmonics. Given the almost uniformity of the results for different powers, below are the

descriptions for a single brand of asynchronous motor (4A80B4Y3) built in relative units. The basic values are the rated currents of the stator and rotating, the magnetic current, slip, electromagnetic and total losses, the power factor and the efficiency, and the product of the coupling $\varphi=1$ and $m = 1$.

In Figure 1, the frequency is nominal in a speed-adjustable electric drive system

The operating characteristics of the current function of an induction motor at

$F = 1$ are given. The stator current I_s is equal to the geometric sum of the magnetizing current I_0 and the applied current of the rotor φ ; the applied current of the rotor is inversely proportional to the current and therefore decreases with increasing. Therefore, the connection of the I_s to the current has a nonlinear and curved appearance. Power dissipation: electromagnetic ΔP_{EM} and total $\sum \Delta P$; also, the power required by the network P_N will have a similar shape in the φ function. When the excitation power dissipation and the magnetic flux gain of the alternating power dissipation are equal, the power dissipation has an extreme value. It should be noted that the stator current does not change when the control frequency changes, while the extreme value of power dissipation changes relative to the value corresponding to the nominal frequency (shifted to the right or left when the frequency decreases or increases).

As the magnetic flux increases, the speed of the induction motor increases slightly, resulting in a decrease in slip s , while the useful power increases. Therefore, the minimum value of power required from the network is the smallest value of the magnetic flux relative to the minimum value of electromagnetic energy dissipation. Characteristics of electromagnetic indicators: Efficiency η power coefficient $\cos \varphi$ and their multiply $\eta \cos \varphi$. Reach a maximum at a certain value of current. When the values of variable power dissipation and excitation power dissipation are equal, the efficiency reaches its maximum value. The power coefficient increases and reaches its maximum value at small values of current, and as the current increases, the active component of the stator current decreases and the magnetizing current increases significantly.

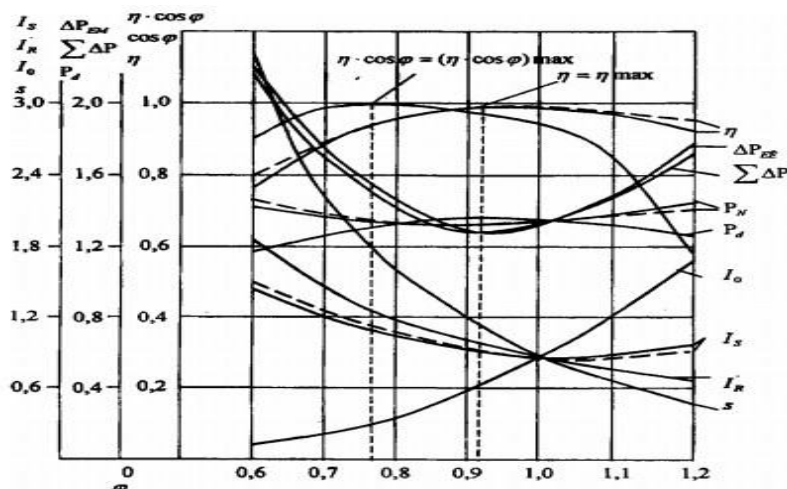


Figure 1. Characteristics of the magnetic flux of electrical and energy parameters of a 4A asynchronous motor in a frequency-adjustable electric drive with a frequency value of $F = 1$.

The typical curve of the load dependence of the induction motor efficiency is shown in the figure. Figure 2 shows that an overestimation of the installed power of the motor leads to a

decrease in its efficiency, i.e. inefficient power consumption. The efficiency of a converter based on powerful semiconductor devices is much higher. Transformer losses are mainly determined by the voltage drop across the semiconductor device. We can assume that the average $U = 2$ V is $U = 4.0$ V for bridge circuits.

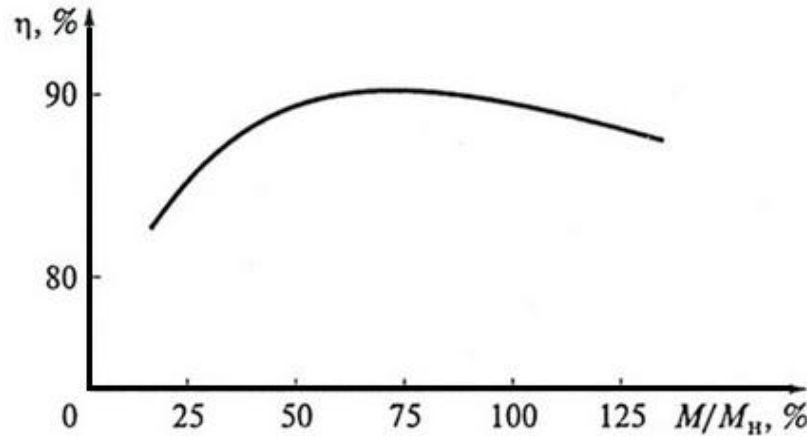
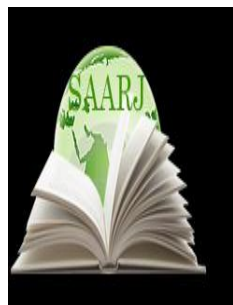


Figure 2. Dependence of asynchronous motor on efficiency load

REFERENCES

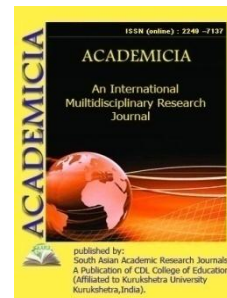
1. O.O. Hoshimov, A.T. Imomnazarov. Elektrmexanik tizimlarda energiya tejamkorligi. Darslik. -T.: «Fan vatexnologiya», 2015. -128 b.
2. Anuchin, A.S. Electric drive control systems / A.S. Anuchin. - Vologda: Infra-Engineering, 2015. -- 373 p.
3. Denisov, V.A. AC drives with frequency control: Textbook / V.A. Denisov. - Art. Oskol: TNT, 2013. -- 164 p.
4. Yani, A.V. Adjustable asynchronous electric drive: Textbook / A.V. Jani. - SPb.: Lan, 2016. -- 464 p.
5. Austin Hughes, Electric Motors and Drives, Fundamentals, Types and Applications. Oxford, UK 2006



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DEVELOPMENT OF UZBEKISTAN TRANSLATION SCHOOL FROM UZBEK TO RUSSIAN LANGUAGE IN THE BEGINNING OF XXTH CENTURY (ON THE BASIS OF UZBEK WRITERS' WORKS)

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ABSTRACT

Translation – one of the most pristine human occupations. Its roots go back to those distant times when the proto-language began to disintegrate into separate languages and the need arose for those who knew several languages who were able to act as intermediaries in the communication process with representatives of various linguistic communities. Nevertheless, for a number of reasons, in particular due to its interdisciplinary nature, the translation formed into an independent science only at the beginning of the XXth century.

KEYWORDS: *Translation, Literary Work, Arts Of Literary Translation, Uzbek Literature, Culture, Poets, Stories*

INTRODUCTION

The idea that it is necessary "to lay the fundamental foundations, if not science, then at least a practical guide to one of the most difficult and demanding arts - the art of literary translation" [1] was expressed at the very beginning of the last century, and in response to this, in the twentieth century, fundamental research on translation studies were conducted by prominent Russian, Western-European and other scientists from the former fraternal republics, which have now become Newly Independent States. The array of the works of scientists and practitioners is devoted to the main problem - the adequacy of the translation to the original literary text. The Uzbek translation school, based on the achievements of Russian and world translation practice, has created a number of reference samples of the Russian literature translation into the Uzbek language. Today, in all its poetic brilliance and polyphonic sound, the Uzbek reader is presented

with the novel by Alexander Sergeevich Pushkin "Eugene Onegin" translated by Aibek. The heroes of Lev Nikolaevich Tolstoy are rushing about in this strange and unexpected world, thinking and speaking in Uzbek, thanks to the novel "War and Peace", professionally adjusted and talented recreated in the Uzbek language by Abdulla Kahhar. Together with the great Dante, Uzbek reader "walkalong" the circles of Hell of the "Divine Comedy", compassing the heroes and grieving about their tragic fate, and all is because the artistic world of the "Comedy" of the great Italian, was fully recreated in Uzbek translation by the National poet of Uzbekistan Abdulla Aripov. At the same time, meridian works of Uzbek literature found their place on the bookshelves of a Russian reader as a result of hard work, talent and sincere love for Uzbek literature of many famous Russian writers and translators. Enough to mention the translations into Russian of the works of Abdullah Kahhar, gazelles and "Xamsa" by Alisher Navoi, the lyric poetry of Hamid Alimzhan and Mirtemir, the novels of Abdulla Kadiri and Aibek. Almost every translation of the Uzbek classics into Russian became not only an event in the literary life of that time, expanding the cultural horizons of Russian-speaking readers, but a lot of examples of this undoubtedly poured into and rightfully "settled down" in the multilingual literary process of the 20th century. "Tales of the Past" by A. Kahhar, "Bygone Days" by A. Kadiri, "Navoi" by Aibek, short poems and poems by Hamid Alimdzhan are known to the reading public in Russia as well as "Peter the First" by A. Tolstoy, "The Brothers Karamazov" by F. Dostoevsky and the stories of A.P. Chekhov, poetry of Konstantin Simonov, as well as works of many others.

However, it should be noted that, for a number of reasons, the modern Uzbek literature appears less and less in Russian translations, and therefore the publication in the magazine "Zvezda Vostoka" ("Star of the East"), and then in the "thick" Russian magazine "DruzhbaNarodov" ("Friendship of nations") of the stories of the famous Uzbek writer Salamat Vafo, aroused particular interest among readers [2]. The stories were translated into Russian by the talented poet and translator Zoya Aleksandrovna Tumanova. The translator was faced with a difficult task: not only to correctly display the informative content of the original literary work in Russian, for this knowledge of the language and acquaintance with the realities of national mode of life is enough, but to clearly determine how and to what extent in the translated literary work "Separate elements of the reflected reality, according to D. Likhachev, are combined with each other ... in a certain system, artistic unity" [3]. In other words, for translator, before taking up the pen, it is important to deeply study the author's intention and his\her vision of the world through the system of linguistic artistic-visual means used by the Uzbek writer in her stories. After all, only after this the artistic world of the written piece can appear before the translator as a whole, as a kind of complete and independent system. And in order to preserve that "flavor" of the original, the translator should try to recreate the artistic function of verbal forms in other language, ethno-linguistic features of the expression of thought and the individual author's use of the original linguistic means. And only after this can there arise what Ninel Vasilievna Vladimirova called the ability to "breathe" the stylistic atmosphere of the translated author" [4].

Let's make a reservation right away, the translation of SalomatVafo's stories into Russian by Zoya AleksandrovnaTumanova was done professionally and extremely conscientiously. But, in our opinion, it is still necessary to note that sometimes the translation loses not only the "flavor" and "stylistic atmosphere" of the original, but also, to some extent, obscures the intention of the author of the original. Let us take, for example, the very first paragraph of the story, a paragraph that serves as a kind of spring of action, since in several lines the Uzbek writer was able to

succinctly and concisely express the entire conflict basis of the work. Let's turn to the test and compare the original and the translation [5]:

Interlinear translation: They say that once they woke up, people saw in the edge of the border a suddenly appeared from somewhere. It was called "Mount Bhutan", that is, a mountain transferred from other places.

Z. Tumanova's translation: Waking up early in the morning, in the morning haze, you can see a mountain in the distance behind the duval. It is called "Mount Bhutan", or otherwise - a mountain transferred from other places.

Original: When people woke up, they found a mountain in the village. It has been called the "Bhutanese mountain," meaning "the mountain from which it has moved."

We will not dwell on the fact that the Russian version became, if it may be said so, somewhat loose due to the introduced words that were absent in the Uzbek version: утренняядымка, вдальизадувалом, можнобылоувидеть. This liberty of translation would not be so striking if from the very first lines of translation, as a result of this liberty, the semantic component of Vafo's story would not be distorted.

The writer focuses the reader's attention on the suddenness and complete unpredictability of the appearance of a mountain on the edge of the aul. The author needs this in order to emphasize the similarity, a kind of parallel alienation and almost the same "unwrittenness" in the "local landscape" of his heroine and the mountain covered with mystical aura: « I didn't come from another place like Menhamoshatoqqa » (**And I, just like this mountain, came here from other places, - says the heroine**). If "just like this mountain", then both the Bhutan-mountain carried by the angels, and the lyrical heroine who arrived of her own free will, the phenomena in these places are accidental, temporary. The reader of the original perceives the beginning of the story in this way, which cannot be said about the Russian reader.

The Uzbek writer is laconic, she uses the expressive means of her native language extremely economically, this is the case about which it was said "words are cramped - thoughts are spacious". Not verbosity of Salomat Vafoseems like it invites the reader to go beyond the "semantic limits" of words, phrases, sentences. The brevity and capacity of the verbal constructions in the story makes the reader himself speculate, or rather "follow" the movement of the writer's thought and inner vision, sometimes called the reader's instinct, to try to "understand" what the writer thought about but didn't put a word into it. It is known, however, that sometimes a pause is more meaningful than a lengthy verbal tirade. In two very short phrases, at the very beginning of the story, the author creates two almost tragic images: a mountain transferred from somewhere by angels, which will disappear from these places on the Day of Judgment, and a woman who will leave these places forever after a terrible sentence, the truth of the earth: « Сенбуернингодамиэмас ... ». (**«You are not from these places...»**). These words will be uttered by the most dear and only person whom the heroine of the story almost deified. The words, cruel in their categoricalness and hopelessness, seemed to slam the gates to the world of happiness and love in front of the woman, concentrated for her in one person - Kokhin. If the mountain continues to rise on the edge of the aul in anticipation of a divine judgment, then for the heroine of the story, after these words, the Day of Judgment has already come. The person for whom she here uttered terrible words, their meaning: "This is not your world, and there is no way for you there." The excommunication from Paradise took place,

almost tantamount to Dante's: "give up hope ...". This author's idea and writing style of SalomatVafo, speaking succinctly and laconically, completely disappeared in Russian translation. Moreover, the interpretation of the beginning of the story, which was not clarified in the translation into Russian, led to the fact that the translator ends the work of SalomatVafo also with a heavy and very verbose tirade "about":

"Oh my world ...

Oh my spiritual mentor Sheikh Sa'non. I am in two worlds yesterday and today ... Priceless desert, sands, sadly crawling, reeds swaying. The sun, rising higher and higher, begins to burn the desert, the voice of the Kochin, filled with longing, is heard and then silenced ... But four angels, lifting by its four ends, like a bed, carry Mount Bhutan after me. " (journalpunctuationretained) [6]

The original ends like this: "When I came out of the Bujyurt (Kohinaitmok), a voice came from my throat: **When I left this (as Kokhin put it) "not my world" a groan escaped my throat: "O great teacher and my idol, Sheikh Sanan, I, just like the mountain, Bhutan, forever lost in the space between two worlds)**

The meaning of this last long-suffering phrase of the heroine will be understandable only to those who are familiar with the legend of the great Sheikh Sanan, who, for the sake of love for a beautiful Christian woman, was ready to renounce the faith. But the legend ends quite unexpectedly: the Lord appears to the girl in a dream, she falls in love with him and leaves this world, Sheikh Sanan, who was madly in love with her, as it turned out, was fulfilling a divine ordinance. And, nevertheless, having escorted the girl to heaven, he sadly says: "Blessed are those who complete the journey and unite with the Beloved ... And the bitter fate of those whose destiny is to lead others to the Goal ..."

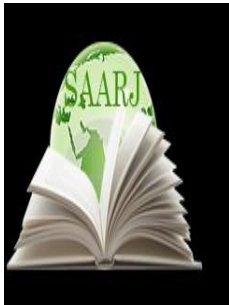
The heroine of Vafo's story is in love with a young man, but unrequitedly. She is ready for any humiliation, like the legendary sheikh for the sake of a Christian girl. Family, child, morality, her whole old world - are thrown on the sacrificial altar of love. But Kokhin, as she calls this man, rejects the love of the heroine. But if in the legend, after the girl's ascension to heaven, the sheikh comes to his senses and continues to faithfully serve God, then in the story the heroine, rejected by her beloved man, does not stop loving him. A legend is always a lesson, and therefore its end, as a rule, is clear and unambiguous. SalomatVafo's story is polyphonic, and it ends not with a dot, but with ellipsis. She leaves the world alien to her, leaving in it her heart, her beloved, but the world to which she is forced to return is also alien to her. There is no beloved. This duality is expressed by the author in the final lines of the story very subtly and tragically: forever lost in the space between two worlds.

And it immediately becomes clear that the rather heavy phrases introduced into the translation text and absent in the original do not serve to reveal the writer's artistic intention, but, on the contrary, to some extent obscure the semantic component of the episode and the story as a whole, thereby distorting the artistic world of the literary work ...

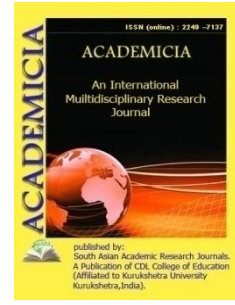
And, nevertheless, the stories "sounded in Russian" by the talented Uzbek writer SalomatVafo, in my opinion not yet appreciated by either Uzbek or Russian critics, were a significant event in the literary life of Uzbekistan.

REFERENCES

1. Chukovskiy K., GumilevN. The principles of literary translation. - St. Petersburg, 1919.
2. SalomatVafo. Awomanforgottenherself (stories), j. "ZvezdaVostoka", № 1-2, Tashkent, 2008, p.7-17; VafoS. Bhutan mountain, j. «Druzhbanarodov» № 1, M., p.131-141.
3. D. Likhachev. The inner world of a work of art. // Questions of literature, No. 8, 1968, p.- 76.
4. J. Teaching language and literature, No. 1, 2008, p.- 38
5. 5. Cited by: SalomatVafo. Butanmountain, j. ZvezdaVostoka, № 1-2, 2008, p.-11; SalomatVafo. Tilsimsaltanati. Novel stories, T.: "Sharq", 2004, 320 p.
6. J. "Star of the East", No. 1-2, 2008, p.-17



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ABSTRACT

The article analyzes the relationship between a mentor and a disciple, the sixth feast of Saint Bukhara, the representative of the Khojagon teaching Sayyid Amir Kulola (1281-1370) and the founder of the Naqshband teaching Bahauddin Naqshband (1318-1389), as well as his role in the development of Naqshband. On the basis of manuscripts and translated sources, as well as a comparative analysis and the method of hermeneutics, the date of birth of Amir Kulol was clarified, the years of his upbringing Bahauddin Naqshband were based on the teachings of Sayyid Ota and Muhammad Boboi Samosi. The ideas of Amir Kulol about knowledge, practice and knowledge of Ladun are analyzed, the role of epistemological ideas in the teachings of Khojagans in the improvement of Bahauddin Naqshband is shown. The tolerant attitude of Amir Kulol towards the attitude of Bahauddin was revealed and this contributed to the acquisition of new knowledge from Orif Revgari and Kusam Sheikh, thereby improving their knowledge, as well as to practice Zikr Khufi in the Naqshbandi teachings, which is a characteristic feature of this tariqah. It was shown that Bahauddin Naqshband, having thoroughly studied the teachings of Khojagan from Amir Kulol, founded the world famous Naqshbandi teaching.

KEYWORDS: Amir Kulol, Khojagon, permitted food, tarikat, Sayyid ota, Yassaviya, Muhammad Bobo Samosi, Bahauddin Naqshband, Naqshbandiya, knowledge, action, divine knowledge, tolerance, secret dhikr.

INTRODUCTION

Amir Kulol was the great man who connected the Khojagon and Naqshbandiya educations. There is no information about birth date of him but in sources there is some words that he was born in Sukhor village near Bukhara. Shahobiddin ibn binti Amit Khamza in his "Maqomoti Amir kulol" mentioned him as Sayyid Amir Kalon as-Sukhori (p.2), at that time there were an addition of the birthplace in the names of great people, it means he was born in Sukhor. Ali Safi's "Rashahatayn ul hayot" also states that Amir Kulol's birthplace was Sukhor (p. 43).

"Maqomoti Amir Kulol" states the following: The father of Amir Kulol is a close friend of Sayyid Ata, a great man of Yassavi's discipline. The sources say that Sayyid Ata was a follower of Zangi Ata, a student of Turkish teacher of sheikhs Ahmed Yassavi. According to the source, "One day, Sayyid Ata came to Afshana village and told Sayyid Amir Kulol's father," O my friend, you will have a child by Allah whose light will be enough to the whole world. Of course, put him name Amir Kalon. "

Indeed, after a short while, the prophecy of Sayyid Ata was fulfilled, and Amir Kulol appeared on the stomach of his dear mother and quickly reflected his qualities. There is a story of Amir Kulol's mother in "Maqomot", "when I was pregnant to Amir Kulol, if I ate something doubtful, there were such severe pains so I felt unconscious. Then I realized that this is the blessing of our child. "

The story of Sayyid Amir Kulol's mother indicates that Amir Kulol used to live only in purity even in his mother's body. The dirty and dubious food did not be accepted by his pure body. Purity has been a divine donative of the Great. The following reference is made in the source after the description of this event:

Nishoni on, ki man farzandi pokam,

Padar ham pok, modar ham afifa

Dilampok as tu, domanipokdoram,

Tariqirostroh buy aqiqa.

It means:

The purity of my parents is the source of my purity. My heart and my body are also pure, that's why my road is pure and the smell of purity comes from it.

The poem shows that when Sayyid Amir Kulol came to the world, his purity and truth were accompanied by him. That means that the main means of reaching the truth is purity.

The first teacher of Amir Kulol was Turkish Sheikh Sayyid Ata, the representative of the Yassavi teaching method. Although he predicted the birth and statue of him, he also named him. Later Sheikh was engaged in the education of Amir Kulol. Sayyid-Ata said, "From the pure ghosts I have learned that the rank of Amir Kulol is very high, and it is beyond me." According to the source, this event was in Hijri 680.

The second teacher of Amir Kulol was Muhammad Boboi Samosi (dead in 1336), a prominent teacher of the Khojagon education, who was the student of Khoja Ali Romitani, who was also known as Hazrat Azizon. With this great man, Khazrat Amir Kulol met at the age of 15 and

served him for 20 years without stopping. Muhammad BoboiSamosi gave him right of being teacher of the education.

Muhammad BoboiSamosi Sayyid educated Amir Kulol and gave the instruction to BahauddinNaqshband to give them all the knowledge that he had given them. At the same time, Amir Kulol fulfilled his teacher's requirements.

The sources also contain honorary titles that are given according to the levels of the teacher's degree of Sufism. These blessed degrees and titles allow to know full, complete knowledge of his personality. These are: *Sayyid(sayyid)*, *shaykhul-shuyukh(teacher of teachers)*, *raisiarbabiltasavvuf (chairman of Sufism)*, *sultanil tariqa(the king of education)*, *burkhanilhaqiqat(supporter of truth)*, *murshid us saliqin(teacher of good people)*, *sayyidalorifin(great knowledgeable)*, *sharafulmustaffavvin(great Sufi man)*, *zaynulvorisonvalmuhaqqiqin(inheritor of telling truth)*, *hazratiborifat(chastity)*, *saint and telling the true prophecy*.

Khazrat Sayyid Amir Kulol's teachings are influenced by the ideas of the Yassavi education founded by Ahmad Yassawi and Khojagon Sufism's which was founded by AbdulkholikGijduvani. An analysis of the essence of the Lord's teachings shows that he was a fan of the moderate flow of tasawwuf ideas. Because his ideas are in full compliance with the Islamic religion and are based on the Qur'an and Hadis Sharif.

He tells his followers that it is always haram and halal to know good and evil, and act accordingly. Amir Kulol said:

Mayozormuru, mayozor kas,

Rahiroskorihaminastu bas.

It means:

Do not harm insect or the man,

This is the right way.

Amir Kulol said in the universe everything else, whether it's a sledgehammer or a small insect or everyone is a blessing created by God, not to mention or harass them. Himself was also fully committed to it. It is written in "Maqomot" in this regard as follows:

"Once a day, Amir Kulol had decided to wash his clothes with his friends team. In one of the Romitan gardens, he washed his clothes and when they were about to dry, Amir Kulol said:

- Oh my friends, do not hang your clothes on walls, you may harm thorns, do not hang your clothes on trees, you may harm the branches of it, do not lay your clothes on the ground, you may harm the grass.

Friends asked:

- Amir, how do you want to dry your clothes?
- I hang it on my shoulders and keep it into sunshine and wait until it dries.

The Amir Kulol's students had *aloniya* remembering in a loud voice. In the book *Rashahat*, it is written: "During the last illness, Amir Kulol called his followers to obey BahauddinNaqshband. One of the disciples asked Amir Kulol:

- Why you to obey him, but did not obeyed you in *aloniya* remembering in a loud voice?

Amir responds:

- Everything that passes by it will be by Allah's wisdom. There is no choice of that person.

The fragment mentioned, first, indicates that the Sayyid Amir showed the existence of *aloniya* in the disciples, and, secondly, it indicates that the act of *zikr* was followed by the heart of the studentss. BahauddinNaqshband followed the teachings of AbdulkholikGijduvani. Amir Kulol also obeyed God's command and taught Bahauddinkhufiya *zikr* –silent remembering.

The most important of the teachings of the Amir Kulol is the importance of acquiring knowledge and knowledge. Regarding knowledge, he told his disciples that Prophet Muhammad (peace be upon him) repeatedly said "Every muslim man and woman must get knowledge."

The Amir Kulol forced everyone getting knowledge and valued an ignorant man more impersonal than an animal.

Agar farzandisultoni yukhoni,

Chu donnish nest badtarazsagoni.

It means: If you are a son of a Sultan and a khan, but you do not have a science, you will be worse than the dog.

The Amir Kulol thinks that the ability given to human beings by Allah is important and basic, and that without the knowledge of the unseen, nothing can be achieved.

The knowledge that Allah has given is superior to each other's knowledge:

Ilme, ki muallimash dar sina buvad,

Darsi nabuvad har on chi dar sina buvad,

Sad xona kitob xoni sude nakunad,

Onro ki kitobxona dar sina buvad.

It means:

It is not possible to learn the knowledge that is placed by Allah in the heart. Even if you read the books that are in your house, you will not be able to equate with what you have learned in the heart.

These verses indicate that Amir Kulol was embodied in the idea that the truth can be achieved by the knowledge given by Allah. He emphasizes that a soul is the place where there is divine knowledge.

Amir Kulol calls for the discovery of the importance of conversing with intelligent, intelligent people in the process of learning, and to stay away from the ignorant. Because sharing with the ignorant can lead to their influence.

Bo bad manshinu, bosh begonia u,

**Bar dam afti gar xuri donai u,
Tir az pai rosti kamonro kaj did,
Didi, ki chi guna jast az xonai u.**

It means:

Do not sit with bad person, stay away from him, because you can be influenced by him. And you see how arrow has escaped after seeing the curvature of the bow, so escape the evil.

**Chi khush guft on xiradmandi suxandon,
Ki ruy az suhbati nodon bigardon,
Daraxkhi nafsi nodon bar nayorat,
Huzurash juz ba dardisar nayorat.**

It means: It is true that the clever word must ignore an ignorant person. The ignorant tree does not know the boundary, so it does not bring anything except headaches.

Amir Kulol considers that science and practice are closely related, and knowledge gained in practice becomes a treasure.

**Har kiro ilmu aql piroya ast,
Har kiro in du nest be moya ast
Ilm boyad bo amal ganje buvad
Az on ,ki be donishamalranjebuvad.**

It means: Who ever wishes to be wise, he is happy, for without it life becomes baseless. Science becomes treasure only when it is with practice. Knowledge without practice brings a lot of disappointment.

Amir Kulol says that obtaining science is a very complex process:

“Dar har kujo boshet dast az talabi ilm dur nadoret. Agar shumoazdaryoyiobvaotashboyadguzashtan, biguzaredvailmbodastored.” it means: Be knowledgeable, wherever you are. If it is necessary to cross the river on a flammable or aqueduct river, you must thrive, but gain the knowledge.

**Dar bodiyayiilm davidan chi xushast,
Vazolamimanisuxanshunidan chi xushast.
Sad bor ba ittifoq bo dil guftam,
Az suhbatinoaqiburidan, chi xushast.**

It means:

It's nice to run after science. How wonderful it is to hear words from the world of words! I said from my heart that it was time to cut off the conversation with ignorance people.

Sayyid Amir Kulol's the seven-centuries old though-provoking teachings of knowledge, knowledge and practice, intelligent propaganda are in harmony with past, present and particularly future life.

The following are the words of Amir Kulol: "Know, the purity of the heart and the tongue is from halâl food. Imagine a human body as a pool of water. Every flower and fruit from this pure water and soil will be absolutely clean and beneficial. The Prophet, may Allah bless him and grant him peace, said, "Whoever consumes only halal food for 40 days, his heart will be opened and he will enjoy the knowledge and wisdom." This is only possible if only pious people (who follows taqwa)."

"Find the nutrition by profession or handicrafting. Find your food with honest work and ... do not waste. "

"Keep your eyes away from looking at what is haram and your ear from the haram, and your hands from the haram, and your feet from the haram."

He was alive in the history by good children and clean disciples. Bahauddin Naqshband is the student who made known his masters name to the world.

According to the source, Amir Kulol had four sons and four caliphs. He gave his four sons to the four Caliphs. His sons followed their father. Their father was a teacher, the guide of the Sufism. His first son, Amir Burhan, were brought up by Bahauddin Naqshband, the second Amir Shah by Sheikh Yodgor, the third Amir Khamza by Mavlono Arif Deggarani and the fourth Amir Umar by Jamoliddin Asiya.

The total number of Hazrat Amir Kulol's companions was 114. Among them Khoja Muhammad Bahauddin, Sheikh Muhammad Khalifa, Amir Kulol Doshi, Alouddin Gijduvani, Khoja Shaykh Dorzuni, Shamsuddin Kulol, Jaloliddin Keshi were famous.

Hazrat Amir Kulâl said in the last few days:

- I have been thinking for three days and nights that what will happen to us and our friends? A voice came from the unseen and said: "O Amir Kulol, we blessed you and your neighbors, our friends, and all who obey you."

Shodamki zi man bar dili kas bore nest,

Kasro zi manu, kori man ozore nest

Gar nek shumorandu, gar band guyand,

Bo neku badi hech kas kore nest.

It means:-I am very glad that there is no weight in my heart. When I and my work do not hurt others, I have nothing to do with their good and bad.

This verse testifies to the fact that Amir Kulol has passed through a calm life through honesty and purity.

In the days when the above words were spoken, spirits left the universe and traveled to immortality. This incident took place on Thursday, the eighth day of the jumadulavval 772 Hijri, in 1370 AD

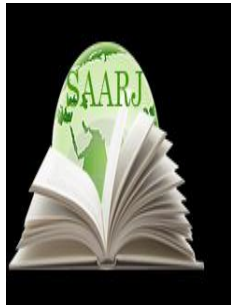
CONCLUSION

In general, it can be said that Hazrat Amir Kulol is a great teacher of Bahauddin Naqshband who closely interacts with the teachings of Naqshband and Khojagon educations.

LITERATURE

1. Abdurahman Jami. (2019) Khoja Bahouddin Naqshband (q.s.) / Nafahot ul-uns min hazarotul quds. // Bahauddin Naqshband (analysis of sources). Prepared for publication, author of articles, comments and reviews G.N.Navruzova. Tashkent: Sano-Standard Publishing House, pages 105-112.
2. Abul Muhsin Muhammad Baqir ibn Muhammad Ali. (2019) Authority Hoja Bahouddin Naqshband. / Persian translator, foreword, commentary and dictionary author Mahmud Hasani. Tashkent: NMIU "Uzbekistan". 335 b.
3. Abul Hasan Muhammad Baqir bin Muhammad Ali. (1993) From the Authorities of Bahauddin Naqshband (Authority of Shahi Naqshband). Durdona. From Mir Kulol and Shahi Naqshband authorities. Persian-Tajik S. S. Bukhari and I. Subhani translation. T.: "Sharq", pages 37-71
4. Alisher Navoi. (2001) Sayyid Amir Kulol r.t. Nasayim ul-muhabbat. A perfect collection of works. Volume Seventeen. Tashkent: "FAN", pages 258-259
5. Knysh A. (2004) D. Muslim mysticism: A short history / Per. from English M.G. Romanov. - SPB.: "Publishing house" "Dilya", - S. 250-251. 6.
6. From the Authorities of Mir Kulol. (1993) / Durdona. From Mir Kulol Shahi Naqshband authorities. Persian-Tajik S. S. Bukhari and I. Subhani translation. T.: Sharq. Pages 7-33.
7. Navruzova G. (2020) Sayyid Amir Kulol - Teacher of Bahauddin Naqshband / Historical memory - materials of the Republican scientific-theoretical conference on self-awareness and a factor of national-spiritual development. XIII. Bukhara: "Bukhara", pp. 5-9.
8. Navruzova G. (2020) Sayyid Amir Kulol's teachings on science and enlightenment. Islamic thinking. Number 3. 12-14 b.
9. Navruzova G., Zoirov E. (2018) Sayyid Mir Kulol - the sixth Piri of Bukhara Sharif./ Seven Piri of Bukhara Sharif. Tashkent: Muharrir Publishing House. Pages 51-59.
10. Navruzova G., Safarova N. (1996) The mystical worldviews of Amir Kulol and Bahauddin Naqshband. Bukhara: Bukhara Publishing House. 100 b.
11. Nasir ad-din Tora ibn Amir Muzaffar Al-Hanafi al-Bukhari. (1993) Hodja Baha-ad-din Naqshband and his teachers and mentors. Popular science collection. Compiler of the collection, translator, introduction, introduction and comments by B. Qazoqov. Bukhara: "Bukhara", pages 13-14.
12. Free Believer Lord. Hazrat Sayyid Amir Kulol (2012) (Historical events). - T.: Tashkent Islamic University Publishing and Printing Association. - 176 b.
13. Raximov K. Sayyid Amir Kulol. (2019) // Moziydan sado. - №2 Pages 18-22.
14. Sadriddin Salim Bukhari. (2007) Hazrat Sayid Amir Kulol. Bukhara Waves №1 Pages 34-35.

15. Trimingham. (1989) J.S. Sufi orders in Islam. Per. from English A.A. Staviskaya, edited and with a foreword. O.F. Akimushkina. M.: Science. The main editorial office of oriental literature, p. 61.
16. Fakhriddin Ali Safiy. (2003) Rashahot: (water drops of life). Historical and educational work. Conversion and ending author: M. Hasaniy; dictionary, ending author and editor-in-chief: B. Umrzoq; Institute of Oriental Studies named after Abu Rayhan of the Academy of Sciences of the Republic of Uzbekistan. - T.: Abu Ali ibn Sina Medical Publishing House, pp. 62-64.
17. Fakhriddin Ali Safi. (2019) Hazrat Hoja Bahaul Haq wad-Din Muhammad (q.s) famous as Naqshband / Rashahot ayn-al hayot // Bahauddin Naqshband (analysis of sources). Prepared for publication, author of articles, comments and reviews G. N. Navruzova. Tashkent: Sano-Standard Publishing House.
18. Shahobiddin ibn bintu Amir Hamza. (1756) The authority of Amir Kulol. Manuscript. 97 v.
19. Shahob ad-din b.bint Amir Hamza. (2001) Life of Amir Kulal. Translation and preface by O. M. Yastrebova. / The wisdom of the Sufis. SPB.: ABC; Petersburg Oriental Studies. S. 27-270.
20. Hasanov X., Navruzova G. (2003) Hazrat Sayyid Amir Kulol (third edition). Bukhara: Bukhara Publishing House. 40 b.
21. Navruzova G. (2020) "Bahauddin Naqshband - the seventh pir of Bukharai Sharif (Noble Bukhara)". Islamic thinking. Scientific-educational, religious-cultural, information publication magazine. Tashkent. Special issue pages 5-8.
22. Navruzova G. N., Ubaydova V. Pharaoh of the weavers of Bahauddin Naqshband. (2020) Academia An International Multidisciplinary Research Journal Vol.10, Issue 5. May Impact Factor: SJIF = 7.13. 922-26.
23. Navruzova G.N. Sayyid Amir Kulol and BahauddinNaqshband//Philosophy and Life. 2021. January, April, special issue 1. 66-79 pages.



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AN OVERVIEW ON TRAUMATIC BRAIN INJURIES

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ABSTRACT

Traumatic brain injury (TBI) may manifest itself in a variety of ways, ranging from minor changes in awareness to a permanent vegetative condition and death. In the most severe form of TBI, a diffuse kind of damage and edema affects the whole brain. Treatment options range from regular cognitive therapy sessions to drastic surgery such as bilateral decompressive craniectomies, depending on the degree of the damage. Guidelines for the best treatment of TBI have been established, but they must be considered in the context of the situation and cannot be used in every case. We have described the present state of TBI therapy in clinical practice and fundamental research in this review paper. We have included a short review of the different subtypes of traumatic injuries, optimum medical treatment, noninvasive and invasive monitoring methods, as well as surgical procedures that may be required in certain cases. We've reviewed the most significant advances in fundamental research in the quest for TBI treatment methods. From an experimental standpoint, we've also addressed the future path of TBI therapy development.

KEYWORDS: Intracranial Hypertension, Management, Treatment Strategies, Traumatic Brain Injury.

1. INTRODUCTION

TBI continues to affect millions of people every year all around the globe. The overall combined rates of TBI-related emergency department visits, hospitalizations, and fatalities have risen throughout the decade 2001–2010, according to the Centers for Disease Control. Individually, however, the incidence of TBI-related fatalities has dropped during the same time period, owing in part to greater awareness, more structured management and standards, and substantial technical advances in current treatment regimens. We must also recognize that a certain proportion of TBIs never get medical attention, implying that total TBI rates are likely underreported. TBI is most common in children (0–4 years old), as well as teenagers and young adults (15–24 years old). Another surge in occurrence occurs in those over 65 years old. Falls and motor vehicle accidents are the two most common causes of TBI. We have a rising group of people living with severe impairments directly linked to their TBI as a consequence of an overall increasing number of TBIs but a reduced incidence of associated fatalities[1]–[4].

Path Physiology of TBI:

TBI pathogenesis is a multi-step process that begins with a primary injury and progresses via subsequent injuries to result in temporary or permanent brain impairments. The main deficiency is directly linked to the brain's major external effect. The secondary injury, which may occur minutes to days after the initial hit, is caused by a molecular, chemical, and inflammatory cascade that causes further brain damage. The release of excitatory neurotransmitters like glutamate and aspartate causes depolarization of the neurons, which leads to a rise in intracellular calcium. Intracellular calcium triggers a cascade of events including the activation of enzymes such as caspases, calpases, and free radicals, resulting in cell death either directly or indirectly through the apoptotic process. This deterioration of neuronal cells is accompanied by an inflammatory response that destroys neuronal cells even more and causes a breach in the blood-brain barrier (BBB), resulting in more cerebral edema. Through various mediators, this whole process is both up and down controlled. After the second damage phase, the healing period begins, which includes morphological, molecular, and functional remodeling[5], [6].

Concussion:

Concussions are often regarded as mild TBIs that do not result in any severe structural damage as a result of a non-penetrating TBI. They typically occur as a result of direct strikes to the head, with following acceleration and deceleration forces. A concussion usually leaves the victim with various degrees of temporary altered mental status, ranging from mild disorientation to complete unconsciousness for a few minutes. Routine neuroradiographic imaging, such as computerized axial tomography scans (commonly known as CT scans) and magnetic resonance imaging (MRI) reveal no abnormalities right away. Newer MRI imaging methods such as diffusion tensor imaging and functional MRI, on the other hand, may lead to an earlier diagnosis of concussion. Even in the face of a mild TBI, modest degrees of axonal damage have been hypothesized to occur.

Chronic Traumatic Encephalopathy (CTE):

Mild TBI may lead to CTE, which is a delayed manifestation of mild TBI. This entity has received widespread public attention since one of the terrible outcomes of CTE is mental problems, which have resulted in suicidal conduct in a number of high-profile players in professional sports. Dysarthric speech, tremors, trouble paying attention, memory and executive

function impairments, incoordination, and pyramidal symptoms are some of the other clinical indications of CTE. CTE is most likely the consequence of increasing neuronal loss.

Extra-axial Hematomas:

Epidural hematomas (EDH) and subdural hematomas (SDH) are both types of extra-axial hematomas (SDH). EDH is caused by a direct hit to the temporal area, which may sometimes result in a skull fracture and a rupture of the middle meningeal artery. However, venous injuries, such as transverse sinus disruption, have also been linked to more posteriorly directed EDH. Once a threshold level of intracranial pressure (ICP) is achieved, EDH may quickly increase in size, allowing a person to present with basically normal mentation, followed by worsening along the herniation syndromes cascade.

Traumatic Subarachnoid Hemorrhage and Contusions:

In most cases, contusions occur as a consequence of coup and countercoup forces. Coup injuries happen at the point of impact, while contrecoup injuries happen on the other side of the impact, most often injuring the frontal lobe and anterior temporal lobe. Trauma is the most common cause of subarachnoid hemorrhage, which occurs when tiny capillaries rupture and leak blood transiently into the subarachnoid region. Because blood is pushed into the subarachnoid space under artery pressure in spontaneous aneurysmal subarachnoid hemorrhage, traumatic subarachnoid hemorrhage is often not as serious a brain damage as spontaneous aneurysmal subarachnoid hemorrhage.

Diffuse Axonal Injury (DAI):

The most severe kind of axonal shearing damage is DAI. For such an injury to occur, significant rotational acceleration/deceleration forces are usually needed. Radiographically, it appears as modest hemorrhagic foci in the corona radiata, corpus callosum, internal capsule, brainstem, and thalamus on T2 and gradient echo sequences. Patients may appear with different degrees of clinical symptoms depending on where the axonal shearing occurs. A minority of DAI patients may have altered consciousness for a few days, while others may develop hemiparesis as a result of internal capsule involvement. Others never recover consciousness because portions of the reticular activating system have lost axonal integrity.

TBI Medical Interventions:

i. Height of the Head:

Raising the head of a person who has suffered a traumatic brain injury usually has immediate consequences. The displacement of CSF from the cerebral compartment, as well as the stimulation of venous outflow, both lower ICP. Although ICP is decreased and cerebral blood flow (CBF) is unchanged by head of bed elevation, mean carotid pressure is reduced.

ii. Hyperventilation:

ICP is reduced by hyperventilation because the intra-arterial carbon dioxide partial pressure (PaCO_2) is reduced, resulting in vasoconstriction. The decrease of cerebral blood volume is the end consequence of this sequence of events. Because vasoconstriction decreases CBF, prophylactic hyperventilations are not usually advised. Focal regions of ischemia may develop in

areas where autoregulation is maintained. In the case of severe TBI, hyperventilation is typically only required for a short time during acute neurological deterioration.

iii. *Hyperosmolar Therapy:*

In the event of a TBI, hyperosmolar treatment may be given as a bolus or as an infusion. The initial effects of mannitol have been demonstrated to be caused by changes in blood rheology. A rise in CBF occurs when blood rheology improves and blood becomes less viscous. Transient vasoconstriction is the body's autoregulatory reaction to this, which eventually lowers CBF. Although mannitol has osmotic diuretic characteristics, this method for lowering ICPs is believed to occur after the main impact.

iv. *Cooling for Therapeutic Purposes:*

TBI is believed to cause oxidative stress as a side effect. Therapeutic hypothermia has been demonstrated to reduce oxidative damage in babies and children. The cerebral metabolic requirement reduces when the body temperature drops. Changes in blood sugar, platelet count, and coagulation factors are all hazards associated with this kind of treatment. When someone is brought to a hypothermic condition, their platelet count and coagulation factors must be evaluated before any invasive treatment. Therapeutic cooling has had inconsistent success in the treatment of severe TBI and is now considered a second-tier treatment option.

v. *Monitoring of the ICP:*

In the case of ICP monitoring in brain-injured patients, several indications have been proposed as recommendations. Some individuals have clinical symptoms of severe neurological impairment but no obvious signals that they need emergency surgery. In patients with a severe TBI, a GCS of 3 to 8, and an abnormal CT scan of the head, there is Level II evidence for using an ICP monitor. If two or more of the following are observed at admission: age over 40 years, unilateral or bilateral posturing, or systolic blood pressure of 90 mm Hg, Level III evidence supports putting an ICP monitor in patients with a severe TBI and a normal CT scan of the head.

Regeneration of the Neurovascular System:

It's been suggested that neuronal and vascular regeneration play a part in brain healing after a head injury. Neurogenesis has been discovered in the subgranular zone of the hippocampus's dentate gyrus (DG) and the subventricular zone of the adult brain. TBI has been shown to promote neurogenesis in the cerebral cortex, DG, and CA3 in animal models. In cells, Thymosin 4 (T4) is an essential G-actin-sequestering molecule. Tb4 injection promotes NPC growth in animal models. Tb4 also promotes NPC differentiation and increases angiogenesis. There is a specific population of astrocytes in the subventricular and subgranular zones that may divide and differentiate into new neurons. After a TBI, these newborn neurons are thought to play a role in replacing neurons in the olfactory bulb, brain, and hippocampus. The number of regenerated neurons in young animals is higher than in older animals, according to animal models. The process of NPC proliferation and differentiation peaks 2 to 5 days after TBI, but some investigations go as far as 14 days[7], [8].

2. LITERATURE REVIEW

H. Dash et al. discussed about Management of Traumatic Brain Disease[9]. Traumatic brain injury (TBI) has been dubbed the modern-day "hidden pandemic" since it is the greatest cause of

death and morbidity in children and young people in both industrialized and developing countries. TBI therapy has experienced a paradigm change in recent years. The Brain Trauma Foundation's protocol-based recommendations are suitable for the treatment of severe TBI. Prophylaxis and early treatment of intracranial hypertension and secondary brain damage, preservation of cerebral perfusion pressure, and providing sufficient oxygen supply to injured brain tissue are the goals and objectives of its management. The authors of this paper address protocol-based methods to the treatment of severe TBI in accordance with current recommendations.

W. Peeters et al. discussed about Traumatic Brain injuries[10]. Traumatic brain injury (TBI) is a major public health and socioeconomic issue throughout the globe, necessitating epidemiological surveillance of TBI incidence, prevalence, and outcomes. The goal of this study was to characterize the epidemiology of traumatic brain injury in Europe and to assess incidence study methods. A comprehensive review and meta-analysis of publications reporting the epidemiology of TBI in European nations were conducted. The keywords epidemiology, incidence, brain injur*, head injur*, and Europe were searched in the PubMed electronic database. Only papers published in English between 1990 and 2014 that reported on data gathered in Europe were included. In all, 28 epidemiological studies on TBI were found in the literature, representing 16 European nations. Between studies, there was a lot of variance in case definitions and case selection. The two most common causes of TBI were falls and road traffic accidents (RTA), with falls being recorded more often than RTA. TBI incidence peaked in the oldest age groups in the majority of studies. An overall incidence rate of 262 per 100,000 for hospitalized TBI was calculated in the meta-analysis. Differences in inclusion criteria and case ascertainment make it difficult to interpret published epidemiologic research. Despite this, changes in epidemiological trends have been discovered: falls are now the most frequent cause of TBI, particularly in the elderly. For accurate monitoring of epidemiological trends and to guide proper targeting of preventive efforts, the quality of standardized data collection for TBI must be improved.

3. DISCUSSION

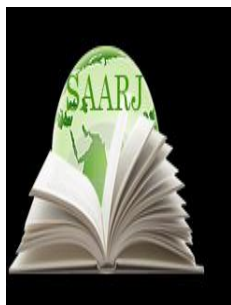
Traumatic Brain Injury (TBI) is a disturbance in brain function caused by a blow, bump, or jolt to the head, the head striking an item abruptly and forcefully, or an object piercing the skull and entering brain tissue. Mild TBI, often known as a concussion, Moderate TBI, and Severe TBI are the three major forms of TBI. Concussions are a kind of TBI that is relatively mild. Mild types produce just transient symptoms that go away within a few days or weeks. TBIs with the most severe consequences may result in irreversible brain damage, coma, or death. TBI is most often caused by falls from a bed or ladder, down stairs, in the bath, and other falls, especially in elderly people and children.

4. CONCLUSION

A severe hit or jolt to the head or body typically causes traumatic brain damage. Despite the fact that there is no effective therapy for TBI rehabilitation today, attempts to create therapeutic methods for TBI recovery have been ongoing for decades. In the acute treatment of TBI patients, standard medical and surgical procedures are always important. The number of TBI survivors with different impairments has grown owing to the increasing population of TBI survivors as a result of improved acute treatment recommendations in the acute phase of TBI. This necessitates a transition in TBI research to the fields of neurorestoration and neurorehabilitation.

REFERENCES

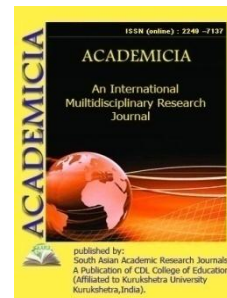
1. E. R. Zanier *et al.*, "Induction of a transmissible tau pathology by traumatic brain injury," *Brain*, 2018, doi: 10.1093/brain/awy193.
2. E. R. Zanier, T. Zoerle, D. Di Lernia, and G. Riva, "Virtual reality for traumatic brain injury," *Front. Neurol.*, 2018, doi: 10.3389/fneur.2018.00345.
3. J. D. Cassidy *et al.*, "Incidence, risk factors and prevention of mild traumatic brain injury: Results of the WHO Collaborating Centre Task Force on Mild Traumatic Brain Injury," *Journal of Rehabilitation Medicine, Supplement*. 2004, doi: 10.1080/16501960410023732.
4. L. J. Carroll *et al.*, "Prognosis for mild traumatic brain injury: Results of the WHO Collaborating Centre Task Force on Mild Traumatic Brain Injury," *Journal of Rehabilitation Medicine, Supplement*. 2004, doi: 10.1080/16501960410023859.
5. S. H. Haddad and Y. M. Arabi, "Critical care management of severe traumatic brain injury in adults," *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*. 2012, doi: 10.1186/1757-7241-20-12.
6. J. Ramos-Cejudo *et al.*, "Traumatic Brain Injury and Alzheimer's Disease: The Cerebrovascular Link," *EBioMedicine*. 2018, doi: 10.1016/j.ebiom.2018.01.021.
7. A. C. McKee and M. E. Robinson, "Military-related traumatic brain injury and neurodegeneration," *Alzheimer's Dement.*, 2014, doi: 10.1016/j.jalz.2014.04.003.
8. L. J. Carroll, J. D. Cassidy, L. Holm, J. Kraus, and V. G. Coronado, "Methodological issues and research recommendations for mild traumatic brain injury: The WHO Collaborating Centre Task Force on Mild Traumatic Brain Injury," *Journal of Rehabilitation Medicine, Supplement*. 2004, doi: 10.1080/16501960410023877.
9. H. H. Dash and S. Chavali, "Management of traumatic brain injury patients," *Korean Journal of Anesthesiology*. 2018, doi: 10.4097/kjae.2018.71.1.12.
10. W. Peeters *et al.*, "Epidemiology of traumatic brain injury in Europe," *Acta Neurochir. (Wien)*, 2015, doi: 10.1007/s00701-015-2512-7.



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A BRIEF STUDY ON AIDS/HIV

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ABSTRACT

HIV/AIDS has long been one of the world's most widespread illnesses. HIV infection and AIDS are caused by the human immunodeficiency virus (HIV), which is a lent virus. AIDS is a human disease in which the immune system gradually fails, allowing life-threatening infections and malignancies to flourish. HIV infection is spread via the transmission of blood, sperm, vaginal fluid, and breast milk. HIV is found in various body fluids as free virus particles as well as virus inside infected immune cells. HIV infects important immune cells such as helper CD4 T cells and macrophages. Through a variety of processes, including pyroptosis of infected T cells, HIV infection causes low numbers of T cells. The symptoms of AIDS are mainly caused by diseases that do not occur in people who have a sound immune system. The majority of these infections are caused by bacteria, viruses, fungi, and parasites that are usually regulated by immune system components that HIV destroys. When a couple with one infected partner uses condoms on a regular basis, the risk of HIV infection is less than 1% per year. Female condoms may offer an equal degree of protection, according to some research.

KEYWORDS: AIDS, HIV, Symptoms, Transmission.

INTRODUCTION

AIDS is caused by the HIV virus. Our bodies normally have an immune system that fights viruses and germs. White blood cells in the immune system defend us against infections. CD4+ cells, commonly known as helper cells or T cells, are found in white blood cells. A person who has been infected has the ability to grow. The immune system of the body is exploited by these illnesses. These infections cause a variety of health issues and may even result in death. HIV is unable to defend against illness, and the number of CD4 cells in the body declines as a result. Although there is no cure for AIDS, there are medications that may help to delay the progression of the illness and keep you healthy for longer. Diseases can't be cured with medication[1], [2].

AIDS is caused by the HIV virus. Our bodies normally have an immune system that fights viruses and germs. White blood cells in the immune system defend us against infections. CD4+ cells, commonly known as helper cells or T cells are found in white blood cells. A person who has been infected has the ability to grow. The immune system of the body is exploited by these illnesses. These infections cause a variety of health issues and may even result in death. HIV is unable to defend against illness, and the number of CD4 cells in the body declines as a result. Although there is no cure for AIDS, there are medications that may help to delay the progression of the illness and keep you healthy for longer. Diseases can't be cured with medication[3].

HIV:

H-It infects only human beings and also transmitted between humans not from animals. It is not transmitted from bites of mosquitoes, bats or any other species.

I-Our bodies have an immune system that protects us from germs, infections, and other diseases. A person with HIV, on the other hand, is unable to fight illnesses. However, the immune system deteriorates.

V-Virus is a tiny, basic organism that is dormant outside of the human body and becomes active once inside.

AIDS:

A-It is not inherited, which means it cannot be passed down from generation to generation. It is spread from an infected person to a healthy one.

I-It causes the immune system to deteriorate.

D--Induces a CD4+ cell deficit in the immunological system.

S-It is a group of illnesses.

Structure of HIV:

Figure 1 shows the structure of HIV and its parts are stated below:

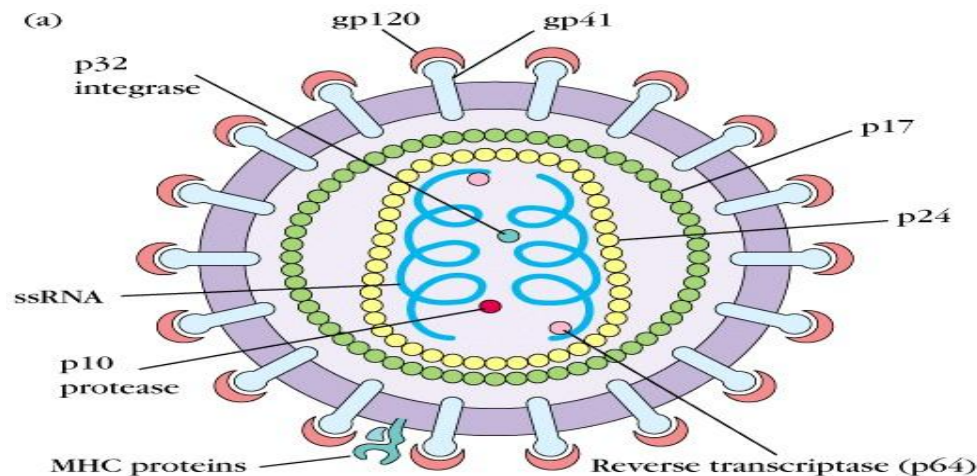


Figure 1: Illustrates the structure of HIV[4]

- **Gp120:**Gp120 gets its name from its molecular weight of 120. It is required for viral entrance into cells because it aids in the attachment of viruses to particular cell surface receptors.
- **GP41:**GP41 is a component of retroviruses' envelope protein complex, which includes the human immunodeficiency virus. It's a group of enveloped viruses that utilize reverse transcriptase to reproduce in their host cells. It goes after a host cell. Envelope of the viral it is the envelope that the virus adheres to.
- **P17:**Protein makes up the viral core. It's in the form of a bullet. Reverse transcription, integrase, and protease are three enzymes needed for HIV replication.
- **P24:**P24 is a part of the HIV capsid.
- **Protease:**Protease is a retroviral aspartyl protease that is required for HIV, the retrovirus that causes AIDS, to complete its life cycle. This enzyme cleaves freshly produced polyproteins at the proper sites to produce the natural protein components of the HIV virus.
- **Integrase:**Retrovirus-produced enzyme that allows the retrovirus' genetic material to be incorporated into the DNA of infected cells. RNA Long strands of DNA are used by all species, including most viruses, to store their genetic material. Retroviruses are unique in that their genes are made out of RNA.

Causes:

It is brought by through sexual intercourse between two people. HIV is a kind of virus. When a person contracts HIV, the virus weakens and destroys their body's defense mechanism (the immune system), rendering it incapable of fighting diseases. It is brought on by:

- Sharing drug needles or syringes.
- Sexual encounter with someone who is HIV positive, whether it is vaginal, or oral.
- Other sexually transmitted illnesses including syphilis, herpes, and gonorrhea seem to enhance the risk of HIV infection during unprotected sexual contact with an HIV-positive partner.

- iv. During pregnancy, delivery, and breastfeeding, an HIV-positive mother may infect her baby.

Transmission:

HIV is spread mostly via sexual contact, blood transfusions, blood products, and infected needles, and transmission from mother to child. Despite the fact that gay interaction is still a significant source of HIV in the United States, “heterosexual sexual transmission is the most important method of HIV transmission globally today.” In industrialized nations, treatment of blood products and donor screening has virtually reduced the danger of HIV transmission via tainted blood products, but the virus continues to spread among intravenous drug users who share needles. Infected blood and contaminated needles continue to be major sources of infection in poor nations. Thirteen to thirty-five percent of HIV-positive pregnant women will pass the virus on to their kids; transmission happens both before and after delivery. Infected moms' breast milk has also been shown to have significant amounts of the virus[5], [6].

The fecal-oral route, aerosols, insects, or casual touch, such as sharing household goods or hugging, do not transmit HIV. Direct inoculation by needle sticks is the main source of danger for health care personnel. Although tiny amounts of the virus may be found in saliva, the virus cannot be transmitted via kissing. HIV may be transmitted from one infected individual to another in the following ways:

- Blood (including menstrual blood)
- Semen
- Vaginal secretions
- Breast milk.

Symptoms:

Many individuals living with HIV show no visible signs or symptoms at all. According to recent research, 70 percent to 90 percent of individuals infected with HIV have flu-like symptoms within a few weeks after infection. Fever, rash, and a severe sore throat are the most frequent symptoms, which all appear at the same time. These symptoms in a person who is otherwise healthy may suggest that they have just been infected with HIV. Patients with HIV may have yeast infections (oral or vaginal) that may not go away or recur often. Herpes infections, which may cause oral, vaginal, or anal sores, are also prevalent[7]–[10].

Infected individuals are more likely to get herpes zoster (shingles). Other pulmonary infections (pneumonia) or atypical mycobacterial infections may be life-threatening for your loved one. Pelvic inflammatory illness, which does not respond to therapy, may affect women. The virus may affect the neurological system (nerves, spinal cord, or brain) and cause a wide range of symptoms, including tingling in the feet and difficulty walking, as well as memory problems.

Diagnosis:

HIV is most frequently diagnosed by looking for antibodies to the virus in your blood or saliva. Unfortunately, your body needs time to produce these antibodies, which may take up to 12 weeks. A novel kind of test that looks for HIV antigen, a protein generated by the virus shortly

after infection, may help confirm a diagnosis fast. The tests for HIV AIDS diagnosis are as follows:

- *Test at home:*

A home test that has been authorized by the Food and Drug Administration. You swab fluid from your upper and lower gums to perform the test. If the test results are positive, you should visit your doctor to have the diagnosis confirmed. If the test is negative, the findings must be repeated three months later to be confirmed.

- *Treatment Tailoring Tests:*

If you are diagnosed with HIV/AIDS, you may undergo a variety of testing.

These tests include the following:

- *CD4 count:* CD4 cells are a kind of white blood cell that HIV targets and destroys.
- *Viral load:* This test determines how much virus is present in your blood. According to studies, individuals with greater viral loads had a worse prognosis than those with lower viral loads.
- *Drug resistance:* This blood test reveals if your HIV strain is resistant to particular anti-HIV medicines.

Treatment:

HIV is treated with antiretroviral medications. These are antiretroviral medicines that work against the human immunodeficiency virus (HIV). They can help you live longer and have a better quality of life. The following are the antiretroviral medication classifications:

- Zidovudine (AZT), Didanosine, Lamivudine, and Tenofovir are examples of nucleoside reverse transcriptase inhibitors (NRTIs).
- Nevirapine, Delavirdine, and Efavirenz are nonnucleoside reverse transcriptase inhibitors.
- Indinavir, Nelfinavir, Amprenavir, Lopinavir, and Atazanavir are all protease inhibitors.

HAART: It is an antiretroviral treatment with a high level of activity. HAART may also be used to treat HIV. It's a three-drug combo.

DISCUSSION

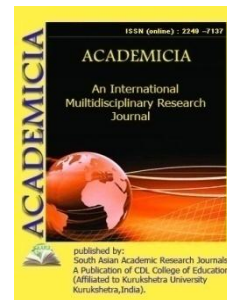
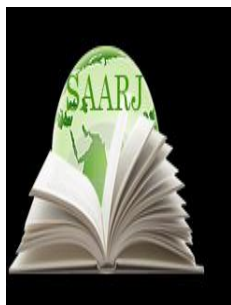
The human immunodeficiency virus (HIV) is a virus that affects the immune system of the body. AIDS may develop if HIV is not treated (acquired immunodeficiency syndrome). Knowing the fundamentals of HIV may help you stay healthy and prevent the spread of the virus. The human immunodeficiency virus causes HIV infection. HIV is acquired via contact with HIV-infected blood, sperm, or vaginal secretions. The majority of individuals acquire HIV by having unprotected intercourse with an HIV-positive person. Sharing drug needles with someone who is HIV-positive is another frequent method to acquire it. HIV cannot be eradicated by the human body, and there is no effective HIV treatment. As a result, if you have HIV, you will have it for the rest of your life. People with HIV, on the other hand, may live long and healthy lives while preventing HIV transmission to their sexual partners by taking HIV medication (also known as antiretroviral therapy or ART).

CONCLUSION

Historically, HIV prevention efforts have mainly focused on creating risk reduction strategies for those who are at high risk of contracting the virus. Only 18 (32.7 percent) of 55 state and municipal submissions to the CDC for funding for HIV prevention programs identified HIV-infected people as a target group for HIV prevention initiatives, according to a 1999 study. Despite the fact that millions of individuals in the United States are at "behavioral risk" for HIV infection, the virus can only be transmitted between infected persons. As the number of people living with HIV continues to rise as a result of antiretroviral therapy (ART), so does the need for lifetime preventive measures tailored to them.

REFERENCES

1. A. A. Awofala and O. E. Ogundele, "HIV epidemiology in Nigeria," *Saudi Journal of Biological Sciences*. 2018, doi: 10.1016/j.sjbs.2016.03.006.
2. K. V. Vijayan, K. P. Karthigeyan, S. P. Tripathi, and L. E. Hanna, "Pathophysiology of CD4+ T-Cell depletion in HIV-1 and HIV-2 infections," *Frontiers in Immunology*. 2017, doi: 10.3389/fimmu.2017.00580.
3. E. J. Wing, "HIV and aging," *International Journal of Infectious Diseases*. 2016, doi: 10.1016/j.ijid.2016.10.004.
4. "HIV." <https://biosci.mcdb.ucsb.edu/immunology/Immunodeficiencies/HIV-structure.htm> (accessed Sep. 15, 2017).
5. P. Hlongwa, "Current ethical issues in HIV/AIDS research and HIV/AIDS care," *Oral Dis.*, 2016, doi: 10.1111/odi.12391.
6. P. M. Sharp and B. H. Hahn, "Origins of HIV and the AIDS pandemic," *Cold Spring Harb. Perspect. Med.*, 2011, doi: 10.1101/cshperspect.a006841.
7. S. Kumar, J. Tadakamadla, A. Y. B. H. Areeshi, and H. A. W. M. Tobaigy, "Knowledge and attitudes towards HIV/AIDS among dental students of Jazan University, Kingdom Saudi Arabia," *Saudi Dent. J.*, 2018, doi: 10.1016/j.sdentj.2017.10.003.
8. E. N. Maleka, "Monitoring and evaluation of sport-based HIV/AIDS awareness programmes: Strengthening outcome indicators," *Sahara J*, 2017, doi: 10.1080/17290376.2016.1266506.
9. C. Sharp, F. Penner, L. Marais, and D. Skinner, "School connectedness as psychological resilience factor in children affected by HIV/AIDS," *AIDS Care - Psychol. Socio-Medical Asp. AIDS/HIV*, 2018, doi: 10.1080/09540121.2018.1511045.
10. D. Sia, Y. Onadja, M. Hajizadeh, S. J. Heymann, T. F. Brewer, and A. Nandi, "What explains gender inequalities in HIV/AIDS prevalence in sub-Saharan Africa? Evidence from the demographic and health surveys," *BMC Public Health*, 2016, doi: 10.1186/s12889-016-3783-5.



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RESISTANCE OF CEMENT AND CONCRETE TO CHEMICAL AND AGGRESSIVE FACTORS

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ABSTRACT

The resistance of the cement mortar to aggressive influences, when exposed to Alr, lime becomes denser due to gas formation in the Alr, the durability of the garage erected in the building. It has also been found that exposure to harmful exhaust gases increases, usually in wet conditions.

KEYWORDS: *Cement Mortar, Aggressive Action, Acid, Carbonic Acid, Carbonization, Tubular Pores, Crystalline Hydrate, Calcium Hydroxide.*

INTRODUCTION

Durability of cement stone means its resistance to the aggressive effects of the external environment (fresh and mineral waters, the combined effects of water and cold, as well as high temperatures, wetting and drying, and the accumulation of salt solutions in the capillaries and pores of cement stone to other crystal hydrates). Because portland cement is a material that is

very resistant to weathering. When cement stone interacts with Alr, lime condenses better and is more durable due to carbonation from carbon dioxide in the Alr.

Aggressive gases, on the other hand, can usually only affect cement in humid conditions. In this case, they often act as acids (SO_2 , H_2S , Cl_2 , etc.). It is known that Portland cement consists of very small tubular pores. The gas penetrates these cavities very easily. With the appearance of wet conditions, the crystals of $\text{Ca}(\text{OH})_2$, which is the main structural element of cement stone in tubular small cavities, are broken down. This poses a very significant risk to the strength of concrete structures.

Cement stone is a material that is not exposed to the harmful effects of Alr. When exposed to Alr, lime becomes more dense due to carbonization with carbon dioxide in the Alr, increasing its durability.

The effects of harmful gases are usually exacerbated in humid conditions. The processes of erosion in this case are almost indistinguishable from the processes under the influence of water.

To better visualize the resistance of cement stone to aqueous media, let us briefly review the history of research in this area.

The invention of Portland cement promoted his work in the field of concrete. From the second half of the XIX century, Portland cement began to be used as reinforced concrete in construction.

As a result of the widespread use of Portland cement in hydraulic structures in the 20s and 30s of the last century, it became clear that the structures were not resistant to water, and many hydraulic structures were demolished.

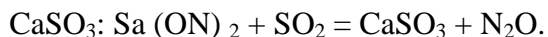
The degree of water resistance of Portland cement-based hydraulic structures in Russia and European countries was determined by Professor A.R. Shulyachenko, engineer V.I. Charnomsky and Academician A.A. Studied by Baykov (late nineteenth and early twentieth centuries). The science of concrete erosion was established as a result of the analysis of the causes of the deterioration of Portland cement under the influence of water, especially sea water. Scientists have also achieved certain results in the study of the water resistance of cement in general. Consider, for example, the effect of fresh water. The best soluble among the hydration products of cement is calcium hydroxide, which is soluble in 1.3 grams per liter of water. In terms of solubility, the next place after lime is hydroaluminate, hydrosulfoaluminate (batsilla), followed by hydrosilicates. In general, cement can be completely melted, but the process is very slow.

If the concrete hardens without reaching the rhythm, its pores are large and water penetrates through them, then the harmful effects of water are clearly visible. Due to the carbonization of the lime separated from the concrete, white saline spots appear on its surface. In most cases, these moldy spots are referred to as salinization of concrete.

Salinity of concrete is the leaching of lime milk from the concrete mass. This process, in turn, weakens the bond with the fillers, thereby reducing the strength of the structure.

The solubility effect of water increases with increasing water hardness. Extremely hard water can also strengthen concrete due to its ability to form calcium carbonate in the pores and surface.

Often concrete also decomposes under the influence of carbonic acid water. Initially, dissolved carbonic acid reacts with $\text{Ca}(\text{OH})_2$ to form



The advantage of this process is that well-soluble Ca (ON)_2 is converted to 40 times less soluble SaSO_3 than itself. However, when SO_2 is 250,300 milligrams per liter, the following secondary process occurs.



The easily soluble calcium bicarbonate $\text{Ca (NSO}_3)_2$ is then washed out of the cement stone. Instead, Sa (ON)_2 is formed again. Thus, almost all of the cementite minerals are soluble. Water with a temporary hardness of not more than 24°C is not dangerous for concrete.

To save concrete from salinization, the surface of concrete structures is plastered with bitumen, varnish, natural stone, and even lead tin. But these are very expensive and at the same time do not last long. It is also possible to compact the surface of concrete by vibration. The effectiveness of these measures is less. This is because if the top protective layer is damaged by impact, the concrete will break down more easily.

The problem of water erosion under the influence of water was solved by the German scientist Mixelis and the Russian scientist A.A. Baykov makes the right decision, they have made extensive use of puttsolan and similar trass, tuff, pumice additives to increase the water resistance of free lime, which is well soluble in water in hardening portland cement. The emergence of Portland cement had put the use of puttsolan unused.

At an international congress in St. Petersburg in 1908, Russian cementers proposed the mandatory placement of Portland cement used in the construction of hydraulic structures, but this was in fact nothing new.

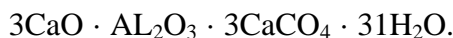
Puttsolan cement is mainly used in the construction of structures under water and underground, as well as in groundwater. In ancient times, for example, in Bukhara, in the construction of foundations, dahma walls, pools, baths in sernam, wet and saline soils, lime puttsolan cement, which is called "ridge", was widely used. "Kir" mainly acted as a surfactant for plant ash, lime (sometimes a mixture of gypsum), grape seed and egg white.

Thus, in Russia, hydraulic compounds such as trepel, opoka, diatomite, trass and tuff, which are not inferior to Italian puttsola, began to be widely used. Previously, 10..15% admixture was used in Portland cement in factories, but later it was added to 20..40% to the extent that it does not affect the strength of cement. This both increases the water resistance of the cement and lowers its cost.

If the water absorbed into the concrete contains dissolved salts, the chemical melting process will also go away. Salts are present in almost all waters and degrade the quality of cement. One ton of river water contains on average up to 1.5 kilograms of salt. Salts of river water: consists of calcium sulfate and calcium carbonate, while salts of sea water contain: table salt 78%, magnesium chloride 11%, magnesium sulfate 5% and various salts of calcium 4%. For this reason, conventional Portland cement is not used in the construction of underwater hydraulic structures at sea. For this purpose it is necessary to create special cements.

It is known from construction experience that concrete sometimes cracks under the influence of water containing calcium, magnesium, sodium, ammonium salts of sulfuric acid and their mixtures. This is because such substances in water chemically react with the hydroaluminate

$3\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot 6\text{N}_2\text{O}$) in ordinary Portland cement, which solidifies to form needle-like crystals reminiscent of bacilli. Often such a compound is also called a "cement bacilli". Its chemical expression is as follows:



When this compound, sometimes called calcium hydrosulfoaluminate, is formed, the hardened cement tends to expand in volume. As a result, the internal tension increases and cracks appear in the cement. This is because the accumulation of dissolved gypsum with insoluble $3\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot 6\text{N}_2\text{O}$ causes an increase in the volume of formation of insoluble hydrosulfoaluminate (relative to insoluble $3\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot 6\text{N}_2\text{O}$) by about 4.6 times. As the cement stone expands, its structure deteriorates, its strength decreases, and it breaks down. Cement bacilli are dangerous for concrete, and are especially dangerous when combined with salinity. Under the influence of bacilli, the structure cracks and cracks, opening the way for water in the concrete. Consequently, favorable conditions are created for the dissolution of calcium hydrate. Thus, the "cement bacilli" accelerates the salinization of cement.

Proper selection of binding materials is important in increasing the water resistance of concrete. This in turn extends the service life of the concrete. To increase the resistance of Portland cement to sulphate water, it is necessary to remove $3\text{CaO} \cdot \text{Al}_2\text{O}_3$ from it. But there is a downside to this measure. When this mineral is completely removed from the cement composition, the hardening of the cement is greatly slowed down. To prevent this, it is necessary to limit the amount of $3\text{CaO} \cdot \text{Al}_2\text{O}_3$ in the resulting cement. In the production of such cement, great attention is paid to the composition of the raw material. In this way, the spread of "cement bacilli" is reduced.

Also, cement made on the basis of clinker, which releases less lime during hardening, is resistant to washing of lime.

If the water that seeps into the concrete is contaminated with industrial effluent, it will have a worse effect on the concrete. Because concrete is an alkaline product, it contains a lot of free-standing lime hydrate. It is therefore, by its very nature, resistant to the effects of acid. Lime dissolves very quickly under the influence of acid. Therefore, the concrete floors of containers, pipes and appliances, walls and ceilings, cellulose, some types of fertilizers, lactic acid and foodstuffs are quickly destroyed.

Alkaline solutions (NaOH, KOH) have different effects on Portland cement. Low concentrations of alkaline solutions do not damage the concrete. From time to time the alkali solution on the cement stone begins to carbonize and crystallize in the presence of carbon dioxide gas. The alkaline salts formed form wet hydrates with the moisture in the alkali. The cement stone then expands in size, but such dangerous expansion is rare under the constant action of dilute alkaline solutions.

Alkaline solutions with very high concentrations break down the cement.

Under such conditions, the solubility of $\text{Ca}(\text{OH})_2$ decreases due to the presence of the same ions (OH^-), but the solubility of other components in the cement stone, especially aluminate compounds, is greatly increased. Under the influence of high concentrations of alkaline solutions, the cement stone breaks down quickly. Thus, increasing the chemical resistance of cement stone is an issue of great importance in the national economy.

V.M.Moskvin has divided the following three mAln types of cement stone depending on the mAln signs of corrosion (deterioration) in the aqueous medium:

Type 1 corrosion - cement stone is damaged as a result of melting of components;

Type 2 corrosion - cement stone is broken as a result of exchange reactions between substances in water and cement components;

Type 3 corrosion - cement stone is broken down as a result of precipitation and crystallization of insoluble salts in the pores of cement paste.

A complete classification of the mAln types of corrosion of concrete under the influence of natural waters was developed by V.V.Kind.

1. Spontaneous melting of calcium hydrate oxide in cement stone, leaching and alkalinization corrosion;

2. Erosion due to the action of acids with a pH value of at least 7 - acid corrosion;

1. Carbonic acid corrosion, which is somewhat similar to acid corrosion and causes the erosion of cementite;

2. Sulfate corrosion, which in turn is divided into: a) corrosion of sulfoaluminate, which occurs under the influence of ions with a concentration of 0.25 ... 0.3 to 1 g / l;

b) sulfoaluminate - gypsum corrosion, the concentration of which in the solution is more than 1 g / l, formed mAlnly under the influence of sulfate ions (SO_4);

c) gypsum corrosion caused by water containing large amounts of Na_2SO_4 and K_2SO_4 ;

5. Magnesium corrosion, which in turn is divided into: a) magnesium corrosion caused by the action of magnesium cations in the absence of SO_4^- ions in water;

These types of corrosion can occur under the influence of natural waters, industrial and domestic wastewater. In addition, the combined effect of gypsum and acid can also be of great importance. Corrosion under the influence of hydrogen sulfide is unusual. In addition, cement and concrete structures can also be exposed to beef fat, vegetable oil, carbohydrates, alcohol, phenol, sugar, various acids and alkalis.

No matter how different the substances that cause corrosion, we will consider some of the classifications of V.M.Moskvin and V.V.Kind the corrosion under their influence.

Sulfoaluminate corrosion is a type of sulfate corrosion that occurs under the influence of sulfate waters containing 0.25..1g / l ions in cement and concrete. If the amount of SO_4^- ions exceeds the specified amount, this corrosion will turn into sulfoaluminate gypsum corrosion. If the concentration of sulfate ions drops below 0.25 g / l, according to V.V.Kind, this will not be dangerous for Portland cements.

Natural waters or industrial effluents contain NaSO_4 , Na_2SO_4 , MgSO_4 , MgCl_2 , NaCl , and similar salts may be present in varying amounts:

$\text{Na}(\text{ON})_2 + \text{Na}_2\text{CO}_3 + 2\text{N}_2\text{O} = \text{CaSO}_4 \cdot 2\text{N}_2\text{O} + \text{NaOH}.$

$3\text{NaO} \cdot \text{Al}_2\text{O}_3 \cdot 6\text{N}_2\text{O} + 3 \text{CaCO}_3 \cdot 2\text{N}_2\text{O} + 19\text{N}_2\text{O} = 3\text{CaO} \cdot \text{Al}_2\text{O}_3\text{CaSO}_4 \cdot 31\text{N}_2\text{O}.$

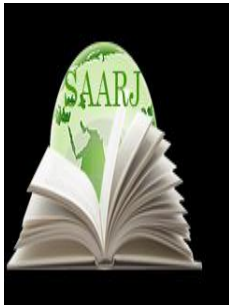
Sodium hydrate oxide is a well-soluble substance that is washed away from the cement stone, forming a sparingly soluble calcium hydrosulfoaluminate during the reaction. As it crystallizes, it absorbs 30..32 moles of water, expands in volume by about 4.6 times, resulting in a sharp deterioration in the strength of the cement stone.

Calcium hydrosulfoaluminate crystals consist of long thin needles that look like some bacilli. Because of this similarity, as well as its very dangerous effect on cement stone, calcium hydrosulfoaluminate is called “cement bacilli”.

In the first period, when calcium hydrosulfoaluminate (ettringite) is formed (even when the gypsum is saturated), it contributes to the compaction of the cement, but as a result of the accumulation of sulphate water, the cement begins to break down rapidly.

USED LITERATURE

1. Timashev V.V., Suleymanov A.T., Sichkaraeva :A.Yu, Tleuberganova A.I. Improving the quality of cement based on high silk raw materials with the help of barium containing additives, 'Cement', 1979, No.5.
2. Luginina I.G., Khudyakova T.M., Sinkaraeva A.Yu. The influence of magnesium oxide husks on the properties of hydrotechnical cement. 'Cement', 1976.
3. Volkonsky B.V., Konovalov P.F., Makashev S.D. Mineralizers in the cement industry. 1964.
4. Egamberdiyev M.S. A new method of obtaining high density concrete. The Republic Of Uzbekistan-Government Agencies scientific – practical conference on energy saving problems (Scientific articles collection)- Bukhara, 1993. 304 – 306 p.
5. Egamberdiyev M.S., Atakuziev T.A. Role of cement exothermy and the formation of the temperature field of the solid concrete mixture during layer-by-layer concreting. // New inorganic materials and technical conferences dedicated to the fifth anniversary of independence of the Republic of Uzbekistan with the participation of foreign scientists- 1996. p.130
6. Egamberdiyev M.S. A new method of obtaining high density concrete // Resources of the people's Republic of Uzbekistan on the network scientific practical conference “neck and energy saving problems” (Scientific summaries) Bukhara, 1993.1.
7. https://scholar.google.com/citations?view_op=view_citation&hl=ru&user=mA18-8IAAAAJ&citation_for_view=mA18-8IAAAAJ:dBIO0h50nwKC
8. https://scholar.google.com/citations?view_op=view_citation&hl=ru&user=mA18-8IAAAAJ&citation_for_view=mA18-8IAAAAJ:HIFyuExEbWQC



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**DEVELOPMENT OF TOURISM IN THE REPUBLIC OF
 KARAKALPAKSTAN**

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ABSTRACT

The oldest caravan routes in Karakalpakstan are the road connecting the East with the West through the famous Silk Road, and ancient and medieval civilization contributed to the emergence of highly original sources and wonderful examples of spiritual culture. Sufficient ignorance of tour operators, the lack of strong links between them and the influx of foreign tourists to the country, the influence of cultural institutions, non-governmental organizations have a negative impact on the development of tourism. Particular attention was paid to the spiritual development of society, a comprehensively developed person, the enrichment of spiritual culture. A number of important measures have been taken in the Republic of Uzbekistan and laid the foundation for future development.

KEYWORDS: *Institutions, Comprehensively, Non-Governmental, Caravan*

INTRODUCTION

First of all, independent Uzbekistan pays special attention to the restoration of ancient national culture and spirituality, the establishment of interaction with world civilization. Indeed, "it is more important than ever to pay attention to spirituality and enlightenment, moral education, the aspiration of young people to education and perfection in today's rapidly changing world and various new threats and dangers that threaten the stability and sustainable development of peoples."

The independence of the Republic of Uzbekistan marked a new era for the revival of national culture and traditions, as well as national crafts. The basis has been laid for the entry of the Republic of Uzbekistan into the world arena. The development of national culture is of great importance for the development of people in all aspects. The restoration of spirituality and values

is the basic conceptual and methodological principle of the model of historical development - the unity of the universal and national spiritual basis, cultural heritage, the restoration of historical programs, the principles of restoration and development of interethnic relations, special consideration of education and enlightenment¹.

The oldest caravan routes in Karakalpakstan are the road connecting the East with the West through the famous Silk Road, and ancient and medieval civilization contributed to the emergence of highly original sources and wonderful examples of spiritual culture. There are thousands of historical monuments and antiquities in the country, most of which are of historical and archaeological significance.

Law of the Republic of Uzbekistan on Tourism,² Decree of the President of the Republic of Uzbekistan on measures to ensure the accelerated development of the tourism industry of the Republic of Uzbekistan, PF-4861 of December 2, 2016 In accordance with the Decree³, the Republic of Karakalpakstan annually holds cultural and entertainment events, which are distinguished by the culture, identity and art of the people.

Sufficient ignorance of tour operators, the lack of strong links between them and the influx of foreign tourists to the country, the influence of cultural institutions, non-governmental organizations have a negative impact on the development of tourism. To see many unique historical, scientific, artistic and cultural heritage sites in the territory of the Republic, including the Travel Tourism route: Mizdakkhan archeological complex of Khojayli district, Davut ota shrine of Kungrad district, Sultan Uvays bobo shrine of Beruni district, Hakim ota mausoleum of Moynak district, Sheikh Jalil bobo mausoleum of Amudarya district, Norinjon bobo mausoleum of Elinqala district, Chinja bobo mausoleum of Ellikqala district; Ecological tourism route: Aral Sea of Moynak district, Lake Sudoche, Kuyi Amudarya biosphere reserve, Ustyurt plain of Kungrad district, Borsakelmes salt lake (salt deposit), open-air ship cemetery, Urga village;

The archeological tourist route includes: Chilpik, Ayazqala, Tpaqraqala, Gyaaur kala, Djampiq kala, Iyshan kala, Qizil kala, Kat kala, Jambas kala archeological sites and many others with a total of about 291⁵ sites. Of these, 131 are archeological sites, 24 are architectural objects, 91 are monumental objects and 45 are attractions^[1].

In the field of tourism, the steady growth of the eastern direction is widely observed. He noted that the number of people wishing to visit Karakalpakstan is growing. The countries of Central Asia are united on the basis of a single Great Silk Road chain, which includes about 20 countries, including the road from Japan to Europe.⁶

The Baday-Tugay sanctuary located in the Beruni region of the Republic of Karakalpakstan can be used as a tourist attraction. With its small area, the trek is very rich in flora and fauna.

On the Kokcha hill in the Turtkul region of the Republic of Karakalpakstan, there is a little-known "angry forest" monument of the Stone Age. It can become one of the most interesting objects for everyone in the development of tourism.

Director of the Institute of History of the Karakalpak branch of the Academy of Sciences of the Republic of Uzbekistan, member of the New York Academy of Sciences VN Yagodin made his contribution to the development of tourism in Karakalpakstan. The Institute of History, Archeology and Ethnography of the Karakalpak branch of the Academy of Sciences of the Republic of Uzbekistan in cooperation with the Tashkent Institute of Reconstruction has

developed a number of projects in the framework of the "Golden Ring of Ancient Khorezm". Many historical sites have been preserved in good condition, despite the fact that historical monuments have been around for thousands of years.⁷

It is necessary to use certain ecological features in the development of tourism in the country. A project to develop tourism in Karakalpakstan has been developed in cooperation with the media, historians and museum staff. A modern car camp has been built in the south-western part of the capital of Karakalpakstan. Every day there are car tourists from Kazakhstan, Russia, Turkmenistan and the Baltic States.

In developing the tourism project, Arab sheikhs and Japanese exoticists expressed interest in visiting unique archeological sites, nature reserves, and expanding tourism infrastructure around the world^[1].

The Ayazkatur travel agency, which was established in 1998, has a special place in the development of tourism in Karakalpakstan. By the year 2000, the summer tourist camp "Ayazkala" began its activities. In 2005, on the basis of a UNESCO grant, the company installed solar panels and water filters.⁸

The main goal of the project on construction and protection of clay constructions in Central Asia on the basis of the UNESCO project was to preserve the clay structures of Karakalpakstan in the climatic conditions of the Aral Sea. Good results have been achieved in a very short period of time since the establishment of Ayazkala-Tour. In October 2007, an international symposium entitled "At the Crossroads of Culture along the Aral Sea" was held in Nukus, Boston and Beruni. The second part of the seminar is dedicated to the 100th anniversary of the great researcher SP Tolstov, who studied the ancient Amudarya rivers. In this symposium: M.Mambetullaev (Nukus), N.Boroffka (Germany), S.B.Bolelov (Russia), M.M.Rojanskaya (Russia), I.A.Arjantseva (Russia), Yu.F.Buryakov (Tashkent), R.A. Hed-don (UK), M.Sh.Kdyrniyazov (Nukus), E.A.Armarchuk (Russia), EDZilivinetskaya (Russia), AITorgoev (Russia), A.V.G.Betts, Head of Archaeological Research of Karakalpakstan and Australia, and V.N.Yagodin participated with their reports.

According to the Resolution of the President of the Republic of Uzbekistan dated February 28, 2017 No PP-2803 "On additional measures for economic development and employment of Muynak district of the Republic of Karakalpakstan in 2017-2018" on October 24-25 in Muynak district International Music Festival, the International Eco-Festival "Restoration of the Aral Sea and the Muynak" and the gastronomic festival "99 dishes from the fish of the Aral Sea". More than 30 tourists from 9 countries of the world (Kazakhstan, Russia, France, Germany, Belgium, South Korea, China, America and England), 18 hotels from the Republic of Karakalpakstan and regions, including Ratmina, Massaget, Ayaz Yurt, Tourism companies such as "Jipek Joly", "Doslyq" and 5 "Movluda Qaldirgosh", "Tazabay Grant Servis", "Moynak Tur", "Nice Nukus", "Ayaz Yurt" took part in it.

At the international gastronomic festival "99 kinds of fish from the island" chefs prepared 112 fish dishes. Chefs of Muynak district prepared 78 fish dishes, 37 of which are ancient. The first place in the gastronomic festival "99 kinds of food from the fish of the island" was awarded to the chefs of Muynak district. The second place was taken by Khorezm region, and the third place was taken by skilled cooks of Amudarya district. Within the framework of this festival, in the

nomination "The best black house" the shepherds of Chimbay, Beruni and Amudarya districts were awarded.⁹

Decree of the President of the Republic of Uzbekistan dated February 3, 2018 No PF-5326 "On additional organizational measures to create favorable conditions for the development of tourism potential of the Republic of Uzbekistan",¹⁰ February 7, 2018 No PP-3514 "On accelerated development of domestic tourism In accordance with the decisions of the Government of the Republic of Uzbekistan "On measures to ensure the provision of tourism" provides for the organization of tourism and excursions throughout the country. A total of 211,478 people, including 48,745 Uzbeks, 13,319 foreign tourists, 68,980 young people and 80,434 people visited the museums for free in order to implement the project "Travel around Uzbekistan". In order to promote the museum exhibits, employees of state museums provided information about the activities of museums in 43 articles in newspapers and magazines, 202 TV and radio broadcasts through the media.

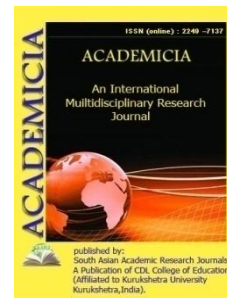
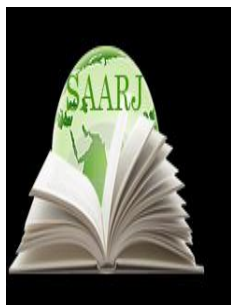
Within the framework of this project, the State Museum of Art's named after IV Savitsky of the Republic of Karakalpakstan was visited by 637 guests from Tashkent, Bukhara, Navoi, Kashkadarya, Samarkand regions, Urgench, Khiva region of Khorezm region in February 2018.^[10]

The transition to market relations has identified a number of important factors in the national and cultural revival of Karakalpakstan. Particular attention was paid to the spiritual development of society, a comprehensively developed person, the enrichment of spiritual culture. A number of important measures have been taken in the Republic of Uzbekistan and laid the foundation for future development. Socio-economic and spiritual changes and the transition to market relations are a large-scale and multifaceted process, but also include major changes in the cultural sphere as an important factor.

REFERENCES

1. Mirziyoev Sh.M. We will resolutely continue our path of national development and raise it to a new level. T. Uzbekistan, 2017. - p. 27
2. Tobacco G.A. The role of cultural and historical traditions in the foreign policy of the Republic of Uzbekistan. AKD. - T., 2014. --- B.13.
3. Bulletin of the Oliy Majlis of the Republic of Uzbekistan, 1999, No. 9, Article 227
4. Collection of Legislative Acts of the Republic of Uzbekistan, 2016, No. 49, Article 559
5. State Committee for Tourism Development of the Republic of Uzbekistan Territorial Department of the Republic of Karakalpakstan 2018 report. P.
6. Order of the Council of Ministers of the Republic of Karakalpakstan, 2018 №194-B., P.3.
7. News of Karakalpakstan. - 2006. --- July 26
8. Ryabikina N. Golden tourism project // Vesti Karakalpakstan, 2002. - №71. - September 3.
9. Jolibekova I.B. Training of personnel in the Republic of Karakalpakstan in the years of Independence. Science and education in Karakalpakstan. 2.2. 104-108 P. ISSN 2181-9203

- 10.** Decree of the President of the Republic of Uzbekistan No. PF-5326 of February 3, 2018 "On additional organizational measures to create favorable conditions for the development of tourism potential of the Republic of Uzbekistan" // <http://lex.uz/docs/34403.05.2019>).
- 11.** Zhollybekova I.B. International cultural ties and cooperation in the field of science, technology and education of the Republic of Karakalpakstan. M. 2011. Scientific life. No. 3. 93-94 -C.



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“MIXED EDUCATIONAL TECHNOLOGIES OF ACCELERATED TEACHING OF ENGLISH IN CLUSTER CONDITIONS” (ON THE EXAMPLE OF NON-PHILOLOGICAL STUDENTS)

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ABSTRACT

The article is devoted to the extremely topical issue of choosing the most effective methods of teaching foreign languages to students of higher education institutions, which can provide motivation for learning a foreign language and increase students' activity. The role and importance of informational and pedagogical technologies have been determined, as well as the effectiveness and expediency of their introduction into the educational process of the educational establishment has been substantiated. The modern innovative pedagogical technologies of teaching English for future preschool teachers and primary school teachers are considered. The purpose of learning a foreign language is to form an educated person, capable of engaging in intercultural communication and solving linguistic tasks. Innovative technologies of teaching foreign languages in higher educational establishments of Ukraine are characterized. The contents of the concept of “technology” and “pedagogical technology” have been clarified. The factors that contribute to the effectiveness of foreign language training of students of pedagogical specialties are clarified and the necessity of introduction of pedagogical technologies in the process of teaching foreign languages is substantiated. Qualitative foreign language training for students is impossible without using of innovative pedagogical technologies. Modern innovative technologies in education are the use of information and communication pedagogical technologies in the educational process, project work, work with educational computer and multimedia programs, distance technologies in learning foreign languages, creation of presentations in Microsoft PowerPoint software environment, use of Internet resources. These technologies help to implement a person-centred approach to learning, provide individualization and differentiation of learning based on students' abilities and level of

knowledge. Modern pedagogical technologies, which combine the communicative and cognitive goals of foreign language training, are used for the formation of communicative competence (communicative skills formed on the basis of linguistic knowledge, skills and abilities).

KEYWORDS: *Foreign Language Teaching, Foreign Speech Activity, Teacher, University, Competence, Teaching, Technology, Pedagogical Technology*

INTRODUCTION

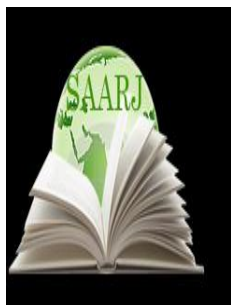
Today, there is a steady trend towards a reorientation of the higher education system towards new values, where humanization of the pedagogical process and the democratization of interpersonal relations have become paramount. A graduate of a higher school must be competitive, in demand on the specialty, which implies a high level of its general development, possession of information and communication competence, high professionalism, an ability to make independent decisions, innovative thinking and productive adaptation to changing. The main task of the state is to prepare highly qualified specialists who knows one or more foreign languages. Educational reforms contributes to the emergence of new teaching methods for the development of creative personality, changed the authoritarian style of educational activity on a humanistic approach taking into account the individual characteristics of the youth. Foreign language is now a means of intercultural communication, that is why the mastery of foreign language speech activity is not only aimed at development of communicative competence (language, speech, sociocultural, crosscultural etc.), but also education by means of foreign language. World changes very fast so using of new and modern pedagogical technologies are not only “trend”, they are very important and necessary for educational process. Analysis of recent research and publications. Speaking foreign language has always been one of the main tasks of methodology of teaching foreign languages. Domestic and foreign methodologists, such as G.E. Boretska, O.P Datskiv, Y.O. Dyachkova, V.L. Skalkin, A. Maley, A. Duff, A.L. Berdychevsky, N.F. Borysko, L.P. Golovanchuk, A.G. Gordeev, V.A. Maslova, V.V. Safonov, S.G. Ter-Minasov used different approaches as for teaching and learning speaking of foreign language. Researchers of scientists and requirements for knowledge of students of higher educational institutions indicate the need to improve educational process using the most effective methods and technologies of learning foreign language. The purpose of the article. The main purpose of this work is to analyse modern pedagogical technologies of teaching and learning English language, to identify and disclose educational opportunities for the use of innovative technologies in teaching and learning English language for future pre-school and primary teachers in high educational establishments. Presenting main material. Pedagogical activity should be innovative as it's one of the essential factors for the successful educational process of any educational institution. Innovative activity creates the basis for creating the competitiveness of an institution in the educational services market and on the other hand it determines the directions of professional growth of teachers or lecturers and their creative search that really contributes the personal growth of students [1]. In this regard, nowadays, the use of modern informational and pedagogical technologies in educational establishments has become increasingly widespread, representing not only modern technical means, but also new approaches to the educational process. This is due to the main purpose of teaching foreign languages: the formation and development of the communicative culture of students, their practical mastery of a foreign language. The task of the university teacher or lecturer is to create all conditions for the

practical training of the language by each student. This involves the selection of such teaching methods that would allow him to show his activity and his creativity. Modern innovative technologies are related to the use of various informational and pedagogical technologies and Internet resources. An analysis of the activities of universities shows that today ensuring of the principle of variability helps the pedagogical process be flexible to any educational model and tasks. As for the background of the development of various options for the content of education, we should identify ideas, which became the introduction of the concept of educational technology into the philosophy of education. According to the Interpretative dictionary technology is a set of techniques used in any business, skill or art. Among the large number of definitions of this concept, we should mention an interpretation of pedagogical technology proposed by B.T. Likhachev: "this is a set of psychological and pedagogical attitudes that determine a special set and layout of forms, methods, teaching methods, educational tools that form the organizational and methodological aspects of the pedagogical process" [4]. I.P. Volkov came to a conclusion that pedagogical technology is a description of the process of achieving the planned learning outcomes [2]. Proceeding from this, among the list of various pedagogical technologies, the most confidently tested by time are the following: multilevel training; cooperative learning; individual and differentiated approach; project method and others. All of them contribute to the development of innovations in education, involving the improvement of pedagogical technologies and related methods, techniques and learning tools, developing students' ability to motivate actions and to navigate independently using and analysing the information; the formation of their creative thinking and the disclosure of their natural abilities. Pedagogical technologies are associated with the widespread use of new information technologies, which make it possible to fully reveal the didactic functions of these methods and to realize the potential educational opportunities. Since today free access to the necessary information is required, in the information centres all the opportunities are created for access to scientific, cultural and information centres around the world in order to form their own independent opinion as a part of educational process according to the tasks. Thus, students should be provided with favourable conditions for using the technological capabilities of modern means of communication both for searching and receiving information, and for developing cognitive and communicative abilities and developing their ability to make decisions quickly in difficult situations. This process proceeds more successfully using informational and communicational training technologies, including specific methods and technical means (computers, audio and video, telecommunication networks, etc.) for working with information. Today, this type of pedagogical technologies is designated by the term "computer technology of instruction", which continues to develop the ideas of programmed instruction, opening up new technological possibilities of educational process with advantages connected with computers and telecommunications. According to the latest data provided, in particular, by the Internet, currently all universities in Ukraine use innovative technologies during educational process (seminars and conferences). They are attended by both specialists of higher education institutions and teachers of secondary schools. All the types of educational establishments that use innovative technologies are always open to modern scientific research. In the curriculum of such establishments we can find such forms of training as design development, training, internships in production, as well as participation in research organizations, practice of different types. Considering the technological aspect of teaching foreign languages in pedagogical institutes and universities, we think that the most widely used are personality-oriented and informationalbased

learning technologies. Personally- oriented technologies are represented by technologies of differentiation and individualization of instruction, design technologies, etc. The main forms of using information technology are: 1) multimedia English lessons (using the basis of computer training programs); 2) testing on computers; 3) English lessons on the basis of computer presentations during lectures, seminars, labs and students' reports. Using the PowerPoint computer program, English teachers can organize a series of multimedia lessons, training modules, electronic study guides that allow students to integrate audiovisual information presented in various forms – graphics, slides, text, video, chat etc.; 4) telecommunication projects, work with audio and video resources online; 5) distance learning, including all forms of educational activity, carried out without personal contact of the teacher or lecture and student. Almost any educational services are presented on the global Internet today, from short-term continuing education courses to comprehensive higher education programs; 6) using of an interactive tablet Smart Board; 7) voice chat on the local network, used to teach phonetics. For the implementation of the chat, free Net Speakerphone or Speaker programs are used, which allow to communicate in any mode: teacher – student, student – student, conference mode; 8) linguaphone devices, which include the teaching console and workplaces of students, as well as equipment according to one of the following schemes: audio-passive, audio-active or audiocomparative [8, p. 125]. Audio passive devices aim to provide students with the opportunity to listen to phonograms; audio-active devices allow students not only to listen to phonograms, but also to train themselves in loud speech, audio and audio devices allow you to record your speech on a tape recorder, and then listen to this recording and compare it with the example. All this is aimed for creation of a foreign language environment in the process of teaching foreign languages and achieving of technical and informational means of instructions. Computer training programs in foreign language classes allow lecture to carry out the following forms of exercises as: pronunciation, grammar material, vocabulary, writing, teaching monologist and dialogical speech etc.

REFERENCES

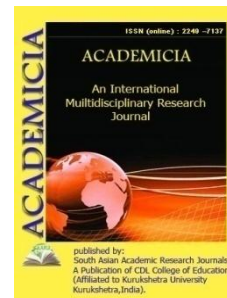
1. Rabinovich F.M., Sakharova T.V. Intensive teaching methods and high school. - Foreign languages at school, 1991, No. 1.
2. Merkulova I.I. The system of problem tasks in teaching reading // IYASH, 1991, No. 6.
3. Milrud R.P. Discussion of the problem in the lesson of a foreign language // IYASH, 1986, No. 4.
4. Rabinovich F.M., Sakharova T.V. Intensive teaching methods and high school. - Foreign languages at school, 1991, No. 1.
5. Denisova L.G. The place of intensive methodology in the system of teaching a foreign language in high school. - Foreign languages at school, 1995, No. 4.
6. Dianova E.M., Kostina L.G. Role-playing game in teaching a foreign language (review of foreign methodological literature) // IYASH, 1988, No. 3.
7. Theory of teaching foreign languages: Linguodidactics and methodology: textbook / ND Galskova, NI Gez.-6th ed., Sr.- M.: Academy, 2009.-333c.



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AN OVERVIEW ON CARDIOVASCULAR DISEASE

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ABSTRACT

In the United Kingdom, cardiovascular disease is a major and increasing issue, accounting for almost one-third of all fatalities and causing considerable morbidity. It is also of special and urgent importance as emerging nations undergo lifestyle changes that bring new risk factors for cardiovascular disease, resulting in an increase in cardiovascular disease risk throughout the developing globe. Because the burden of cardiovascular disease may be reduced via deliberate risk reduction, primary prevention should be a top goal for all health policymakers. International recommendations agree on the significance of quitting smoking, losing weight, and exercising, however guidelines differ somewhat in their approach to hypertension and significantly in their approach to achieving an optimum lipid profile, which remains a controversial topic. Although formerly popular concepts like the polypill seem to be empty of in-vivo effectiveness, there are still areas of potential interest, such as the advantage of lowering serum urate and the utility of lowering homocysteine levels.

KEYWORDS: Alcohol, Cardiovascular Disease, Diet, Exercise, Hypertension, Primary Prevention, Smoking, Uric Acid.

INTRODUCTION

Coronary heart disease (CHD), cerebrovascular disease (CVD), peripheral arterial disease (PAD), rheumatic and congenital heart disorders, and venous thromboembolism are all examples of cardiovascular disease (CVD). CVD is responsible for 31% of global mortality, with CHD and cerebrovascular accident accounting for the bulk of this. Throughout England, CVD accounts for almost 34% of all fatalities, while in the European Union, the number is closer to 40%. As the incidence of CVD risk factors increases in formerly low-risk nations, the global rate of CVD is expected to climb. Currently, 80 percent of CVD deaths occur in developing countries, and CVD is projected to overtake infectious illness as the leading cause of death in most developing countries. CVD is not only a major cause of death, but it is also the leading cause of disability-adjusted life years worldwide.

The INTERHEART research investigated the impact of CVD risk factors such as dyslipidemia, smoking, hypertension, diabetes, and abdominal obesity, as well as the preventive benefits of fruits and vegetables intake and regular physical exercise. These risk variables were shown to be constant across all populations and socioeconomic levels examined, indicating the feasibility of globally consistent methods to CVD primary prevention[1]–[4].

Lifestyle Modifications:

Exercise:

Exercise is widely acknowledged to have a beneficial influence on the majority of health outcomes, and CVD is no exception. Even at extremely high levels of exercise, the risks of death and morbidity are low, and in the vast majority of cases, the benefits exceed the dangers. The National Institute for Health and Clinical Excellence (NICE) recommends 150 minutes of moderate intensity aerobic exercise or 75 minutes of intense aerobic activity each week. This may be characterized in terms of perceived changes in metabolic rate or in terms of relative metabolic rate changes. They also recommend doing muscle-strengthening exercises two or more times each week. NICE only makes a consensus recommendation on the benefits of exercise for primary prevention, while the AHA and ESC guidelines provide class 1 A recommendations with almost similar prescriptions, based on a robust and consistent body of evidence.

Diet:

Diet is believed to have a major influence in CVD risk, but the body of data isn't conclusive, and the recommendations aren't unanimous either. The American Heart Association recommends the DASH diet, which is low in sugar and saturated fats and rich in vegetables, fruits, and whole grains. This has been proven to reduce blood pressure (BP) and low-density lipoprotein cholesterol (LDL-C), both of which are independent risk factors for CVD, but it does not claim to demonstrate a direct reduction in CVD risk[5], [6]

Smoking:

Smoking has long been recognized as a significant risk factor for cardiovascular disease. Smoking doubles the 10-year CVD death rate in Europe, according to 21 studies, and smoking is responsible for 30% of CVD mortality in the United States. Not only is it harmful, but it also has a dose-dependent impact with no known safe lower limit. Passive smoking is also

hazardous, since it raises CVD risk by 30% in the workplace, and UK public health measures such as smoking bans have been linked to a substantial reduction in CVD occurrences.

Stopping smoking is the most cost-effective strategy in CVD prevention, with some benefits seen as soon as a month after quitting. Regardless of the duration or severity of the smoking habit, all recommendations suggest quitting, with immediate and long-term advantages. Nicotine replacement treatment (NRT), bupropion (a norepinephrine dopamine reuptake inhibitor), and especially varenicline (a partial nicotine receptor agonist) are all widely prescribed pharmacologically. Both of the first two increase abstinence rates by 50–70%, whereas varenicline triple abstinence rates.

Weight:

BMI > 25 is a risk factor for CVD, with the lowest all-cause mortality observed at BMI 20–25. However, since BMI 20 is associated with higher all-cause mortality, reductions below this level are not usually advised. No particular weight-loss strategy is recommended in the recommendations, although maintaining a healthy weight is recommended to reduce CVD risk. BMI is a strong predictor of CVD risk, especially at higher levels, although there is solid evidence that visceral adiposity and liver fat are important risk factors at all levels of BMI. This helps to explain why the CVD risk profile in overweight people differs depending on where the adipose tissue is deposited. There is growing evidence that, in addition to lowering BMI, lowering waist circumference as a proxy for lowering visceral fat should be a key goal for lowering CVD risk.

Alcohol:

Given the recognized consequences of frequent and excessive alcohol use, alcohol consumption is a contentious topic. The problem arises because previous data indicated a J-shaped curve in terms of risk, with abstention linked to an increase in CVD compared to light drinkers, and low levels of alcohol use linked to a reduced risk of CHD. Aside from the known physiological effects of alcohol, such as interfering with platelet aggregation, data from the INTERHEART research seems to support these assertions, indicating lower risk for those who drink moderately or little [7], [8].

However, a recent large mendelian study by Holmes et al. found that decreases in alcohol consumption are linked with lower CVD risk throughout the alcohol intake spectrum within a genetic subgroup for alcohol dehydrogenase. This suggests that lowering alcohol consumption, especially for moderate drinkers, is linked to a lower risk of cardiovascular disease. The ESC recommendations state that there is no safe amount of alcohol consumption.

Medical Treatment:

- *Lipid-reduction therapy:*

Lipid-lowering interventions have long been utilized in primary prevention, and sub-fractions of blood lipids have been investigated to distinguish their separate impacts on the CVD risk profile. LDL-C is the most well-studied atherogenic subfraction, with a significant link between LDL-C levels and CVD risk: lowering LDL-C by 1.0 mmol/L reduces CVD mortality and non-fatal MI risk by 20–25 percent.

Although it has been suggested that increased levels of high-density lipoprotein cholesterol (HDL-C) are cardio protective, the causal connection has yet to be established. The negative CVD profile of HDL-raising medications like torcetrapib, as well as a recent randomized randomization study showing no inherent advantage from naturally higher HDL-C levels, support this debate.

- *Anti-Hypertensive Therapies:*

Hypertension is a risk factor for the development of CVD on its own. Increasing blood pressure over 115/75 mmHg has a constant and exponential impact, with each 20 mmHg rise in systolic blood pressure (SBP) or a 10 mmHg increase in diastolic blood pressure (DBP) doubling the risk of a cardiovascular event. Previous meta-analyses have revealed a decrease in CVD risk over a broader range of blood pressures, indicating that there is no upper limit to the benefit of lowering blood pressure and no clear cut-off point beyond which additional reductions become detrimental. According to recent meta-analyses, the advantages of decreasing blood pressure from a baseline of 140 may be ambiguous or perhaps harmful. This data suggests that lowering blood pressure reduces mortality in hypertensives, but there is no evidence for early therapy in normotensive or pre-hypertensive individuals.

- *Glucose in the Blood:*

Glucose management is important in diabetics, but it has no statistically meaningful relationship with CVD risk in non-diabetics. On average, people with diabetes mellitus (DM) have a higher risk of cardiovascular disease (CVD), while those with impaired fasting glucose (IFG) have a higher risk of CVD and DM development. Serum glucose decrease has been found to lower CVD risk in diabetics, with the lowest risk occurring at normal blood sugar levels. More severe glucose reductions were harmful, with specific thiazolidinediones and dipeptidyl peptidase-4 inhibitors posing a particular CVD risk. In contrast to conventional treatment, recent studies with oral hypoglycaemics from the sodium/glucose transporter 2 inhibitor family, such as empagliflozin, have proven to decrease all-cause mortality by 32 percent, CVD death by 28 percent, and HF death by 35 percent. Although it seems that these advantages were mediated by cardio-renal haemodynamic effects rather than glucose reduction, the significant benefits shown would suggest that it be used early in diabetes patients. More evidence on these medicines is needed to update current recommendations.

- *Anti-platelet Therapy:*

Antiplatelet treatment is an important component of secondary prevention, however it should be avoided in individuals without comorbidities for primary prevention owing to a higher risk of bleeding and no evidence of CVD risk reduction. The counsel given to diabetic patients is contradictory: According to ESC recommendations, the danger of bleeding outweighs the advantages of aspiration treatment, while the American College of Chest Physicians recommends aspirin therapy in patients with DM and a 10% chance of a 10-year CVD event.

LITERATURE REVIEW

B. Reamy et al. discussed about prevention of cardiovascular disease[9]. In the United States and across the globe, cardiovascular disease is still the leading cause of mortality. Cardiovascular disease prevention is a goal that can be achieved. According to a World Health Organization study published in 2010, lowering risk factors in young people and maintaining an optimal risk

profile until age 50 may avoid 90% of atherosclerotic cardiovascular disease occurrences. Poor risk profiles are caused by a variety of factors, including misinformation and poor execution of established preventative measures, misguided concerns about medicines, and a misunderstanding of optimal food and lifestyle choices. Every patient needs a personalized cardiovascular disease preventive plan that includes methods for reducing modifiable cardiovascular risk factors.

S. Wiloughby et al. discussed about Platelets and Cardiovascular disease[10]. Platelets have an essential function in cardiovascular disease that is frequently overlooked. For example, greater pro-aggregatory stimuli or decreased anti-aggregatory chemicals may change the platelet's usual response, resulting in enhanced platelet activation/aggregation, which can occur in both chronic (e.g. stable angina pectoris) and acute cardiovascular disease situations (e.g. acute myocardial infarction). Furthermore, platelet hyper aggregability has been linked to coronary artery disease risk factors (e.g. smoking, hypertension, and hyper cholesterolaemia). Finally, the growing usefulness of anti-platelet treatments in the therapy of the aforementioned disease states underlines the critical role platelets play in cardiovascular disease etiology. The normal physiologic role of platelets in maintaining homeostasis, the pathophysiologic mechanisms that lead to platelet dysfunction in cardiovascular disease, and the role and advantages of anti-platelet treatments are all covered in this article.

DISCUSSION

Cardiovascular disease (CVD) is a general term for conditions affecting the heart or blood vessels. It's usually associated with a build-up of fatty deposits inside the arteries (atherosclerosis) and an increased risk of blood clots. Signs and symptoms can include: Chest pain, chest tightness, chest pressure and chest discomfort (angina) Shortness of breath. Pain, numbness, weakness or coldness in your legs or arms if the blood vessels in those parts of your body are narrowed. The most important behavioural risk factors of heart disease and stroke are unhealthy diet, physical inactivity, tobacco use and harmful use of alcohol. The effects of behavioural risk factors may show up in individuals as raised blood pressure, raised blood glucose, raised blood lipids, and overweight and obesity.

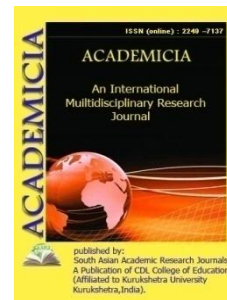
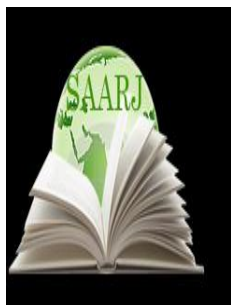
CONCLUSION

The goal of CVD prevention is to decrease the incidence of major cardiovascular events, resulting in less early impairment and morbidity while also extending survival and quality of life. The American, European, and British recommendations all show a variety of strategies for lowering CVD risk profiles, with significant agreement on smoking and exercise, but minor differences in other variables. Pharmaceutical choices have evolved over time, while lifestyle recommendations have remained essentially constant. Primary prevention is evolving, and as more long-term evidence becomes available, we will have a better knowledge of how to decrease CVD risk. If we want to decrease the burden of a preventable illness, we must maintain our efforts.

REFERENCES

1. C. P. Pang, "Molecular diagnostics for cardiovascular disease," 1998, doi: 10.1515/CCLM.1998.106.
2. G. Davidović and G. Brajušković, "Apoptosis in cardiovascular diseases," *Medicus*. 2006.

3. E. A. Leonard and R. J. Marshall, "Cardiovascular Disease in Women," *Primary Care - Clinics in Office Practice*. 2018, doi: 10.1016/j.pop.2017.10.004.
4. B. Neal, N. Chapman, and A. Patel, "Managing the global burden of cardiovascular disease," 2002, doi: 10.1016/S1520-765X(02)90022-2.
5. N. Hou and J. D. Luo, "Leptin and cardiovascular diseases," *Clinical and Experimental Pharmacology and Physiology*. 2011, doi: 10.1111/j.1440-1681.2011.05619.x.
6. J. R. McCarthy, "Nanomedicine and Cardiovascular Disease," *Current Cardiovascular Imaging Reports*. 2010, doi: 10.1007/s12410-009-9002-3.
7. M. Cozzolino, M. Mangano, A. Stucchi, P. Ciceri, F. Conte, and A. Galassi, "Cardiovascular disease in dialysis patients," *Nephrol. Dial. Transplant.*, 2018, doi: 10.1093/ndt/gfy174.
8. M. Rosa-Garrido, D. J. Chapski, and T. M. Vondriska, "Epigenomes in Cardiovascular Disease," *Circulation Research*. 2018, doi: 10.1161/CIRCRESAHA.118.311597.
9. B. V. Reamy, P. M. Williams, and D. P. Kuckel, "Prevention of Cardiovascular Disease," *Primary Care - Clinics in Office Practice*. 2018, doi: 10.1016/j.pop.2017.11.003.
10. S. Willoughby, A. Holmes, and J. Loscalzo, "Platelets and cardiovascular disease," *European Journal of Cardiovascular Nursing*. 2002, doi: 10.1016/S1474-5151(02)00038-5.



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AN OVERVIEW ON THE POTENTIAL OF ANTIBIOTICS

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ABSTRACT

Since the late 1800s, scientists have noticed that the development of certain bacteria inhibits the growth of other germs. Natural anti-bacterials were discovered as a result of these findings of antibiosis between microorganisms. This article discusses key results from many national and worldwide combined organizations' educations on a short overview of antibacterial agent detection in recent years. In India, particularly in the emerging antibiotics, techniques for the appropriate choice of medication are needed to address a complex issue involving prescribers, dispensers, and consumers.

KEYWORDS: Antibiotic, Antibiotic resistance, Bacterial Infection.

INTRODUCTION

Infection therapies were mainly dependent on medical folklore prior to the early twentieth century. Over 2000 years ago, antimicrobial mixtures that were employed in the treatment of infections were reported. 1 To cure illnesses, several ancient civilizations, including the ancient Egyptians and Greeks, utilized carefully chosen mold and plant materials and extracts. In the late 1880s, Paul Ehrlich pioneered synthetic antibiotic chemotherapy as a science and the creation of antibacterials. He then suggested the concept of developing compounds that would function as a selective medication, binding to bacteria and killing them without hurting the human host. In 1907, he found a medicinally effective chemical, the first synthetic antibacterial salvarsan, now known as arsphenamine, after screening hundreds of colors against different species[1].

Antibiotics:

Selman Waksman and his colleagues coined the word antibiotic in 1942 in a journal article to designate any chemical generated by a microbe that inhibits the development of other bacteria in high dilution. Substances that kill bacteria but are not generated by microbes were omitted from this criteria (hydrogen peroxide). Synthetic antibacterial substances, such as sulfonamides, were also eliminated. The word "antibiotic" is now used to refer to any medicine that kills or slows the development of bacteria, regardless of whether the medication is generated by a microbe or not. Antimicrobial medication used to treat and prevent bacterial infections. Bacteria may be killed or inhibited by these substances. Antibiotic (which means "against life") is a word that is often used interchangeably with antimicrobial to refer to any chemical that is used to fight microorganisms. Antibacterial and antibiotic are two different things, according to some sources; antibacterial is used in soaps and disinfectants, while antibiotics are employed in medicine. Antibiotics were a game-changer in medicine in the twentieth century. This has resulted in widespread issues, prompting the Globe Health Organization to designate antimicrobial resistance as a "major danger." Antimicrobial resistance is occurring today in every area of the world and has the potential to harm anybody, of any age, in any nation[2]–[7].

Medical Uses:

Antibiotics are drugs that are used to cure or prevent bacterial and protozoan illnesses. When an infection is suspected of causing an ailment but the pathogen responsible has yet to be identified, empiric treatment is used. This entails the administration of a broad-spectrum antibiotic depending on the indications and symptoms given, and is started while test results are awaited, which may take several days. When the pathogenic bacteria responsible for the infection is identified, definite treatment may begin. Typically, this will include the administration of a narrow-spectrum antibiotic. The antibiotic used will also be determined by its cost. Identification is essential since it may decrease the expense and toxicity of antibiotic treatment, as well as the risk of antimicrobial resistance developing. Antibiotics may be used for non-complicated acute appendicitis to prevent surgery.

Side-effects:

Antibiotics are thoroughly tested for adverse effects before being approved for clinical use, and they are generally regarded as safe and well tolerated. Depending on the kind of antibiotic administered, the microorganisms targeted, and the particular patient, certain medicines have been linked to a broad range of undesirable side effects ranging from moderate to severe. Side effects may indicate the antibiotic's pharmacological or toxicological characteristics, as well as hypersensitivity or allergic responses. Newer medicines' safety characteristics are often less well known than those with a lengthy history of usage. Diarrhea is a common side effect caused by a shift in the species composition of the intestinal flora, which may lead to an excess of harmful bacteria like *Clostridium difficile*. Antibacterials may also alter vaginal flora, causing yeast species of the genus to overgrow.

Correlation with obesity:

Antibiotics aren't known to induce obesity in people. Antibiotic exposure at an early age (6 months) has been linked to an increase in body mass in studies (at 10 and 20 months) Another research discovered that the kind of antibiotic used was important, with macrolides having the greatest risk of being overweight when compared to penicillin and cephalosporin. As a result, there is a link between early antibiotic exposure and human obesity, although whether this is a

causative connection is unknown. Although there is a link between antibiotic usage and obesity in children, the impact of antibiotics on obesity in humans must be balanced against the benefits of clinically justified antibiotic therapy in infancy[8].

Interactions:

Birth control pills:

There are few well-controlled research on the effects of oral contraceptive failure and antibiotics. Antibiotics do not interact with birth control pills, according to the majority of research, including clinical trials that show the failure rate of contraceptive pills caused by antibiotics is extremely low (about 1 percent). Noncompliance (forgetting to take the pill), vomiting, or diarrhea are all factors that may lead to oral contraceptive failure. ethynyl estradiol serum levels in the blood are affected by gastrointestinal problems or interpatient variations in oral contraceptive absorption. Women with irregular periods are more likely to fail, therefore they should be encouraged to take backup contraception throughout antibiotic therapy and for one week thereafter. Backup contraception is indicated if patient-specific risk factors for decreased oral contraceptive effectiveness are identified.s

Alcohol:

Interactions between alcohol and some antibiotics may occur, resulting in adverse effects and reduced antibiotic treatment efficacy. While modest alcohol intake is unlikely to produce severe adverse effects with many common antibiotics, there are certain medicines for which alcohol consumption may induce serious side effects. As a result, the kind of antibiotic used determines the possibility for adverse effects and efficacy. Additionally, alcohol intake may decrease the effectiveness of doxycycline and erythromycin succinate. The reduced activity of the liver enzymes that break down the antibiotic molecule is another impact of alcohol on antibiotic action. Antibacterial action may be dependent on the bacterial development phase, and it often requires continued metabolic activity and bacterial cell division. These results are based on laboratory research, and they have also been proven to eradicate bacterial infection in clinical situations. Because antibacterial activity is often dependent on concentration, in vitro antibacterial activity characterization frequently involves determining the lowest inhibitory concentration and minimum bactericidal concentration of an antibiotic.

Resistances:

TThe development of antibiotic resistance in bacteria is a frequent occurrence. Resistance typically arises as a result of evolutionary processes that occur during antibiotic treatment. Antibiotic therapy may favor bacterial strains with physiologically or genetically improved resistance to antibiotics at high dosages. It may result in the preferred development of resistant bacteria under certain circumstances, while the medication inhibits the growth of vulnerable germs. Biodegradation of medicines, such as sulfamethazine-degrading soil bacteria introduced to sulfamethazine via treated pig feces, may lead to resistance. Bacterial survival is often due to inheritable resistance, although antibacterial resistance may also spread via horizontal gene transfer. Antibacterial resistance may come at a biological cost, lowering the fitness of resistant strains and therefore limiting the proliferation of antibacterial resistant bacteria in the absence of antibacterial chemicals, for example. Additional mutations, on the other hand, may compensate for this fitness cost and let these bacteria survive. Antibiotics and antibiotic resistance are both

old substances and processes, according to paleontological evidence. Antibiotic targets for which mutations have a detrimental effect on bacterial reproduction or viability are useful. A mutation in the bacterial chromosome or the accumulation of extra-chromosomal DNA causes acquired resistance.

Vaccines:

Immune modulation or augmentation is used in vaccines. Vaccination either activates or strengthens a host's immunological competence to fight infection, resulting in macrophage activation, antibody production, inflammation, and other typical immune responses. Antibacterial vaccinations have resulted in a significant decrease in bacterial illness worldwide. Vaccines produced from attenuated whole cells or lysates have mostly been superseded with less erectogenic cell-free vaccines made up of purified components like as capsular polysaccharides and their conjugates, as well as inactivated toxins (toxoids) and proteins.

Phytochemicals:

Some antioxidant dietary supplements, such as grape seed extract, also include phytochemicals (polyphenols), which have antibacterial effects in vitro. Phytochemicals have been shown to decrease peptidoglycan production, harm microbial membrane structures, change the hydrophobicity of bacterial membrane surfaces, and alter quorum sensing. With the rise in antibiotic resistance in recent years, researchers are looking into the possibility of novel plant-derived antibiotics.

LITERATURE REVIEW

S. Sengupta et al. discussed about roles of antibiotics and antibiotic resistance[9]. Antibiotics are chemotherapeutic drugs that have been used to treat bacterial infections in clinical practice since the 1940s. However, after the widespread development and spread of antibiotic-resistant bacteria, the advantages provided by these magic bullets have been significantly diminished. While it is clear that overuse and misuse of antibiotics contributes substantially to the development of resistant strains, antibiotic resistance has also been found in wild bacteria from distant locations that are unlikely to be affected by human activity. Antibiotic biosynthetic genes and resistance-inducing genes are known to have evolved billions of years ago, long before antibiotics were used clinically. As a result, it seems that antibiotics and antibiotic resistance determinants play additional functions in nature that are frequently overlooked due to the overemphasis on antibiotics' therapeutic significance and the problem presented by antibiotic resistance in pathogens. Antibiotics are often found at sub-inhibitory quantities in the natural environment, serving as signaling molecules that aid quorum sensing and biofilm development. They also affect host-parasite interactions and play a key role in the generation of virulence factors (e.g., phagocytosis, adherence to the target cell, and so on). Antibiotics and antibiotic resistance in the naturally existing microbial population are poorly understood from an evolutionary and ecological standpoint. As a result, more research into the function of antibiotics in nature is required. Studies into the complexities of microbial physiology promise insight into the intricacies of microbial physiology and are expected to offer some guidance in preventing the development and spread of antibiotic resistance. This article summarizes some of the most current research on the function of antibiotics and the genes that confer antibiotic resistance in nature.

G. Cheng et al. discussed about Antibiotic alternatives[10]. Sub-therapeutic doses of antibiotics have been used in food-animal feeds for decades to protect animals from illness and enhance production performance in contemporary animal husbandry. Meanwhile, worries about the development of antibiotic-resistant bacteria as a result of overuse of antibiotics and the advent of less new drugs have spurred attempts to create "antibiotic alternatives." The question of whether the alternatives can really replace antibiotics is still being debated. This article covers current developments in antibiotic alternatives as well as their future prospects. Immunity modifying agents, bacteriophages and their lysins, antimicrobial peptides, pro-, pre-, and synbiotics, plant extracts, pathogenicity inhibitors (bacterial quorum sensing, biofilm, and virulence), and feeding enzymes are all extensively addressed. Finally, the viability of antibiotic alternatives is thoroughly examined. It's difficult to predict if alternatives will be able to replace antibiotics in veterinary care in the near future. At this moment, the best and quickest approach to minimize the negative consequences of antibiotic misuse and guarantee the safety of animal-derived food and the environment is to use antibiotics wisely and develop scientific monitoring systems.

DISCUSSION

Antibiotics are antimicrobial substances that are effective against microorganisms. Antibiotic medicines are extensively utilized in the treatment and prevention of bacterial infections since they are the most common kind of antibacterial agent. Bacteria may be killed or inhibited by these substances. Antibiotics are very useful in the battle against illness, but they may also be dangerous in certain cases. Antibiotics may induce allergic reactions and severe, perhaps life-threatening diarrhea, which is caused by the bacterium *Clostridium difficile* (C. diff). Antibiotics should be given for 7 to 14 days in most cases. Shorter treatments may sometimes be just as effective. Your doctor will choose the appropriate antibiotic kind and duration of therapy for you.

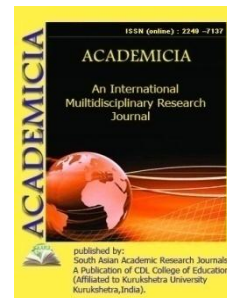
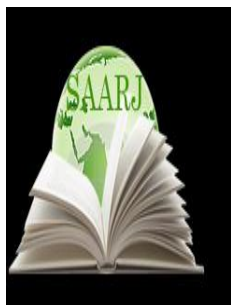
CONCLUSION

Antibiotics have saved millions of lives and revolutionized contemporary medicine, but their effectiveness is waning. Antibiotics: The Essential Elements Healthcare workers, health systems, hospitals, clinics, and nursing homes may all play a role in advancing antibiotic use. Antibiotics are used to cure, prevent, and regulate illness in food animals, as well as to enhance feed utilization in certain instances. Antimicrobial agents ensure food safety and quality by decontaminating or sanitizing animal production facilities, transport facility equipment, and effective hygiene during food processing. Following the Fundamental Elements has already improved the quality of antibiotic recommendations in several hospitals. Patients get the greatest antibiotic therapy when antibiotic regimens and protocols are approved.

REFERENCES

1. D. V. T. Nair, K. Venkitanarayanan, and A. K. Johny, "Antibiotic-resistant Salmonella in the food supply and the potential role of antibiotic alternatives for control," *Foods*. 2018, doi: 10.3390/foods7100167.
2. B. Li and T. J. Webster, "Bacteria antibiotic resistance: New challenges and opportunities for implant-associated orthopedic infections," *J. Orthop. Res.*, 2018, doi: 10.1002/jor.23656.
3. M. F. Chellat, L. Raguž, and R. Riedl, "Targeting Antibiotic Resistance," *Angewandte Chemie - International Edition*. 2016, doi: 10.1002/anie.201506818.

4. J. Suez *et al.*, "Post-Antibiotic Gut Mucosal Microbiome Reconstitution Is Impaired by Probiotics and Improved by Autologous FMT," *Cell*, 2018, doi: 10.1016/j.cell.2018.08.047.
5. B. G. Bell, F. Schellevis, E. Stobberingh, H. Goossens, and M. Pringle, "A systematic review and meta-analysis of the effects of antibiotic consumption on antibiotic resistance," *BMC Infect. Dis.*, 2014, doi: 10.1186/1471-2334-14-13.
6. R. E. de Lima Procópio, I. R. da Silva, M. K. Martins, J. L. de Azevedo, and J. M. de Araújo, "Antibiotics produced by *Streptomyces*," *Brazilian Journal of Infectious Diseases*. 2012, doi: 10.1016/j.bjid.2012.08.014.
7. J. J. Segura-Egea *et al.*, "Antibiotics in Endodontics: a review," *International Endodontic Journal*. 2017, doi: 10.1111/iej.12741.
8. A. M. Egorov, M. M. Ulyashova, and M. Y. Rubtsova, "Bacterial enzymes and antibiotic resistance," *Acta Naturae*. 2018, doi: 10.32607/20758251-2018-10-4-33-48.
9. S. Sengupta, M. K. Chattopadhyay, and H. P. Grossart, "The multifaceted roles of antibiotics and antibiotic resistance in nature," *Frontiers in Microbiology*. 2013, doi: 10.3389/fmicb.2013.00047.
10. G. Cheng *et al.*, "Antibiotic alternatives: The substitution of antibiotics in animal husbandry?," *Front. Microbiol.*, 2014, doi: 10.3389/fmicb.2014.00217.



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PRACTICAL ACTIVITY OF THE STUDENT IN PERFORMANCE OF LABORATORY WORKS IN PHYSICS

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ABSTRACT

In this article it is analyzed the questions of practical activity of school pupils in fulfilling of the lowborn on physics. The first relationship is between learners and symbols (for example, drawing, drawing, diagram, bar graph, formula) as each teaching material appears in the form of speech or formula [1]. The student is undergoing a formal change. Changing content in the process of performing laboratory work in physics in the process of a creative approach to performing laboratory work in physics. Each result is obtained in at least two combinations: understand the laboratory work; concept, formula, law, use laws (1) and theoretical knowledge, practical skills and abilities, methods of activity, activation of the student's activity (2). A functional description of the problem or process should come first. Awareness of the need and determination of the significance of the process, assessment of its connection with other processes is associated with functional analysis.

KEYWORDS: *Interest, Motivation, Personality, Activity, Sinter, Analyze, Process, Phenomenon, Creativity, Attract, Didactics, Consciousness.*

INTRODUCTION

Interest in performing laboratory work in physics reveals the motives of knowledge and skills.

Personality develops from the need to think, from the dynamics of thinking to the dynamics of movement. The student, in the synthesis of external influence and internal affect, begins to think creatively. The result is expressed as an independent activity[2].

In the process of interaction between study and activity, two relations are distinguished: the student and the educational material, the student and the existing reality. The first relationship is between learners and symbols (for example, drawing, drawing, diagram, bar graph, formula) as each teaching material appears in the form of speech or formula [1]. The second relationship is between students and reality. The reality revealed in laboratory classes in physics is considered the direction of academic subjects.

The student's activity in terms of relationships consists of the following stages:

1. Collision with the legend.

In this process, two changes appear:

- a) Under the influence of the student, the conventions are brought into a conscious form;
- b) Under the influence of conventional designations, the origin of the student changes - designations, the content is distributed on their basis[3].

1. Rewriting the content based on conventions in its direction. This process also shows two changes:

- a) Changing the content of the symbols under the influence of the student, determining the area, the direction to which the collection belongs;
- b) Under the influence of the student's conventions, a change occurs - the concept of reflection, synthesis and analysis. Thus, the study of didactic designations (for example, drawing, drawing, diagram, histogram, formula) explaining their meanings[5].

The study of the relationship between designation and their meaning is a methodological problem awaiting its researchers.

The student is undergoing a formal change. Changing content in the process of performing laboratory work in physics in the process of a creative approach to performing laboratory work in physics. In the process of a creative approach to the implementation of laboratory work in physics, the changes in the content that have appeared have a didactic meaning[4].

Thus, the content, the analysis of its content is a problem related to the didactics of creativity. When performing laboratory work in physics, a student in the process of translation is faced with the conventions of practical activity, as well as the specialty of making various connections. According to the importance of the relationship, they are divided into 2 groups:

- a) negative connections;
- b) positive connections.

Negative connections hinder the active conduct of laboratory classes, as well as the development of meaningful connections by the student [6]. The material for the student to conduct laboratory studies should carry information. Negative connections lead to a misunderstanding of the goals of performing laboratory work, not being able to distinguish the difference between knowledge and reality, not being able to distinguish between methods for conducting practical exercises, applying connected theoretical knowledge in educational practice, as well as in life.

Overcoming negative connections, the student contributes to the active conduct of the practice.

By reducing negative connections, positive connections are simultaneously increased, the student improves practical skills. Therefore, it is important for a teacher, as well as a teacher-researcher, to know positive connections, to be able to apply them.

There are the following connections between the student and the performance of laboratory work:

1. Communication depending on the content. When performing laboratory work in physics, the ability to memorize the methods of cognitive and practical activity of the student when performing a particular laboratory work. The theoretical foundations for performing laboratory work can be particularly understood by synthesis and analytical analysis of the results. The student leads to an increase in the educational effectiveness of the monitoring of progress.
2. Purposeful communication. This type of communication is determined by the content of the laboratory work. There are usually two ways to achieve a concept by a student.

Objectives of laboratory work in physics: the purpose is understood with the help of the material necessary to perform laboratory work, studying problems, classes, self-explanation of laboratory work[7]. This makes it possible to understand the purpose of laboratory work, leads to mutual understanding between the student and the teacher.

By posing problematic questions and having experienced difficulties in solving these problems, the student understands his goal.

The second method of goal setting in laboratory work is considered effective, but at the same time dangerous, since the student may misunderstand cognitive and practical difficulties, and may also refuse them. This danger becomes less with the development of the ability to perform laboratory work, as well as the development of thought.

3. Functional communication. A functional description of the problem or process should come first. Awareness of the need and determination of the significance of the process, assessment of its connection with other processes is associated with functional analysis. When performing laboratory work, the student performs certain functions. For example, when performing laboratory work in grade 6 on the topic "Useful working coefficient", the following functional properties of theoretical knowledge, practical skills and practice development can be divided: the relationship between general work and useful work; development of the student's consciousness by determining the difference in their content; correct writing of the formula for general and useful work; knowledge between weight and force of movement, knowledge of the physical meaning of performing work, correct spelling of units of measurement, correct concept of unit of measurement[5].

Bringing to the student the function of laboratory work performed by objects has the double meaning of the student's practical activity: determining the relationship between the laboratory work performed, the laboratory work performed or future work. Ensuring the relationship between different objects.

3. Real connection. When performing laboratory work at school, the information about the object and the method of the object's activity are interrelated. For example, there is a rule that in the

formulas $A = FsA = PhF = maF = mg$ when changing the places of the factors, the value of the product does not change.

This topic contains information about any multiplier, as well as a description of the student's method of practical activity - by changing the places of the multipliers. ($A = sFA = hPF = amF = gm$). Currently not paid to the methods of practical activity of the student.

Therefore, in modern pedagogical activity in the first place is the question of gaining knowledge on topics. In fact, the methods of developing practical skills in a student are two sides of the studied object. The organization of the student's practical activity is chosen by moving from the performance of laboratory work by the student to the receipt of information.

Thus, one of the important properties of the student's practical activity is the student's use of the teacher's theoretical knowledge, practical skills in order to enrich the level of knowledge.

Mutual influence in the learning process has 3 stages: primary, secondary, and last. In accordance with these stages, the student prepares himself in consciousness to perform laboratory work: to be aware of the performance of laboratory work, to make and apply decisions by performing laboratory work[5].

Each result is obtained in at least two combinations: understand the laboratory work; concept, formula, law, use laws (1) and theoretical knowledge, practical skills and abilities, methods of activity, activation of the student's activity (2). Decision-making for obtaining information with the help of devices (1) and the psychological mechanism of the student's practical activity - memory, thinking, the use of methods of mental activity (2); application of knowledge for laboratory work (3) and logical methods - distribution of choice, induction or deduction.

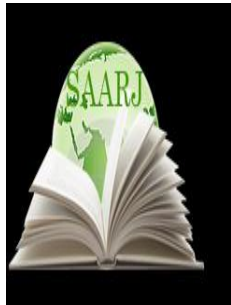
A student in the process of performing laboratory work achieves the results of 3 types:

1. Consciousness. Physiological technology and the corresponding means are involved in this process of practical activity.
2. Making decisions. In this method of performing laboratory work, psychological technologies of practical activity and the corresponding means are involved.
3. Execution. In this case, logical technology and the corresponding means are involved. The process is based on the use of physical and psychological technologies.

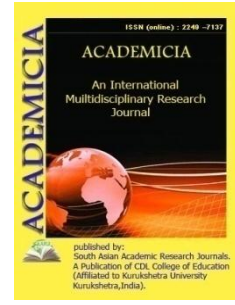
REFERENCES:

1. Makhmutov M.I. Organization of problem-based learning at school. - M.: Education, 1977. - 240 p.
2. Ruzarin G.I. Research methodology. - M., 1999. -- 181 p.
3. Yu.Mahmudov, U.Eshkoraev. Continuity of education and variability of integrative approaches to membership: Collection of scientific and methodological articles. - Tashkent: "Noshirlik yog'dusi", 2019. -3406.
4. Eshkaraev, U. Ch. (2002). Harvesting non-grain wheat. Agricultural machinery, (2), 42-43.
5. Eshkaraev, U. Ch. (2018). Harvesting Of Non-Grain Part Of Wheat Harvest On Irrigated Lands Of Uzbekistan. Actual science, (2), 32-35.

6. Salomov, A.A., & Khurramov, R.S. (2019). Theoretical Aspects Of Logical Thinking Development In The Lessons Of Mathematics At Elementary School. Internauka, (41-1), 12-14.
7. Zokirov, Javohir Gaybullo Ogli, & Xurramov, Rustam Sayfiddinovich (2021). Formation Of Ethnopedagogical Views Among Students Through The Study Of The Life And Work Of Alisher Navoi. Oriental renaissance: Innovative, educational, natural and social sciences, 1 (10), 339-343.



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PRACTICAL STUDY OF THEORETICAL INFORMATION IN PRIMARY SCHOOL MOTHER TONGUE LESSONS

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ABSTRACT

The subject and objectives of the methodology of teaching the mother tongue in primary school. The subject of study of the methodology of the mother tongue is the process of acquiring the mother tongue in the educational environment. Simultaneously with the teaching of the methodology to take into account the requirements of educating students to develop their speech, thinking, to develop them as individuals. To prepare answers to the questions of mother tongue teaching methodology in primary school, what the student needs, how to teach, why it should be taught, and so on.

KEYWORDS: *Mother tongue classes, methodology of teaching, structure and graphics, skills, practical knowledge.*

INTRODUCTION

The role of the mother tongue in the school education system and in life. The need for consistency and perspective in mother tongue teaching in the primary grades. The content of knowledge and types of lessons in the native language in primary school.

Principles of structure of the native language program in primary school. Program sections, their general and specific aspects. The amount of knowledge, skills and competencies that need to be mastered in each department.

The scientific basis of the methodology of teaching the native language to primary school and its place among other disciplines. The connection of the methodology with the theory of worldview with the sciences of language, pedagogy, psychology, psycholinguistics, logic, literature.

Principles of mother tongue teaching. Relying on the instructions of other disciplines in the development of the principles of teaching methods of mother tongue. The principle of paying

attention to the matter of language, the internal connection of language, cultivating sensitivity to language, paying attention to the expressiveness of language, the principle of forming oral speech before written speech.

Methods of testing the methods of teaching the native language. Theoretical methods of research: the methodological basis of the phenomenon, the study of related disciplines: the study of "history of the problem" and its evaluation in terms of current tasks: the study of methods of research of related disciplines: the analysis of experimental materials and the formation of practical recommendations.

Empirical (experience-based) methods of verification: study of the work experience of advanced teachers: purposeful observation of the teaching process: a common experimental method in the development of methodology, its differences from the previous ones, tasks. Stages of research. A brief description of the methodological heritage in the field of mother tongue teaching in primary school.

Literacy teaching methods. Goals and objectives of literacy teaching methods. Reading and writing is a type of speaking activity. Psycho-physiological analysis of the reading and writing process of a child and a literate person who has just started school. Sound structure and graphics of the Uzbek language, their interdependence.

Modern analysis-synthesis sound method in literacy teaching. The traditional (habitual) principles of the modern method of analysis-synthesis sound in teaching literacy are educative and nurturing, based on the live speech of students, the method is based on the acquisition of sound; organizational preparation and division into main periods and the principles that are relatively closely formed or in the process of formation.

Differential and individual approach to students in the process of literacy teaching; to teach basic concepts of grammar and spelling without theory; word analysis by syllable-sound; draw a copy of the concept. Incoming modeling element; (educating students).

Educational tasks of literacy classes. To study the readiness of children to teach literacy. Literacy process. The preparation period in literacy teaching, the topics of reading and writing lessons at this stage, and the types of work.

The main period in literacy teaching (alphabet period). Tasks of the main period. Reinforcing reading lessons in which new material is studied and the types of work used in it. The dependence of the construction of the "Alphabet" on the order of learning sounds and letters in the process of teaching literacy. Differential and individual approach to literacy teaching.

The final part of the main period, its functions. The main types of training sessions during literacy training are: work on sound; articulation of sounds, work on diction. Enhancing students' speech in the process of teaching literacy; work on the dictionary. Basic practical knowledge of grammar, spelling in the period of literacy teaching. Peculiarities of lesson organization in low-component schools.

Teaching elementary writing during literacy training. Content and tasks of teaching writing; stages of writing skills formation. Description of the current font. Methods of developing calligraphy skills in connection with teaching writing. Organizational and hygienic conditions of teaching writing. ways to teach letter writing. Typical graphic errors encountered in students.

Basic spelling elements in the process of teaching writing. Enhancing students' speech in writing lessons. During literacy training and writing lessons, the requirements for them. Types of reading and writing lessons, the system of reading and writing lessons. New research in the field of literacy. Literacy problems and prospects. Preparing children for literacy in the family and in kindergarten.

Methods of reading in the classroom. Educational significance and tasks of reading lessons in the classroom. Tasks to teach reading in primary grades and to form active readers. Educational opportunities of reading lessons. The concept of reading skills. The qualities of reading skills are conscious, expressive reading. Ways to improve the process of formation of reading skills. Types of errors in reading and ways to eliminate them.

To study the subject of tense in verbs. Person-number suffixes in verbs. Enhancing students' speech in the process of verb learning. Learning the elements of syntax and punctuation in elementary school. Classification system of materials. Conditions for the formation of basic syntactic concepts in students. Introduce punctuation to younger students.

Methods of learning spelling. Grammatical and anti-grammatical directions in teaching correct writing. The psychological nature of spelling skills. Methods of working on the spelling rule.

Spelling exercises grammatical-spelling analysis, transcription, dictation and its types, lexical-grammatical analysis, description. Exercise selection criteria. Important conditions for the formation of spelling skills.

Testing knowledge, skills and competencies in the mother tongue. Description of four-year primary education "Mother tongue" lessons. Mother tongue lessons. General description of the lesson.

Types and structure of mother tongue lessons. Methods of developing students' speech. Ways and tasks of developing speech in young students. The concept of speech and its cultivation.

Speech development is the responsibility of the native language learner. Requirements for student speech. Speech is an important tool in developing students thinking. The interrelationship of student speech development with other types of lessons from the mother tongue.

Working on the dictionary. Lexicology is the linguistic basis of the methodology of working on a dictionary. The main directions of work on the dictionary in school. Vocabulary enrichment: clarification of students' vocabulary; speech conditions and its role in vocabulary enrichment. Methods of explaining the meaning of words. Work on synonyms and antonyms, polysemous words.

Ways to activate students' vocabulary in connection with reading, retelling a work of art, studying the material, preparation for narration and essay. Syntactic work in the system of student speech development.

The level of syntactic skill that students acquire. Working on vocabulary and speech in primary school. Types of speech exercises. A general understanding of connected speech.

Types of exercises from related speech. Specific skills in related speech. Related speech. Oral retelling and written narration. Requirements for retelling and writing a sample text. Types of

retelling and narration. Close to the sample text or its full retelling and narration: selective retelling: abbreviated retelling and narration: creative retelling and narration.

Related speech. Oral story and written essay. Essays are a form of expressing students' knowledge, thinking, imagination, and a means of independently applying all the skills they have acquired in language.

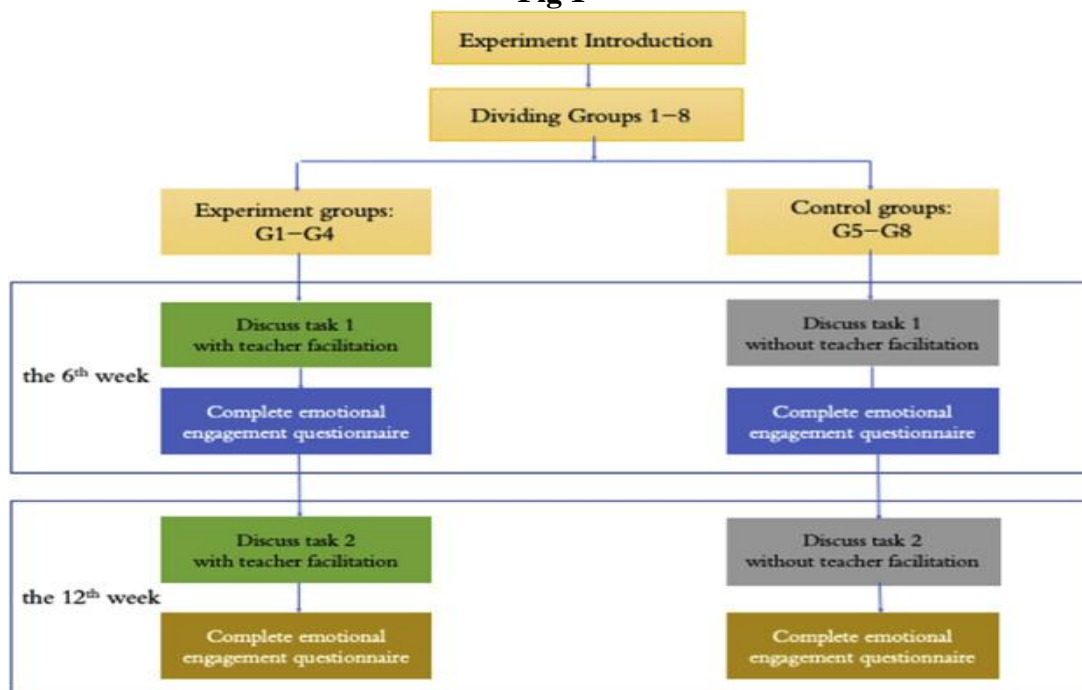
Types of oral and written essays. The importance of essay in educating students. The subject of the essay, breaking it down; collection of material, systematization, planning and preparation for the essay: the ability to use the plan in writing the essay, the language preparation of the text of the essay: work on writing and improving the essay. Student essay analysis and follow-up.

Speech errors and ways to eliminate them. The main types of speech errors that students make, ways to correct and prevent them. Extracurricular activities in the native language. Forms and tasks of extracurricular activities. Types of work in extended day groups.

Competing teams - is the collection of a large number of ideas, freeing students from the same inertia of thinking, overcoming the ideas that first appeared in the process of solving creative tasks.

Development of creative activity experience revives scientific thinking, encourages the development of new problem-solving skills, conscious research in problem-solving.

Fig 1



Test lessons in group work

Performing didactic functions - (Formation of didactic functions) the formation of mental activity in students; consolidation and application of knowledge; the activity of the future specialist in the learning process is not only learning, but also the development of didactic rules aimed at its implementation to consist of; it is envisaged that the learning activities of students

will be as close as possible to the future professional activity, character and structure, as a result of which the activities of the teacher and the student will be projected. Cognitive assignments are created by the teacher.

The teacher's knowledge of cognitive tasks, his experience in the field of composing cognitive tasks, skills, performs the work of the subject, moving from one state to another. In order to study and generalize the existing experience in designing creative activities of students in mother tongue education, lessons of primary school teachers were observed and

The following questions were answered:

- a) questions related to the purpose of creative education - the relevance of the purpose, objectives of the creative organization of education;
- b) questions related to the content of creative education – creativethe relevance of the assignments to the content of the educational material, the relevance of the students to the real learning opportunities, the place of this or that creative work in the system of educational assignments;
- c) questions related to the process features of creative education - the type of lesson, the appropriateness of the stages of creative tasks, the real learning opportunities of children in creative education, the pace of work, the methods used in creative work,application of previously learned knowledge and methods of activity in the performance of creative tasks, means of recording new knowledge and methods of activity;
- g) questions related to the results of creative work - the relevance of the importance of this or that creative work for students, the adequacy of assignments for students to fully master the content of educational material, the role of creative work in the formation of independent activity in children.

Experimental work in three stages 2016-2017, 2017-2018 - implemented during 2019. A total of 420 students participated in the experimental and control groups. Of these, a total of 136 people in the experimental work on the example of general secondary schools (regional) in Navoi region (70 people in the experimental group, 66 people in the control group) and a total of 140 people in the experimental work on the example of secondary schools (regional) in Bukhara region,72 people in the control group, 68 people in the control group) and a total of 144 students (70 people in the experimental group, 74 people in the control group) took part in the experimental work on the example of general secondary schools (regional) in Samarkand region.

The purpose of the identification experiment or confirmatory experiment is to study the role and importance of designing students 'creative activity in mother tongue education as a creative learning tool, to determine the level of research of the problem, ie to design students' creative activity in primary school mother tongue education , the study of the psychological, pedagogical, methodological bases of the design of education, the search for ways to solve specific problems related to the features of the design. To do this, we began by looking for answers to the question of whether the organization of lessons based on the design of creative activities of students in mother tongue education increases or decreases the level of knowledge of students.

By choosing a general secondary school, students were able to complete only 2-3 exercises in each session allocated for the experiment. Most of them attended the lesson as “observers”.

Students' activity was observed in the lessons organized on the basis of a certain preparatory project by designing the creative activity of students in mother tongue education. The students managed to do 4-5 exercises in each lesson and their answers to the teacher's questions were also reasonable. Student assessment rates increased.

In the process of designing elementary school native language lessons the following conclusions were drawn in the technology of student activation:

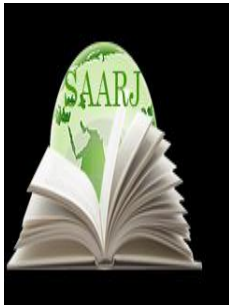
1. The analysis of the state educational standard of mother tongue in secondary schools, the basic curriculum, the curriculum of primary school mother tongue, pedagogical-psychological, methodological literature and research work and the genesis of innovative teaching ideas, didactic and methodological bases of student activation in the process of designing primary school mother tongue lessons were studied.
2. In the process of designing primary school mother tongue lessons, opportunities for modeling the learning process based on innovative approaches and principles of student activation technology were identified.
3. Activation of students in native language lesson technology design process (communicative, information work, self-development, socially active citizenship, national and cultural, mathematical literacy, science and technology news improving the use of tools and methods (activating game technologies, competing teams, performing didactic functions, relay task relay) in the development of basic and general science-related competencies (learning tasks, relay handouts, media visual aids) creative thinking on the basis of the principles of visual-figurative and verbal-logical presentation of educational material on the subject (sociality, convenience, science, mobility, membership).
4. Ensuring freedom of speech and speech development in the process of designing technologies for activating students in primary school mother tongue lessons (reproductive A1, productive A1, the scientific ideas of the practical application of the partially researched A1, creative A1) to achieve the level of creative mobility were formed.
5. Cognitive tasks in the development of speech skills of primary school students are an educational chain between linguistic exercises and learning problems. They are an important step in the integration of classroom, group, individual work in the classroom: they are designed for students' thinking, focused on an active learning situation. By changing the status of the student in the traditional educational environment, it makes him a subject of the educational process, serves to stimulate the emotions, motivation, emotions of students.
6. Development of the content of the subject of mother tongue in primary school, the formation of current knowledge of speech and language in students, the formation of speaking skills, the experience of creative activity, education and development of language and its attitude to the people and homeland. Based on the tools and opportunities to develop the creative abilities of each student, technological maps and developments of lessons were developed and implemented in primary school mother tongue classes.
7. The creative organization of the subject of mother tongue in primary school was carried out in grades 1-4: from the 2nd half of 1st grade the simplest forms of cognitive tasks were used in conjunction with the phonetic, lexical, grammatical aspects of the language; From the 2nd grade onwards, students were taught to group, compare, and draw independent conclusions through

cognitive tasks, and from the 3rd grade onwards, they were taught to analyze, reunite, apply, and evaluate evidence in their native language. In the 4th grade, students developed skills such as the ability to work independently, to expand and narrow the text, to describe the object on the basis of evidence, to evaluate the results of their own activities and the activities of others.

8. Experience has shown that the knowledge, skills and abilities of students, the experience of creative activity, the attitude to the elements of language are highly developed. As a result of the experimental study, the coefficient of mastery of the training material was transferred from the experimental group to the control group increased by 11.7% compared to.

REFERENCES:

1. General secondary and secondary special, qualification requirements of vocational education in General Educational Sciences // collection of legislation of the Republic of Uzbekistan, 2017. –page. 141-142.
2. Tajbenova S. Research in the process of continuous mother tongue education using the research method // müğallım həm uzlıksız bilimlendirio'. - Nökis, 2008. № 4. - page 37-40.
3. Tajbenova S. Continuous mother tongue lessons research (research) about the stage // müğallım həm uzlıksız bilirlendirio'. - Nökis, 2008. № 5,6. - page 97-100.
4. Tajbenova S. Problematic questions and assignments in the lessons of the primary class native language // knowledge also Society. – Nökis, 2015. № 2. - V. 37-41.
5. Tajbenova S. Studying definitions in native language lessons // pedagogy. – Tashkent, 2017. № 6. – page. 118-122.
6. Tajbenova S. Differentiated Approach to Theoretical Knowledge in Terms of Its Practical Applicability // Eastern European Scientific Journal. – Germany, 2018. №2. – P.P. 219-222.



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INFORMATION ON THE ECOLOGY OF GLOSSY IBIS- (PLEGADISFALCINELLUS L.1766) ANDEURASIAN SPOONBILL- (PLATALEA LEUCORODIA L.1758) 'S SOUTH-KYZYLKUM WATER DISTRIBUTION

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ABSTRACT

The article presents the data on the ecology of colonially nesting birds in the reservoirs of desert zones of Uzbekistan, the ways of colony formation, the influencing factors and features of the adaptation of birds. In the formation of colonies involving mixed species, the attitude of the members of the colony towards vital needs, especially food and nesting site, plays a decisive role. The flight of the bird during the spring and autumn migrations is recorded in the literature in a number of regions of the country, such as Tashkent, Bukhara, Navoi, Kashkadarya, Samarkand, Surkhandarya (Maslov, 1947, Sagitov, 1989, Mitropolsky 2007).

KEYWORDS: Desert Zone, Colony, Environmental Factor, Adaptation.

INTRODUCTION

Every change that occurs in natural biotopes due to human economic activities is primarily noticed by the representatives of the fauna of the region and reacts to it with appropriate ethological actions (Turaev, 2019). As far as we know, the Aral Sea waters of the Republic and the surrounding tugai forests have long been chosen as a favorite habitat of representatives of the fauna of the region, including birds. However, since the 1950s, the unfavorable ecological situation that has arisen has begun to have a negative impact on the life of aquatic and underwater bird species, as well as all representatives of animal autonomy. As a result, species that have lived for many years have left the area one after another. This situation requires a re-analysis of the ecology of the distribution of species in the country.

The following article provides information on the ecology of the distribution of caravans and spoons from a small number of species in the country, where in recent decades there have been attempts to build nests in the ornithofauna of water bodies in the desert zone of the republic.

MATERIALS AND METHODS

These data were obtained on the basis of our observations in the south-western part of the Kyzylkum in Karakir, Zamonbobo, Dengizkul, Khadicha, Zikri, Cho'chqaxona lakes, Tudakul Water Reservoir and Kagan fishery during 2001-2020. It should be noted that during our observations, 16 species of birds listed in the Uzbek and International Red Data Books were recorded among the birds registered in the reservoirs. Below we find the following species of glossy ibis (*Plegadis falcinellus* L.1766), spoonbill (*Platalea leucorodia* L.1758). In this case, the analysis of species home ecology was based on the method of Novikov (1949), the ecology of birds was based on the method of Kashkarov (1927), the collective analysis of species was based on the method of Lanovenko, Felatov, Felatova in 2017

RESULTS AND DISCUSSION

Glossy ibis (*Plegadis falcinellus* L.1766) and spoonbill (*Platalea leucorodia* L.1758) which are analyzed in this article, are considered to be migratory, nest-building species of our country's ornithofauna. Due to its small number and the limited size of the nesting area, the species mentioned above are listed in the "Red Book" of Uzbekistan as a declining species.

Glossy ibis (*Plegadis falcinellus* L.1766) - There are 3 subspecies of blackbirds in the world fauna, which are found in a number of countries (Africa, America, Europe, Asia, Australia) on almost all continents of the world, and in different types - in flight, wintering, reproduction.

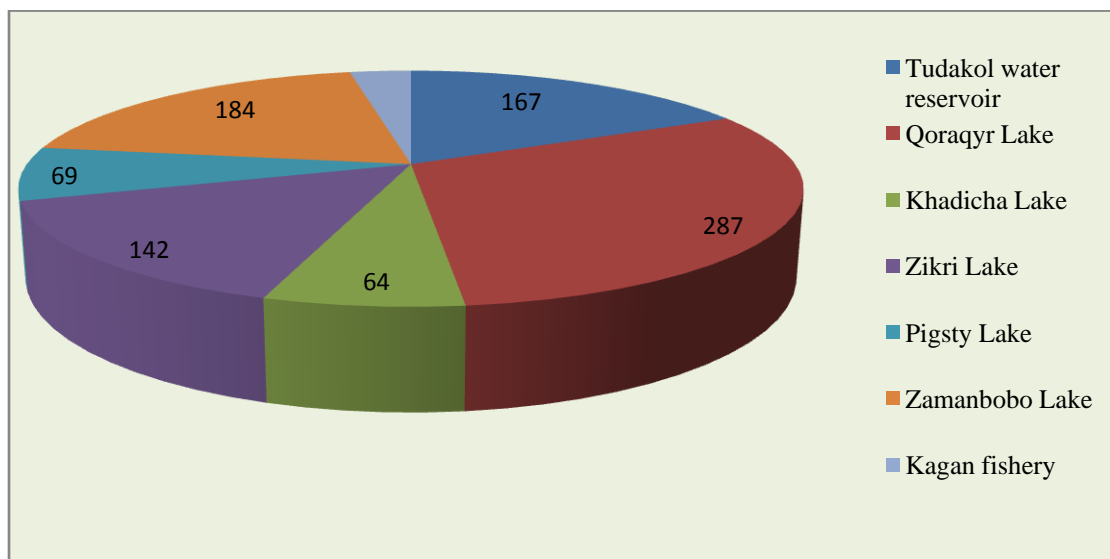
The only subspecies of glossy ibis (*Plegadis falcinellus* L.1766) found in the territory of the Republic is believed to be a migratory nest-building species. In the literature, until the second half of the last century, the species' nest-building efforts were reported to occur only in the Aral Sea basins of the lower reaches of the Amudarya (Sagitov, 1987). The flight of the bird during the spring and autumn migrations is recorded in the literature in a number of regions of the country, such as Tashkent, Bukhara, Navoi, Kashkadarya, Samarkand, Surkhandarya (Maslov, 1947, Sagitov, 1989, Mitropolsky 2007).

In the literature on the occurrence of the species in the basins of the Zarafshan downstream, Lemmani (1882), Gladkov (1932), Maslov (1947) and others have noted that it occurs in small numbers in spring and sometimes in autumn flight.

Our long-term observations show that in the basins of different types of water formed in the southern part of the Kyzylkum Desert, there are some changes in the number, range, duration and habitat of this species, as observed today in the lives of a number of water and underwater birds. Spring migration of the bird takes place a little later. In our long-term observations, the spring flight time of the bird was observed from the second half of March (14.03.2020, 26.03.2017) to the first ten days of April, depending on the air temperature, and these movements lasted until mid-April (7.04.2002; 11.04.2011;) continues. In the first days of migration, the glossy ibises form a small herd (from 5 to 25) and are in the shallows and ponds of almost all water basins of the region - actively feeding, and from the last ten days of April (25.04.02) the glossy ibises begin to build nests.

During our observations, the first attempts of the birds to build nests in the waters of Bukhara region and adjacent regions were recorded in the reeds of the Kagan fishery (Turaev, 2003). 287 nests were registered in Qoraqyr Lake, 64 nests in Khadicha Lake, and 69 nests in the reeds of

Cho'chqaxona Lake. In 2015-2018, 184 nests were recorded in Lake Zamanbobo and 142 nests in Lake Zikri.



Distribution of glossy ibis involved in reproduction across regional waters

It should be noted that in the regional water basins, the movement of cattle to build nests is often changed. This is due to the strength of anthropogenic impacts in water bodies and human control of the hydrological regime in water bodies (in Kagan fishery ponds, Zikri and Khadicha - frequent changes in water levels), reed mowing in reefs or "weeding" reeds ("Foot rot" (Oyoqog'itma), Qoraqyr, Khadicha lakes), sometimes associated with high levels of poaching activity.

The movement of laying the first eggs in the nests in the observed basins (depending on air temperature) begins in the last days of April (27.04.02., 30.04.03) and lasts until the first half of May.

Glossy ibises are a species that lives as a community. This bird builds nests in a mixed community with blue and straw crows, little blackbirds, some white crows with some snouts, and straw crows.

In the formation of colonies involving mixed species, the attitude of the members of the colony towards vital needs, especially food and nesting site, plays a decisive role. Usually in the colony the nutrient composition of the species or the location of the hive, the homogeneity of the building material of the hive forms them as competitors for these elements and the species try to squeeze each other out of the colony, otherwise harmony between different species is observed (Sioxin, Chernichko 1988; Turaev, 2019).

Therefore, during our observations in the ponds of Tudakul and Kagan fisheries of Bukhara region grey heron - *Ardea cinerea*, purple heron - *Ardea purpurea*, little egret - *Egretta garzetta*, pygmy cormorant - *Phalacrocorax pugmaeus*, Eurasian spoonbill - *Platalea leucorodia* and glossy ibis - *Plegadis falcinellus*, the diversity of species in the food spectrum and the presence of hierarchical features in nest placement showed that a healthy environment between species was

formed. There was a consensus among the members of the colony on the placement of the nests of the species in the reeds on the reeds and in some external disturbances (Turaev etc., 2019).

In the community, the nests of caravans are 3.0-5.5 cm above the water level in the lowest tier. placed at a height of 15.0–17.0 cm. The nests were placed between reeds, reedbeds (Kagan fishery, Zikri Lake, Khadicha Lake) or on the branches of a willow bush (Tudakul Reservoir, Zamonbobob Lake, Qaraqyr Lake), depending on the vegetation cover of the water basin where the community is located.

The composition of the building material of the hive also varies in terms of the amount of material. We observed that the nesting material of nests placed between reeds and reeds was low (in Kagan fishing ponds, Khadicha and Zikri lakes), but in nests located in willow bushes (Tudakul reservoir, Zamonbobob, Qaraqyr lake) the weight of construction material was used.

The composition of the building materials of the hive consists of thin stalks of reeds, leaves, balls of flowers and slender twigs. Nest size (n -10): nest height-190 mm, nest width - 210 mm, nest width 170 mm, nest depth 31 mm (Turaev, 2006).

Caravans' nest-building activities were first recorded in May 2003 among gargoyles in the watershed in the Kogon fishery.

We have witnessed that the nests were completely laid in eggs in the first ten days of May. Efforts to build the nests were made almost simultaneously, with the number of nests in the community on May 6 being 29, and on May 10 laying eggs in 50 nests. Up to 4-6 dark blue eggs (n-40) are laid in the nests, with an average of 4.2 eggs per nest. The dimensions of the eggs are very close to the dimensions recorded in the literature, length 57.0-54.0 mm, width 37.0-35.0 mm. average 52.0-36.0 mm. Also, the weight of low-pressed eggs was 31.4 to 42.0 g (n-17) with an average of 38.0 g. (Turaev 2006).

Eggs are laid for 21 days in the presence of both sexes, and the bird, which is released from laying eggs, feeds along the shores of the shallows of the water basin.

In the observed nests, the first chicks appear in the second half of May. On May 20, we noted that there were 3 chicks of 4-5 days old in one of the nests on the team. The body of the chicks is covered with a sparse black downy feathers, when their body size is measured: the weight of the chicks - 53 g; 59 gr; 69 gr ;, beak length - 14mm; 16 mm; 16.5mm ;, wing -23mm; 25mm; 26mm ;, tarsus - 26mm; 27mm; 29mm;, were identified.

Examination of food debris in the hive revealed that the hive consisted of shrimp, perches, water beetles and aquatic insects. 05/26/02 we observed the discovery of chicks in almost all nests of the colony. However, the percentage of hatching from eggs laid by cattle was relatively low (72.3%). The average number of opened chicks in 14 surveyed nests (p = 14) was 3.1. The main reasons for this are:

-First of all, due to the fact that the nests are located too close to the water level, the water level in the pools fluctuates, which leads to the partial death of chickens and eggs in the nest.

- In addition, due to the inconvenient placement of thrush nests between reed stems and reeds, it is sometimes observed that when the parent bird flies out of the nest and lands, eggs and young chicks die, falling into the water. On the first day of May 2003, during our observations, it was noted that 3 eggs from 2 nests were released into the water.

From the first days of July, chicks begin to fly out of the nest. It is observed that birds of prey arrive from the shores of islands near reed thickets, where nests of communities are located, and then feed in groups in neighboring water bodies. Since August, shepherds completely leave the nesting site. It prepares for the flight since the last days of August, and in September it meets its last representatives for feeding only in some waters of the region, including the Tudakul reservoir, the Kagan fishing ponds, the shores of Dengizkul and Zikri lakes. In warmer autumn years, the autumn emergence of glossy ibises can last until the last days of October (10/29/2013, 10/27/2017, 10/30/2019). Hunting for cattle is prohibited. Protected in the waters of Sudocha, Tuzkon, Qaraqyr, Dengizkul of the republic.

Spoonbill- (*Platalea leucorodia* L.1758)- It belongs to the family of ibises of the genus spoonbilled-stork and is one of the weakest, most endangered species of flying or nesting species in the avifauna of Uzbekistan. Listed in the Red Book of Uzbekistan 2 (VU: D).

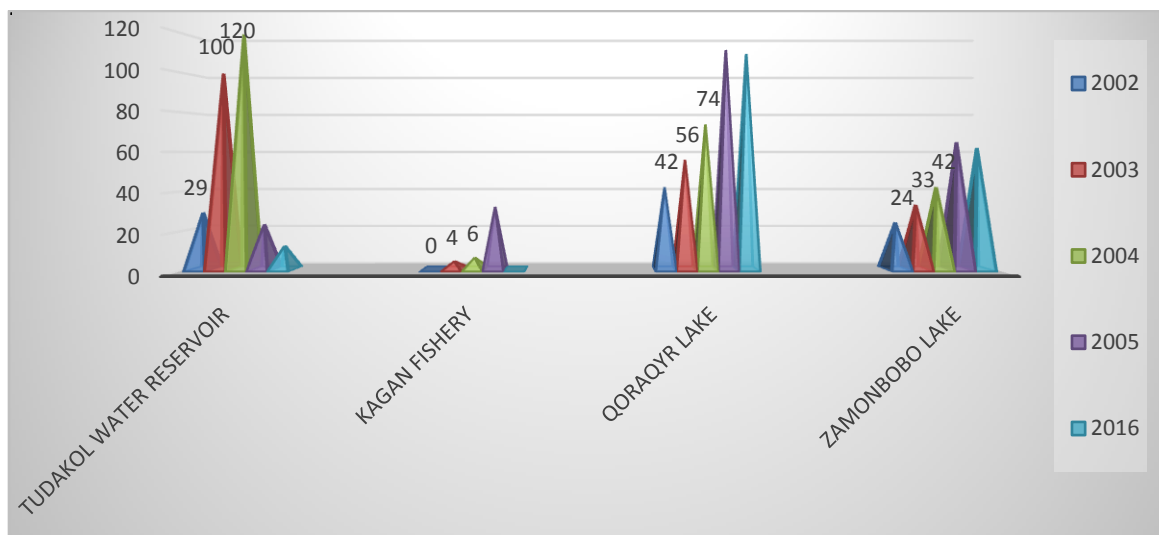
In Uzbekistan, there is a subspecies *Platalea leucorodia* L. Information is presented in the works of a number of researchers on the ecology of the distribution of this species in Uzbekistan (Kenzhegulov, 1967, Ametov, 1984, Zagitov, 1987, Shernazarov, 1996, Mitropol'skiy, 2007). These data indicate that reed habitats around the waters of the Lower Amu Darya and Syr Darya deltas are the main breeding grounds for the species.

In the middle reaches of the Amudarya and the lower reaches of the Zarafshan River, snails are noted as a small migratory species (Maslov, 1947, Akhmedov, 1950, Salikhbaev, Ostapenko, 1966, Sagitov, 1987, Mitropolsky, 2007).

However, as a result of the ecological crisis in the Aral Sea region, from the second half of the last century, changes began to be observed in the ecology of the distribution of snails, like all species of the Aral Sea. By the second year, the bird's range expanded southeast of the Aral Sea. Confirmation of our opinion is the fact that in the last years of the century birds met during the construction of nests in the lakes Aydarkol and Alan of the republic.

It was noted in our observations that similar changes have taken place in Bukhara region and adjacent areas. On March 27, 2002, in the pond of the Tudakul Reservoir, in the center of a colony of grey herons and large glossy ibises, 29 nesting holes were recorded (Turaev etc., 2003, 2006).

After that, the nest-building efforts of squirrels were recorded in a number of water basins of the region, including Kagan fishery (32), Khadicha Lake (6), Zikri Lake (12), Zamonbobob Lake (65) and Cho'chqaxona Lake (29). was found. Although this species seems to have adapted to the region's waters for a short time and is growing in numbers, their numbers have been observed only in the spring and autumn migrations in the Tudakul Reservoir and Kagan fishery ponds, where the first nests were built (Turaev, 2003). .

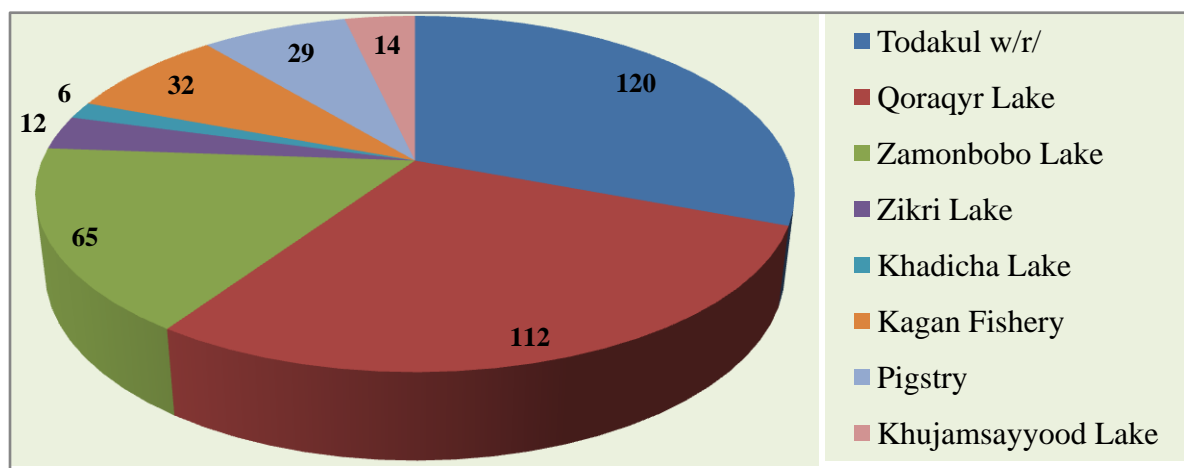


Dynamics of change of nesting movements of spoonbills over the years in water reservoirs

By 2016-2018, the nest-building efforts of squirrel nests show that the number of nests in the newly selected Lakes Zamonbobo, Qaraqyr, Zikri, Cho'chqaxona, Khojamsayod remains relatively stable.

If one of the largest reservoirs of the country, Lake Aydar, has been observed to nest on the same island for several years (Shernazarov, 1996), in our observations, it is noted that spoonbills often change their nesting sites in the waters of Bukhara region.

This is due to the high impact of anthropogenic activities around the region's waters (reed harvesting, weeding of reeds, grazing of livestock around water bodies and frequent control of water levels in water bodies, etc.), as well as the proximity of water bodies. due to which it is done in the short term.



Pools where nesting attempts of spoonbills are recorded

Spring migration of spoonbills in the region is observed from the second half of March to the last days of March, depending on the air temperature (27.03.02., 21.03.13.). From the first ten days of April, nest-building efforts begin (4.04.04., 8.04.16.). Spoonbills are a species that lives as a

community at all stages of life (migration, feeding, resting and nesting). When building a bird's nest, sometimes a small number of nests is formed, consisting of 6-12 nests (in Zikri, Khadicha, Kagan fisheries), sometimes up to 47-130 nests (Tudakul reservoir, Qaraqyr, Zamonbobo lake). The nests are mainly composed of grey heron - *Ardea cinerea*, purple heron - *Ardea purpurea*, little egret - *Egretta garzetta*, great cormorant - *Phalacrocorax carbo*, pygmy cormorant - *Phalacrocorax pugmaeus* and glossy ibises - *Plegadis falcinellus*. In this case, the bird chooses its nests in a separate part of the colony (often the center of the colony). The distance between the nests is 44.3cm depending on the nesting capacity. from 2.0 to 3.0 meters, at a height of 44.2 to 86.3 cm above the water level. As a building material for the nests use last year's dried stems and leaves of reeds.

The earliest egg-laying movements in the mentioned colonies were recorded in the Tudakul Reservoir pond in the first ten days of April (09.04.2002, 12.04.2008), while in the second half of April to the first half of May (19.04.2002, 24.04.2004). , 5.05.2012.). attempts to lay eggs en masse in the nests are observed. But the number of nests in the colony increases throughout the season. Due to this, the time of egg laying in the nests in the colony varies. In particular, on May 18, 2008, when inspecting the colony in the ponds of the Kagan fishery, it was noted that in 10 out of 12 nests eggs of different stages were laid, and in 2 nests the chicks hatched from eggs (Turaev, 2012).

Similarly, on May 31, 2009, 16 of the 29 nests recorded in Cho'chqaxona Lake had 4 eggs, 3 eggs in 8 nests, 2 eggs in 2 nests, and construction of 3 nests had already begun. The nest-building efforts of snails, like most aquatic and underwater species in the region, have been shown to continue until July, depending on air temperature. During our observations, chicken nests were recorded in the last days of August (23.08.2003) in a colony in a pond west of Tudakul. In one of the nests, 3 and in the remaining 2 nests, 3 bird nests were registered, with 2 hatchlings (approximately one month old). We can observe that this condition occurs only under the influence of air temperature, and most importantly anthropogenic factor. Such actions were recorded in 2008 in the Kagan fishery ponds. Due to the sharp drop in the water level, the island where the 12 chicks nested was connected to the coast, and the chicks in the nests were completely killed by jackals and stray dogs. This forces the birds to rebuild their nests.

During our observations, we have seen that the number of eggs in re-laid nests is 2, sometimes 3 (Turaev, Azimov, 2012). In the nests lay up to 3–5 large brown-spotted, white eggs. An average of 3.8 eggs were observed in 60 nests recorded in the colony. This figure corresponds to the figure in other waters of the republic (Shennazarov, 1994). The period of laying eggs in the basins of the region begins in the second half of April (18.04.2003, 16.04.2016). The eggs are laid for 21-25 days in the presence of both sexes. x 44.3 mm. From the second half of May the chicks hatch from the eggs, and in June and July the chicks leave the nests completely and spread out to feed on the shallow shores of the ponds. The food composition of snails is based on various aquatic invertebrates, aquatic insects, shrimp, small fish, dogs, and sometimes young frogs. It has been preparing to fly since the last days of August and in September it feeds only on the last representatives in some waters of the region, including the Todakol reservoir, Kagan fishing ponds, Zikri, Zamonbobo, Dengizkul, Qaraqyr, Oyoqogitma lakes. In the warmer years of autumn, the autumn flight of spoonbills can last until the last days of October (29.10.2013, 27.10.2017, 30.10.2019).

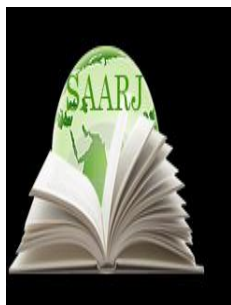
CONCLUDING

During the ecological crisis around the Aral Sea, a number of birds of the republic, including sparrows and blackbirds, a rare species of our fauna, have been expanding their range in the waters of Bukhara region since the last century and becoming regular nesting species. As mentioned above, the habitat of these species in the region is observed in the lakes Zamonbobo, Qaraqyr, Zikri. Given the fact that these reservoirs, in turn, are included in the list of important ornithological regions (IOR) of international importance, the opportunities for further increase in the number of these species in the regional reservoirs are expanding.

REFERENCES:

1. Zaletaev V. S. Natural environment and birds of the northern deserts of the Transcaspiian region Publishing house "Science" Moscow, 1968.
2. Kashkarov, D.N. Method for the quantitative study of vertebrate fauna and analysis of the data obtained: Tr. Wed State University, ser. 8. Zool., Issue 1. 1927. Tashkent. Publishing house Wed Gos. un-that. P.3-24.
3. Kashkarov D.Yu., Pavlenko T.A. Methodical instructions for the registration of the number of game animals in the conditions of Uzbekistan. Inf. soob. Academy of Sciences of the Uzbek SSR, Institute of Zoology and Parasitology. "FAN", 1975.
4. Kovshar V.A. Action Plan for the Management of Globally Significant Bird Species Astana-Almaty, 2010., p. 97.
5. Lanovenko E.N., Filatova E.A. Methodical recommendations for conducting ornithological monitoring in the water bodies of southern Uzbekistan. Tashkent, 2017, p. 22.
6. Rustamov A.K., Kovshar A.F. Birds of Central Asia Vol. 1. Almaty 2007
7. Sagitov R.A., Pukinsky Yu.B., Pukinskaya M.V. Modern settlements of copepods and ankle birds on the Karakyr lakes of the Bukhara region // Fauna and ecology of birds of Uzbekistan. - Samarkand 1989, 193-205 p.
8. Siokhin V.D., Chernichko I.I., Ardamatskaya T.B. Colonial hydrophilic birds of the south of Ukraine Publishing house "Naukova Dumka" 1988
9. Turaev MM Fauna and ecology of waterfowl in the Amu Darya river basins. Dissertation materials, Tashkent, 1995.
10. Turaev MM New information on the ecology of the caraway (*Plegadis falcinellus* L.1766). Ecological problems of biodiversity of the Republic of Uzbekistan Proceedings of the Republican scientific-practical conference. Navoi. 2006. pp. 48-50
11. TuraevMukhtorEkological change in the Aral region; adaptations by the spoonbill and black-crowned night heron. Disaster by Design; The Aral Sea and its Lessons for Sustainability. Emerald 2012, 283-290
12. Turaev M., Shernazarov E. Nesting birds of the Tudakul reservoir (South-West Uzbekistan) // Kazakhstan Zoological Yearbook Selevinia. 2006, 206-208 p.
13. Shernazarov E. Anthropogenic transformation of fauna, population and ecology of water and near-water birds of Uzbekistan. Abstract doc. Dissertation. Tashkent, 1996

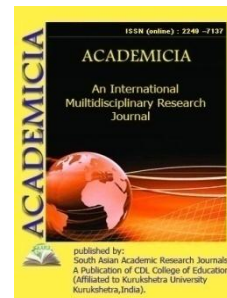
14. A.Ten, R.Kashkarov, G.Maketova, M.Turaev. "Akpetkylakes, Sarykamyslake, Ayakaghytmalake, andtheirdesertsurrounds: threenewImportantBirdAreasinUzbekistan" Sandgrouse 34. 2012г. 137-147с.
15. Turaev MM, Rakhmonov.R. "Data on the ecology of the distribution of the Cygnus olor g.1789 in the waters of the southern Kyzylkum", Bulletin of the Khorezm Mamun Academy, 2021-5. Pages 88-93.
16. Turayev Mukhtor Murodovich, Sharifova Shokhsanam Shokir Qizi "Seasonal Dynamics of Bird Differences and Numbers in the SouthWestern Kizilkum Reservoirs".Scholars Academic and Scientific Society204, Borhawor, Murajhar, Hojai, Assam, India-782439, www.sassociety.com., Journal:South Asian Research Journal of Biology and Applied Biosciences SARJBABVolume 3, Issue -2,Year 2021,Page Number 31-35,Date of Issue: 20-10-2021.
17. Turaev MM, Rakhmonov RR Peculiarities of colonies of nesting birds in the water basins of the desert zone of Uzbekistan. Bulletin of the Khorezm Mamun Academy, 2019-3 / 1,49-55 pages.



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A BRIEF STUDY ON INDOOR AIR POLLUTION

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ABSTRACT

Indoor air pollution (IAP) is a major health hazard that kills millions of people each year. IAP may be caused by a variety of contaminants, therefore it's critical to determine their primary sources and concentrations; as well as develop methods for controlling and improving indoor air quality (IAQ). We examine and evaluate the main sources of significant pollutant emissions, their health impacts, and problems connected to IAP-based diseases, such as sick building syndrome (SBS) and building-associated sickness, in this paper (BRI). In addition, methods and approaches for controlling and reducing pollutant concentrations are highlighted, and current developments in attempts to resolve and enhance IAQ are described, along with their distinct benefits and potentials. The development of new materials for sensors, IAQ-monitoring systems, and smart houses is expected to be a viable approach for controlling and improving IAQ in the future.

KEYWORDS: *Indoor Air Quality, Indoor Pollution, Human Diseases, Smart Home.*

INTRODUCTION

Because most individuals spend 90 percent of their time inside, mostly at home or at work, the quality of the indoor environment has a significant impact on human well-being. Indoor air pollution (IAP) is responsible for the deaths of 3.8 million people per year, according to the World Health Organization (WHO). Inside houses or buildings, IAP may be produced by inhabitants' activities such as cooking, smoking, using electrical equipment, using consumer goods, or emitting from building materials. Carbon monoxide (CO), volatile organic compounds

(VOCs), particulate matter (PM), aerosol, biological contaminants, and others are all harmful pollutants found within buildings. As a result, research on air quality management has shifted from outside to interior settings during the last decade, reflecting lifestyle changes related to increasing levels of urbanization. Reduced IAQ has been shown to have a detrimental impact on human health by generating building-related disease. IAP exposure, both short- and long-term, may result in a variety of illnesses. As a result, the development of monitoring systems is critical to IAQ regulation[1]–[5].

Indoor Air Quality (IAQ) and Indoor Air Pollution (IAP):

IAQ, as defined by the EPA, is the air quality within and around buildings and structures, particularly as it pertains to the health and comfort of building occupants. IAP, on the other hand, refers to the presence of pollutants in the interior air of non-industrial buildings, such as volatile organic compounds (VOCs), particulate matter (PM), inorganic compounds, physical chemicals, and biological variables, all of which may have harmful effects on the human body. IAQ has evolved and grown as a study area in order to safeguard humans from such contaminants. Pollutant concentrations, environmental conditions (temperature, airflow, and relative humidity), light, and noise are the primary factors used to assess IAQ. Thermal conditions are important in IAQ for two reasons: (i) a variety of issues associated with poor IAQ may be addressed easily by changing relative humidity or temperature, and (ii) building materials in high-temperature buildings can be highly released.

Main Pollutants in Indoor Air Environment:

Many indoor air contaminants have been identified as having negative effects on IAQ and human health. NO_x, volatile and semi-volatile organic compounds (VOCs), SO₂, O₃, CO, PM, radon, hazardous metals, and microbes are the most common indoor air pollutants. Some of these may be found in both indoor and outdoor settings, while others are native to the outdoors. Organic, inorganic, biological, and radioactive contaminants may all be classed as indoor air pollutants[6]–[8].

Particulate Matters:

Carbonaceous particles in combination with adsorbed organic compounds and reactive metals are classified as PM. Sulfates, nitrates; end toxin, polycyclic aromatic hydrocarbons, and heavy metals are the major components of PM (iron, nickel, copper, zinc, and vanadium). PM is divided into three categories based on particle size: (i) coarse particles, PM₁₀, with a diameter of 10 μm; (ii) small particles, PM_{2.5}, with a diameter of 2.5 μm; and (iii) ultrafine particles, PM_{0.1}, with a diameter of 0.1 μm. PM is particularly dangerous since it may be inhaled, creating severe health problems by damaging the lungs and heart. Indoor PM levels have been found to frequently surpass outside PM levels. Particles that move from the outside and particles produced by inside activity are both causes of indoor PM. PM are spread within buildings due to cooking, fossil fuel combustion activities, smoking, machine operation, and household hobbies. Due to its penetrability into the tiny airways and alveoli, PM_{0.1} produced by fossil fuel burning poses a higher health risk than PM₁₀ and PM_{2.5}.

VOCs:

VOCs (volatile organic compounds) are gases that include a range of chemicals and are released by liquids or solids. One of the most common VOCs is formaldehyde, a colorless gas with an

unpleasant odor that is produced by numerous construction materials such as particleboard, plywood, and glues. Indoor VOC concentrations are at least 10 times greater than outside values, independent of building location. Interior VOCs are primarily produced by four sources: (i) human activities such as cooking, smoking, and the use of cleaning and personal care items; (ii) indoor chemical reactions; (iii) penetration of outside air via infiltration and ventilation systems; and (iv) building materials. Air exchange rates, home age and size, building modifications, outside VOC levels, and door and window opening may all influence VOC concentrations.

NO_x:

Nitric oxide (NO) and nitrogen dioxide (NO₂) are the two main nitrogen oxides, both of which are produced by combustion sources such as stoves and heaters. NO and NO₂ concentrations in the environment fluctuate dramatically depending on local sources and sinks. Their typical concentration in buildings without combustion activities is half that of the outdoors, but indoor levels frequently surpass outside levels when gas stoves and heaters are utilized. NO₂ is generally considered a main pollutant since it is quickly reduced to NO under ambient circumstances. Nitrous acid (HONO) is formed when NO₂ reacts with water. It is a powerful oxidant and a frequent indoor contaminant. Interior NO₂ levels have been shown to be a result of both outside and inside sources; therefore, high outdoor NO₂ levels from combustion or local traffic sources may affect indoor levels.

Ozone:

Ozone is a strong oxidizing agent that is mostly generated in the atmosphere through photochemical interactions of O₂, NO_x, and VOCs. Due to its delayed reactivity with most airborne contaminants, it cannot be utilized to remove other indoor chemical pollutants. Although ozone allows for quick reactions with a variety of indoor contaminants, the reaction products may irritate people and harm materials. The outside environment and the functioning of electrical equipment are the primary sources of indoor ozone. Photocopiers, disinfection devices, air-purifying equipment, and other office machinery are typical sources of indoor ozone gas. Corona discharge and photochemical processes are the two types of ozone emission methods used by these devices.

SO₂:

Among the sulfur oxides (SO_x) found in the atmosphere, sulfur dioxide (SO₂) is the most frequent gas. SO₂ is mainly generated through the burning of fossil fuels, and it mixes with aerosols and PMs to create a complex collection of different air particles. Vented gas appliances, oil furnaces, cigarette smoke, kerosene heaters, and coal or wood stoves are all producers of SO₂. Furthermore, outside air is considered a major source of indoor SO₂. Indoor SO₂ levels are often lower than those seen outside. Because of its reactivation, SO₂ emissions inside are typically low and readily absorbed by interior surfaces. It is well known that the hourly concentration of SO₂ in buildings is often less than 20 parts per billion. Humans are only exposed to SO₂ via inhalation, which may affect respiratory function.

CO_x:

Combustion activities, such as cooking or heating, generate the majority of carbon monoxide (CO) in indoor air. CO may also be introduced into interior settings through infiltration from the outside air. Unvented kerosene and gas space heaters; leaky chimneys and furnaces; back-

drafting from furnaces, gas water heaters, wood stoves, and fireplaces; gas stoves; generators and other gasoline-powered equipment; and tobacco smoke are all significant sources of indoor CO emissions. The typical CO concentration in a building without any gas stoves is about 0.5–5 ppm, while the concentration around gas stoves may vary from 5 to 15 ppm, and even 30 ppm or more. CO exposure may have negative health consequences, including (i) cardiovascular and neurobehavioral impairments at low concentrations, and (ii) unconsciousness or death at high doses.

Toxic Metals:

Human activities and natural processes both emit heavy metals into the atmosphere. Infiltration of outside pollutants (dust and dirt), smoking, fuel consumption products, and building materials are all sources of IAP by heavy metals. Heavy metals in indoor dust may harm people's health if they enter their bodies via inhalation, ingestion, or skin contact. Heavy metals in indoor air are divided into two groups based on their effects on humans, according to the International Agency for Research on Cancer (IARC): (i) non-carcinogenic elements such as cobalt (Co), aluminum (Al), copper (Cu), nickel (Ni), iron (Fe), and zinc (Zn); and (ii) both carcinogenic and non-carcinogenic elements such as arsenic (As), chromium (Cr), cadmium (Pb).

Aerosols:

Indoor aerosols are either primary aerosols produced by indoor gas-to-particle reactions or secondary aerosols produced by indoor gas-to-particle processes. Furthermore, outside particles that find their way inside are likely to be a source of indoor aerosols. Secondary inorganic aerosols (SIAs) are PMs made up of inorganic components such as anthropogenic or crustal sources and water-soluble ions, while secondary organic aerosols (SOAs) are produced when VOCs are converted from gas to particle.

Radon:

Building materials, soil gas, and tap water are the main sources of indoor radon. Because soil contains small amounts of radium, radon is most likely one of the components of the gas filling soil pores. When it comes to radon emissions from construction materials, every substance that contains tiny quantities of radium has the potential to emit radon. Masonry materials (i.e., stone, concrete, and brick) are the most common sources of indoor radon emission among building materials, with tons of such materials utilized in construction.

Pesticides:

Inorganic and organic pesticides are widely used as impregnation or surface coating protectants for timber construction materials these days. Bacteria, fungus, insects, rodents, and other creatures are all controlled and prevented using pesticides. Pesticides are typically semi-volatile substances in the interior environment, and depending on characteristics like vapor pressure, product viscosity, and water solubility, they may exist as gas or particle. Furthermore, it has been suggested that carpets and textiles may act as long-term reservoirs for organochlorine pesticides. Pesticides in fibers are thought to move into polyurethane foam pads when used in carpets, textiles, and cushioned furniture, resulting in carpets, textiles, and cushioned furniture reflecting an integrated pesticide exposure throughout their lifespan. Furthermore, pesticides may infiltrate buildings from the outside. Because they are protected from sunshine, severe temperatures, rain, and other elements once inside, they may last for months or years. In the indoor environment,

possible exposure pathways include dermal absorption, ingestion, and inhalation of particles or volatile molecules containing pesticides. Pesticide exposure is linked to a variety of health problems, including (i) short-term irritation of the skin and eyes, dizziness, migraines, and nausea, as well as (ii) long-term chronic effects including cancer, asthma, and diabetes.

Biological Pollutants:

Biological allergies (e.g., animal dander and cat saliva), house dust, cockroaches, mites, and pollen) and microbes are examples of biological pollutants found in indoor settings (viruses, fungi, and bacteria). Antigens, or biological allergens, come from a variety of insects, animals, mites, plants, or fungus, and react with particular immunoglobulin E (IgE) antibodies to cause an allergic reaction. Furry pets (dog and cat dander), house dust mites, molds, plants, cockroaches, and rodents are common indoor sources of allergies, but there are also outdoor ones. Viruses and bacteria are often transmitted by humans and animals. Exposure to biological allergens has been shown to induce sensitization, respiratory infections, respiratory allergic disorders, and wheezing, while indoor exposure to bacteria and viruses is likely to produce noninfectious and infectious health consequences.

LITERATURE REVIEW

J. Hao et al. discussed about Indoor air pollution and its control[9]. The present state of interior air pollution and its management in China is examined by outlining the polluting characteristics of key indoor air pollutants, the methods and techniques used to control indoor air pollution, and the significant issues that now plague indoor air pollution control. Although formaldehyde and benzene indoor pollution has been successfully reduced in China in recent years, toluene and xylenes indoor pollution remains a significant problem. Furthermore, research indicates that particulate matter (PM), biological pollutants, and semi-volatile organic compounds (SVOCs) indoor pollution is a significant problem in China. In China, the creation and implementation of IAQ-related laws and standards, research on indoor air pollution and its management, and the growth of the indoor environmental monitoring and cleaning sector have all played important roles in avoiding and managing indoor air pollution. However, issues like the lack of mandatory IAQ standards, the lack of regulation and labeling of pollutant emissions from indoor decorating and refurbishing materials, the lack of an effective performance evaluation system for air cleaning products, and the lack of proper air cleaner maintenance must all be addressed in order for IAQ to improve further.

M. Bentayeb et al. discussed about Indoor Air Pollution and respiratory health[10]. There are few studies on the impact of indoor air pollution on the elderly respiratory system. The goal of this review is to provide available epidemiological data to synthesize current understanding on the harmful respiratory consequences of indoor air pollution in those over 65 years old. We selected relevant articles published in English between 1991 and 2011 on the respiratory health consequences of indoor air pollution in elderly (>65 years) using the MEDLINE database via PubMed. A total of 61 studies were found, and 33 relevant publications were chosen after applying the following inclusion criteria: (i) epidemiologic studies published in English in peer-reviewed journals between January 1991 and December 2011, (ii) study population aged 65 or older, and (iii) outcome of respiratory symptoms and disease excluding lung cancer. The majority of studies found links between major indoor air pollutants and different short- and long-term respiratory health outcomes including wheezing, dyspnea, cough, phlegm, asthma, COPD,

lung cancer, and, more infrequently, lung function loss. Chronic obstructive pulmonary disease (COPD) and ambient cigarette smoke have the most consistent connection (ETS). In order to establish causal connections between exposures to indoor air pollution and underlying processes in this sub-population, further research in the senior population is required.

DISCUSSION

Indoor air pollution is the deterioration of indoor air quality caused by hazardous chemicals and other elements, and it may be up to ten times more damaging than outside air pollution. According to statistics, the health effects of interior air pollution significantly exceed those of outdoor air pollution in developing nations. Excess moisture, volatile organic compounds, carbon monoxide, and radon are four significant indoor air contaminants, according to the Environmental Protection Agency. The majority of indoor air pollution is caused by sources that emit gases or particles into the atmosphere. Pollution is continuously released by things like construction materials and air fresheners. Indoor pollution is also caused by other sources such as cigarette smoke and wood-burning stoves. Some contaminants in indoor air have been present for a long time. By not smoking inside and keeping craft materials in well-ventilated locations, you may help the environment. Ensure that your gas stove is well-ventilated, and keep clutter to a minimum to avoid interior air pollution.

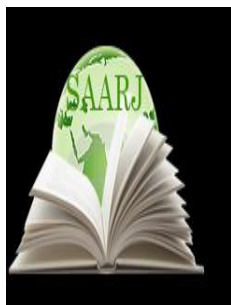
CONCLUSION

To summarize, contaminants in the indoor air environment have a major role in the development of human illnesses. PM, VOCs, CO, CO₂, ozone, radon, heavy metals, aerosols, pesticides, biological allergens, and microbes are just a few of the indoor air pollutants that may cause poor indoor air quality and therefore damage human health. The majority of these pollutants come from two primary sources: (i) human activity in buildings, such as combustion, cleaning, the use of certain building materials during construction or restoration, and the operation of electronic equipment; and (ii) transportation from outside sources. Even though these pollutants are often present in low quantities in buildings, long-term exposure may pose serious health concerns. Sick building syndrome (SBS) and building-related disease are the two most common types of building-related illness (BRI). Many methods and procedures for the management and reduction of pollutant concentrations have been adopted to minimize IAP's effects. The development of improved materials for sensors, IAQ-monitoring systems, and the smart home is anticipated to be useful in the future for the control and improvement of IAQ.

REFERENCES

1. H. J. Qu, H. P. Qin, T. T. Yao, and S. J. Luan, "Validation of a prediction method for indoor air pollution," *Huanjing Kexue/Environmental Sci.*, 2008.
2. B. Barnes, A. Mathee, E. Thomas, and N. Bruce, "Household energy, indoor air pollution and child respiratory health in South Africa," *J. Energy South. Africa*, 2009, doi: 10.17159/2413-3051/2009/v20i1a3296.
3. J. W. Peabody *et al.*, "Indoor air pollution in rural China: Cooking fuels, stoves, and health status," *Arch. Environ. Occup. Heal.*, 2005, doi: 10.3200/AEOH.60.2.86-95.
4. Y. Han, N. Zhu, N. Lu, J. Chen, and Y. Ding, "The sources and health impacts of indoor air pollution," 2010, doi: 10.1109/ICBBE.2010.5515150.

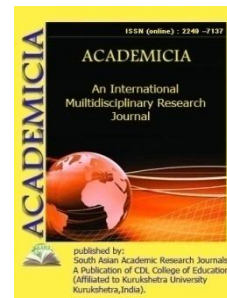
5. A. Stanković, M. Nikolić, and M. Arandjelović, "Effects of indoor air pollution on respiratory symptoms of non-smoking women in Niš, Serbia," *Multidiscip. Respir. Med.*, 2011, doi: 10.1186/2049-6958-6-6-351.
6. J. Zhang and K. R. Smith, "Indoor air pollution: A global health concern," *British Medical Bulletin*. 2003, doi: 10.1093/bmb/ldg029.
7. T. Chen and H. Liao, "The Disease Burden of Indoor Air Pollution From Solid Fuel Use in China," *Asia-Pacific J. Public Heal.*, 2018, doi: 10.1177/1010539518761481.
8. Max Roser and Hannah Ritchie, "Indoor Air Pollution - Our World in Data," "*Indoor Air Pollution*". Published online at *OurWorldInData.org*. 2018.
9. J. Hao, T. Zhu, and X. Fan, "Indoor air pollution and its control in China," in *Handbook of Environmental Chemistry*, 2018.
10. M. Bentayeb *et al.*, "Indoor air pollution and respiratory health in the elderly," *J. Environ. Sci. Heal. - Part A Toxic/Hazardous Subst. Environ. Eng.*, 2013, doi: 10.1080/10934529.2013.826052.



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A REVIEW ON GLOBAL GENDER DIFFERENCES IN OBESITY

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ABSTRACT

Obesity is a worldwide epidemic. However, the incidence of obesity and overweight among males and females varies considerably within and across nations, with more women than men being obese on average. In underdeveloped nations, especially in the Middle East and North Africa, gender inequalities in overweight and obesity are accentuated. In industrialized nations, however, males are more likely than women to be overweight. According to current research, a variety of societal factors across the globe aggravate gender inequalities in excessive weight gain. Gender variations in food intake are caused by a variety of contextual variables, and women typically report eating healthier meals but may eat more sugar-laden foods than males. Both males and females acquire weight as a result of acculturation, which occurs via complicated sociocultural processes. Excess weight gain has impacted both genders as a result of the dietary shift going to take place in so many developing nations, but it has had an even larger effect on women's physical activity levels. Furthermore, in certain cultures, greater physical size amongst women or men is seen as a signal of fertility, health, or wealth. More study on gender inequalities in obesity and overweight will enhance our knowledge of the worldwide obesity epidemic as it progress.

KEYWORDS: Disparities, Gender, Obesity, Physical activity, Weight gain.

INTRODUCTION

What was once a worldwide obesity crisis has now become a pandemic? Excess weight gain is usually caused by an energy imbalance. Excessive calorie consumption, especially of energy-dense foodse.g. sugar-sweetened drinks (SSB), increasing food portions, and sedentary behavior are frequently blamed for the epidemic. Sex “refers to biological and physiological traits that distinguish men and women,” while gender “refers to the socially created roles, attitudes,

activities, and qualities that a particular culture deems acceptable for men and women,” according to the World Health Organization. Obesity has biological and social factors that differ significantly by gender or sexuality[1]. Power and Schulkin examine the sex variations in adipose storage and metabolism in more depth, speculating on the evolutionary roots of these differences. Excess weight gain may have different health consequences depending on gender. Menopause is a biological condition that changes fat distribution in women, which may raise the risk of obesity or aggravate the harmful consequences of obesity on health. Gender inequalities and associated sociocultural variables are generally missing from the population health (obesity) discourse, and hence from possible policies and remedies, despite these physiological factors linked to sex-specific variations in excess weight gain[2].

According to global survey statistics, the incidence of overweight and obesity in both men and women varies by area and has significantly risen between 1980 and 2008. Global trends in women overweight and obesity have been recorded by studies based on a country's economic position (gross domestic income or gdp), not just among men (or both sexes). However, some research suggests that not only do worldwide disparities in obesity incidence vary by gender, but so do the social factors of obesity. This study looks at global changes inside the prevalence of overweight by gender, as well as how these trends are linked to sociocultural gender disparities and, as a result, their impact on overweight and obesity globally[3].

We performed a review of available survey data with a focus on observational studies that contained data on the prevalence of overweight in both male and female adults. We only considered publications published in English, and the normal adult population was defined as community-dwelling people who did not have specific dietary requirements and were not pregnant or nursing. We looked for papers published between 1988 and February 2011 in the MEDLINE (accessible via PubMed) and EMBASE databases. Additional papers were found by scanning references in relevant articles and manually checking the contents page of journal articles (Obesity Reviews), as well as Google Scholar, for articles published between 1988 and February 2011. Attempts were undertaken to locate research on nations that were not included in the original search. A total of 1800 items were received; 287 articles were chosen for possible eligibility based just on specific criteria, and 191 of these were examined. The parameters mentioned in the published paper were utilized to classify overweight and obesity. The CDC BMI cutoffs for overweight (25.0 BMI 30.0) and obesity (BMI 30.0) were utilized in the majority of studies. However, the majority of publications about people in East Asia and the Pacific, as well as a handful about people in Sub-Saharan Africa and Latin America and the Caribbean, employed different definitions for overweight (27.0 BMI 31.0) and obesity (BMI 31.0)[4].

When the 105 nations and territories studied were classified by World Bank income categories, we discovered that all income levels had a higher overall incidence of female obesity than male obesity. However, there was a higher incidence of male overweight relative to female overweight in the elevated [non-Organization for Economic Co-operation and Development (OECD) and OECD) categories. OECD (all high-income) countries and territories included Australia, Belgium, Canada, Denmark, England, Estonia, Finland, France, Germany, Greece, Ireland, Israel, Italy, Japan, Luxemburg, the Netherlands, Norway, Poland, Portugal, Slovenia, Spain, South Korea, Sweden, Switzerland, and the United States, according to the World Bank classification; and high-income nonOECD countries and territories included Australia, Belgium,

Canada, Denmark, England, Estonia, Finland, France, Germany, Greece, Ireland, Israel, Furthermore, when grouped by area, the Middle East and North Africa showed the largest inequalities in woman obesity and overweight (Fig. 1), while both Europe and Asia and the OECD countries had a higher incidence of male overweight relative to female. Gender differences in obesity and overweight were also found between urban and rural regions within each income category and region, with urban areas having larger gender disparities for obesity and overweight than rural one[5].

DISCUSSION

We classified developed nations as elevated countries and countries like all low- and middle-income countries, according to the World Bank. It's tough to quantify socio cultural influences. However, societal and cultural variables seem to affect both food consumption and physical activity at a worldwide level, and may be linked to gender differences in weight gain. We examine established and developing nations separately since socio cultural variables differ between them. Finally, we examine individual Arab nations, which include both poor and high-income countries, but which have comparable but distinct traditional cultures.

1. Developed nations

In the second part of the twentieth century, the bulk of occupational positions for both men and women in industrialized nations were inactive, and recreational time physical exercise for both men and women was scarce. In the U.S, for example, more than half of people follow the public health guideline of 30 minutes of physical exercise each day. The bulk of physical activity in all European Union nations is sedentary, and it does not differ significantly by gender. As a result, gender differences in obesity and overweight in these nations are likely driven by food consumption rather than or in addition to the physical activity and associated sociocultural variables[6].

Despite the fact that sociocultural variables influence food consumption habits, the percentage of energy consumed from animal source meals is greatest in high-income nations. Gerbens-Leenes et al. discovered that high-income nations consume the most kcal per capita per day, as well as the highest percentage of energy consumption from fat, based on a global study. Furthermore, researches based on data from industrialized nations have shown that there are gender-based dietary preferences and that one's sociocultural milieu affects these choices. Despite the fact that women are more likely than males to report eating or desiring to eat "healthier" meals, they seem to prefer and consume more energy-dense packaged foods including such cookies, chocolate, and ice cream. Women consume less dairy foods than males, according to national survey data both from the United States and Europe. Men, on the other hand, drink much more alcohol than women. Men consume a higher proportion of their calories from protein than women, according to studies. This is likely owing to men's predilection for and consumption of meat-based items[7].

Alcohol use is thought to be a cause of or linked to weight gain in males but not in women. Although males drink more alcohol than women, there are significant variations in alcohol metabolism between the sexes. The amount of alcohol drunk and the kind of alcohol ingested seems to have an impact on whether or not it promotes excessive weight gain. In both men and women, cross-sectional studies in a variety of groups have shown a positive association between alcohol intake and waist circumference (WC). Tolstrup et al. showed that, in males, drinking

frequency was not related with changes in WC and was negatively associated with significant WC gain in a large prospective cohort of Danish middle-aged men and women (that the authors defined as 5-y change in WC above the highest quintile of the sex-specific distribution, 6.9 cm for men). Drinking frequency was shown to be negatively related to both WC and significant WC increase in women. Furthermore, there's no significant connection between the quantity or kind of alcoholic beverage consumed and substantial WC increase in either sex in this research[8].

In addition to the impact of sociocultural variables on excess weight increase as a consequence of gender variations in food intake, cultural influences may also have an impact on weight gain via other, more difficult to quantify ways. Christakis et al. conducted a new social network study of the Framingham Heart Study cohort and discovered that men had a 100 percent increased risk of becoming fat if a male friend became obese, while the same impact of friend on fat was not significant among females. Acculturation may also play a role in obesity inequalities between men and women. The majority of studies that have looked at the relationship between acculturation and obesity and related factors (such as dietary intake and physical activity) have focused on acculturation in the United States, particularly among Mexican Americans, who are among the fastest growing segments of the population. Mexican Americans are not just more obese than their non-Hispanic white counterparts, but women are considerably more fatter than males, while non-Hispanic whites have no significant gender difference in obesity incidence. Mexican-American males, like non-Hispanic whites, are more overweight than Mexican-American women. Oza-Frank and Cunningham discovered a substantial positive connection between BMI and the amount of time spent in the United States among migrants, and that this relationship was stronger among females than men, especially Hispanic females[9].

Furthermore, acculturation regarding family attitudes was linked to a less favorable body fat deposits in Mexican-American men, so although structural assimilation (or assimilation to the presenter country's social network and structure) was linked to a more advantageous adiposity and less excessive weight gain in Mexican-American women. The adaption of dietary and physical habits that are typically unhappier (e.g., higher in added fats and sugars) and much more sedentary than an immigrant's home country is thought to be the source of the impact of acculturation on excess weight gain. Physical activity and smoking both substantially increase with cultural assimilation among women but not males among U.S. Latinos, according to a study of the relationship among cultural assimilation and obesity-related health variables among U.S. Latinos[10].

Gorman et al. founds that by increasing acculturative stress exacerbates chronic health conditions (e.g., type 2 diabetes, hypertension, and heart disease) at a higher rate in men than in women, and also that gender discrepancies in the effect of acculturation on wellness are mediated by the significantly lower rate of acculturation in men compared to women. As a result, although acculturation seems to affect excess weight gain in both Mexican-American men and women, as well as probable immigrants from those other countries, it tends to have a larger impact on women; yet, it appears to be more linked to the development of chronic illnesses in males.

2. Developing nations

In many emerging nations, daily food and lifestyle have altered dramatically as a result of economic development. The line between a traditional diet and an agricultural lifestyle has

blurred. Often, they are developing nations in the midst of a dietary shift. The nutrition transition is defined by markets with existing, demographic, ecological, and cultural changes that have a detrimental impact on both energy intake and expenditure. Rapid urbanization, as well as rising domestic output and importation of edible oils, has had a lasting nutritional effect on developing nations. Diets tend to contain more fat, sugar, and processed carbohydrates when dietary changes occur, and lifestyles grow more sedentary[11].

For most of the second part of the twentieth century, occupation remained a major example of physical activity in many developing nations, especially when compared to industrialized ones. Men engage in much more daily physical activity than women in a variety of nations and regions in South Asia, the Middle East, North Africa, Sub-Saharan Africa, Latin America, and the Caribbean. However, in many developing nations around the end of the twentieth century, there was a shift away from agricultural work (both for output and sustenance) to wage labor, which reduced women's physical activity more than men's. In rural regions, the shift in employment that leads to a reduction in daily exercise is more common both between men and women. Physical inactivity linked to unemployment or underemployment in Russia has been linked to weight increase.

Although Westernization has had a significant impact on food and lifestyle patterns throughout East Asia and the Pacific, traditional ideas about body image remain, according to Davis et al. in a literature review. A bigger body type is acceptable in many nations, and it may nevertheless be culturally linked with a higher social position. Cultural attitudes may also affect how overweight and obese people are seen in these nations, according to data from the Marshall Islands. Thinness, especially among women, has been linked to infertility and disease, while bigger body forms have been linked to good health. Cultural ideas like these may have an impact on dietary choices and lifestyle behaviors in the Islands[12].

3. Arab nations with distinct cultural traditions

Other sociocultural variables that may be linked to physical inactivity and, as a result, influence excess weight growth are also worth considering. Women are frequently overprotected in conservative cultures, especially in the Mideast area and the high-income nonOECD nations of Oman, Kuwait, and Saudi Arabia, and are unable to openly engage in physical exercise owing to cultural or religious restrictions. In Egypt and the West Bank, women have been shown to be more accepting of excessive weight gain than males. Furthermore, Al-Riyami et al. in Oman claim that both (high) fertility and illiteracy are linked to higher central adiposity through impairing a woman's understanding of "the significance of [her] body." As a result, bigger socioeconomic developments, in combination with the pre-existing sociocultural context, have had an even higher effect on women's physical activity levels in some nations.

CONCLUSION

Gender differences in weight gain are influenced by a variety of sociocultural factors throughout the globe. Gender inequalities in obesity, on the other hand, are largely unexplored, much alone addressed. Since the middle of the twentieth century, sociocultural variables linked to eating habits seem to have a larger impact on gender inequalities in obesity and overweight in industrialized nations, where both men and women's jobs have been mainly sedentary. Physical activity habits have altered significantly in many developing nations lately, affecting women in particular. Women, who are typically more sedentary than males, seem to be particularly

susceptible to the effects of these meals on excess weight gain when combined with a concurrent dietary shift that has pushed an increased intake of energy-dense foods rich in refined carbs. In developing nations, sociocultural ideas and norms about physical exercise and fatness are more visible, and therefore seem to have a larger impact on gender inequalities in obesity and overweight than in developed countries.

Both qualitative and qualitative techniques should be improved to better evaluate gender-specific features, in addition to additional study that tackles the possible sociocultural reasons of gender inequalities in obesity. This is especially true when it comes to epidemiologic studies that inquire about employment status. Women often claim to be jobless in surveys, despite the fact that they may have a full day of domestic chores and child care, as well as employment in the formal labor market. As a result, we recommend that surveys be better structured to capture the bulk of responsibilities that a woman may have in a normal day. More study on the impact of policies and associated cultural norms on excess weight gain is needed at the national level to understand how macro-level variables may both drive and ameliorate gender inequalities in obesity. Given the worldwide gender inequalities in obesity, gender-specific or gender-tailored remedies may be required to halt or reverse the global obesity epidemic. Obesity prevention measures, from community-level initiatives to national policy, may be the same for men and women in the end. However, if they are delivered in a gender-specific way, they may be more helpful in preventing obesity. If (better) customized to gender, tools and methods intended to assist obese people with weight reduction or the prevention of future weight gain is more successful. However, caution must be used to ensure that weight management policies and initiatives do not unintentionally create or aggravate gender inequalities in excess weight growth or loss.

REFERENCES

1. F. Garawi, K. Devries, N. Thorogood, and R. Uauy, "Global differences between women and men in the prevalence of obesity: Is there an association with gender inequality?," *Eur. J. Clin. Nutr.*, 2014, doi: 10.1038/ejcn.2014.86.
2. W. R. Robinson, "Gender-specific effects of early nutritional restriction on adult obesity risk: Evidence from quasi-experimental studies," *Obesity*. 2012, doi: 10.1038/oby.2012.35.
3. J. C. K. Wells, A. A. Marphatia, T. J. Cole, and D. McCoy, "Associations of economic and gender inequality with global obesity prevalence: Understanding the female excess," *Soc. Sci. Med.*, 2012, doi: 10.1016/j.socscimed.2012.03.029.
4. R. Kanter and B. Caballero, "Global gender disparities in obesity: A review," *Advances in Nutrition*. 2012, doi: 10.3945/an.112.002063.
5. S. Y. Tsai *et al.*, "Increased 4E-BP1 Expression Protects against Diet-Induced Obesity and Insulin Resistance in Male Mice," *Cell Rep.*, 2016, doi: 10.1016/j.celrep.2016.07.029.
6. D. R. Gartner, D. R. Taber, J. A. Hirsch, and W. R. Robinson, "The spatial distribution of gender differences in obesity prevalence differs from overall obesity prevalence among US adults," *Ann. Epidemiol.*, 2016, doi: 10.1016/j.annepidem.2016.02.010.
7. M. Gómez-Serrano *et al.*, "Proteome-wide alterations on adipose tissue from obese patients as age-, diabetes- and gender-specific hallmarks," *Sci. Rep.*, 2016, doi: 10.1038/srep25756.
8. Y. Rochlani, N. V. Pothineni, and J. L. Mehta, "Metabolic syndrome: Does it differ between

- women and men?," *Cardiovasc. Drugs Ther.*, 2015, doi: 10.1007/s10557-015-6593-6.
9. M. M. Leung, H. Fu, A. Agaronov, and N. Freudenberg, "Diet-related determinants of childhood obesity in urban settings: A comparison between Shanghai and New York," *Public Health*, 2015, doi: 10.1016/j.puhe.2015.02.017.
 10. J. C. K. Wells, "The New 'Obstetrical Dilemma': Stunting, Obesity and the Risk of Obstructed Labour," *Anat. Rec.*, 2017, doi: 10.1002/ar.23540.
 11. S. J. T. Guilcher *et al.*, "The association between social cohesion in the neighborhood and body mass index (BMI): An examination of gendered differences among urban-dwelling Canadians," *Prev. Med. (Baltim.)*, 2017, doi: 10.1016/j.ypmed.2017.02.022.
 12. N. Katsiki, G. Ntaios, and K. Vemmos, "Stroke, obesity and gender: A review of the literature," *Maturitas*. 2011, doi: 10.1016/j.maturitas.2011.04.010.



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“ABOUT HOW CHEAP (ACTUALLY VERY EXPENSIVE) LOANS MAY NOT ENRICH THE POOR”

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ABSTRACT

Credit - after the delivery of goods (services) at an agreed price on the basis of the contract (rendering of services) and the satisfaction of the project owner - is allocated and transferred to the account of the supplier (service provider). The fact that part of the directed loans does not reach the destination and its other return is focused on higher sectors will lead to a faster head of the relatively wealthy society. In this article, we will pay more particular attention to the effectiveness of the authority loans which is given to businessmen in order to flourish economics. That is, even people who do not fall into the poorer category will seek to obtain these loans and, if possible, bet on the sector that will bring the greatest benefit to the economy.

KEYWORDS: *Potential Projects, The Government Loans, Minimum Wage, Expense Of Resources, Credits , The Government, , The Minimum Wage , Return, Program, Poorer Category*

INTRODUCTION

New projects with the potential in our country, Uzbekistan, to create high-performance and sustainable jobs can be allocated soft loans at the rate of 8% per annum in the amount of more than 1,000 times the minimum wage at the expense of resources under the program (studied in detail with the involvement of relevant specialists on site). In this article, we will pay more particular attention to the effectiveness of the authority loans which is given to businessmen in order to flourish economics.

Giving loans to the population at 7% for a number of reasons may not make them richer. First, with a market interest rate of around 20%, a 7% loan is a very scarce commodity that everyone wants to get. That is, even people who do not fall into the poorer category will seek to obtain these loans and, if possible, bet on the sector that will bring the greatest benefit to the economy. The government, no matter how well-intentioned it may be, will not be able to take full control of the entire republic (as has been the case before). That is, once these loans begin to be issued, some (large enough) of the loans will not reach their intended destination and will even be diverted to another more lucrative sector of the economy. Naturally, the main beneficiaries in this process will be people who are closer to the lenders or people who are willing to pay extra to get a loan. The fact that part of the directed loans does not reach the destination and its other return is focused on higher sectors will lead to a faster head of the relatively wealthy society. That is, if the rich get richer faster with cheap credit, then the poorer the population, the poorer the poor, the richer the poor.

Secondly, such projects have been implemented many times so far. But I don't think any such projects have improved the lives of the poor. Let's say the loans started to be given to the poor at the same time, which will not only affect the market price of the pets mentioned in the project, and secondly, there will be a noticeable increase in feed prices as a result of the simultaneous increase in demand for pet food. That is, while loans are cheaper for the poorer segments of the population, the fact that these households buy pets more expensively and feed them more expensively than in the past can significantly reduce the attractiveness of these loans. Let's say no one at the market interest rate is doing this. Because he knows that the return on this business is at a lower interest rate on the loan.

In this case, as other costs increase, the proximity of "cheap" loans to the market price will lead to a decrease in its profitability, and the purchase of animals and the fact that the price of feed will reach a certain point will lead to unprofitable losses. This could lead to further impoverishment of the relatively poor population using "cheap" loans.

Thirdly, the fact that loans are three times cheaper than the market price is, of course, in stark contrast to the central bank's inflation targeting policy. That is, these loans put pressure on inflation. In the short run, a further rise in inflation, or at least a slower-than-expected decline, will inevitably lead to more suffering for the poorer sections of the population compared to other sections of the population.

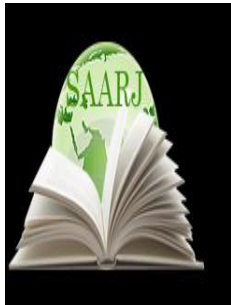
CONCLUSION

In general, no matter how good a decision is made and with good wishes, the decision itself will be bad. Not only will this decision do great harm to the economy in general, but it could also

lead to the fact that the lives of the poorer segments of the population that we want to improve are actually not better but worse.

REFERENCES:

- The Upside of Inequality. Edward Conard.
- <https://www.penguinrandomhouse.com/books/548475/requiem-for-the-american-dream-by-noam-chomsky-edited-by-peter-hutchison-kelly-nyks-and-jared-p-scott/>
- <https://www.penguinrandomhouse.com/books/670729/post-corona-by-scott-galloway/>
- Fundamentals of Credit and Credit Analysis: Corporate Credit Analysis, 2000
- <https://www.alibris.com/The-Bankers-Handbook-on-Credit-Risk-Implementing-Basel-II-Morton-Glantz/book/10453372> <https://www.alibris.com/search/books/author/Morton-Glantz?aid=1851927>
- <https://www.alibris.com/Commercial-Banking-The-Management-of-Risk-Benton-E-Gup/book/10070485>



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THE IMPORTANCE OF TEXT CONTENT IN THE FORMATION OF INDEPENDENT THINKING IN PRIMARY SCHOOL STUDENTS

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ABSTARCT

This article discusses the characteristics of independence, activity and curiosity, as well as the qualities that encourage students to think independently, so that they can think independently.

KEYWORDS: *Education, Thinking, Activism, Attention, Method, Technology, Independence.*

INTRODUCTION

Shavkat Mirziyoyev spoke in his speech at the conference about " Ensuring social stability, preserving the purity of our sacred religion - the need of the hour" in Tashkent on June 15, focused on the education of the younger generation.

"Another important issue that has always been on our minds is the morals and behavior of our young people, in a word, their worldview," he said. World is changing fastly today. Young people are the ones who feel these changes the most. But at the same time, don't forget about yourself. May the call to know who we are and what a generation of great people always resonate in their hearts and motivate them to remain true to themselves. How do we achieve this? Upbringing, upbringing and only at the expense of upbringing," the President said.

Literature review and methodology

It is known that the attention to the education and all-round development of the younger generation in our country is growing day by day. The successors of the future are the young generation, who will develop into intelligent, perfect people, show their talents, make a worthy contribution to the development of society, naturally, worldview, free thinking and independent thinking. thinking is important.

Independent thinking is an individual, unique trait that requires activity, concentration, achievement of goals, and a creative approach to problem solving. This, in turn, leads to a better

understanding of the content of teaching and learning tasks in the classroom and a critical assessment of the current situation.

DISCUSSION

We all know that the attention paid to the education and all-round development of the younger generation in our republic is growing day by day. As a result of the teacher giving targeted learning assignments on the topic and students thinking and completing them independently:

- connect the topic with real life in the process of thinking;
- Analytical, logical approach to the issue;
- Independent observation, reflection;
- Perception of abstraction;
- To understand the essence of things and events that are not reflected in our eyes;
- Enrichment of personal concepts by covering various aspects of life, the laws;
- serves for independent decision-making in problematic situations.

Based on the above ideas, we have developed a lesson plan for the formation and development of students' independent thinking on the example of the topic "Modern Family" in the textbook "Grade 3" of primary education.

TOPIC I.: My friend's family (3rd grade).

II. Aim of the lesson:

Educational aim:

Develop students' independent thinking, reasoning, knowledge, skills and competencies in the subject;

To achieve students' literacy through textbooks and additional tools;

To gain a broader understanding of the family, its place in society, its responsibilities, and the modern family.

Upbrining aim:

Instilling in students a love for books;

To make them realize that the family is the Motherland, the family is the sacred place;

To gain the warmth and attention of family members, relatives, and friends.

Developmental aim:

Development of independent thinking;

Broadening the scientific worldview on the topic;

Improve fluency, etc.

III. Basic concepts and terms: designer-engineer, editor, art exhibition, university, student.

IV. Method of the lesson: "Chain of Thought", "Concept Analysis" technologies.

V. Form of the lesson: conversation, question-answer.

VI. Lesson method (way): visual method.

VII. Materials used in the lesson: textbook, handouts, pictures on the topic.

VIII. During of the lesson:

Result.

1. Organizational part: greeting students, information on duty, determining attendance, talking about the weather.

2. Review the topic, control homework:

Learnt lesson: "Istiqlol" ship.

Review questions:

1. What did you learn about Abu Rayhan Beruni?

2. Tell us about the planets?

3 On which planet do we live?

3. Chain of ideas. The purpose of this method is to gather as many ideas as possible from them, to give students a diversity of opinion without giving up the same way of thinking. "Homeland begins at home", "Book - a source of knowledge". By comment these translations:

- The teacher listens to the answers and identifies the options that reveal the meaning of these stories;

- Explain to students that books are our friends, increase their love for books.

4. New topic statement (worked with the textbook).

My family

The Behruz's family is respected by everyone in the neighborhood. Because they have big libraries in their homes. Would you please tell me how many books there are? His father calls the library a "treasure," but he is not jealous of anyone. The gates are always open for book lovers. If you want to read a book, young or old, you can easily go to the library. Folk tales, poems and interesting stories collected on separate low shelves for children are the soul of Behruz. His father said that books played an important role in his success in life.

His father is a designer-engineer at a large enterprise. Whenever you look, your desktop is full of drawings and books. Her mother is the editor of a popular magazine. She also loves to read. Behruz and his brother tell a story every night before going to bed. Her sister Lola is a painter. Behruz used to think that artists shouldn't read books. "A person who doesn't read a book is not an artist," says Lola's sister.

His brother Dilshod is a student at the University of World Languages. In addition to Uzbek, she speaks Russian, English, Chinese and French. It has a separate shelf in its libraries. Behruz is very jealous of his sister and brother. She wants to be a doctor in the future. The Behruz family is called a "modern family" in the neighborhood. Behruz is very proud of that.

5. Methods for strengthening a new topic: "Concept Analysis" technology.

The purpose of the technology: to determine the level of mastery of the topic and mastery of basic concepts on the topic, the ability to express their knowledge independently, work individually and in small groups, respect the views of colleagues, as well as independent thinking to teach them to put their knowledge into a system.

Materials used in the lesson: handouts, list of basic concepts, slides.

Training schedule:

- students are divided into groups;
- Students are introduced to the requirements and rules of the course;
- handouts are distributed to team members;
- Students comment on the concepts in the handout based on their knowledge (individually);
- The teacher reads the concepts on the topic in the handout and together with the team marks the correct explanation of each concept or is presented on the screen with a slide with the explanation of each concept;

At the end of the lesson, each student will identify the differences between the correct answers, gain the necessary understanding, and reinforce their knowledge.

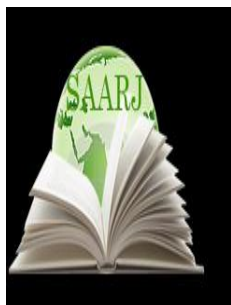
CONCLUSION

IX. Homework: Re-learn the topic. Write an independent text on the topic "My family". This means that students need to develop independence, activism and curiosity in order to think independently. These are the qualities that encourage independent thinking. In order to develop students' independent thinking in the classroom, it is necessary to develop their ability to independently analyze their work, the causes of errors and their elimination, creative approach to the process, control and independent evaluation of their work.

REFERENCES:

1. Davletshin G.M. Psychological bases of education. T., 1990.
2. Goziev E.G. Psychology of thinking. - T., 2001.
3. Goziev E. "Development of students' thinking in the process of education" Tashkent "Science" Publishing House, 1980.
4. Abu Nasr Faroobi. A city of noble people. - T.: A. Qodiriy National Heritage Publishing House, 1993.
5. Abdullaeva BS and b Methods of teaching geometric materials to primary school students - Tashkent: OOO "Jahon print", 2011.
6. Azizkhojaeva N.N. Pedagogical technology and pedagogical skills. - T.: TDPU. 2003.
7. Musaev Jahongir. "Developing students' independent thinking skills" (Monograph). Editor-in-chief of Sharq Publishing and Printing Joint-Stock Company. Tashkent. 2010.
8. Kaldibekova A., Khodjaev B. "Ways to increase the cognitive activity of students" (manual) Tashkent 2006.

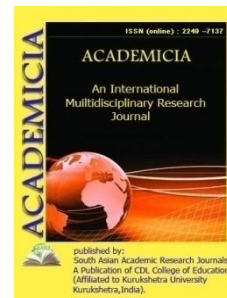
9. Yuldashev J., Yuldasheva F., Yuldasheva G. Quality assurance of interactive education. – T.: 2008.
10. Curriculum for primary education in the new edition // Primary education.- Tashkent, 2005.- No5.
11. The concept of primary education // Primary education, 2014
12. Primary education program. XTV Order No. 190 of June 3, 2017
13. Gulomova H. and others. Mother tongue lessons in the first grade. Tashkent: Teacher, 2009.



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AN OVERVIEW ON LIVER FUNCTION TEST

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ABSTRACT

Laboratory liver tests are diagnostic and therapeutic tests used to evaluate and treat individuals with hepatic dysfunction. The liver is in charge of glucose, protein, and fat metabolism. Some enzymes and end products of the metabolic pathway that are very sensitive to abnormalities may be used as biochemical markers of liver malfunction. Serum bilirubin, alanine amino transferase, aspartate amino transferase, ratio of aminotransferases, alkaline phosphatase, gamma glutamyl transferase, 5' nucleotidase, ceruloplasmin, and -fetoprotein are some of the biochemical indicators discussed in this article. Clinical diagnosis of illness involving the liver or other organs may be complicated by a single or conjugated change of biochemical indicators of liver damage in patients. The term "liver chemistry tests" is a loosely defined word that refers to a variety of serum chemistries that may be used to evaluate hepatic function and/or damage.

KEYWORDS: Alanine Amino Transferase, Alkaline Phosphatase, Bilirubin, Gamma glutamyl transferase, 5' nucleotidase.

1. INTRODUCTION

Serum Bilirubin:

Bilirubin is a catabolic product of haemoglobin generated inside the reticuloendothelial system. It is released in an unconjugated form that enters the liver and is transformed by the enzyme UDP-glucuronyltransferase to conjugated forms bilirubin mono and diglucuronides. The normal range for total bilirubin in the blood is 2 to 21 mol/L. Bilirubin levels are fewer than 12 mol/L for indirect (unconjugated) bilirubin and less than 8 mol/L for direct (conjugated) bilirubin.

Serum bilirubin levels more than 17 mol/L indicate liver illness, whereas values greater than 24 mol/L indicate abnormal liver testing in the lab. At a blood concentration of approximately 40 mol/L, bilirubin becomes visible inside the sclera, skin, and mucous membranes, causing jaundice. Unconjugated hyperbilirubinemia is caused by excessive bilirubin synthesis, poor hepatic absorption or conjugation, or both. Gilbert's disease, Crigler-Najjar syndrome, reabsorption of massive hematomas, and inefficient erythropoiesis are all caused by a hereditary deficiency of UDP-glucuronyltransferase. Higher levels of serum conjugated bilirubin are observed in viral hepatitis, hepatocellular damage, toxic or ischemic liver injury. In acute viral hepatitis, hyperbilirubinemia is related to the degree of hepatocyte histological damage and the length of time the illness lasts[1]–[3].

Alanine amino transferase (ALT):

When compared to other bodily tissues, ALT is present in the kidney, heart, and muscle, with a higher concentration in the liver. The transamination process is catalyzed only by ALT in the cytoplasm. The normal range for ALT in the blood is 7-56 U/L. Any kind of liver cell damage may cause ALT levels to rise. Nonspecific levels of up to 300 U/L are considered high. People with illnesses that target mainly hepatocytes, such as viral hepatitis, ischemia liver injury (shock liver), and toxin-induced liver damage, have significant increases of ALT levels higher than 500 U/L. Despite the fact that there is a link between high ALT levels and hepatocellular disorders, the absolute peak of ALT elevation does not correspond to the degree of liver cell damage. A significant rise in aminotransferase levels may be caused by viral hepatitis A, B, C, D, and E.

Aspartate amino transferase (AST):

The transamination process is catalyzed by the AST enzyme. There are two genetically distinct isoenzyme forms of AST: mitochondrial and cytoplasmic versions. When compared to other bodily tissues such as the liver, skeletal muscle, and kidney, the heart has the greatest concentration of AST. The normal range for serum AST is 0 to 35 U/L. Extensive tissue necrosis after myocardial infarction, as well as chronic liver disorders including liver tissue degeneration and necrosis, are associated with elevated mitochondrial AST. The mitochondrial isoenzyme contributes around 80% of AST activity in the liver, while the cytosolic isoenzyme is responsible for the majority of circulating AST activity in healthy individuals. The ratio of mitochondrial AST to total AST activity, on the other hand, is useful in detecting liver cell necrosis and alcoholic hepatitis. AST increases are common in individuals with cirrhosis and even in liver disorders when the ALT is usually elevated. AST values were 73U/L in hyperemesis gravidarum, 66U/L in pre-eclampsia, and 81U/L in hemolysis with low platelet count and high liver enzymes in symptomatic pregnant patients[4]–[7].

AST/ALT ratio:

Clinically, the ratio of AST to ALT is more useful than evaluating individual high values. A lack of the coenzyme pyridoxal-5'-phosphate may lower serum ALT activity, which raises the AST/ALT ratio. The ratio rises as the liver's function deteriorates, with 81.3 percent sensitivity and 55.3 percent specificity in detecting cirrhotic individuals. In alcoholic liver disease and post necrotic cirrhosis, the mean ratios were 1.45 and 1.3, respectively. With 87 percent sensitivity and 52 percent specificity, a ratio higher than 1.17 was observed in one-year survival among patients with viral cirrhosis. Advanced liver fibrosis and chronic hepatitis C infection are indicated by a ratio higher than 1. However, alcoholic hepatitis is characterized by an AST/ALT

ratio higher than 2. The AST/ALT ratio of 0.9 in NASH and 2.6 in individuals with alcoholic liver disease was used to distinguish nonalcoholic steatohepatitis (NASH) from alcoholic liver disease in a recent research. In individuals with NASH-related cirrhosis, a mean ratio of 1.4 was discovered. Wilson's illness may cause the ratio to surpass 4.5, and hyperthyroidism can also produce an altered ratio.

Alkaline phosphatase (ALP):

ALP is found in the small intestine mucosal epithelia, proximal convoluted tubule of the kidney, bone, liver, and placenta. In the gut, it transports lipids, and in the bone, it calcifies. The liver is responsible for the majority of serum ALP activity, with bone contributing 50%. The normal range for serum ALP is 41 to 133 U/L. ALP is typically normal or slightly elevated in acute viral hepatitis. Hepatitis A presenting cholestasis is linked to an increase in ALP with persistent itching. Tumors release ALP into the bloodstream, and isoenzymes including Regan, Nagao, and Kasahara are unique to tumors. ALP levels may also be increased as a result of hepatic and bone metastases. Other illnesses that induce an increase in ALP include infiltrative liver diseases, abscesses, granulomatous liver disease, and amyloidosis. Cirrhosis, hepatitis, and congestive heart failure may all cause somewhat increased ALP values. Hypothyroidism, pernicious anemia, zinc insufficiency, and congenital hypophosphatasia all cause low levels of ALP[8].

Gamma Glutamyl Transferase (GGT):

Hepatocytes and biliary epithelial cells, renal tubules, pancreas, and intestine all contain GGT, a microsomal enzyme. It is also found in the cell membrane, where it transports peptides into the cell and participates in glutathione metabolism. Even though it is present in higher quantity in renal tissue, serum GGT activity is mostly ascribed to the hepatobiliary system. GGT levels range from 9 to 85 U/L in the typical range. GGT levels peak in acute viral hepatitis in the second or third week of illness, and in some individuals, they stay high for up to six weeks. About 30% of individuals with chronic hepatitis C infection have an elevated level. GGT levels were also increased in patients with simple diabetes, acute pancreatitis, myocardial infarction, anorexia nervosa, Guillain Barre syndrome, hyperthyroidism, obesity, and dystrophica myotonica. In alcoholism, serum GGT levels are elevated by more than 10 times. It's linked to structural liver damage, activation of hepatic microsomal enzymes, and alcoholic pancreatic injury. Because serum antioxidant carotenoids such as lycopene, -carotene, -carotene, and -cryptoxanthin are inversely related with alcohol-induced increases in serum GGT in moderate and heavy drinkers, GGT may be used as an early predictor of oxidative stress. In more than half of individuals with nonalcoholic fatty liver disease, GGT levels are 2–3 times higher than the upper reference range.

5' Nucleotidase (NTP):

NTP is a glycoprotein that is widely distributed throughout the body and is found in the cytoplasmic membrane, where it catalyzes the release of inorganic phosphate from nucleoside-5-phosphates. The recognized normal range is 0 to 15 U/L. Patients with obstructive jaundice, parenchymal liver disease, hepatic metastases, and bone illness had higher levels of NTP activity. NTP is a specific marker for primary or secondary hepatic tumors in the early stages. ALP levels rose in conjunction with NTP, indicating intra- or extra-hepatic blockage caused by cancer. NTP levels are elevated in both acute infective hepatitis and chronic hepatitis. When compared to chronic hepatitis, acute hepatitis causes a greater increase in NTP activity, which is

attributable to the shedding of plasma membranes with excessive NTP activity owing to cell destruction or the leaking of bile carrying high NTP activity. In the second and third trimesters of pregnancy, serum NTP activity was modestly but substantially increased.

Ceruloplasmin:

Ceruloplasmin is an acute phase protein that is produced in the liver. It binds to copper and acts as a primary copper transporter in the bloodstream. Ceruloplasmin levels in the blood range from 200 to 600 mg/L. Infections, rheumatoid arthritis, pregnancy, non-Wilson liver disease, and obstructive jaundice can raise the amount. Menke's illness, kwashiorkor, marasmus, protein-losing enteropathy, copper insufficiency, and aceruloplasminemia may all cause low levels. Ceruloplasmin levels are low in Wilson's illness. Because ATP7B is damaged, a decreased rate of ceruloplasmin synthesis is responsible for copper buildup in the liver due to a copper transport deficiency in the golgi apparatus. In chronic active liver disease (CALD), serum ceruloplasmin levels were higher, while in Wilson's disease, they were lower (WD). As a result, it is the most reliable standard chemical screening test for distinguishing CALD from WD.

α -fetoprotein (AFP):

The AFP gene is highly active in the foetal liver, although it is suppressed substantially soon after birth. The mechanisms that cause postpartum liver AFP transcriptional suppression are not well known. AFP is a significant serum protein generated at high quantities by the foetal liver and visceral endoderm of the yolk sac, and at low levels by the foetal gut and kidney in the growing mammalian foetus. AFP protects the developing female brain from estrogen exposure during embryonic development, which is necessary for female fertility. The conclusion that maturation stoppage of liver-determined tissue stem cells causes hepatocellular carcinomas was reached in response to liver damage and during the early phases of chemical hepatocarcinogenesis. AFP levels should be between 0 and 15 g/L. In individuals with cirrhosis, an AFP value of 400-500g/L has been deemed diagnostic for hepatocellular carcinoma (HCC). In HCC patients, a high AFP concentration of 400g/L is linked to larger tumors, bilobar involvement, portal vein invasion, and a poorer median survival rate.

When cut-off values of 10% to 15% are utilized, Lens culinaris-reactive AFP, also known as AFP-L3, is the predominant glycoform of AFP in the blood of HCC patients, and it may be identified in about one third of patients with minor HCC (< 3 cm). AFP-L3 is a measure for HCC clearance after therapy. It has been observed that an AFP-L3 level of 15% or above is linked to HCC-related portal vein invasion. The AFP-L3 / AFP ratio may be used to assist in HCC diagnosis and prognosis. The risk of sudden infant death syndrome (SIDS) is directly linked to maternal blood alpha-fetoprotein levels in the second trimester, which may be mediated in part by decreased foetal development and premature delivery.

2. LITERATURE REVIEW

P. Jamjute et al. discussed about Liver Function test and pregnancy[9]. The physiological alterations in liver function that occur during pregnancy are often transitory and very rarely permanent. Pre-eclampsia and eclampsia, acute fatty liver of pregnancy AFLP, haemolysis, high liver enzyme and low platelets HELLP syndrome, cholestasis, hyperemesis gravidarum, and isolated instances of raised liver enzymes may all have severe consequences during pregnancy. Early interpretation of liver function tests (LFTs) may lead to prompt treatment and perhaps

minimize problems in both the mother and the baby. Normal LFTs may not necessarily imply a healthy liver. The interpretation of basic blood LFTs may lead to a variety of problems. LFTs are often utilized to evaluate liver damage rather than hepatic function. Abnormal LFTs may suggest an issue with the liver and give clues to the nature of the disease, although this is not always the case. This overview discusses the different biochemical tests, their etiology, and a method for interpreting aberrant LFTs. Alanine transaminase, aspartate aminotransferase, alkaline phosphatase, bile salts, bilirubin levels, albumin, and prothrombin time are all common assays.

A. Blann discussed about purpose of Liver Function test[10]. The liver is the biggest single distinct organ in the body. It performs four main functions: metabolism and synthesis, excretion, storage, and possible toxin detoxification. Because of these many roles, a single test is insufficient to completely evaluate how the liver is working; at least five separate liver function tests are needed. Part 2 of a four-part series, this article cover the information that these tests may give on acute and chronic liver illness, as well as how disease impacts liver function.

3. DISCUSSION

A liver function test is one of many tests that look at the amounts of enzymes and other proteins in your blood. A hepatic panel, commonly known as a liver function test (LFT or LF), is a collection of blood tests that give information about the condition of a patient's liver. Prothrombin time (PT/INR), activated Partial Thromboplastin time (aPTT), albumin, bilirubin (direct and indirect), and others are among the assays available. In a patient with some degree of intact liver function, the liver transaminases aspartate based test (AST or SGOT) as well as alanine aminotransferase (ALT or SGPT) are helpful indicators of liver damage. The majority of liver disorders have minor side effects at first, but they must be identified early. Hepatic (liver) functioning in some illnesses may be critical. This test is done on a blood sample from a patient. Some tests are related to functioning (e.g., albumin), cellular integrity (e.g., transaminase), and biliary tract conditions.

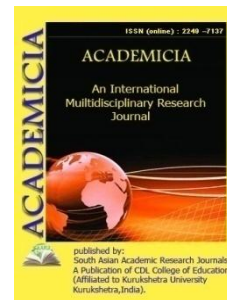
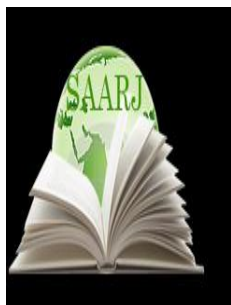
4. CONCLUSION

Laboratory liver tests aid in determining the changes in indicators that indicate liver disease. The evaluation of enzyme abnormalities such as the prevailing sequence of enzyme modification, the amplitude of enzyme alteration in the case of aminotransferases, isolated elevation or in conjugation with another parameter, the rate of change and the nature of the course of alteration, or a follow-up period of 6 months to 1-2 years aids in disease diagnosis. However, since many severe liver illnesses are associated with normal levels, and abnormal levels may be detected in asymptomatic healthy people, a single laboratory liver test is of limited use in screening for liver disease. The pattern of enzyme abnormalities, when evaluated in light of the patient's symptoms, may help guide the diagnosis.

REFERENCES

1. C. B. O'Brien, "The Hospitalized Patient with Abnormal Liver Function Tests," *Clinics in Liver Disease*. 2009, doi: 10.1016/j.cld.2009.02.010.
2. J. R. Kozic *et al.*, "Abnormal Liver Function Tests as Predictors of Adverse Maternal Outcomes in Women With Preeclampsia," *J. Obstet. Gynaecol. Canada*, 2011, doi: 10.1016/S1701-2163(16)35048-4.

3. M. D. B. Stephens, "Asymptomatic abnormal liver function tests in clinical trials," *Pharmacoepidemiol. Drug Saf.*, 1994, doi: 10.1002/pds.2630030206.
4. B. Bengsch and R. Thimme, "A challenging diagnosis of elevated liver function tests," *Praxis (Bern. 1994).*, 2013, doi: 10.1024/1661-8157/a001181.
5. L. T. Hoekstra *et al.*, "Physiological and biochemical basis of clinical liver function tests: A review," *Annals of Surgery*. 2013, doi: 10.1097/SLA.0b013e31825d5d47.
6. T. Hayakawa *et al.*, "Studies on the risk factors for fenofibrate-induced elevation of liver function tests," *Yakugaku Zasshi*, 2002, doi: 10.1248/yakushi.122.169.
7. O. Mitchell, A. M. Cosar, M. U. Malik, and A. Gurakar, "Late liver function test abnormalities post-adult liver transplantation: a review of the etiology, investigation, and management," *Hepatology International*. 2016, doi: 10.1007/s12072-015-9685-2.
8. P. Coates, "Liver function tests," *Aust. Fam. Physician*, 2011.
9. P. Jamjute, A. Ahmad, T. Ghosh, and P. Banfield, "Liver function test and pregnancy," *Journal of Maternal-Fetal and Neonatal Medicine*. 2009, doi: 10.1080/14767050802211929.
10. A. Blann, "What is the purpose of liver function tests?," *Nurs. Times*, 2014.



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THE IMPACT OF MINIMIZING INTERNATIONAL PROCESSING ON THE GROWTH, DEVELOPMENT AND YIELD OF COTTON

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ABSTRACT

On the saline soils of the Republic of Karakalpakstan, field studies were carried out to identify the effectiveness of minimizing inter-row cultivation of cotton. According to the results of the study, it was established that when several operations are combined in one pass of the tractor, fuel costs are significantly reduced, soil compaction is reduced, and good conditions are created for the normal growth and development of cotton. With international processing, it is possible to combine inter-row cultivation and furrowing before vegetative irrigation.

KEYWORDS: Soil, Processing, Minimization, Combining, Cultivation, Cotton, Cotton Growth And Development, Saving Fuel And Energy.

INTRODUCTION

In cotton growing, the bulk of work is mechanized. Cultivation of cotton is carried out with the use of heavy tractors and agricultural machines, which cause, especially with their repeated use, excessive soil compaction. The bulk density of the soil increases, the water, air, nutritional regime of the soil deteriorates, which affects the activity of beneficial microorganisms, and, in general, adversely affects fertility, as a result, the yield of plants decreases. In the conditions of the Republic of Karakalpakstan, where most of the irrigated lands are saline and low-humus, soil compaction is especially undesirable.

The transition to the minimization of soil cultivation, by combining several operations for preparing the soil and caring for plants, with the implementation of two, three methods in one pass of the tractor unit is one of the important conditions for preserving the potential soil fertility, reducing labor and material costs.

As you know, the main purpose of inter-row cultivation is loosening the topsoil and combating weeds. The depth and frequency of processing are important. With a delay in the timing of inter-

row cultivation, moisture is lost, soil compaction and debris increase, which creates unfavorable conditions for the formation of the root system, growth and development, and the yield of cotton.

Research method - field method.

The object of research is saline soils, the frequency of processing, cotton.

Research results and their discussion. The experiment studied two varieties of cotton, C-4727 and Chimbay 5018, the frequency of inter-row cultivation (8 and 5), incl. eightfold - studied as a control.

According to the results of phenological observations carried out on August 1 and September 1, it was established that in 2013 the height of the main stem of C-4727 variety with eightfold processing was 85.3 cm, and with fivefold processing 89.4 cm, the number of sympodial branches, respectively, 9.3 and 8.9 pieces, the number of bolls 4.7 and 4.8 pieces. For the Chimbay 5018 variety, respectively, they amounted to 80.4 and 81.2 cm, 9.0 and 9.1 pieces and 2.8 pieces. When observed on September 1, the height of the main stem and the number of sympodial branches remained almost unchanged, and the number of bolls doubled, i.e. for grade C-4727 with eightfold processing they amounted to 8.1 pieces, and with fivefold processing 9.1 pieces, and for grade Chimbay 5018, respectively, 8.2 and 8.6 pieces. According to table 1, it can be seen that the Chimbay 5018 variety lags behind the C-4727 variety in all indicators, i.e. these are the biological characteristics of varieties. With all the multiplicity of inter-row processing, the height of the main stem and the number of sympodial branches are almost the same, and the number of bolls of variety 4727 with eightfold processing was 8.1 pcs, and with fivefold processing - 9.1 pcs, i.e. increased by 1.0 pcs, and for the Chimbay 5018 variety, 8.2 and 8.6 pcs, respectively. The differences depending on the frequency of processing are insignificant, but by minimizing inter-row processing, energy and material costs are saved.

Thus, for the normal growth and development of cotton varieties C-4727 and Chimbay 5018, it is advisable to minimize inter-row cultivation, i.e. instead of eight times, it is necessary to carry out five times inter-row processing.

TABLE 1 INFLUENCE OF MULTIPLICITY AND INTER-ROW TREATMENTS ON THE GROWTH AND DEVELOPMENT OF COTTON

№ var.	Variants		on 1.VIII			on 1.IX		
	Cotton varieties	Frequency of inter-row processing	Main stem height, cm	Number of sympodial branches	Number of bolls, pcs	Main stem height, cm	Number of sympodial branches	Number of bolls, pcs
2013 y.								
1	C-4727	8	85,3	9,3	4,7	88,2	9,7	8,1
2	C-4727	5	89,4	8,9	4,8	92,6	9,6	9,1
3	Chimbay 5018	8	80,4	9,0	2,8	84,6	9,0	8,2
4	Chimbay 5018	5	81,2	9,1	2,8	84,5	9,6	8,6
2014 y.								
1	C-4727	8	68,5	8,8	1,7	79,6	9,2	7,5
2	C-4727	5	65,5	9,3	1,5	76,8	9,9	6,8
3	Chimbay 5018	8	53,0	8,8	1,4	68,9	9,8	6,4

4	Chimbay 5018	5	62,0	9,2	1,2	72,8	9,5	7,0
2015 y.								
1	C-4727	8	76,7	9,0	5,2	83,6	9,0	7,0
2	C-4727	5	81,3	9,0	5,7	87,1	9,1	7,3
3	Chimbay 5018	8	66,1	9,1	4,2	68,7	9,8	7,3
4	Chimbay 5018	5	72,7	8,5	5,7	75,5	9,1	7,6

The yield of raw cotton in terms of cotton varieties averaged 29.4-32.2 c / ha. With eightfold processing, the yield of raw cotton of the C-4727 variety was 30.8 c / ha, and with fivefold processing 32.2 c / ha, i.e. contributed to an increase in yield by 1.4 c / ha with significant savings in energy and material costs.

The yield of cotton of the Chimbay 5018 variety with eightfold processing is 30.5 c / ha, i.e. the additional yield was 1.1 c / ha. The data on the yield of cotton varieties C-4727 and Chimbay 5018 indicate that there is no need to carry out eightfold inter-row cultivation, since with fivefold processing no less was obtained than eightfold, even contributed to an increase in yield by 1.1-1.4 c / ha, with significant savings in energy and material costs.

CONCLUSIONS

In the conditions of saline lands of the Republic of Karakalpakstan, for normal growth, development and obtaining a high yield of raw cotton, instead of eightfold inter-row cultivation, it is necessary to carry out a fivefold inter-row cultivation. With fivefold inter-row cultivation, cotton does not lag behind in growth and development compared to eightfold, and the yield is 1.1-1.4 c / ha higher than in the control option.

TABLE 2 INFLUENCE OF THE FREQUENCY OF INTER-ROW CULTIVATION ON COTTON YIELD

Variants			Yield of raw cotton			Average	Deviation, ±
№	Cotton varieties	Frequency of inter-row processing	2013 y.	2014 y.	2015 y.		
1	C-4727	8	36,6	28,4	27,5	30,8	00
2	C-4727	5	37,9	29,0	29,8	32,2	1,4
3	Chimbay 5018	8	34,9	25,9	27,5	29,4	00
4	Chimbay 5018	5	36,0	25,8	29,8	30,5	1,1

C-4727 variety md = 0,8; 0,9; 0,67 c/ha.

P = 1,28; 2,0; 1,4%

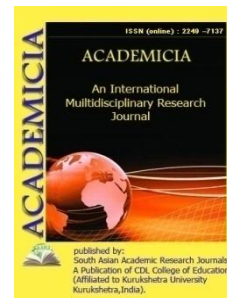
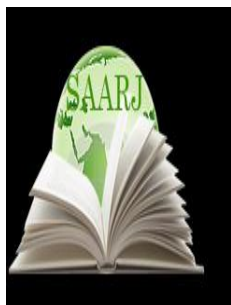
Chimbay 5018 variety md = 0,8; 0,9; 0,67 c/ha.

P = 1,62; 2,7; 1,53%

USED LITERATURE

1. Ismailov U.E. Scientific basis for increasing soil fertility. Nukus. Bilim 2004. 186 p.

2. Ismailov M.E. Minimization of inter-row cotton cultivation. Nukus. "Miraziz-Nukus". 2012. 86 p.
3. Yuldashev S.Kh., Soloviev V.M., Kamilova M., Mavlonov Sh. Factors of cotton yield. Tashkent. FAN. 1982
4. Smetov I.U. Scientific foundations of the technology of cotton cultivation in the conditions of the lower reaches of the Amu Darya. Nukus. "Karakalpakstan". 1993.



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INFLUENCE OF COMPOSTS ON THE GROWTH, DEVELOPMENT AND PRODUCTIVITY OF COTTON

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ABSTRACT

The field experiment was carried out on studying the effectiveness of using different types of composts together with mineral fertilizers in feeding cotton in the conditions of saline soil of the Republic of Karakalpakstan. According to the results of the research the growth, development and productivity of cotton are provided when mineral fertilizers N250 P175 K125 kg/ha were used with rice and wood husk - 25%, manure - 25%, chicken manure - 45% and phosphogypsum in the amount 20 t/ha.

KEYWORDS: *Compost, Mineral And Organic Fertilizers, Saline Soil, Cotton, Productivity.*

INTRODUCTION

Today, the role of agriculture in economics and work is very important. Industry and intellectual level of the country is directly connected with agriculture.

As shown in the world agricultural experiments, crop productivity is dependent on the amount of fertilizers in soil. Chemical agriculture is an important source of increasing crop productivity, the most effective way of fastening agricultural industry economically.

The basis of agricultural politics of the Republic is fastly developing agriculture mainly by mechanizing and meliorating.

In recent years, requirement for ecological free products has been increasing in the world. Therefore, working by planning beforehand is the demand of the time. Using mineral fertilizers and at the same time, giving organic green manure crop fertilizers to agricultural crops provides the improvement of ecological free products.

One of the most important agrotechnical actions is providing crop with mineral fertilizers on time and amount. Therefore, the importance of the theme is using composts, which made from organic waste replacing mineral fertilizers and phosphogypsum, at the same time local fertilizers.

Especially, using composts instead of mineral fertilizers is an important task and according to the results of the scientific works:

The method of the research. Field experiment. Effectiveness of different structural composts, mineral and organic fertilizers in feeding cotton was studied comparing with each other.

The object of the research. Saline soil, C-4727 type of cotton, mineral and organic fertilizers, composts.

Results of the research and analyzing them. We prepared three types of composts to feed the cotton.

Compost type 1 contains rice and wood husk – 25%, manure – 25%, chicken manure – 45 %, phosphogypsum – 5%.

Compost type 2 contains rice and wood husk – 25%, manure – 25%, chicken manure – 35 %, phosphogypsum – 15%.

Compost type 3 contains rice and wood husk – 25%, manure – 25%, chicken manure – 25 %, phosphogypsum – 25%.

In the experiment the following methods of feeding were studied: only mineral fertilizers in the amount N250 P175 K125 kg/ha, manure 10 and 20 t/ha with mineral fertilizers, compost types 1, 2, 3 with 10 and 20 t/ha mineral fertilizers.

According to the received results, different types of composts and their amount, mineral and organic fertilizers influence on the growth and development of cotton in various ways.

When the growth and development of cotton were determined on the 1st of September, the height of the main stem was 72,5-82,0 cm, number of fruitful branches - 9,5-11,5 and number of buds - 7,5-8,1, when only mineral fertilizer was used. When organic fertilizer was used together with mineral fertilizer (in variants 2-3), the height of the main stem was 79,0-90,1 cm, 83,0-88,0 cm, number of fruitful branches - 11,0-12,5 pieces, 11,5-14,0 pieces and number of buds - 8,0-8,6 pieces, 8,5-9,3 pieces. There was not many difference when organic fertilizer was used in the amount of 20 t/ha.

When compost type 1 (contains rice and wood husk – 25%, manure – 25%, chicken manure – 45 %, phosphogypsum – 5%) was used with mineral fertilizers in the amount of 10 t, the height of the main stem of cotton was 84,5-92,5 cm, number of fruitful branches - 13,5-15,5 pieces, and the number of buds - 10,0-10,5 pieces. When the amount of compost was used as 20 t/ha (variant 5) the height of the main stem was 91,5-94,5 cm, number of fruitful branches - 14,5-15,1 pieces and the number of buds - 11,0-11,6, so the number of buds increased by 1,0-1,1 pieces.

In compost types 2 and 3, when the amount of chicken manure was decreased, instead the amount of phosphogypsum increased, there was not almost any difference in the growth and development of cotton.

So, it is expedient to use compost type 1 in the amount of 20 t/ha together with mineral fertilizers in the amount of N250 P175 K125 kg/ha.

Influence of compost and mineral fertilizers in different structure and amount on the growth and development of cotton, 2010.

Variants	1.VIII			1.IX		
	The height of the main stem, cm	Fruitful branches	Number of buds, piece	The height of the main stem, cm	Fruitful branches	Number of buds, piece
1	70,5	7,5	1,5	72,5	9,5	7,5
2	76,4	8,5	2,5	79,0	11,0	8,0
3	80,0	10,5	3,0	83,0	11,5	8,5
4	84,0	12,0	4,0	84,5	13,5	10,5
5	90,5	14,0	4,5	91,5	14,5	11,0
6	86,0	12,5	3,5	87,5	12,5	10,0
7	82,5	13,0	4,0	84,0	13,0	10,5
8	80,5	12,5	3,0	82,5	13,5	9,0
9	84,6	12,5	3,5	85,0	13,0	9,5
in 2011						
1	74,5	10,5	3,5	76,5	11,0	8,0
2	80,4	11,0	4,5	80,0	12,0	8,5
3	86,7	13,0	5,0	87,0	14,0	9,0
4	87,8	14,0	4,5	88,0	14,0	10,0
5	92,1	14,5	5,0	92,0	14,5	11,0
6	86,5	13,0	4,0	87,0	13,0	9,5
7	84,5	14,0	5,5	85,0	14,0	10,0
8	80,0	13,0	4,0	82,0	13,0	9,0
9	86,0	13,0	4,0	86,0	13,0	10,0
in 2012						
1	81,3	11,0	4,0	82,0	11,5	8,1
2	89,4	11,5	4,7	90,1	12,5	8,6
3	88,6	12,7	6,0	88,0	13,0	9,3
4	91,0	15,1	4,7	92,5	15,5	10,2
5	94,3	14,6	6,1	94,5	15,1	11,6
6	88,6	13,0	4,5	89,0	13,5	9,0
7	95,1	14,0	6,1	95,6	14,5	9,7
8	90,4	13,2	5,0	90,0	13,5	9,1
9	88,3	13,5	5,1	87,5	13,5	9,6

One of the factors which influence on the amount of cotton yield is the weight of cotton in one bud. When mineral fertilizers were used in the amount of N250 P175 K125 kg/ha the weight of cotton in one bud was 4,3 g. When 10 and 20 t/ha organic fertilizer was used together with mineral fertilizer the weight of cotton in one bud was 4,5 and 5,0 g, and it was more by 0,2 and 0,7 g comparing to using only mineral fertilizer.

When different structural composts were used in the amount of 10 and 20 t/ha, it was 5,2-5,4 and 5,3-5,6 g. It was more by 0,9-1,3 g comparing to using only mineral fertilizer.

Cotton yield was 26,4 c/ha when mineral fertilizers were used N250 P175 K125 kg/ha. It was 30,4-33,6 q/ha when different structural composts used additionally to mineral fertilizers. In this, when compost type 1 was used in the amount of 10 t/ha cotton yield was 31,5 q/ha, when used in the amount of 20 t/ha it was 33,6 q/ha, it provided to get 5,1 and 7,2 q/ha additional products comparing to using only mineral fertilizers. When compost types 2 and 3 were used together with mineral fertilizers 4,0 and 6,2 additional products were got comparing to using only mineral fertilizers. In order to get high yield from the cotton it is recommended to use mineral fertilizers in the amount of N250 P175 K125 kg/ha, and compost in the amount of 20 t/ha which is prepared from rice husk, manure, chicken manure and phosphogypsum.

Cotton weight in one bud and influence of different compost and mineral fertilizers on cotton yield (2010-2012)

Variants	Cotton weight in one bud, g	Difference, ±	Cotton yield, q/ha			Average	Difference, ±	
			in 2010	in 2011	in 2012		from NPK	NPK + 10 t manure
1	4,3	00	25,5	26,5	27,4	26,4	00	-2,0
2	4,5	0,2	27,0	28,6	29,6	28,4	2,0	00
3	5,0	0,7	28,6	29,5	30,4	29,5	3,1	1,1
4	5,4	1,1	30,6	31,8	32,1	31,5	5,1	3,1
5	5,6	1,3	32,8	33,5	34,5	33,6	7,2	5,2
6	5,2	0,9	30,8	31,2	32,3	31,4	5,0	3,0
7	5,3	1,0	31,8	32,4	33,6	32,6	6,2	4,2
8	5,2	0,9	29,5	30,7	31,1	30,4	4,0	2,0
9	5,4	1,1	30,7	31,6	32,3	31,5	5,1	3,1

CONCLUSION

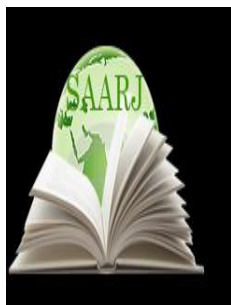
The use of composts of different types in combination with mineral fertilizers in feeding cotton has a positive effect on the growth, development and accumulation of high yields and on the improvement of agrophysical, agrochemical and microbiological properties of soil. Soil productivity increases, nutrient, water and air regimes improve, and a favorable environment is created for plant growth.

Due to the low soil fertility of Karakalpakstan, we must first of all think about increasing it. Therefore, we need to think about the use of organic green manure and compost of any composition in the soil.

USED LITERATURE

1. Ismailov U.E. Scientific basis for increasing soil fertility. Nukus. Bilim. 186 p.
2. Lee V.N. Fertility of irrigated lands in Uzbekistan. Tashkent. FAN. 1989.144 p.
3. Smetov I.U. Scientific bases of cotton cultivation in the conditions of the lower reaches of the Amu Darya. Nukus. Karakalpakstan. 1994. 144 p.

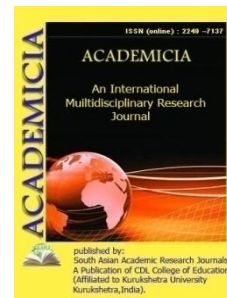
4. Saimbetov A. Influence of various composts on soil fertility and cotton productivity. Abstract of the thesis. diss. for the degree of Doctor of Philosophy in Agricultural Sciences. Tashkent. 2018. 45 p.



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TACTICAL ASPECTS OF SURGICAL TREATMENT OF OBESE PATIENTS WITH POSTOPERATIVE VENTRAL HERNIA

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ABSTRACT

The authors analyzed the results of surgical treatment of 98 ventral hernias in obese patients with saggy abdomen. Indications for surgical treatment of patients with large and giant POVH (postoperative ventral hernias), mainly, were decreased ability to work - 43 (43.8%) patients, cosmetic dissatisfaction - in 38 (38.7%), adhesive disease with symptoms of partial intestinal obstruction (coprostasis) - in 17 (17.3%) patients. The analysis of the influence of alloplast and skin autoderma plasty on the development of postoperative complications and healing was carried out.

KEYWORDS: *Ventral Hernia, Alloplasty, Autodermal Plasty.*

INTRODUCTION

Ventral hernia is one of the most common pathologies in general surgical practice and obesity is one of the reasons worsening the results of hernia repair [1,3,10-13]. Similarly, morbid obese patients have high intra-abdominal pressure compared to non-obese patients. Every year in the world, one can observe a tendency to an increase of up to 20–26% in the number of patients with large and giant incisional ventral hernias (POVH), which significantly reduce the quality of life, negatively affect the somatic, psychological and social status of such patients [4,6]. Large and gigantic hernias are diagnosed in 3–7% of the inhabitants of the Earth [7,9]. Most patients with POVH are people of working age. The urgency of the problem of surgical correction of the

ventral in patients with overweight is due not only to a large number of complications of the early and late postoperative period, relapses, but also to uncertainty in tactical and methodological approaches.

Aim of the study: Improvement of treatment results and quality of life in patients with overweight ventral hernias.

Materials and methods

The work is based on the analysis of the results of hernioplasty in 98 obese patients with postoperative, recurrent and primary ventral hernias. All operations were performed in the surgical department of the AndGosMI clinic from 2016 to 2020. The patients were divided into two groups: the control group (53) and the main group (45). Group 1 consisted of 53 people, consisting of patients who underwent only traditional hernioplasty and used standard diagnostic and treatment methods. The second group included 45 patients in whom hernioplasty was supplemented with the implementation of developed and improved methods of treatment and correction of recurrent GV, using autoderma plasty (ADP) and alloplastic grafts (ALG).

To characterize the hernial protrusion, the classification of J. Chevrel and A. Rath (1999) was used, which allows for a statistical study of the reliability of the relationships between different groups of patients and the percentage of relapses and recommended in the resolution of the 5th anniversary conference "Actual problems of herniology" (Moscow, October, 2006) [6,7]. 39 patients suffered from II degree obesity (BMI-36.7 kg / m²), in 28 people. there was degree I obesity (BMI-32.3 kg / m²), in 6 cases - III degree obesity (BMI-> 40.0 kg / m²). In all cases, obesity was combined with abdominoptosis. The classification provides for three positions. S - localization: median hernia (M), lateral (L) and combined (ML). W - the width of the hernial orifice: W1 - up to 5 cm (small hernias), W2 - 5 - 10 cm (medium size), W3 - 11-15 cm (large size), W4 - over 15 cm and over 30 (giant) ... R - presence and frequency of relapse (R0, R1, R2, R3,).

According to the classification (SWR), 10 patients in the control group and 12 in the main group had large (W3) and giant (W4) hernias. The overwhelming majority of patients, 28 (62.2%) and 32 (60.3%), respectively, had supra-umbilical (M1) and peri-umbilical (M2) hernias. The smallest number of patients had ventral hernias of lateral (L) 5 (11.1%), 7 (13.2%) and combined (M + L) locations 12 (26.7%) and 14 (26.4%). Of 98 patients, 12 (26.7%) and 12 (22.6%) of the main group had the first relapse (R1), while two or more relapses were observed in 33 (%) in the control group and in 41 (%) patients in the main group. groups (R2, R3, R4).

A fairly large number of patients (64) were previously operated (65.3%) for postoperative ventral hernias, 12 twice, and 4 6-3 times. Previously, they used plastics of the hernial orifice with local tissues (according to Sapezhko or Mayo), in three cases, plastic was performed with a mesh graft. The aggravating factor was concomitant obesity of varying severity, which took place in 18 (40%) patients in the comparison group and 32 (43.3%) in the main group.

All patients were admitted as planned after a standard preoperative examination on an outpatient basis: general clinical blood and urine tests; blood chemistry; coagulogram; blood test for the presence of hepatitis viruses, syphilis; electrocardiography; X-ray examination of the lungs; examination by a therapist. If necessary, the patients underwent a more complete study:

ultrasound, spirometry, examination by related specialists, etc. Electromyographic (EMG) was used to assess the functional state of the anterior abdominal muscular system.

In 13 (13.2%) studied patients with recurrent GV, the duration of herniation at the time of surgery was up to 1 year. At the same time, herniation for a period of 1 to 3 years was in 38 (39%), and 4-6 years - in 29 (29.6%) patients. The reasons for the duration of the anamnesis: (from 7 to 10 years or more), our patients (18) explained the fear of the operation, the presence of severe concomitant diseases and, in some cases, the abstinence of the surgeons from the operation.

The duration of hernia carriage in this contingent of patients played an extremely significant role in the outcome of surgical treatment: the longer POVH existed, the more often unfavorable conditions were created for the organism to adapt to an increase in intra-abdominal pressure in the early postoperative period.

The probable reasons contributing to the occurrence of large and giant POVH in this contingent of patients were: suppuration of the surgical wound - 21 (21.4%) cases, repeated surgical interventions - 18 (18.3%) cases, early physical activity - 11 (11, 2%) cases and ligature fistulas - 8 (8.1%) patients, cough, which served to increase intra-abdominal pressure in 9 (9.1). Pregnancy soon after surgery was the cause of recurrent GV in 8 (8.1%) patients, which was apparently associated with certain features of the lower median approach.

Hernia repair for recurrent GV, especially in elderly and senile people, is a serious intervention, accompanied by severe trauma, manipulations on pathologically altered tissues of the abdominal wall and abdominal organs. One of the most controversial issues is the problem of reducing the likelihood of developing various postoperative complications in the group of patients with the highest operational risk. This category includes primarily patients with a large defect in combination with obesity.

In this regard, patients with recurrent GV require special preoperative preparation.

The clinic uses a comprehensive preoperative preparation of patients with large and giant hernias with control of the study of cardiopulmonary activity. During the period of preoperative preparation, we solved the following tasks:

1. Prevention of a sharp increase in intra-abdominal pressure in the early postoperative period (bowel cleansing, elimination of cough and straining during urination).
2. Adaptation of the cardiovascular and respiratory systems to increased intra-abdominal pressure - wearing a strong bandage and tight elastic bandaging.
3. Corrective therapy of concomitant diseases (cardiac pathology, arterial hypertension, diabetes mellitus, etc.).
4. Prevention of complications from the postoperative wound by treatment and treatment with disinfectants, alcohol solutions, quartzization (excoriation, trophic ulcers and dermatitis).

Assessment of the state and reserve capabilities of the respiratory system. When studying the effectiveness of standard preoperative preparation, the following feature was noted. Only in 51.2% of patients in the main group, on admission, the function of external respiration (FVD) remained within the normal range. In 34 cases, a decrease in the compensatory capabilities of the

respiratory system was revealed. Respiratory failure was noted in 7 patients. This required treatment to maintain the proper level of ventilation and gas exchange processes. After correction of external respiration in 7-14 days, a repeated study of the FVD was carried out. Against the background of treatment, there was a good dynamics with a significant change in indicators, however, in general, the average value of all parameters was below the recognized norm - 62.2% in terms of VC.

Focusing on the indicators of VC, the value of which, according to spirometry data, should not be lower than 70% of the due value, only in 70.2% of patients by the end of treatment, the function of external respiration was within normal limits. Revealed changes after corrective therapy in 23 patients that fit into the 1st stage. DN and 2 grade II, demanded prolonged training.

The program of complex preoperative preparation as a whole had the goal of: drug treatment of diagnosed concomitant therapeutic diseases, vitamin therapy, correction of cardiopulmonary disorders, reduction of the patient's weight (up to 10-15 kg), abdominal volume and adaptation to increased intra-abdominal pressure, and also prevention of thromboembolic and purulent-septic complications from the surgical wound.

Patients were prescribed light laxatives, cleansing enemas every 2-3 days. After bowel preparation, the patient drinks only tea and water for 2 days before the operation. The deficiency of salts, carbohydrates and proteins, if necessary, is replenished by parenteral administration of saline preparations, concentrated solutions of glucose, amino acids, protein preparations.

The duration and intensity of preoperative preparation of patients with recurrent GV depended on the shape, size and size of the hernia, the presence or absence of its complications, age, as well as concomitant therapeutic and concomitant surgical pathology. Only a comprehensive preparation of patients for surgery, especially in elderly and senile people, makes it possible to expand the indications for surgical interventions, improves the conditions for performing the operation and contributes to a smoother course of the postoperative period.

For the prevention of thromboembolic complications in patients with recurrent POVH, we investigated the coagulation and anticoagulation systems of the blood. We studied the coagulation and anticoagulation system of the blood in 97 patients (including 15 men and 82 women) aged 32 to 74 years, 8 of them were over 50 years old.

In patients with recurrent GV, the blood clotting activity is significantly increased. This is evidenced by the shortening of the clotting time on average to 214 ± 13.5 sec and the recalcification time to 96 ± 13 sec ($P < 0.001$). At a normal rate of 638 ± 30 sec ($P < 0.05$), the test time for the patient's plasma sensitivity to heparin was shortened. This can be explained by the decrease in blood heparin observed in our patients. The content of procoagulants (prothrombin, proaccelerin, proconvertin), calcium in the blood serum was within the normal range.

In patients of the comparison group, we used the following plastic options: "traditional" - layer-by-layer restoration of the anatomical integrity of the abdominal wall; layer-by-layer suturing and creation of duplication of the musculo-aponeurotic layer according to the Sapezhko and Mayo type.

It should be noted that the "traditional" methods of hernia orifice plasty in this group of patients were not performed with gigantic POVH. At the same time, in these patients, the compared tissues in all cases were strong, i.e. retained the anatomical structure. At the same time, the

convergence of the tissues did not cause tension in the suture line. In addition, all of them did not have diseases from the respiratory system and cardiovascular systems of the body. The overwhelming majority were patients who did not perform heavy physical work.

Our experience in the surgical treatment of POVH indicates that the indications for this method of plasty in the studied patients are justified in the case of large POVH values. With its gigantic size, the indications for this method of plastics should be set strictly individually. This is due to the fact that the reduction of a significant volume of the contents of the hernia itself increases intra-abdominal pressure. At the same time, an additional decrease in the volume of the abdominal cavity due to duplication of the abdominal wall can further increase the intra-abdominal pressure with the ensuing consequences.

Patients of the main group who underwent hernia repair with autodermal plasty and alloplasty with a mesh implant had laxity of the musculo-aponeurotic layer, diseases of the respiratory system or the cardiovascular system or the gastrointestinal tract, most of the patients were engaged in heavy physical labor.

In addition, the majority of women were persons of reproductive age. In the main group, the skin incision was performed along the hernial protrusion. Then subcutaneously fatty tissue was widely separated to aponeurosis around the hernial sac. After that, the hernial sac was treated, hernial defects were repaired, and the diastasis of the rectus abdominis muscles was eliminated. All patients in the study group received a mesh implant. To prevent small abdomen syndrome and respiratory failure, according to indications, tension-free hernioalloplasty without suturing the aponeurosis or reconstruction of the abdominal wall according to Ramirez was performed.

The most optimal should be considered the use of wide bordering incisions with complete excision of the skin-subcutaneous fat flap together with the postoperative scar.

Along with this, it should be noted that the correctly selected shape and direction of the incision allow you to quickly expose the defect of the abdominal wall along its entire circumference and, moreover, does not disfigure the general configuration of the abdomen.

With the localization of recurrent GV, mainly in the epigastric region, it is preferable to make longitudinal and oblique transverse incisions, with localization in the mesogastrium, transverse. When localized in the hypogastrium, transverse or T-shaped with complete removal of the cutaneous and subcutaneous apron, which is especially pronounced in obese women.

For prosthetic repairs, the graft was fixed using the "onlay" technique. If necessary, in order to increase the volume of the abdominal cavity, to prevent the development of ACS, the plasty of the anterior abdominal wall was performed using a tension-free method, i.e., the mesh was applied to the aponeurosis without it. Suturing, as well as a combined method with the addition of mobilization of the sheaths of the rectus abdominis muscles according to Ramirez.

In the event of a deficiency and a defect in the aponeurosis, the peripheral sections of the explant were placed over the edges of the aponeurosis and fixed to it with a twisted suture. This method is a true tension-free hernioplasty. The mesh explant replaced the aponeurosis defect formed by the hernial protrusion. This type of surgery is indicated for large hernias that correspond to W3 – W4 according to the "SWR" classification.

After the completion of the plasty of the anterior abdominal wall, dermatolipidectomy was performed, along a line previously applied to the anterior abdominal wall before the operation, which borders the hernial protrusion, the old postoperative scar and the skin and fat fold. The weight of the excess skin and fat flap ranged from 4 to 12 kg. After the completion of hernioplasty, all patients in the control and study groups left a perforated drainage tube above the aponeurosis, the free ends of which were removed below the horizontal incision and fixed to the skin and drained. In the postoperative period, patients of both groups were prescribed banding of the anterior abdominal wall, antibiotic prophylaxis, early rising, breathing exercises, anticoagulants, and physiotherapy. The drainage tube was removed within 2 to 8 days under dynamic ultrasound observation.

Results. To assess the effectiveness of treatment results in patients in the groups under discussion, the following comparison parameters were used as the main criteria: 1. Abdominal complications of the early postoperative period. 2. Extra-abdominal complications of the early postoperative period. 3. Wound complications in the early postoperative period. 4. Long-term results of surgical treatment.

In patients of both groups, at the stages of treatment, the level of intra-abdominal pressure was measured over time. Based on the data obtained, regular changes in the indices of intra-abdominal pressure were revealed in the direction of their increase at the stages of the operation, associated with immersion of the hernial contents and hernioplasty. Tension-free hernioalloplasty and combined technique with mobilization of rectus muscles according to Ramirez, applied to 10 patients in the control group and 58 patients in the main group, which achieved an increase in the volume of the abdominal cavity, allowed avoiding an increase in intra-abdominal pressure.

The results of using various methods of hernioplasty in patients with recurrent GV were assessed according to the following criteria: the effectiveness of treatment; the percentage of complications in the postoperative period; postoperative mortality; the average number of bed-days in the postoperative period.

At the same time, we identified complications associated with surgical intervention and general complications that occur after various surgical interventions.

Postoperative complications from the wound in the studied patients were diagnosed in 30 cases. At the same time, hematoma was diagnosed in 6 (13.3%) patients of the comparison group and in 3 (5.6%) of the main group, wound infiltration - in 7 (15.5%) of the comparison group and in 2 (3.7%) of the main group. group, ligature fistula was observed only in 5 (11.1%) patients in the comparison group, wound suppuration - in 6 (13.3%) patients in the comparison group and in 1 (3.5%) of the main group.

In general, after hernia repair with hernia orifice repair using the "traditional" method, wound complications were diagnosed in 24 (53.3%) patients, and after ADP in 3 (12%) patients, after ALP also in 3 (10.7%). It should be noted that in the initial period of our work, we drained the subcutaneous fat only in obese patients.

In the long term, after plasty by the "traditional" method, good results were diagnosed in 28 (62.2%) patients, after ARP - in 23 (92%), after ALP in 27 (96.4%) patients.

Along with this, in 10 (22.2%) patients, we noted a satisfactory result - after plastic surgery by the "traditional" method, in 1 (4%) - ADP and in 1 (3.5%) with ALP.

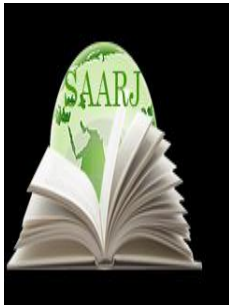
CONCLUSIONS

Thus, a feature of the clinical course in patients with ventral hernias and obesity is the presence of concomitant pathology, which requires special preoperative preparation. For medium and large hernias, alternatively, alloplasty with biologically inert polypropylene explants is applicable. For all forms of postoperative median ventral hernias, it is advisable to perform autodermoplasty, with placement and fixation using the "onlay" or "sublay" method with similar suture material, as well as tension-free methods of plastic surgery together with mesh allograft or autodermal plastic. The choice of plastic surgery for ventral hernias depends on the size of the hernial orifice according to the "SWR" classification (Chevrel J.P., Rath A.M., 2000). In case of W1, both plastic surgery with local tissues and explants using the "onlay" and "sublay" techniques is possible.

REFERENCES

1. Antropova N.A. // Surgical treatment of primary complex and recurrent inguinal hernias with alloplasty according to the original method. // Autoref. dis. Cand. medical sciences. Ekaterinburg. - 2002. - P. 24.
2. Baulnn NA, Andreev VA Baul ni AA Aesthetic correction of the abdominal wall in patients with obesity and incisional ventral hernias // Materials of the 5th Russian Scientific Forum "Surgery 2004". Moscow, 2004, - P. 11-12,
3. Belosludtsev D.N. The choice of alloplasty method in the treatment of incisional ventral hernias. // Autoref. dis. Cand. medical sciences. Nizhny Novgorod. - 2007. - P. 24.
4. Gorelik S.G. Auto- and alloplasty in the treatment of ventral and pelvic hernias. // Autoref. dis. Cand. medical sciences. Moscow 2005. - P. 24.
5. Grigoryuk A.A., Kravtsov Yu.A. et al. The use of medical glue MK-7m in the surgery of hernias of the abdominal wall: experimental and clinical research // Pacific Medical Journal. -2007. - No. 4. P. 76-79.
6. Grigorieva T.S. "Improving the method of hernioplasty in patients with inguinal hernias in a surgical hospital" one day "" (Abstract of the thesis. Candidate of Medical Sciences. - Samara. - 2009. P. 18.
7. Darwin V.V., Ilkanich A.Ya., Onishchenko S.V. Principles of the formation of a program for the surgical treatment of extensive and giant incisional hernias. // Materials of the III international conference "Actual problems of herniology." Saint-Peterburg. - 2019. P. 108-109.
8. Kirpichev A.G., Surkov N.A. The use of a prolene mesh for plastic surgery of the anterior abdominal wall. // Moscow, 2017.
9. Mirzabekyan, Yu.R. Prediction and prevention of wound complications after plasty of the anterior abdominal wall for postoperative ventral hernia // Surgery.-2018.-№1.-P.66-71.
10. Nazaryants Yu.A. Clinical and anatomical substantiation of combined plasty of incisional ventral hernias // Abstract of the thesis. Krasnoyarsk. - 2017. - P. 24.

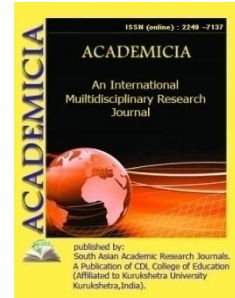
11. Satarov O.T. Mirzabekyan, Yu.R. Dobrovolsky S.R. Prediction and prevention of wound complications after plasty of the anterior abdominal wall for postoperative ventral hernia // Surgery.- 2018.-№1. P.66-71.
12. Sergeev V.A. The use of low-temperature argon plasma in hernioplasty of incarcerated incisional ventral hernias // Abstract of the thesis. Moscow. -2017. – P. 24.
13. Khayitov I.B. Development of differentiated tactics of surgical treatment of ventral hernias in patients with saggy abdomen // Abstract of the thesis. dis. Doctor of Philosophy (PhD) in medical sciences. Tashkent. - 2018 .- P. 17.



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A TELEMEDICINE WOUND CARE MODEL USING 4G WITH SMART PHONES OR SMART GLASSES

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ABSTRACT

To determine the viability of a wound-management paradigm based on 4th-generation digital communication industry standards (4G) and smart phones or smart glasses. This wound treatment approach is a real-time, interactive platform for telemedicine, wound dressing changes, and surgeries. It was established in March 2015 between Jinhua, Zhejiang Province, and Shanghai, China, which are separated by 328 kilometers. A video program (APP), 4G internet, smart phones or smart glasses, and a central server were all included. This model service was utilized 109 times in one month on 30 patients with wounds on their lower limbs. The service functioned effectively after a brief learning curve and was considered user-friendly. After the research, two patients (6.7 percent) had healed wounds, while others needed wound dressing changes. This concept was well received by both local practitioners and patients (100 percent and 83.33 percent, respectively). This telemedicine approach is practical and useful since it allows for medical wound healing services in distant regions where experts are rare.

KEYWORDS: Application, Light, Smart Glass, Smartphone, Telemedicine.

1. INTRODUCTION

Since its inception in the late 1950s, telemedicine has been widely recognized as a valuable tool in the delivery of health care. Studies have also shown that telemedicine's application (APP) is especially helpful to wound care in isolated populations and distant areas. Smart phones with video APPs are currently quite popular and extensively utilized all over the globe. A smart phone may use a video APP to record, transmit, and save videos, as well as communicate online with people all over the globe. Phones have evolved beyond only making phone conversations to include Internet surfing and a broad range of device-based software applications (APPs). As a result, even in the most distant and resource-poor situations, it is the most popular acquisition

terminal for telemedicine. Meanwhile, new wearable computers such as Google Glasses (Google, Inc., Mountain View, CA) and Vuzix Glasses (Rochester, NY) are gaining worldwide attention from a variety of professions. They may be worn like regular glasses and enable video to be captured from the wearer's viewpoint. It also interacts with others and offers an interface for accessing the Internet[1]–[4].

When utilized, it has the benefit of being hands-free and relying mostly on voice instructions. Its potential to influence health care delivery, medical documentation, surgical training, and patient safety has been shown in studies. Since its inception in the 1990s by Gottmp, the wound healing center has grown into a well-known and widely recognized idea based on a multidisciplinary platform. Wound healing has been shown to benefit from telemedicine as a speciality that requires a significant visual component. Hangzhou was the first wound healing center in China, opening in 2004, followed by Xi'an, Lanzhou, and Shanghai. The apparent concentrated distribution of these developing wound healing clinics in major cities is one of their most distinguishing characteristics; nevertheless, there remains a scarcity of wound experts in rural regions. The distance needed to go to these major wound healing clinics in a big metropolis like Shanghai may be challenging for those patients who are unable to walk freely. To address this issue, we created a telemedicine system in 2011 that used fourth-generation mobile communication technology standards (4G) optical cable and high-resolution video to diagnose and treat wounds between the wound healing department at Ninth Hospital and community health care centers throughout Shanghai. It has been utilized over 600 times and has shown to be useful and beneficial. However, since basic infrastructure in rural regions of China is lacking, we devised a plan to utilize the Shanghai telemedicine model to assist improve wound care in these areas, the impact of which is yet unknown. To perform a cohort research, a novel telemedicine wound care model was built up utilizing 4G net with smart glasses or smart phones between Shanghai and Jinhua, which are 328 kilometers away[5]–[7].

Gold nanoparticle (Au NP)-based colorimetric assays are developing as an alternate method for heavy metal detection, 1921 with excellent sensitivity, specificity, and simplicity of signal read-out utilizing UVvis spectrometers 1921 or glass slide readers, for example. However, owing to their relatively large equipment, higher prices, and lack of wireless connection, which is critical for distributed sensing and spatiotemporal mapping of contamination in distant places and field settings, these current systems that use NPs are still restricted. The detection of subppm quantities of mercury(II) ions has recently been shown utilizing dye-embedded polymer sheets as colorimetric substrates that are digitized using, for example, smart-phone cameras as an alternative to Au NP-based plasmonic methods. However, because of inevitable changes in ambient light conditions and human operation and/or alignment during the picture capture process, this current method does not take use of the phone's processing/computational capacity, and thus has limited detection sensitivity and repeatability.

To provide a field-portable, cost-effective, and wirelessly connected platform for sensitively quantifying heavy metal ion concentration in water samples, we present a battery-powered mobile sensing device that consists of a lightweight (37 g) opto-mechanical attachment to a smartphone, as well as a custom-developed Android application for detection quantification, reporting, and sharing. This lab-on-a-phone gadget uses dual-wavelength illumination using light-emitting diodes (LEDs) at 523 and 625 nm to measure mercury-induced modest transmission variations in a colorimetric assay using citrate-stabilized plasmonic Au NPs and

aptamers (Apt) combined in disposable test tubes. We also showed geographic mapping of mercury(II) pollution in California using our cellphones.

The majority of bulky and expensive analytical equipment are used to detect environmental pollution such as trace-level hazardous heavy metal ions. However, there is a significant worldwide need for portable, quick, specific, sensitive, and cost-effective identification techniques that can be utilized in resource-constrained and field environments. The author present a smart-phone-based hand-held platform that enables for the measurement of mercury(II) ions in water samples with a sensitivity of parts per billion (ppb). The author developed an integrated opto-mechanical connection to a smart phone's built-in camera module to digitally measure mercury content utilizing a plasmonic gold nanoparticle (Au NP) and aptamer decorative transmission assay applied in disposable test tubes for this purpose. The author quantified mercury(II) ion concentration in water samples using a two-colourratio metric method using light-emitting diodes (LEDs) at 523 and 625 nm and a custom-developed smart application to process each acquired transmission image on the same phone to achieve a limit of detection of 3.5 ppb with this 40-gram smart-phone attachment. We created a mercury contamination map using our smart-phone-based detection technology by assessing water samples from municipal tap water sources, rivers, lakes, and beaches in California (USA). This sensitive and specific heavy metal detection platform running on cellphones could be quite useful for distributed sensing, tracking, and sharing of increased pollution information as a function of both space and time, thanks to its cost-effective design, field-portability, and wireless data connectivity[8].

The research protocol was approved by both participating institutes' medical ethics committees and followed the Declaration of Helsinki's standards. From April to May 2015, 30 patients with skin abnormalities on their lower limbs visited the First People's Hospital of Wucheng District in Jinhua, Zhejiang Province, China. All of the participants signed the informed consent. Specialists from Shanghai Ninth People's Hospital's Wound Healing Department, which is associated with Shanghai Jiao Tong University School of Medicine, provided remote consultation to the First People's Hospital in Wucheng District in Jinhua. Local surgeons from Jinhua's First People's Hospital's orthopaedic department were in charge of keeping track of each patient's medical data and carrying out the treatment plans suggested by distant experts. Local surgeons got pre-training in fundamental wound healing knowledge, which lasted around four days, to enhance their wound care skills. Under the supervision of wound healing experts in Shanghai, local surgeons were evaluated after a period of training to guarantee they fulfilled the criteria of wound care.

A video APP based on PCs and smart phones or the usage of smart glasses with a central server for multiway communication comprised the telemedicine system. Computers were accessible to specialists, smart phones were available to both experts and local surgeons, and smart glasses were available to local surgeons. The video APP enabled real-time viewing of the patients' wound in Jinhua to experts in Shanghai through a 4G wireless local area network (Wi-Fi). Figure 1 depicts the facilities in question. The ZTE M901C (Zhongxing Telecommunication Equipment Corporation, Shenzhen, Guangdong, China) smart phones utilized in this research featured a 13-megapixel camera and a 6.0-inch display with a resolution of 1280x720 pixels. It was able to produce a video with a resolution of 1920x1080 pixels at a frame rate of 30 frames per second. Lenovo Vuzix M100 Smart Glasses were utilized as the smart glasses (Lenovo NewBusiness Development, Beijing, China). A computerized central processing unit, a display screen, a high-definition camera, a microphone, a conduction transducer, and wireless connection were all

included in the smart glasses. It shot movies at a resolution of 1080 pixels at 30 frames per second using a 5-megapixel high-definition camera. The video APP was created by livecast media (Vancouver, BC, Canada), and it allowed for multiway communication, including one-to-many, many-to-one, and many-to-many[9], [10].

In one instance, a person in Shanghai called "shep1" and a user in Jinhua named "shglass2" were both online and able to communicate in real time.

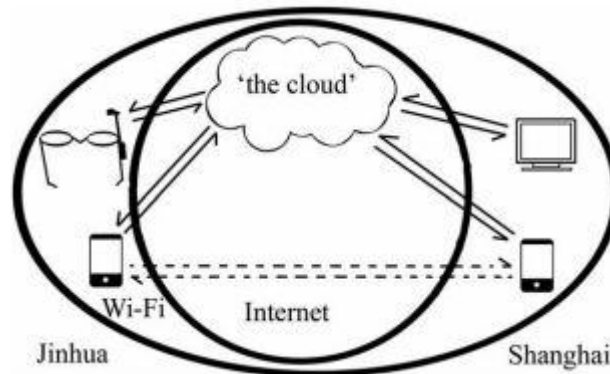


Figure 1: The above figure shows the telemedicine wound care model.

1.1 Adherence and comprehension training for users:

Before launching this model, we tested it in healthy volunteers to see whether it was feasible and to educate both remote experts and local surgeons on how to utilize it. Local surgeons spent an average of three days of training. A YES or NO questionnaire was used to gauge local surgeons and patients' approval of the model.

1.2 The telemedicine system's procedure

When each patient arrived at the clinic, an expert surgeon conducted a physical examination and obtained comprehensive medical information. The surgeon reported the patient's medical record to experts after preparing the patient. Wound healing experts in Shanghai evaluated the wound and provided expert comments via a multiway real-time video conversation. Following a discussion, the expert and the local doctor jointly determined the final treatment choices. Following that, the surgeons and patients decided to meet again for the following session. If patients needed surgery, wound healing experts may use the telemedicine system to offer real-time intraoperative consultation.

2. DISCUSSION

Where there is 4G connectivity, this telemedicine platform with APP for smart phones or smart glasses may be used. Costs were expensive in the late 1950s, when telemedicine was first introduced. Increasing network coverage and lowering prices in developing nations, on the other hand, offer a broad variety of possibilities for smart phone APPs in everyday life, which has been particularly beneficial to telemedicine. Telemedicine is now affordable thanks to modern technology, particularly mobile phones with great mobility and high-speed telecommunication networks. Indeed, telemedicine lowers expenses and enhances the quality of life for patients in distant and rural regions by decreasing transportation and staff time. We described our recent experience with smart phones or smart glasses and 4G for wound treatment in this paper, a

wound care model that emerged from talks between Shanghai and the First People's Hospital of Wucheng district, Jinhua, Zhejiang province in China. This wound care approach was considered user-friendly after its debut. This approach was generally well received by both local surgeons and patients.

The advantages of this type are many. To begin with, it offers a platform for popularizing the idea of wound healing while also allowing local health professionals to undergo systematic wound care training. Local surgeons were interested in our research and shown excellent compliance with the usage of smart phones and smart glasses. Second, it guarantees that individuals who are unable to move freely get health treatment as quickly as possible. Local participants in this research got high-quality medical care close to their homes. Third, a wound-care approach is interactive, real-time, and remote, similar to video conferencing. A single case might be presented in multiple clinics, and physicians could debate it and make a conclusion collectively. Telemedicine effectiveness requires effective communication between distant experts and local surgeons. Local surgeons often follow experts' recommendations, although their ideas may be crucial to the treatment strategy in certain instances.

Fourth, telemedicine may reduce the number of needless referrals to specialists, saving time and money. In wound healing, like in dermatology, a significant visual component is thought to be beneficial. The majority of wound diagnosis and treatment is done via morphological observation, which is possible with the telemedicine system. However, the clinical history, physical examination, and, if required, auxiliary examination are still essential. Specialists advised the usage of elastic bandages in one instance owing to varicose veins. Following a physical examination, one patient with sores on their foot and ankle and a filariasis diagnosis dating back over 30 years was sent to a specialist hospital to address lymphatic obstructions. Because the trial lasted just one month, the majority of participants still needed therapy at the conclusion. Because these patients had long-standing wounds and were of an older demographic, their wounds would take longer to heal fully. Telemedicine is not without its difficulties. Smart phones and smart glasses both have fundamental flaws that restrict their use in telemedicine. Because the smart phone is not hands-free, the consultation cannot take place when there is just one local surgeon on site and examining the wound.

Local surgeons using smart glasses must also put their face near to the wound because it fails to gain magnification of regional anatomy, which has the ability to infect patients. Furthermore, in recent years, issues about privacy and security during telemedicine have gotten a lot of attention. Many individuals are concerned that health-related data may be abused. The usage of the telemedicine service is jeopardized by such ethical and legal problems. There were other publications that addressed the necessity of creating legal rules related to telemedicine, with many of them believing that adequate security and privacy safeguards were required. It should not, however, exclude the utilization of telemedicine services. In this research, a telemedicine wound care model was presented using smart phones or smart glasses, and the results were consistent with our prediction. This approach is especially beneficial since it allows for high-quality medical care in distant regions where wound healing experts are rare.

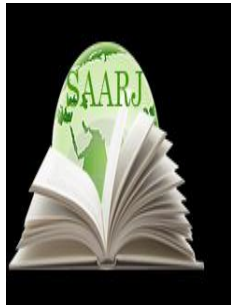
3. CONCLUSION

This wound care approach, in general, is an interactive, real-time, and remote treatment method aimed at improving health care service. It is a novel method of implementing telemedicine that

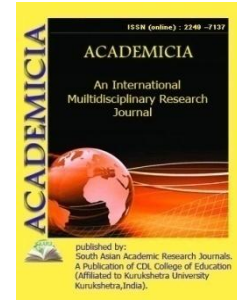
may be used to change wound dressings or perform procedures with the assistance of expert views. This concept was well received by both local surgeons and patients.

REFERENCES

1. J. Ye *et al.*, "A telemedicine wound care model using 4G with smart phones or smart glasses: A pilot study," *Med. (United States)*, 2016, doi: 10.1097/MD.00000000000004198.
2. N. Chauhan and J. Shah, "Smart Phone Based Audiometry in City Traffic Police," *Indian J. Otolaryngol. Head Neck Surg.*, 2018, doi: 10.1007/s12070-018-1327-2.
3. Y. H. Hong, B. H. Teh, and C. H. Soh, "Acceptance of smart phone by younger consumers in Malaysia," *Asian Soc. Sci.*, 2014, doi: 10.5539/ass.v10n6p34.
4. I. Uddin, A. Baig, and A. A. Minhas, "A controlled environment model for dealing with smart phone addiction," *Int. J. Adv. Comput. Sci. Appl.*, 2018, doi: 10.14569/ijacsa.2018.090973.
5. E. Zvornicanin, J. Zvornicanin, and B. Hadziefendic, "The use of smart phones in ophthalmology," *Acta Informatica Medica*. 2014, doi: 10.5455/aim.2014.22.206-209.
6. K. Kim, G. R. Milne, and S. Bahl, "Smart phone addiction and mindfulness: an intergenerational comparison," *Int. J. Pharm. Healthc. Mark.*, 2018, doi: 10.1108/IJPHM-08-2016-0044.
7. Q. Wei *et al.*, "Detection and spatial mapping of mercury contamination in water samples using a smart-phone," *ACS Nano*, 2014, doi: 10.1021/nn406571t.
8. B. Janković, M. Nikolić, J. Vukonjanski, and E. Terek, "The impact of Facebook and smart phone usage on the leisure activities and college adjustment of students in Serbia," *Comput. Human Behav.*, 2016, doi: 10.1016/j.chb.2015.09.022.
9. N. Chan, J. Charette, D. O. Dumestre, and F. O. G. Fraulin, "Should 'smart phones' be used for patient photography?," *Can. J. Plast. Surg.*, 2016, doi: 10.1177/229255031602400109.
10. Y. F. Chang, C. S. Chen, and H. Zhou, "Smart phone for mobile commerce," *Comput. Stand. Interfaces*, 2009, doi: 10.1016/j.csi.2008.09.016.



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THE BRIEF REVIEW ON THE VARIOUS THERMODYNAMIC CYCLES

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ABSTRACT

The organic Rankine cycle and the super critical Rankine cycle for the conversion of low heat to electricity are discussed in this paper, as well as the collection of possible workflow parameters, the screening of 35 workflow fluids for two cycles, and an overview of fluid characteristics output on the loop. Thermodynamic and physical characteristics, durability, environmental consequences, protection and compatibility, supply and prices are all important considerations when choosing an operating liquid. The kinds of working fluids, the effect of latent heat, density, and actual heat, and the overheating efficiency are all covered in this article.. Superheating is needed for moist fluids in organic Rankine cycles. In the case of dry fluids, superheat may have a detrimental impact on cycle efficacy. Fluids with low critical temperatures and pressures are good candidates for the supercritical Rankine cycle.

KEYWORDS: *Organic Rankine cycle, Rankine, Renewable energy source, Supercritical Rankine cycle.*

INTRODUCTION

A thermodynamic cycle is a connected series of thermodynamic processes that include the movement of heat and work into and out of a system while changing pressure, temperature, and other state variables, and that ultimately restores the system to its original condition. The working fluid (system) may function as a heat engine by converting heat from a heated source into productive work and disposing of the leftover heat to a cool sink while going through a cycle.

The cycle may also be reversed, with labor being used to transport heat from a cold source to a warm sink, thus functioning as a heat pump. The system is in thermodynamic equilibrium at all times throughout the cycle, making it reversible (its entropy change is zero, as entropy is a state

function). Part of the world's energy demand will be met by renewable energy sources such as thermal and geothermal energy sources, as well as a large amount of industrial waste heat. Traditional ways of generating electrical power, on the other hand, are unable to efficiently convert the moderate temperature heat generated by these sources, resulting in huge quantities of moderate temperature heat being wasted [1]. In this instance, research into how to convert this low-quality heat source into energy is of great importance.

The organic Rankine cycle, the supercritical Rankine cycle, the Kalina cycle, the Go swami cycle, and the three-way flash cycle are among the thermodynamic cycles suggested and studied for converting low-quality heat sources into electricity[2]. Despite widespread claims that Kalina cycles have 15 to 50 percent higher heat induction than organic Rankine cycles, data shows that the difference in efficiency for the Kalina loop is only three percent in real operating cycles and simulations under the same atmospheric temperature and cooling system conditions. The biological Rankine cycle, on the other hand, is much less complicated and needs less maintenance [3]. The Figure 1 shows the sketch of the Rankine cycle.

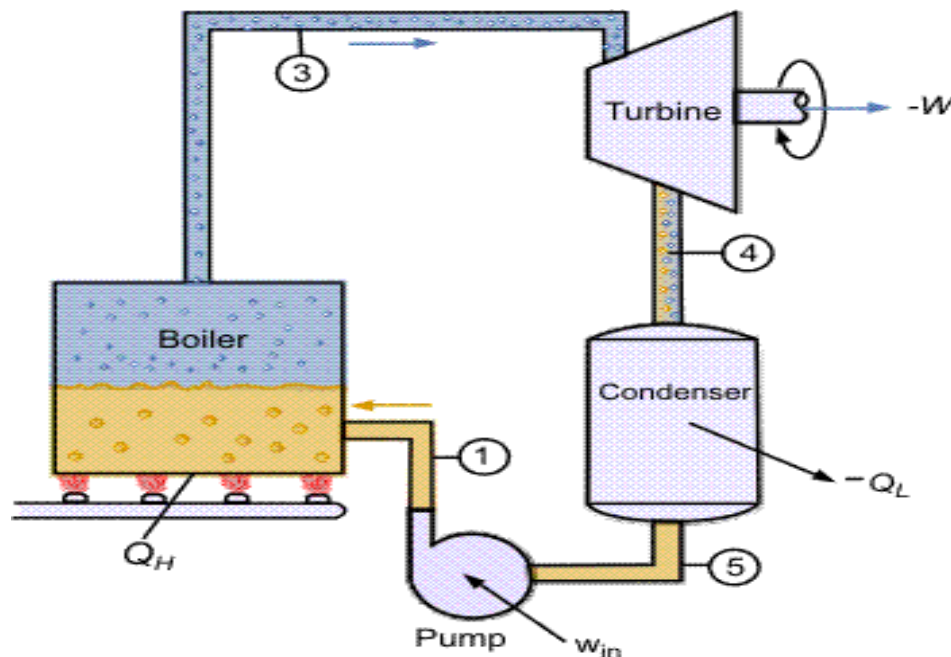


Figure 1: Rankine Cycle[4]

The fundamental working cycle of all power plants is the Rankine cycle, in which the operating fluid continually evaporates and condenses [5]. The working fluid used is mainly determined by the temperature range available. Pressure-enthalpies (p-h) and temperature-entropy (t-e) are used to depict this loop (T-s). The Rankine cycle operates in the following stages:

Isobaric Heat Transfer 1-2-3 The feed pump delivers high-pressured liquid that has been heated to saturation temperature. More energy is incorporated into the liquid, allowing it to evaporate before being fully transformed to saturated steam.

Expansion 3-4 Isentropic. In the turbine, the steam is expanded to produce work that may be converted to electricity. As the process moves into the two-phases region, the expansion is

limited by the temperature of the coolant medium and the corrosion of the turbine blades caused by the liquid training in the vapour flux. The quality of the exit vapour should be more than 90%.

4-5 Isobaric Heat Rejection The vapor-liquid combination left by the turbine (4) is condensed at a low pressure in a surface condenser, usually with cooling water. In properly-built and operated condensers, the vapour pressure is far below ambient pressure.

Isentropic compression of 5-1. The condensate pressure in the feed pump has been increased. Pump effort is generally low due to the tiny real volume of liquids, therefore thus is often ignored in thermodynamic measurements.

Many application cycles have previously been discovered after the researchers developed and tested variants of the Rankine heat transfer cycles into electricity. However, there is still more to be learned in terms of improving output and lowering prices. This is a side-by-side comparison of the two periods.

Organic Rankine Cycle: The organic rankine cycle (BRC) is based on the steam rankine cycle principle, but it recovers heat using organic working fluids with low boiling temperatures. In a T-s diagram, an ORC structure and operations are shown. The loop includes an expansion turbine, a condenser, a pump, a boiler, and a superheater. Superheat is required. Pure working fluids such as HCFC123 (CHCl_2CF_3), PF5050($\text{CF}_3(\text{CF}_2)_3\text{CF}_3$), HFC-245,fa ($\text{CH}_3\text{CH}_2\text{CHF}_2$), HFC-245,ca, isobutene, n-pentane, and flavored hydrocarbons (CH_3), isobutene ($(\text{CH}_3)_2\text{C}=\text{CH}_2$) [6]. Fluid mixes were also proposed for organic rankin cycles[7].

Water characteristics are prevalent in chemical job fluids. The slope of the job fluid saturation curve in a T-s graph may be positive (e.g. isopentane), positive (e.g. R22), or vertical (e.g. R11), indicating that the fluids are warm, dry, and isentropic. Wet fluids, such as water, are often overheated, while many dry or isentropic organic fluids do not need to be. Another advantage of organic fluids is that the ORC turbine often only needs a single phase expander, resulting in a smoother, less expensive approach[8].

Supercritical Rankine Cycle: To achieve a better thermal balance with the supply of heat, working fluids with low critical temperatures and pressures should be compressed at supercritical pressures and heated till expansion. The T-s diagram depicts the structure and process of the CO₂ supercritical Rankine cycle. The supercritical rank-in process isn't as straightforward as a two-phase area. The Rankine organic cycle produces a tighter thermal fit with less irreversibility. The supercritical Rankine cycle R143a and the standard organic Rankine cycle R152a both have the same thermal limit[9].

By establishing a set of assumptions, thermodynamic cycles may be utilized to simulate actual devices and systems. It is often essential to simplify assumptions in order to reduce an issue to a more manageable size. For example, a gas turbine or jet engine may be represented as a Brayton cycle, as illustrated in the diagram. The device itself is made up of a number of steps, each of which is represented as an idealized thermodynamic process in its own right. Despite the fact that each stage that interacts with the working fluid is a complicated actual device, it is possible to describe it as an idealized process that approximates its real behavior. If energy is provided by methods other than combustion, it is assumed that the exhaust gases will be transferred from the exhaust to a heat exchanger, which will sink the waste heat to the environment and reuse the working gas at the intake stage.

It's possible that the gap between an idealized cycle and real performance is substantial. The following Figure 2, for example, show the discrepancies in work output predicted by an ideal Stirling cycle and real Stirling engine performance:

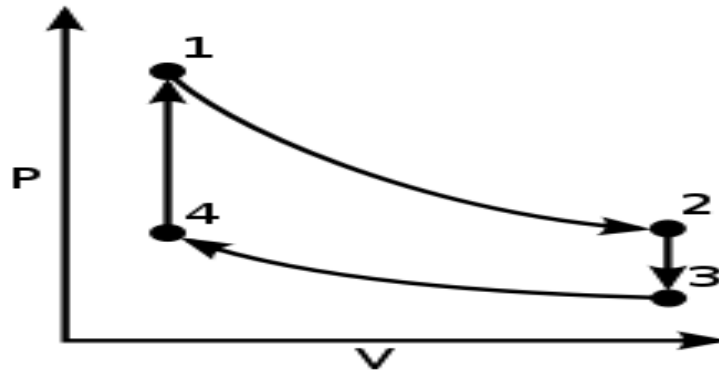


Figure 2: Deal Stirling Cycle

LITERATURE REVIEW

For variable temperature thermal sources, there is no one-size-fits-all fluid. Choices must be taken while selecting fluids. The critical temperature and the fluid's j value are important characteristics that indicate the time and working temperature of the fluid that can be supplied by the fluid, according to the authors [10].

DISCUSSION

For variable temperature thermal sources, there is no one-size-fits-all fluid. Choices must be taken while selecting fluids. The critical temperature and the j value of the fluid, according to the authors, are important characteristics that indicate the time and working temperature of the fluid that can be supplied by the fluid. Among the thermodynamic cycles proposed and researched for converting low-quality heat sources into electricity are the organic Rankine cycle, the supercritical Rankine cycle, the Kalina cycle, the Go swami cycle, and the three-way flash cycle[3]. Despite widespread claims that Kalina cycles have 15 to 50 percent higher heat induction than organic Rankine cycles, data shows that in real operating cycles and simulations under the same atmospheric temperature and cooling system conditions, the difference in efficiency for the Kalina loop is only three percent. The biological Rankine cycle, on the other hand, is simpler and requires less upkeep. The organic rankine cycle (BRC) uses organic working fluids with low boiling temperatures to recover heat, similar to the steam rankine cycle.

An ORC structure and operations are illustrated in a T-s diagram. An expansion turbine, a condenser, a pump, a boiler, and a superheater are all part of the loop. It is necessary to use superheated water. HCFC123 (CHCl_2CF_3), PF5050 ($\text{CF}_3(\text{CF}_2)_3\text{CF}_3$), HFC-245fa ($\text{CH}_3\text{CH}_2\text{CHF}_2$), HFC-245ca, isobutene, n-pentane, and flavored hydrocarbons (CH_3), isobutene($(\text{CH}_3)_2\text{C}_5\text{H}_2$)[6]. For organic rankin cycles, fluid mixtures were also suggested. Chemical work fluids have a lot of water properties. In a T-s graph, the slope of the job fluid saturation curve may be positive (e.g. isopentane), positive (e.g. R22), or vertical (e.g. R11), signifying warm, dry, and isentropic fluids. Water and other wet fluids are often overheated, while many dry or isentropic chemical fluids are not. Organic fluids also have the benefit of just

requiring a single phase expander in the ORC turbine, resulting in a smoother, less costly approach.

Working fluids with low critical temperatures and pressures should be compressed at supercritical pressures and heated till expansion to create a better thermal balance with heat supply. The structure and operation of the CO₂ supercritical Rankine cycle are shown in the T–s diagram. The supercritical rank-in process is more complicated than that of a two-phase area. With reduced irreversibility, the Rankine organic cycle provides a tighter thermal fit. The temperature limit of both the supercritical Rankine cycle R143a and the conventional organic Rankine cycle R152a is the same.

CONCLUSION

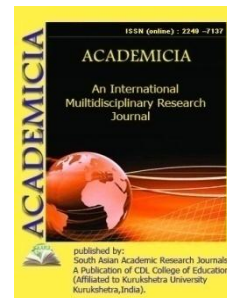
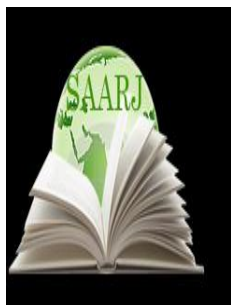
Organic rankine cycles and supercritical rankine cycles were explored for low-grade heat conversion to fuel. Organic Rankine cycles are not in compliance with the thermal sources, unlike an overly critical Rankine cycle, although the supercritical Rankine cycle usually requires greater operating pressures. The efficiency of the cycle is greatly influenced by the functional fluids. Thermodynamic and physical characteristics, durability, environmental implications, protection and performance, as well as availability and cost, are all aspects to consider when selecting a working fluid. Types of work fluids, latent heat effects, density and actual heat, and the effectiveness of superheating are all discussed in detail. Turbines with high-density working fluids and latent high heat have a high work performance. The study also discovered that isentropical and dry fluids are preferred in organic rankine cycles. Superheating is needed for moist fluids in organic Rankine cycles. In the case of dry fluids, superheat may have a detrimental impact on cycle efficacy. Fluids with low critical temperatures and pressures are good candidates for the supercritical Rankine cycle.

REFERENCES

1. I. Renewable Energy Agency, “Renewable Power Generation Costs in 2017,” *Int. Renew. Energy Agency*, 2018.
2. T. C. Hung, “Waste heat recovery of organic Rankine cycle using dry fluids,” *Energy Convers. Manag.*, 2001, doi: 10.1016/S0196-8904(00)00081-9.
3. V. I. Lakshmanan, R. Roy, and B. Gorain, “Renewable energy,” in *Innovations and Breakthroughs in the Gold and Silver Industries: Concepts, Applications and Future Trends*, 2019.
4. “Rankine Cycle,” *thermopedia*. .
5. B. Saleh, G. Koglbauer, M. Wendland, and J. Fischer, “Working fluids for low-temperature organic Rankine cycles,” *Energy*, 2007, doi: 10.1016/j.energy.2006.07.001.
6. J. Sarkar, “Review and future trends of supercritical CO₂ Rankine cycle for low-grade heat conversion,” *Renewable and Sustainable Energy Reviews*. 2015, doi: 10.1016/j.rser.2015.04.039.
7. T. Heppenstall, “Advanced gas turbine cycles for power generation: A critical review,” *Appl. Therm. Eng.*, 1998, doi: 10.1016/S1359-4311(97)00116-6.
8. D. B. Baranowski, M. K. Flatau, P. J. Flatau, and J. M. Schmidt, “Multiple and spin off

initiation of atmospheric convectively coupled Kelvin waves,” *Clim. Dyn.*, 2017, doi: 10.1007/s00382-016-3487-7.

9. M. Hilmer and P. Lemke, “On the decrease of Arctic Sea ice volume,” *Geophys. Res. Lett.*, 2000, doi: 10.1029/2000GL011403.
10. H. Chen, D. Y. Goswami, and E. K. Stefanakos, “A review of thermodynamic cycles and working fluids for the conversion of low-grade heat,” *Renewable and Sustainable Energy Reviews*. 2010, doi: 10.1016/j.rser.2010.07.006.



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THE USE OF INCORPORATION TO INCREASE INFORMATION COMPETENCE IN PRIMARY SCHOOL MATHEMATICS

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ABSTRACT

The essence of this article is to increase students' information competence by providing them with a variety of new information in math classes. In the process of passing the subject of mathematics, the teacher teaches, educates, forms some characteristics of students. Math lessons provide new and interesting information through a variety of text, pictures, numbers, and expressions, and increase the information competence of these intelligent students. That is the consequence of an interconnected world.

KEYWORDS: *Lesson, Problem, Math, Corporation, Information, Competence, Elementary School, Education, Methodology, Technology, Student, Problem.*

INTRODUCTION

At present, great attention is paid to the further development and radical improvement of education in our country. In particular, knowledge of mathematics, economics, foreign languages has become a modern requirement. The radical reforms in the field of education in our country are based on specific democratic, national and universal values. Due to the ongoing reforms in the field of education, the demand in this area has also increased. It is unthinkable to organize mathematics lessons in primary school without the use of integration. Because in math class, every subject is connected at least once. This will give the student new information. Through this topic, students develop information competence. Today, it is the duty of every educator to bring up students who have enough knowledge, who can apply their knowledge in practice, who can express their opinion on each topic independently, who have sufficient information resources. The advantage of information and communication technologies is that they teach students to think independently, broaden their worldview, listen and observe, strive and explore, develop thinking, and work independently. The teacher and the student work together. Today, students

need not only to have enough knowledge, but also to be able to put it into practice. This is what the concept of competence represents.

Competence is the ability to apply the theoretical knowledge, skills and abilities acquired by a student in a particular subject in solving practical and theoretical problems encountered in everyday life.

The concept of "competence" was originally introduced into the field of education as a result of psychological and pedagogical research, and is now used as a modern term. "Competentia" is derived from the Latin word, which when translated into Uzbek literally means "a person who knows well", "someone with experience". Therefore, the competence depends on the different situations that occur in the process of training, how the leader behaves in unexpected situations, the ability to communicate, the ability to understand the mental state of subordinates, new skills in dealing with competitors. The ability to apply the knowledge, skills and competencies acquired by the leader in the use of information full of contradictions in specific tasks, to have a plan for action in a constantly evolving and complex process.

A competency-based approach to mathematics education involves students acquiring a variety of skills that enable them to act effectively in situations encountered in professional, personal, and community life. Thus, the competency approach focuses on strengthening the practical application of the basics of mathematics education. Practical exercises and applications, as well as project work have been included in science curricula in order to build students' core competencies and increase their interest in learning general subjects through small-scale research. This not only improves the quality of learning in a particular subject, but also opens up opportunities for interdisciplinary and interdisciplinary communication in everyday life and increases the effectiveness of education. The organization of mathematics lessons requires a greater emphasis on practice than theory, and a certain abandonment of an approach based on providing students with ready-made teaching materials.

The teacher and the student work together. The teacher, as a manager, shows the student different directions. The student is active in the classroom and thinks independently. Teaching increases the effectiveness of the lesson. Like all subjects, mathematics has a role to play in improving information competence in primary school students. The word "information" refers to information about an expected or actual event. At present, all information can be relatively divided into the following types.

- Technical information
- Agro biological information
- Political information
- Legal information
- Economic information, etc.

The types of information are interrelated and complementary. Among this information, economic information is the main one, accounting for 80% of its volume. The word information is derived from the Latin word "informatio", which means "to explain, to describe". In many cases, the word "information" is used instead of the word "given". Information is a clear and practical

message. The data includes messages and observations. It becomes information when an opportunity arises for a need, such as increasing one's knowledge of something.

Information in general is broadly: a reflection of the real world; in the narrow sense: voluntary information consisting of the subject of storage, transmission, modification and management. In the modern sense, information is a scientific concept in the broadest sense, the exchange of information between people, between humans and animate and inanimate nature, especially computers. Information technology is a set of methods and tools for collecting, storing, transmitting, modifying, and processing information. New information technology in education means the latest information technology that can only be used in the educational process. New information technologies are the provision of computer-based information retrieval and processing services by various categories of users. Information technology is the use of computer technology and communication systems to create, collect, transmit, store, and process information for all areas of social life. No matter what profession a person has, if he approaches his work and training diligently and kindly, he will master its secrets, at the same time, he will understand himself and develop in this field. If a teacher loves and nurtures children, he will grow up and become wise. The teacher educates the future child.

Teaching with the use of interactive methods allows students to independently acquire all-round scientific and theoretical knowledge, to form knowledge and skills, and on this basis to form and increase the activity of students' scientific worldviews, to think freely. Provides teaching, identification and realization of creative abilities, formation of teacher-student cooperation and, finally, the achievement of a guaranteed end result. In interactive methods, the teacher is engaged in creating an environment for students to acquire independent and perfect knowledge, to direct them to the basics of science, to arouse interest and affection. New pedagogical technologies change the methods and forms of teaching, diversify them and make the student an active participant in the learning process.

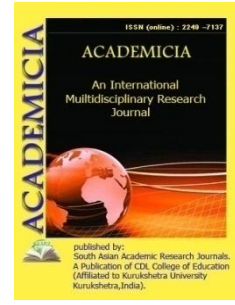
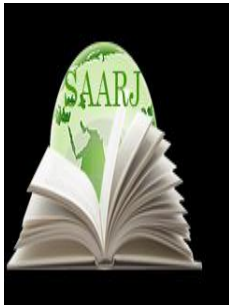
Competence includes not only the cognitive component, but also the motivational, ethical, social, and moral systems of value orientation. In elementary math classes, students learn a lot of information and feel the need for a lot of information. To prevent this, students need to be provided with an adequate supply of information. In this way, students develop information competence. The State Education Standards and Curriculum includes the basic and general science competencies to work with information, the content of which is as follows: to find, sort, process, store and effectively use the necessary information from media sources to acquire, to ensure their safety, to form the capacity to have a media culture. In addition, to be aware of mathematical literacy, scientific and technical innovations and to make personal, family, professional and economic plans based on accurate calculations in the competence of use, to be able to read various diagrams and models in daily activities, the formation of the ability to use scientific and technical innovations that lead to favorable conditions. These competencies are designed to increase the information capacity of the student. Many methods and tools are used to improve students' information competence in elementary math classes. One of the most commonly used methods is integration. That is, by linking math to other subjects, the student is given more information. In mathematics, each subject can be linked to English or another foreign language. Teaching students to say numbers in English, to name actions, or to name any term in a topic in English will be new information for the student. By linking the same math to each subject, it is possible to increase students' information competence. One of the great tasks of a

teacher is to teach students how to sort information. That is, the student must be able to distinguish between necessary and unnecessary information. This is one of the biggest challenges facing students and teachers today. Mathematics is the basis of knowledge of the universe and plays an important role in revealing the specific laws of events and phenomena in the environment, as well as in the development of production, science and technology. As the President Sh.M.Mirziyoyev noted, "Mathematics is the basis of all sciences. A child who knows this science well will grow up to be smart, open-minded and successful in any field. " In the words of the famous Russian mathematician A.Ya. Khinchin: "As a result of mastering the science of mathematics, a person is brought up to be honest, truthful, courageous and patriotic. In short, it is important to increase information competence in students from primary school. Mathematics plays a big role in this. Every modern teacher uses different means of communication, different methods and interesting programs in the process of explaining each subject, each topic to the students. Elementary school students are very curious. That's why every piece of information is asked "why?", "Why?", "How?" often ask questions such as The main requirement of the teacher is to provide students with useful information.

Many methods and tools are used to improve students' information competence in elementary math classes. One of the most commonly used methods is integration. That is, by linking math to other subjects, the student is given more information. In mathematics, each subject can be linked to English or another foreign language. Teaching students to say numbers in English, to name actions, or to name any term in a topic in English will be new information for the student. By linking the same math to each subject, it is possible to increase students' information competence. One of the great tasks of a teacher is to teach students how to sort information. That is, the student must be able to distinguish between necessary and unnecessary information. This is one of the biggest challenges facing students and teachers today.

REFERENCES

1. I.M.E.Jumayev, Z.G'.Tadjiyeva. Methods of teaching mathematics in primary school. T., "Science and Technology", 2005
2. National Curriculum of General Secondary Education "Tashkent" 2021
3. State educational standards and curriculum of general secondary education (primary education) Tashkent-2017
4. Saidova MJ Improving the use of information technology in primary school mathematics: Ped. Dissertation for the degree of Doctor of Philosophy in Science. Tashkent, 2020.
5. Haydarkulova M. "Increasing information competence through inclusion in mathematics lessons in primary school" AJMR
6. Haydarkulova M. "The importance of incorporating mathematics lessons in primary school" Article "Journal for teachers" March



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CHARACTERISTICS OF MARRIAGE MOTIVATION IN YOUNG PEOPLE

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ABSTRACT

The article provides information on the problems associated with family and family relationships, the manifestation of marriage motivations in students and their perception of the causes of family divorce. Morshteyn's concept of "encouragement-value-role", which emphasizes that there are three stages in a row in all relations (in the period of choosing a spouse and preparing for marriage) in the period of marriage. Based on the practical work carried out in our research work, the motivations of marriage in the period before marriage were shown to change after marriage was established.

KEYWORDS: *Family, Motivation, Marriage Motivation, Family Divorce.*

INTRODUCTION

Family this is one of the most important social institutions and requires constant scientific research. In the period of economic, political and social changes in our country, it becomes necessary to study family problems and to develop methodological foundations for solving family problems.

The increase in the number of family divorces, especially in the early years of marriage, is due to the fact that young people form a solid basis for their attitude to family life, the ways of family stabilization izlash, in particular, the formation of an adequate image among young people, the ability to imagine the future spouse, and the provision of harmony between their

Family is the highest product of human thinking. After all, this small place not only benefits our lives, but also plays an important role in the development of the country, in the development of society.

A married couple is the basis for the formation of a family as a small group and a social unit. The family performs a number of vital functions, including economic, reproductive, educational, recreative, relaxation, management, etc.

In the course of research conducted by the researchers with different ages, it was found that the most serious mistakes were made by young people before they were married, during meetings. It was known that many young people in their spouses make decisions with carelessness, emphasizing insignificant, secondary features in family life.

The image of the future spouse is a sub - ideal representation of the psychophysical, psycho physiological, psychological, socio-psychological and spiritual characteristics of the desired spouse, which is formed as a result of interiorization and demonstration of signs, structural features and relationships. The cleverly constructed image of a marriage partner is a real idea that reflects the physical, psychological and spiritual characteristics of the desired spouse of a man at a certain moment; it is formed without taking into account the laws of harmony of the spouses.

The results of psychological analysis of the theoretical material show that marriage motivations in young people have a specific feature and the predominance of some inappropriate marriage motivations can affect the formation of destructive behavior in their behavior after their marriage. The following models of partner selection are most often summarized and highlighted: (selection of a similar partner; selection of a partner of sympathy; selection of a partner in terms of value; selection of a partner in terms of psychological compatibility.) The partner is chosen depending on the possibility of repeating the accepted censor in the family with him.

The most widely structured and developed theory of choosing a marriage partner is Bernard Morshteyn's concept of "encouragement-value-role", which emphasizes that there are three stages in a row in all relations (in the period of choosing a spouse and preparing for marriage) in the period of marriage. According to his theory, only couples who have gone through all three stages have the opportunity to get married worthy. The first stage - stimulation-consists in separating a person from a large number of people. Based on this, the first choice of a partner, a pleasant activate appears. At this stage, the criteria for selection are external data, social status, the characteristics of the partner's self-presentation, the manifestation of his psychological qualities.

The stage of stimulation is not only the stage of assessing a partner, but also the stage of assessing his qualities. Guessing how much the person himself can interest the partner. At the incentive stage, it is important to approach the territorial closeness between partners and form the basis for mutual sympathy. Therefore, many people find their spouse among their neighbors, colleagues, acquaintances or classmates.

At the first stage of the relationship, the impact of external data on the choice of a spouse was also studied. Scientists have found out that both men and women prefer to have an attractive partner next to them. Men are more sensitive to the appearance of a partner in the early stages of their relationship, and for women, the attractive appearance of a partner is a factor that strengthens relationships in these mature stages.

In the study of the individual's attitude towards marriage building, marriage readiness and marriage building motivation are mainly used questionnaires and questionnaires. Included sociologist S.I. The "marriage motivations" questionnaire, developed by Golod, is also aimed at

studying exactly marriage motivations. According to the famous Russian sociologist Sergei Isaevich Golod, the leading reasons for getting married are: - Love, - common views and interest, - feeling lonely, - compassion, - waiting for a child, - casual, - material well - being; - possession of the shelter of my future husband.

According to the terms of this questionnaire, the respondent S.I. Of the 8 options offered by Golod, he should choose only one basic option that is acceptable to him. We conducted a research using the questionnaire "marriage building motivation" in order to investigate marriage motivations. The examiners were offered a series of 8 matrimonial motivations and were offered to choose one of them. 144 students participated in the research. The result was as follows:

«Indicators of respondents on the methodology of "marriage building motivation" (n=144)

TABLE 1

Marriage motives	1	2	3	4	5	6	7	8
Number of indicators	42	12	3	5	12	8	33	19
Percentage of indicators	29%	8,3%	2%	3,5%	8,3%	5,5%	23%	20,5%

As can be seen from the Table 1 data, in our research group, the student took the highest place in the youth as the marriage motivations were Love, material provision, the shelter of my future spouse. In fact, in the eyes of many young people, love is imagined as the basis of this strong family. Of course, young people can see love as a priority. But the pleasure in family life can not be given from self-indulgence. To do this, it is necessary to fight, strive, be able to withstand in the family, successfully pass the tests and take care of it until the end of the given life and try to preserve it and at the end of the life to leave it as the most sacred heritage to the children, to the future generation.

And some young people build a family with the aim of wealth, career, material or social cohesion. "If I marry this young man, I will live richly "or" if I marry this girl, I will achieve a certain career, position with the help of her parents, " she imagines her socio-economic future life on the basis of her thoughts. And this in most cases generates a chippakkaka of the imagination and desire of young people. Young people in the family should first be taught to rely on their efforts and strength, along with the support of their parents.

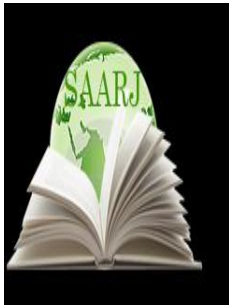
Based on the practical work carried out in our research work, the motivations of marriage in the period before marriage were shown to change after marriage was established. During the conversation with the respondents, more in them, the misunderstanding of their perception about real family life before marriage, the lack of attention to the important aspects of choosing a spouse for himself, the educational upbringing of shargana, has shown that the influence on the family's resilience.

Based on the research work carried out, the following can be recommended: - to create national methodologies that study the motivations of marriage building in young people; - to study and focus on the Coordination of the motivations of marriage builders in the pre - marital period yet;

- to develop the national structure of marriage building motivations and to explain their content and essence in educational activities.

LITERATURE:

1. Karimova V. Psychology of family life: a tutorial. - T.: 2006-142B.
2. Karlson A. Society - family - personality. - M.: 2003.
3. Richardson R.U. The forces of family ties. - St. Petersburg: 1994.
4. Sharafutdinova, Khadichaxon Gulyamutdinovna. "Destruction of family relations psychoprophylaxis family-neighborhood-educational institution cooperation." *ACADEMICIA: An International Multidisciplinary Research Journal* 10.11 (2020): 1000-1007.



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ANXIETY-AS AN EMOTIONAL STATE

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ABSTRACT

The article describes anxiety, its manifestations, the views of psychologists on anxiety, the causes and consequences of increased anxiety and ways to overcome it. The ideas in this regard were also put forward by Eastern thinkers, who expressed in their works their thoughts about the state of manifestation of such feelings as feelings of the individual, anxiety. The characterization of emotional states by its highly dynamic nature is noted both as a result of scientific research and as a result of daily observations. In some periods, these properties are more pronounced.

KEYWORDS: Anxiety, Emotions, Emotional State, A Sense Of Fear, Overcoming Anxiety.

INTRODUCTION

Through the state of anxiety in a person, a person can experience various emotional experiences, and this condition undoubtedly affects the perfection of the individual. The ideas in this regard were also put forward by Eastern thinkers, who expressed in their works their thoughts about the state of manifestation of such feelings as feelings of the individual, anxiety. The issue of personality formation in the works of Eastern thinkers is one of the topical issues. A number of opinions have been put forward on the fact that the psycho-physical changes that occur in the process of the formation of an individual are distinguished by their importance.

In particular, Abu Rayhon Beruni considers the cases of anxiety in them in the context of the content of moral qualities in man. As for Abu Ali ibn Sina in his extensive psychoneurological practice, various emotions prove that various changes in the body, heart, blood vessels, respiratory organs can lead to arrhythmia, nerve endings, sensations and fear can lead to a state of intoxication of the body. Ibn Sina believes that mental disorders are the result of physical discomfort, Having determined that there is a link between physiological phenomena and mental phenomena. Ibn Sina re-attaches importance to the leadership role of the central nervous system in the course of its activities, indicating that nervous disorders (fear, nervousness, suffering) lead to the weakening and weakening of the whole organism.

It is known that the formation of the human psyche is due to various factors. Such factors include natural, socio-psychological, purposeful educational factors and, of course, factors of the child's personal activity.[10] in the current period of Science and technology development, it is natural that various conditions, situations, objects frighten or cause human anxiety. This is how the need for scientific study of airing can be explained, rather than other fundamental feelings. Studies aimed at studying anxiety in psychology allow a broader understanding of this emotion. Anxiety was first described by Sigmund Freud [8]. From the point of view of Freud, anxiety is a function of the Ego, awareness of the approaching danger, threat helps a person to respond in such situations (danger, threatening situations) and is a method of adaptation[6]. Freud described anxiety as an unpleasant emotional experience, which is a signal about the expected danger. The meaning of anxiety is the experience of uncertainty and a sense of helplessness. Anxiety is characterized by three main features: 1) a specific unpleasant sensation; 2) corresponding somatic reactions, first of all heart palpitations; 3) awareness. [7]

Anxiety – belongs to the category of fundamental emotions of man (Gelgorn E, Lufbor-Roudj, 1966). It can be imagined that anxiety occurs in a person as a response reaction to a threatening stimulus. Understanding the risk, understanding it is formed in the process of life experience and personalitylararo attitude. But for some people, some independent pathogens gradually acquire the character of dangerous effects. As a result, a feeling of fear can occur involuntarily, accompanied by a strong feeling of excitement, anxiety or horror. Proceeding from the above points, one can say that fear is the emotions of a person who perceives danger and its consequences. [2]

K.Izard notes that fear is experienced as anticipation of danger, anxiety, insecurity. K.Izard divides the causes of fear into 4 types: a) external phenomena and processes; b) desire, aspiration and need; C) emotions; d) cognitive processes of the individual. [3]

Fears arising as a result of these reasons can be either congenital or acquired. The feeling of fear directly provokes anxiety and, as a strong stressor, causes a state of stress in a person.

Dressing from such an airing is carried out by overcoming stress, aimed at emotions, in order to cope with stress. Coping with stress aimed at emotions (Emotion-focused coping) stressogen provides for controlling the emotional response to events through the following methods: a) by changing behavior(bixoral approach); b) by changing one's own thoughts(cognitive approach).

Coping with stress aimed at emotions, people often use it in 2 cases: a) stress that can not be changed Inogen situations; b) when they do not have enough reserves to cope with the situation. To behavioral strategies used in overcoming stress aimed at emotions, it is possible to include the following:-to look at the situation from the outside; - to generalize cognitive redefining ("it was also possible to avoid this"); - by using such contemplative operations as comparison ("in others there is not the same");- to carry out a re - assessment of the situation from the positive side (what it will give).

Z.Freud's cognitive strategies (defenses) are also Coping. Z.It consists of Freud's defenses and rationalization of overcoming problems, projection, variable aggression, nostalgia, specialization, hero bending, regression, dreams, apathy, compensation etc.[7]

Problem-oriented (problem – focused coping) the goal of coping with anxiety is to reduce the risk of stressogen situation and reduce the person's resources to deal with it.Bunda as behavioral

strategies: a) stressogen a comprehensive analysis of the situation and the use of active actions to solve it; b) change the situation with the application of assertive behavior is applied. Stress management-based bixoral techniques use relaxation, systematic desensitization, biological feedback, modeling, and social learning to overcome anxiety about behavior change. Another of the techniques aimed at overcoming anxiety are cognitive techniques. Cognitive techniques: 1. A.Rational emotional therapy of Ellis; 2.A.On Beck, cognitive therapy can be introduced.

The characterization of emotional states by its highly dynamic nature is noted both as a result of scientific research and as a result of daily observations. In some periods, these properties are more pronounced. For example, sometimes due to the discrepancy between the size of the behavior or activity index imposed by adults on adolescent children and the low assessment of their capabilities, a teenager may have a strong anxiety and, as a result of repeated occurrence of this condition, may also become a feature of the adolescent's personality. It is desirable to prevent and correct such a condition in a timely manner.

Correction of the state of anxiety should be organized in the following two directions: the emergence of a state of anxiety and the relief from its negative consequences; the combination of the occurrence of anxiety as an interim personal experience. In the elimination of anxiety: to teach a person the methods by which he manages a strong sense of anxiety in himself; it is possible to carry out it by the formation of important knowledge, skills and skills that the individual has acquired, expanding his capabilities, increasing the effectiveness of his activities. Of course, in the formation of behavior, the family environment of the individual, the role of Group, community and social influences are important.[9]

Anxiety can be manifested by long-term, persistent, daily symptoms (general anxiety disorder) or short bursts of panic attacks, which significantly reduce the quality of life. The frequency, number and intensity of symptoms vary from person to person.

Anxiety can cause mental or psychological problems [3]. Behavioral manifestations of anxiety include avoidance of situations that cause anxiety or negative memories to come out, as well as a change in the sleep regime, a change in habits, an increase or decrease in food intake, and an increase or decrease in motor tension (such as touch).

Emotional manifestations of anxiety include "a feeling of fear, difficulty concentrating attention, tension or irritability, anticipation of the worst, irritability, anxiety, observation (and anticipation) of danger signs (and phenomena) and feeling of emptiness of consciousness."], and "nightmares, obsessive thoughts, Deja Vu and the feeling of being trapped in your own mind" [6].

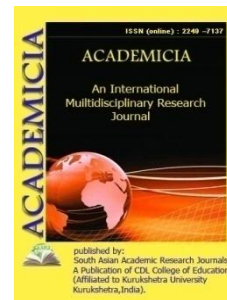
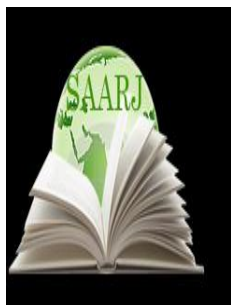
Cognitive anxiety is manifested by thinking about perceived risks, such as fear of death. "The pain in the chest seems to be the result of a fatal heart attack or head-to-head shooting pain in the area of the tumor. Thinking about death creates a strong sense of fear in a person, thinking about death more often than usual, or not being able to get it out of his head." Improper anxiety is a bad indicator of personal development, which in turn negatively affects it. It negatively affects the development of anxiety in the real problems that arise as a result of the work of the advocates [1].

Anxiety can be a harbinger of a neurosis or a symptom, as well as a means and mechanism of its development. Anxiety is the main components of post-traumatic stress disorder[1]. In particular,

mental disorders such as Phobia, hypochondria, hysteria, obsessive-compulsive disorder and others are also associated with anxiety. Due to this, the study and correction of anxiety characteristics of an individual is a period requirement.

LITERATURE:

1. Jerrold S. Greenberg Stress management. 7th ed. - St. Petersburg: Peter, 2002. - 496 p.: ill—
- (Series "Masters of Psychology").
2. Zakharov A.I. Prevention of deviations in the behavior of the child. - St. Petersburg: Soyuz, 1997
3. Izard K. E. Human emotions. - M.: Publishing House of the Moscow University, 1980
4. Sinyagina N. Y. Psychological and pedagogical correction of child-parent relations. - M.: Humanit.ed.center VLADOS, 2001.
5. Yerbatykh Yu.V. Psychology of stress and methods of correction. St. Petersburg: Peter, 2008.
6. Yerbatykh Yu. V., Ivleva E. I. Psychophysiological and clinical aspects of fear, anxiety and phobias. - Voronezh: Istoki, 1998.
7. Horney K. Neurotic personality of our time. - M.: "Progress-Universe", 1993.
8. Eidemiller E. G., Justitskis V. V. Family psychotherapy. - L.: Medicine, 1989.
9. Sharafutdinova, Khadichaxon Gulyamutdinovna, Fazilat Karshievna Kulmamatova, and Sarvinoz Haydarova. "The role of cognitive psychology in the elimination of destructive behavior." *Asian Journal Of Multidimensional Research* 10.4 (2021): 957-964.
10. Shabbazova, Dilfuza Ruzikulovna. "Analysis Of Factors Of Mental Development." *Scientific Horizons* 11-1 (2018): 350-355.



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ASSIGNMENTS THAT MOTIVATE PRIMARY SCHOOL STUDENTS TO CREATIVE ACTIVITY

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ABSTRACT

In this article, the topic of assignments that motivate primary school students to creative activity will be considered from a scientific and practical point of view. The development of creative activity in students depends on the educational materials presented to them, as well as didactic tasks based on these materials.

KEYWORDS: PIRLS, TIMSS And PISA, Creativity, Nobility, Education, Didactic Assignments, Modeling, Creative Activity.

INTRODUCTION

Today, the pedagogical importance of creative activity in the field of education is increasing. Creative activity, creative thinking and creative imagination formation PIRLS, TIMSS and PISA are required from readers in international research programs. The formation of creative activity [1] in students is associated with the development of personality and its perception. Creativeness intellect has a relatively high degree of appearance, and certain factors are the basis for its formation. Just as well as being creative activity is not born, it is formed in the process of Education. Bunda says that depending on how much support each reader receives from those around him or her inherent talents and abilities, the reader will realize his or her own strengths.

The development of creative activity in students depends on the educational materials presented to them, as well as didactic tasks based on these materials. The analysis of previous educational programs, textbooks, teaching and methodological manuals, compiled for primary classes, showed that the formation of creativeness in students consisted mainly of writing conditionally defined assignments, for example, essays and descriptions, conducting questions and answers, drawing pictures, making certain items. Most assignments are aimed at seeking answers based on

the students' intuition. To date, in the development of the national program of the primary class, evristical exercises, which serve to formulate creative activity in their students, algorithms for solving problems, as well as tasks of the character of modeling, designing, independent research are required.

In order for students to understand the essence of their personal creative activities, it is necessary to conduct current and final reflex exercises. For example, on page 25 of the current 4th grade "reading" textbook, creative assignments on the topic "What Remains of a man" by Joseph khoshib [2] :

- 1). Give examples of kindness and slowness.
- 2). What did the author mean when he said that it is necessary to collect the total good in life?
- 3). Joseph cite two analogies that khodhib reiterated about the uneducated man.
 1. _____
 2. _____
- 4). What Remains of the man from the proverbs how did you come to mind?

Similar reflection questions arouse creative thinking and creative imagination in students.

Below are examples of didactic questions and assignments that motivate students to creative activity:

1. What do you dream about?
2. What can you create?
3. What can you depict a picture of?
4. What colors do you like?
5. Do you love your parents?
6. What is the reason?
7. How do you want your parents to be?
8. What do you want to do in the future?
9. How do you dream of a school (class)?
10. Describe the school (class)in your dream.
11. Which training subject do you like?
12. What kind of work did you want to do in the lessons you liked?
13. How do you want the teacher to be the one who will teach?
14. What is the reason?
15. What kind of work do you do in your spare time outside the lesson?
16. What books do you read in your spare time outside the lesson?
17. What qualities did you have from what you read?

18. What heroes do you like in the books you read?

19. Write down the differences of the heroes in the work from each other_____

20. Write down how much the things in the work you read differ from each other_____

21. What does the author say about the work?

22. What conclusion did you draw on the work?

23. Which circles do you want to go to and why?

24. What kind of circle did you want to go to?

25. How do you want to spend your vacation?

26. Write down your impressions on the surface of the holiday

27. To whom did you want to be like? Why?

28. Who do you want to make friends with?

29. What should be a friend in your eyes?

30. Write down the five most important qualities of a friend

Why do you think those are important?

32. What do you think if you believe in the story in the work? "yes" or "no". Give one example.

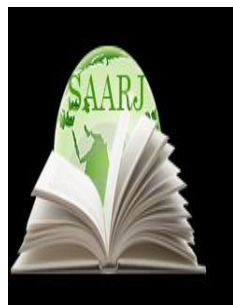
33. Describe the most effective place in your work you read.

34. Write a short essay on the topic "the hero I love".

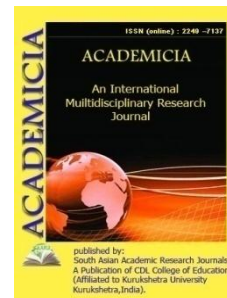
In order to determine the degree of formation of creative activity in students, educators are required to analyze and accurately assess each creative task performed by them. For the formation of creative activity in primary school students, it is considered necessary to form communication skills with the aim of their socialization. For the effective formation of creative activity, creativity, creative inclinations must first be formed in the pupils, and then this activity must be expressed in the products created by them.

LITERATURE:

1. Safarova R., Abdullaeva B. and b. Concept of primary education // RTM, - T.: 2014.
2. S.Matchanov., A.Shajalilov. H.Gulamova and b. 4-th class reading textbook // "Yangiyul poligrafsh servise", - T.:2020.



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ORIGIN OF CENTRAL ASIAN SANDS

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ABSTRACT

In our republic, in the years of independence, large-scale measures have been taken to effectively use irrigated sands and sandy loam lands and improve the ecological and reclamation state of lands. The interpretation of their name in the sense of evil (disastrous), which is often found in popular literature, is just as wrong as the translation of Kyzyl-kum in the sense of red - beautiful. These sieves are brass and are sequentially inserted into one another, forming a single set (column), closed at the top and bottom. Standard consisting of 11 sieves was adopted.

KEYWORDS: *Independence, Large-Scale, Sequentially*

The main sandy massifs in Turkmenistan, Kazakhstan, Uzbekistan are located on an area of 300 thousand / ha. In Central Asia, desert-sandy lands make up 38 million hectares, or 38.2% of the total area. Today, the effective use of lands with a deteriorated reclamation state and low fertility is an urgent problem [1]. Through the use of various agro-technological measures, sandy and sandy loam soils are enriched with nutrients, innovative technologies are used to restore and increase soil fertility. Protection from the effects of winds of sands, sand dunes, sand rows with low fertility and prone to wind erosion, cultivation of agricultural crops in these lands, as well as the development of technology for the use of various fertilizers in natural and artificial screens (N, P, K, local fertilizers - manure, lignin) in proportional ratios, suitable times, norms and methods to increase the yield of high-quality cotton and wheat under irrigation conditions are

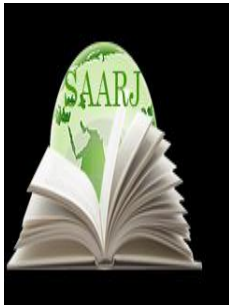
one of the urgent problems of agricultural soil science and agrophysics, cotton growing and grain growing [2].

In our republic, in the years of independence, large-scale measures have been taken to effectively use irrigated sands and sandy loam lands and improve the ecological and reclamation state of lands. As a result of these measures, on sandy and sandy loam lands, in particular, from each hectare of farmland in Central Fergana, an increase in the yield of raw cotton by 2-3 centners and wheat by 4-6 centners was achieved. At the same time, due attention has not been paid to the development of acceptable agricultural technologies aimed at determining the genesis, morphogenetic properties of sandy and sandy loam lands with a difficult reclamation state, preventing erosion processes occurring in them. In the Action Strategy of the Republic of Uzbekistan for 2017-2021 & quot;... further improvement of the reclamation state of irrigated lands, development of a network of reclamation and irrigation facilities, widespread introduction of intensive methods in agricultural production, primarily modern water and resource-saving agricultural technologies & quot; is defined as one of the important strategic tasks ... In this regard, research work to improve the reclamation state of infertile, difficult to reclaim sandy lands, the development and implementation of modern water and resource-saving agricultural technologies are becoming important [3]. The study, to a certain extent, serves to fulfill the tasks stipulated in the Decrees of the President of the Republic UP-4533 of April 19, 2013 & quot;On measures to radically improve the land reclamation system & quot; and UP-4947 of February 7, 2017 & quot;On the strategy of actions for the further development of the Republic of Uzbekistan »As well as in other regulatory documents adopted in this area [4]. Starting to study individual sand massifs, they find out the meaning of their local names, since they usually very aptly reflect the most characteristic features of the massif and each tract. At the same time, the distorted interpretation of the name also distorts the idea of the very nature of the massif and its economic significance. So, for example, in Central Asia there are a number of massifs called Kara-Kum, i.e. black sands. The interpretation of their name in the sense of evil (disastrous), which is often found in popular literature, is just as wrong as the translation of Kyzyl-kum in the sense of red - beautiful. These sands are called black because of the abundance of shrub vegetation in them, which determines the dark color of the horizon. Some of the names of the massifs really emphasize the color of the sands (Kyzyl-Kums — ancient red sands, Ak-Kums — young white dune sands), other names mark the characteristic vegetation (Ojorli-kum, Cherkezli-kum), and still others — the characteristic forms of relief. Elucidation of the connection with undistorted strata can give an answer about the origin of the winding sands in cases of their similarity with these strata. But sands can sometimes migrate thousands of kilometers from their power sources when transported by rivers and hundreds of kilometers when carried by the wind. In these cases, a microscopic examination of the sands is necessary to elucidate their genetic links. To determine the mechanical composition of sands, the most acceptable method of separating them into fractions is using a set of sieves with different hole diameters. These sieves are brass and are sequentially inserted into one another, forming a single set (column), closed at the top and bottom. standard consisting of 11 sieves was adopted. For the production of sand analysis on sieves, the weight of samples of fine-grained sand should be at least 200 g, and coarse-grained - up to 500 g These sieves can be used in an expeditionary setting, but the analysis on them is quite laborious (in 8 hours it can be divided into fractions and 6 - 8 samples of carbonate-free sands are weighed; in the presence of carbonates and the need to remove them by dissolution, the same period is required). To solve the problems of the genesis of sands, mechanical analysis is

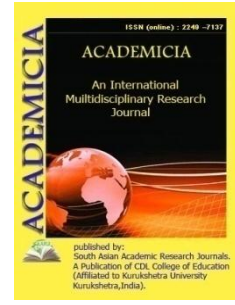
usually done not in the field. Sampling for chemical analysis of sands should be carried out either according to a method common for minerals, or according to the method of soil research. Sands in dry state are easily moved by winds, even at a speed of 3 m / s. In cases of weaker winds or more favorable climatic conditions, sand accumulations transverse to the winds can develop in the presence of sod cover. Influence of the landscape environment on the intensity and nature of sand movement.

LIST OF USED LITERATURE

1. Mirzazhanov K.M. The face of central Fergana in the past and present. T. 2014. 159-173 p.
2. Zokirova S.Kh. [and etc.]. Characteristics of pebble soils in the Fergana region and ways to improve it // Universum: chemistry and biology: electron. scientific. zhurn. 2020. No. 2 (68). URL: <https://7universum.com/ru/nature/archive/item/8665> (date accessed: 09/26/2020).
3. Zokirova S.Kh., Kadirova N.B., Khamrakulov Zh.B. Field moisture capacity moisture of soils sands and soils of central Fergana // Universum: chemistry and biology: electron. scientific. zhurn. 2020. No. 5 (71). URL: <https://7universum.com/ru/nature/archive/item/9327> (date accessed: 09/26/2020).
4. Zokirova S.Kh. [and etc.]. Study of the irrigation regime of cotton in conditions of hydromorphic soils // Universum: chemistry and biology: electron. scientific. zhurn. 2020. No. 2 (68). URL: <https://7universum.com/ru/nature/archive/item/8740> (date accessed: 09/26/2020)



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**A STUDY TO ASSESS THE IMPACT OF TRANSFORMATIONAL
 LEADERSHIP ON THE GROWTH OF REVENUES IN START-UP
 COMPANIES IN BANGALORE CITY**

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1.0 ABSTRACT

Entrepreneurship and Start-ups have become the buzz words during the beginning of the 21st century in general in India and particularly in Bangalore City. Dubbed as the Silicon Valley of India and home to thousands of Information Technology (IT) and Information Technology Enabled Services (ITES) companies since the late eighties and blessed with a salubrious climate round the year and availability of technical manpower, it is not a surprise that Bangalore has become the leading City in India for start-ups. Whilst India has 44 Unicorns (technology enabled start-ups with a valuation of over a billion US dollars) and ranks third in the world amongst countries which have the most number of Unicorns, not surprisingly Bangalore is leading the pack and is home to 18 of these Unicorns. Undoubtedly, the enthusiasm amongst the founders of the start-ups in Bangalore is very high and highly infectious, to say the least. These founders have applied their minds, knowledge, and skills to offer innovative solutions in the areas of Fintech, Edutech, Foodtech, Agritech, e-Commerce, etc. Ideas alone do not guarantee that these start-ups will succeed. Key factors that contribute to the success of start-ups, amongst others, are leadership styles of the founders, access to capital, a sound and sustainable business model, ability of the founders to take moderate and calculated risks, and having products and services that meet the needs of customers. This research paper tries to examine the connection between the leadership style of the founders with specific reference to Transformational Leadership style and the growth of revenues of the start-ups. A survey was conducted in Bangalore City wherein a

questionnaire covering demographic data and the Multifactor Leadership Questionnaire (a standard tool used by researchers worldwide to measure Transformational, Transactional and Passive-Avoidant leadership styles) was sent to 476 founders of start-ups. The responses were analysed using statistical tools such as Regression Analysis and Anova. The hypothesis was tested using independent t-test. The analysis of data did not point towards a strong connection between Transformational Leadership and growth in revenues of the start-ups.

KEYWORDS: *Entrepreneurship, Start-ups, Leadership, Transformational Leadership, Revenues*

2.0 INTRODUCTION

Of late, Bangalore City has attracted a lot of global attention for becoming the start-up capital of India and for finding a place in the top 30 entrepreneurial ecosystems in the world. According to the Global Start-up Ecosystem Report 2021 released by Start-up Genome and Global Entrepreneurship Network in September 2021, Bangalore was ranked 23rd and figures in the top 30 cities of the world that have a good ecosystem to promote start-ups. The same report mentions that Bangalore City has 1800-2300 active start-ups and is also home to 18 Unicorns (technology based start-ups that have a valuation of US\$ 1 billion), the highest in the country.

Whilst this is good news as start-ups contribute to generation of employment and the economic development of the country, a worrying factor is the high rate of failure amongst start-ups in India (90% failure rate). The reasons for failure are many: not having the right leadership skills, not having the right business model, lack of capital, lack of an innovative idea, not understanding customer's needs properly, etc.

Northouse (2012) brings out the difference between Transformational Leadership and Transactional Leadership. Transactional Leadership focuses on the exchange that happens between leaders and followers, whereas Transformational Leadership is all about the leader engaging with a follower and influencing him to achieve more than what he is capable of. Transformational Leadership has often been compared to Charismatic Leadership, in terms of similarities between the two approaches.

In this context, this research paper tries to examine the impact of Transformational Leadership in not just sustaining the revenues of the companies but also ensuring growth in revenues of start-up companies in Bangalore City.

3.0 REVIEW OF LITERATURE

Northouse (2012) says that Transformational Leadership has often been compared to Charismatic Leadership, in terms of similarities between the two approaches. Some researchers have viewed Transformational and Transactional Leadership as being part of the same continuum. There have been other perspectives on characteristics of Transformational Leadership: *visionary, social architect, creating trust, and creative deployment of self* (Bennis and Nanus) and *model the way, inspire a shared vision, challenge the process, enable others to act, and encourage the heart* (Kouzes and Posner). The Transformational Leadership approach has an intuitive appeal and has been widely researched from many different perspectives. The approach gives a lot of importance to the follower's needs, values, and morals. Based on

research, it can be said that there is enough evidence to prove that Transformational Leadership is an effective form of leadership.

Nitu Bose Ghosh and GeethaRajaram (2015) in an article “Developing Emotional Intelligence for entrepreneurs: the role of Entrepreneurship Development Programs” looked at the correlation between Emotional Intelligence, decision making, creativity, emotional resilience, entrepreneurial motivation, risk taking, and the effectiveness of Entrepreneurship Development Programs in developing Emotional Intelligence amongst entrepreneurs. Their study concludes that when entrepreneurs have entrepreneurial attributes, Emotional Intelligence acts as a catalyst and influences the entrepreneurial skills of the entrepreneur, thereby increasing the chance of individuals starting their own business ventures (South Asian Journal of Management, Vol.22, No.4, 2015)

Richard Sudek, UCI Applied Innovation’s Chief Innovation Officer and Executive Director, in an article “What is the best leadership style for start-up companies?” published on the website <https://innovation.uci.edu>, talks about the difference between leaders and managers. He elaborates that while a leader creates mission and purpose for an organisation, a manager implements that mission or vision. He talks about two styles that seem to resonate with entrepreneurs – Charismatic Leadership and Transformational Leadership. Mr. Sudek further elaborates that an ideal leadership style is one that combines Charismatic Leadership and Transformational Leadership. He also talks about leaders being willing to practice the concept of Shared Leadership and concludes that there is no definite answer to the question of which leadership style is best and infers that it depends on the situation. Mr.Sudek emphasises that being genuine, giving people common cause & vision, sharing of leadership when needed are most important for an entrepreneur.

In an article titled “What entrepreneurs get wrong” published in the Harvard Business Review, Vincent Onyemah, Martha Rivera Pesquera, and Abdul Ali (2013) emphasise that salesmanship is the key to success in entrepreneurship. They state that the five mistakes entrepreneurs often make are: starting late, failing to listen to customers, offering discounts unnecessarily, selling to family & friends, and failing to seek strategic buyers. They further list five objections that entrepreneurs often face in their entrepreneurial journey: customers not being convinced about the efficacy of the product or service, credibility of the entrepreneur, size of the venture, not being convinced about the price for the product or service and the risk of incurring switching costs.

M. H. BalaSubrahmanya (2017), in an article titled “How did Bangalore emerge as a global hub of tech start-ups in India? Entrepreneurial ecosystem – evolution, structure, and role” says that characteristics of the entrepreneurs aside, it is the entrepreneurial ecosystem which plays a major role in ensuring that the start-ups successfully emerge and are able to stabilise, sustain, succeed and scale to eventually have a greater impact on the economy.

According to Jayson Demers (2015), the 10 most critical factors that dictate the success of start-ups are: *the idea, the leader, the team, the capital, the plan, the execution, the timing, the crisis response, the marketing, and the growth.*

Priyanka Shorewala and Priya Chaudhary (2016) in an article “Why Indian start-ups fail? – Do’s and Don’ts” list down the top reasons for failure as: not serving the needs of the market, not having adequate funds, having the wrong team, not estimating the competition properly, having

the wrong pricing, not having a user friendly product, having a flawed business model, not having the right marketing plan, ignoring customer feedback, and wrong timing to enter the market (IOSR Journal of Business and Management, Vol. 18, Issue 2, Ver IV, February 2016)

In “The changing role of the entrepreneur: models and strategy to master the changing role of leaders in today’s dynamic business environment”, Kelly Bruning (2009) says that entrepreneurs must become leaders by delegating responsibilities and focusing on vision, mission, and strategy. She argues that entrepreneurial transition includes: *doing*, *managing*, and *managing managers*.

Jason Cope et al (2011), write in their article “Exploring distributed leadership in the small business context” that the leader has to develop a broader range of leadership skills as part of the transition while the venture grows. They argue that entrepreneurship increasingly becomes a distinct form of leadership during the growth process.

Manfred F.R. Kets de Vries (2013), in his article “The Eight Archetypes of Leadership” points out that distributive, collective, and complementary leadership contribute to the success of organizations. He lays down the eight archetypes of leadership as: the strategist, the change-catalyst, the transactor, the builder, the innovator, the processor, the coach, and the communicator.

4.0 Objectives of the Study

- To get an insight into the start-up scenario in Bangalore City
- To get an insight into Transformational Leadership
- To study the impact of Transformational Leadership on the growth of revenues in start-up companies in Bangalore City

5.0 Research Methodology

The research methodology used for conducting the research is descriptive and exploratory in nature. A questionnaire pertaining to demographic data and the Multifactor Leadership Questionnaire was circulated to 476 founders of start-up companies in Bangalore. The sampling method used is Random Sampling and the sampling technique used is Simple Random Sampling. The responses were analysed using Regression Analysis and Anova. In addition, the hypothesis was tested using the independent t-test. The hypothesis used for the study is “Transformational Leadership has no impact on the growth of revenues in start-up companies”. Secondary data was collected from published sources, journals, and the internet.

6.0 Findings

Of the 476 respondents who responded to the survey, 393 were male and 83 were female. 55% of the respondents had recorded an increase in revenue as compared to the previous year whereas 45% had not.

6.1 Regression Analysis

Regression Analysis was used to find out the relationship between the dependent and independent variables. In this study, Revenue was taken as the dependent variable and all

questions pertaining to determining the leadership style of the leaders (questions 16-60) in the Multifactor Leadership Questionnaire were taken as independent variables.

TABLE 6.1: COEFFICIENTS^A

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.725	.346		4.986	.000
	Q16	-.064	.058	-.097	-1.100	.272
	Q17	-.021	.060	-.032	-.355	.723
	Q18	.052	.051	.093	1.031	.303
	Q19	-.028	.045	-.065	-.627	.531
	Q20	.070	.056	.094	1.253	.211
	Q21	-.039	.054	-.073	-.727	.468
	Q22	.047	.093	.045	.504	.614
	Q23	-.070	.076	-.113	-.921	.357
	Q24	.046	.072	.072	.636	.525
	Q25	.019	.049	.042	.380	.704
	Q26	.093	.049	.171	1.889	.060
	Q27	-.077	.063	-.121	-1.227	.221
	Q28	-.030	.065	-.044	-.461	.645
	Q29	.060	.115	.094	.520	.603
	Q30	-.003	.049	-.006	-.059	.953
	Q31	-.042	.060	-.078	-.692	.490
	Q32	.015	.041	.034	.369	.712
	Q33	.012	.056	.018	.211	.833
	Q34	.002	.037	.004	.043	.966
	Q35	.011	.039	.025	.273	.785
	Q36	.040	.046	.076	.872	.384
	Q37	-.004	.059	-.009	-.070	.944
	Q38	-.054	.051	-.093	-1.076	.283
	Q39	-.019	.046	-.046	-.413	.680
	Q40	.043	.058	.082	.743	.458
	Q41	-.052	.077	-.090	-.680	.497
	Q42	.010	.042	.023	.246	.806
	Q43	-.006	.048	-.008	-.118	.906
	Q44	.033	.082	.048	.403	.687
	Q45	-.008	.093	-.012	-.082	.934

	Q46	.018	.088	.026	.208	.835
	Q47	-.059	.084	-.078	-.697	.476
	Q48	-.010	.051	-.019	-.203	.840
	Q49	.031	.076	.048	.408	.684
	Q50	.017	.087	.022	.194	.847
	Q51	.054	.122	.071	.444	.658
	Q52	-.036	.085	-.050	-.419	.676
	Q53	.000	.064	.000	-.009	.993
	Q54	-.031	.060	-.058	-.521	.603
	Q55	-.020	.067	-.031	-.301	.764
	Q56	-.045	.085	-.058	-.530	.597
	Q57	.023	.080	.028	.283	.777
	Q58	.062	.081	.083	.766	.444
	Q59	-.086	.084	-.119	-1.023	.307
	Q60	.022	.061	.029	.356	.722
a. Dependent Variable: Q11 (Revenues)						

1. B Coefficients: The B Coefficients tell us how many units of Revenues increase for single unit increase in each predictor. Likewise, 1 point increase on “I provide others with assistance in exchange for their efforts” corresponds to 0.55 points increase in revenues. Given only the scores on our predictors, we can predict the Revenues by using the formula:

Slope (Y) = $mx+b$; meaning= $Y = 1.725 + (-0.064 \times Q16) + (-0.021 \times Q17) \dots$ & so on.

The Column mentioned above as ‘Sig’ holds the p-values for our predictors. As a rule in statistics, we always say that a B Coefficient is statistically significant if its p-value is smaller than 0.05, in the above table none of the Coefficients are statistically significant

2. The beta Coefficients allow us to compare the relative strengths of our predictor.
3. The t-Statistic Column is used to check the null hypothesis Vs. alternate

6.2 SPSS Regression Output - Model Summary Table

TABLE 6.2: MODEL SUMMARY				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.284 ^a	.081	-.016	.502
a. Predictors: (Constant), Q60, Q42, Q34, Q20, Q32, Q36, Q18, Q43, Q22, Q17, Q33, Q50, Q27, Q56, Q48, Q16, Q58, Q25, Q35, Q38, Q47, Q26, Q54, Q59, Q37, Q23, Q28, Q57, Q39, Q55, Q30, Q52, Q21, Q19, Q53, Q40, Q44, Q24, Q49, Q31, Q51, Q41, Q46, Q45, Q29				

1. The model above predicts Revenues. R denotes the Correlation between the predicted & observed Revenues. In this case it is very low
2. R Square is simply the square of R, this indicates the proportion of Variance in Revenues that can be explained by all our predictors (Independent Variables). R Squared tells the researcher that how many points fall on the regression line.
3. Since, Regression maximizes R Square, this will be somewhat lower for the entire population, a phenomenon known as shrinkage. The Adjusted R Square estimates the population R Square for our model above and thus ensures and gives a more realistic indication of its predictive power.

6.3 Analysis of Variance (ANOVA)

Anova provides the researcher the information about the total variation of the dependent variables to the explained & un-explained portions

TABLE 6.3: ANOVA ^B						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	9.512	45	.211	.839	.762 ^a
	Residual	108.377	430	.252		
	Total	117.889	475			
a. Predictors: (Constant), Q60, Q42, Q34, Q20, Q32, Q36, Q18, Q43, Q22, Q17, Q33, Q50, Q27, Q56, Q48, Q16, Q58, Q25, Q35, Q38, Q47, Q26, Q54, Q59, Q37, Q23, Q28, Q57, Q39, Q55, Q30, Q52, Q21, Q19, Q53, Q40, Q44, Q24, Q49, Q31, Q51, Q41, Q46, Q45, Q29						
b. Dependent Variable: Q11 (Revenues)						

The above **ANOVA table** denotes that the regression model predicts the dependent variable significantly or not! It is observed from the “**Regression**” row and continues till the “**Sig**” column and indicates the statistical significance of the regression model that was run above. Here p value (.762) which is >0.05 and indicates that the overall regression model is not statistically significant and cannot predict the outcome variable which is Revenues

6.4 Independent t-test to test the research hypothesis

Null Hypothesis: Transformational Leadership has no impact on the growth of revenues in start-up companies

TABLE 6.4: GROUP STATISTICS					
	Q11 (Revenues)	N	Mean	Std. Deviation	Std. Error Mean
Q60	Yes	261	3.17	.622	.038
	No	215	3.14	.729	.050

TABLE 6.5: INDEPENDENT SAMPLES TEST

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2- tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Q60	Equal variances assumed	4.022	.045	.469	474	.639	.029	.062	-.093	.151
	Equal variances not assumed			.462	422.45	.644	.029	.063	-.095	.153

Conclusion: from the above Independent t-test, since $p (0.644) > 0.05$ (2-tailed test) is more than our chosen significance level 0.05, the researcher does not reject the Null Hypothesis

7.0 SUGGESTIONS AND CONCLUSION

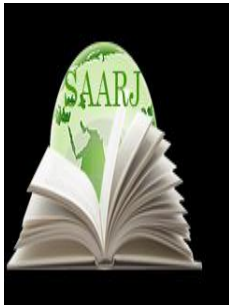
The output of the Regression Analysis and Anova tests have shown that there is no statistically significant relationship between Transformational Leadership and Revenues of start-up companies in Bangalore City. The independent t-test used to test the hypothesis also supports this and according to the t-test, the null hypothesis cannot be rejected and we can conclude that **Transformational Leadership has no impact on the growth of revenues in start-up companies.**

However, keeping in mind that the study was conducted to determine the impact of Transformational Leadership on the growth of revenues in start-up companies in Bangalore City only, the limitations of the study are that the results of the study may not be a true representation for the entire country. Further, there could be other factors that can impact the growth of revenues in start-up companies other than Transformational Leadership and this has not been considered in the study. This leaves scope for exploration by other researchers in the future.

8.0 REFERENCES

- "The Global Start-up Ecosystem Report 2021", Start-up Genome and Global Entrepreneurship Network, September 2021
- Peter G. Northouse, "Leadership: Theory and Practice", Sage Publications, 2012
- Vincent Onyemah et al, "What entrepreneurs get wrong", Harvard Business Review, May 2013
- Richard Sudek, "What is the best leadership style for start-up companies?", <https://innovation.uci.edu>, 2019

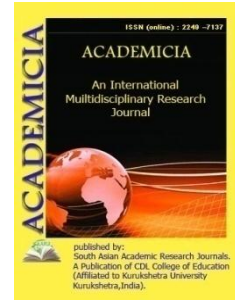
- Nitu Bose Ghosh and GeethaRajaram, “Developing Emotional Intelligence for entrepreneurs: the role of Entrepreneurship Development Programs”, South Asian Journal of Management, Vol.22, No.4, 2015
- M. H. BalaSubrahmanya, “How did Bangalore emerge as a global hub of tech start-ups in India? Entrepreneurial ecosystem – evolution, structure, and role”, Journal of Developmental Entrepreneurship, Vol 22, No. 1, 2017
- Jayson Demers, “The top most critical factors that dictate start-up success”, Entrepreneur India, 2015
- Priyanka Shorewala et al, “Why Indian start-ups fail? – Do’s and Don’ts”, IOSR Journal of Business and Management, 2016
- Kelly Bruning, “The changing role of the entrepreneur: models & strategy to master the changing role of leaders in today’s dynamic business environment”, Proceedings of the Academy of Entrepreneurship, 2009
- Jason Cope et al, “Exploring distributed leadership in the small business context”, International Journal of Management Review, 2011
- Manfred F.R Kets de Vries, “The eight archetypes of leadership”, Harvard Business Review, 2013



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A STUDY OF THE PROCEDURE SOME ISSUES OF THE PROCEDURE ON MAKING A LABOUR CONTRACT AND HIRING TO WORK

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ABSTRACT

The article is devoted to the analysis of the urgent problem of modern labor law: the effectiveness of the security functions of legal norms governing the conclusion of an employment contract and determining the procedure for agreeing and securing the terms of an employment contract by the parties. With the conclusion of an employment contract, its parties enter into new legal relations and become participants in labor relations. It is known that an employment contract is a legal fact that creates an employment relationship between an employer and an employee, therefore, from the moment the employment contract is concluded, the rights and obligations of the employer and employee under this contract arise. Although concluding an employment contract is not a lengthy process, concluding it in violation of the procedure established by law can violate employees' rights and cause many problems for employers. For this reason, the article states that concluding an employment contract in accordance with the rules established by the Labor Code is the responsibility of not only employers, but also employees.

KEYWORDS: *Labor Law, Labor Legislation, Employee, Employer, Labor Contract, Legal Fact.*

INTRODUCTION

With the conclusion of an employment contract, the parties, entering into new legal relations, become participants in labor relations. It is well known that an employment contract, being a legal fact, the emergence of an employment relationship between an employer and an employee,

therefore, the rights and obligations of both the employer and the employee arise from the conclusion of an employment contract.

Taking into account the importance of an employment contract for establishing employment relations and ensuring the rights and interests of both employers and employees, it can be argued that the current labor legislation clearly establishes the procedure and conditions for concluding an employment contract. The rules for concluding an employment contract are reflected

in §2 of Chapter VI (articles 77-87) of the Labor Code of the Republic of Uzbekistan, which are imperative, that is, an employment contract must be concluded by the parties by mutual agreement and in accordance with the law. At the same time, violations of the law aimed at ensuring the right of employees to freely choose a profession and work will entail the responsibility of employers in the future.

The conclusion of an employment contract requires compliance with all the principles established by the Labor Code of the Republic of Uzbekistan. Legal scholar M.V. Presnyakov notes that the conclusion of an employment contract should be based not only on special principles of labor law, but also on the business qualities of the hired personnel [1].

If you pay attention to part 3 of Article 72 of the Labor Code, you can see that it says that there are additional circumstances before the conclusion of an employment contract (passing a competition, appointment to a position, etc.).

M.Y.Hasanov notes that the list of legal facts before the conclusion of an employment contract provided for in article 72 of the Civil Code is not set out in detail. Based on the content of this norm, we can say that other circumstances are possible before the conclusion of an employment contract [2].

A number of such legal facts, with the exception of passing a competition and being elected to a position, include appointment to a position, sending an employee to work by an authorized state body, obtaining a preliminary employment permit (by foreign citizens and stateless persons), written consent of one of the parents or a person replacing the parent to employ an employee under the age of sixteen.

In accordance with national legislation, when concluding an employment contract, it is necessary to take into account the age of employees. According to article 77 of the Labor Code, persons who have reached the age of 16 will have the opportunity to exercise their constitutional right to work, since this article allows for the employment of persons under the age of 16. Therefore, employers should know the age of the hired employees.

There are several restrictions in the labor legislation regarding the age of employees. According to R.N. Rakhmatullin, the age restrictions of employees established by the legislation can be of two types:

- 1) General restrictions on all types of work;
- 2) Special restrictions for specific types of work.

These restrictions depend on the maximum and minimum age of the employee. The minimum age limit is set by labor legislation. And a special age limit is regulated by federal law for certain types of work[3].

To prepare young people for work, it is allowed to hire students of secondary schools, secondary specialized, vocational educational institutions to perform light work that does not harm their health and spiritual and moral development, does not violate the learning process, in their free time – after they reach the age of 15 with the written consent of one of the parents or one of the persons replacing parents.

In addition, the employment of persons under the age of 18 must be carried out in accordance with the requirements of article 241 of the Labor Code, which states that minors should not be allowed to work where unfavorable working conditions may harm the health, safety or morals of this category of workers. The list of such works and the limits of lifting and moving weights for persons under the age of eighteen is established in consultation with representatives of the Ministry of Labor of the Republic of Uzbekistan, the Ministry of Health of the Republic of Uzbekistan, the Council of the Federation of Trade Unions of Uzbekistan and Employers [4].

It should be noted that the OMT Convention No. 138 on the MINIMUM AGE FOR EMPLOYMENT (1973) and the 182 Convention on the PROHIBITION and IMMEDIATE MEASURES FOR THE ELIMINATION of THE WORST FORMS OF CHILD LABOR (1999) [5], ratified by the Republic of Uzbekistan, are directly relevant to the issue under consideration. The provisions of the above conventions are implemented in the Labor legislation of the Republic of Uzbekistan and our state fully complies with these norms.

According to the Russian scientist G.U. Golovina, when concluding an employment contract, it is necessary to take into account not only the age of the employee, but also the state of his health. If the employer imposes unacceptable work on the employee, then the law should establish responsibility for him[6].

Taking into account the correctness of S. Golovina's opinion, according to article 239 of the Labor Code of the Republic of Uzbekistan, all persons under the age of eighteen can be hired only after an initial medical examination and must undergo mandatory medical examination annually until they reach the age of eighteen. It follows from this that the labor rights of minors are fully guaranteed [7].

The process of hiring citizens in our country is one of the most complex processes, and the main means of protecting the rights of citizens is an illegal (unjustified) refusal of employment by employers.

The legal scholar M.Y.Hasanov has repeatedly mentioned this in his scientific works. In his opinion, the inadmissibility of illegal refusal of employment is the most important guarantee of the constitutional right to work for all [8].

Article 78 of the Labor Code lists the circumstances of illegal refusal to hire citizens, which, in our opinion, do not fully cover the rights of employees.

For example, the employer does not specify which persons should be hired. In the Russian Federation, this situation is regulated differently: the law prohibits refusal of employment in a case unrelated to his business qualities [9]. However, the labor legislation of the Republic of Uzbekistan does not say anything about the business qualities of an employee.

In addition, in the resolution of the Plenum of the Supreme Court of the Russian Federation No. 2 of March 24, 2004 the definition of the concept of "business qualities of an employee" is given,

according to which the business qualities of an employee should, in particular, be understood as the ability of an individual to perform a certain labor function, taking into account his professional and qualification qualities (for example, the presence of a certain profession, specialty, qualification), personal qualities of an employee (for example, health status, availability of a certain level of education, work experience in this specialty, in this industry) [10].

Consequently, if the Labor Code of the Republic of Uzbekistan also clearly defines the business qualities of an employee, then some practical problems will find their solution.

Article 78 states that the refusal to hire persons proposed by the employer is considered as an illegal refusal to hire. However, it does not explain the concept of "persons proposed by the employer".

M.Y.Hasanov gives his definition of this concept. In his opinion, in practice there are often cases when an employee's invitation letter is signed by the employer and the seal of the organization is affixed. If an applicant applies to this employer with a request to hire him within the time specified in the letter and submits all the necessary documents for employment, such a letter contains the employer's obligation to hire the proposed employee for a certain specialty and position. In most cases, this letter indicates not only the job function (specialty, qualification or position) offered for the job, but also some other working conditions (salary, structural units, etc.) [11].

In some foreign countries, we can see that the essence of this concept is fixed in the norm of the law.

Part 3 of article 78 of the Labor Code also reveals some misunderstandings. In particular, the article states that in case of refusal to accept a job, the employer must, at the request of the employee, provide a written response within three days, justifying the reason for the refusal to accept a job. But how can a person who is not hired be an employee? For this reason, we consider it necessary to make appropriate amendments to this article.

When applying for a job, the applicant is required to provide the relevant documents provided for in article 80 of the Labor Code. The article also states that it is prohibited to provide documents that are not provided for in legislative documents. However, in practice, the list of documents required from the employer is increasing.

According to the scientist-practitioner D.R.Matrasulov, despite the fact that the current Labor Code does not include such documents as a statement, description, autobiography, photographs, all employers require their submission. Therefore, if these documents are necessary for employment, then it should be proposed to amend the law [12].

In our opinion, the list of documents that employers may need for employment should be strictly fixed in the law with the corresponding amendments to the Labor Code.

The final stage of the employment contract is the execution of the employment contract. According to article 82 of the Labor Code of the Republic of Uzbekistan, employment is carried out on the basis of an employment contract between an employee and an employer. This order must be executed in full accordance with the content of the signed employment contract, and the employee must be notified and a receipt received.

The employment contract comes into force not from the date of issuance of an order by the employer confirming its conclusion, but from the date of its signing by the parties (article 83 of the Labor Code). An employer's order is a way of registering an employee's employment.

Failure to issue an order does not imply the conclusion of a contract, but may cause some problems for the employer. However, there is no provision in the labor legislation on the consequences of non-execution of an order to conclude an employment contract.

Also, article 82 of the Labor Code states that an employee can actually be hired with the consent of the employer and it is considered that he has concluded an employment contract from the date of commencement of work. However, this norm does not establish the obligation of employers to conclude an employment contract in the event of such a situation.

This gap in legislation may lead to further violations of workers' rights. Therefore, employers should avoid this and be responsible for it.

Articles 84-87 of the Labor Code relate to the probationary period before employment, and the norms describe in detail the purpose, conditions, terms, results and other conditions for inclusion in an employment contract.

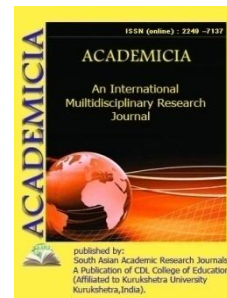
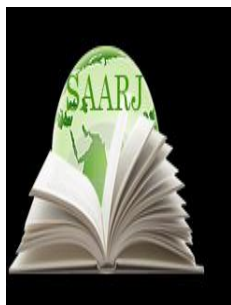
At the same time, the labor legislation allows citizens to work in several jobs and receive additional income. The procedure for combining and working in several positions and professions is reflected in the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated October 18, 2012 No. 297 "On approval of the Regulations on the principle of combining and working in several professions and positions" [13].

In conclusion, it should be noted that signing an employment contract is not a lengthy process, but failure to comply with the procedures provided for in the law can lead to violations of workers' rights and create problems for employers. In this regard, the conclusion of an employment contract is an obligation not only of employers, but also of employees. In this case, responsibility and attention are required from them. In this regard, it is necessary to eliminate the existing uncertainties in the employment contract and fill in the gaps.

REFERENCES

1. Labor law of Russia. Textbook. Under. about. ed. M.V. Presnyakov, S.E. Channova. "Povolzhsky Institute of Management named after P. A. Stolypine", 2014. - P. 52.
2. Hasanov M.Yu. Labor law of the Republic of Uzbekistan. A common part. - T.: Ed. "LESSON PRESS", 2016. - S. 111.
3. Rakhmatullina R.N. Individual-contractual regulation of the conclusion, amendment and termination of an employment contract. Monograph. - M.: "Justicinform", 2013. - S. 38.
4. "List of unfavorable working conditions prohibited for the recruitment of persons under the age of eighteen" (registration number: 1990, 29.07.2009), Resolution "On the establishment of restrictions on heavy loads that persons under eighteen years of age can carry and carry." (registration number: 1954 from 05/12/2009).
5. www.ilo.org.
6. Golovina S.Yu. An employment contract as a legal structure. Perm University Bulletin. No. 3 (21), 2013. - S. 67-68.

7. Regulation "On the procedure for medical examination of personnel" (reg. No. 2387 of 29.08.2012).
8. Hasanov M.Yu. Comments to Section VI of the Labor Code of the Republic of Uzbekistan "Labor Contract". Handbook on personnel issues. No. 7 (31), 2009 (electronic version).
9. Orlovsky Yu.P. Labor law of Russia. Textbook for bachelors. - M.: "Yurayt", 2014. - S. 367-368.
10. Resolution of the Plenum of the Supreme Court of the Russian Federation of March 17, 2004 N 2 (as amended on November 24, 2015) "On the application by the courts of the Russian Federation of the Labor Code of the Russian Federation" // www.consultant.ru.
11. Hasanov M.Yu. Comments to Section VI of the Labor Code of the Republic of Uzbekistan "Labor Contract". Handbook on personnel issues. No. 7 (31), 2009 (electronic version).
12. Matrasulov D.R. Dynamics of the Labor Code of the Republic of Uzbekistan. // Prospects for the development of labor legislation in market relations. Round table materials. TSUU, 2015. -- B. 22-23.
13. Collection of laws of the Republic of Uzbekistan, 2012, No. 41-42, art. 2016, No. 43, p.



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THE QUALITY OF PRESCHOOL EDUCATION AT THE PRESENT STAGE

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ABSTRACT

The article reveals the concepts that are necessary to understand the multifaceted concept of "quality of preschool education." The presented material will be of interest to those who are interested in the preschool education system as the first stage of education, namely to teachers, methodologists and parents.

KEYWORDS: *Quality Of Preschool Education, Educational Conditions, Developing Subject-Spatial Environment.*

INTRODUCTION

Modern society is characterized by rapid and profound changes. The preschool education system is also changing and improving. She has always fulfilled and is fulfilling the most important social order of society, is one of the factors of its development.

At this time, there is a growing interest in assessing the quality of preschool education. This is a rather complex problem and it is connected with the fact that this formation is considered as one of the main resources for the development of the state at different levels.

Let's consider the concepts of this problem.

Quality is a methodological category that reflects the degree to which the result corresponds to a set goal.

The quality of education is understood in pedagogical science as

the set of its properties, which determine its adaptability to the implementation of social goals for the formation and development of personality.

The quality of preschool education is an integrative concept that includes several components: conditions for the implementation of the educational process; organization and content of the educational process; the effectiveness of education and its assessment; the cost of achieving performance.

Quality management of preschool education is a purposeful process of influencing management objects, carried out in the design and implementation of the educational process in order to establish, ensure and maintain the quality of education that meets the requirements of consumers.

The quality of preschool education as a whole is a multidimensional synthetic concept. It is this versatility that determines the approaches and sets the logic for the formation of the information base for its assessment. The problem of quality in pedagogical research is being developed in the following areas: the concept of education quality, methods of assessing the quality of education, methods of assessing the quality of education, the integrity of the system and the quality of education, the interaction of educational levels and its quality, factors that determine the quality of education, the market environment and the quality of education, the mechanism quality management of education, information technology, monitoring and quality of education, education quality management system [1].

The most pressing problems of preschool education:

- improving the quality of preschool education;
- mandatory minimum content of educational programs for preschool children in terms of preparing children for school;
- a system for assessing the quality of preschool education at the stage of a child's transition to school;
- ensuring continuity in the content of education between preschool and primary levels;
- equalization of starting opportunities for children in the transition to school as a scientific and practical problem;
- ways to achieve the physical and mental health of the child [2].

The main trends in the change in the species diversity of preschool educational institutions in recent years is an increase in the number of kindergartens with the priority implementation of various directions of development of pupils: physical culture and health, artistic aesthetic, intellectual and ethnocultural development and education of preschoolers.

According to the results of state accreditation, each preschool institution (both state and non-state) receives a certificate of the established form, according to which it is assigned an appropriate category [4].

The quality of education of preschool education graduates:

□ The specificity of preschool education is such that the achievements of preschool children are determined not by the sum of specific knowledge, abilities, skills, but by the totality of personal qualities. The planned results of the development of the basic

general education programs of preschool education are subdivided into final and intermediate;

- the planned final results of the mastering by children of the main general educational program of preschool education should describe the integrative qualities of the child that he can acquire as a result of mastering the Program;
- intermediate results of the Program mastering reveal the dynamics of the formation of integrative qualities of pupils in each age period of the Program mastering in all areas of children's development.

Concluding the above, it can be noted that the quality of education in a preschool institution is the result of the activities of the team, which is determined by the following positions:

how a child in an institution realizes his right to individual development in accordance with age-related capabilities and abilities;

how is the pedagogical process organized in kindergarten

(regime, choice of programs and technologies, provision of benefits, a system for improving the professional growth of teachers through various forms of methodological work, etc.);

what conditions are created in the preschool educational environment (educational environment focused on the intrinsic value of preschool childhood; positive microclimate in the team; a system of stimulating high-quality work, the creative orientation of the activities of the preschool educational institution and its leader; focus on educational needs and family needs; systematic collective discussion of the state of the educational process and acceptance competent management decisions, etc.) [2].

Thus, the quality of preschool education is integration:

guaranteed implementation of state educational standards, i.e. the quality of the educational process in a preschool educational institution, which allows the child, as a subject of the educational process, to achieve a guaranteed level of education, ensuring the transition to the next educational stage - primary school.

The ability of educational actors to set goals in different contexts and achieve them:

The quality of a full-fledged, age-appropriate development of the child, the preservation of his health;

The quality of professional and personal achievements of teachers of a preschool educational institution;

Quality of management of the preschool education system;

The ability to meet the requirements and expectations of major and indirect customers and interested parties, i.e. quality of preschool education outcomes meeting expectations

The needs of consumers (primarily parents) and corresponding to government regulations.

Striving for improvement, i.e. striving not only for the real, but also for the potential quality of education in a preschool educational institution.

Based on the foregoing, the following fundamental levels of manifestation of the quality of preschool education can be formulated:

providing parents with the opportunity to choose an individual educational route for their child,

ensuring social protection of the preschooler from incompetent pedagogical influences;

□ providing parents with guarantees that by the end of preschool childhood their child will receive the necessary level of preparation for successful education in primary school.

So, at the present stage of development, the system for assessing the quality of educational activities of pupils in a preschool educational organization does not provide for assessing the quality of educational activities based on the achievement of the planned results of mastering OEP by children, but involves assessing the quality of the conditions of educational activities provided by organizations.

The need for an educational organization to master new educational programs and technologies that are adequate to the social order of the state, family, society poses a problem for the organization to manage its quality.

One of the main tasks of quality management in an educational organization is the training and retraining of teaching staff. Teachers with the necessary amount of knowledge, skills and abilities ensure higher productivity and quality of work, which in turn has a positive effect on a qualitative change in the educational organization. In this regard, the psychological barrier of personnel of educational organizations to innovations, their intellectual activity, the growth of general culture, the ability to perceive and process scientific information, and use modern pedagogical technologies are reduced.

In order to improve the quality of knowledge of teachers, an innovative personnel policy is needed, ensuring their interest in the continuous improvement of professional knowledge [20]. The construction of a system for the development of employees within the organization is carried out at four levels: the level of strategic management, the level of management of the organization as a single living organism, the level of management of groups and associations of employees, the level of management of individual employees [14].

We consider it expedient to include the following elements in the effective human resource management system:

- analysis of educational needs and strategic planning;
- design of the educational process;
- resource management;
- the formation of motivation to improve the quality and increase the professionalism of teaching staff;
- measuring the satisfaction of participants in the educational process and managing social responsibility.

Based on the listed components, we consider it expedient to develop a quality management model for a preschool educational organization, which includes the goal, objectives, ways to achieve them, environmental subjects, its components, and expected results.

Work on the management of professional training and retraining of personnel should be an integral part of the training of the personnel reserve of an educational organization. In this case, measures for the training and retraining of personnel will be reflected in the planning system of the educational organization.

An educational organization that fosters a desire for knowledge (“want to know why”) in its educators thrives in the face of rapid change and renews its cognitive knowledge and applied skills to compete in the educational market.

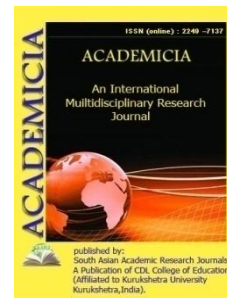
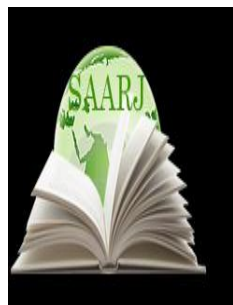
Thus, the education quality management system is of fundamental importance in the management of a preschool educational organization - a certain set of organizational structure, processes, powers and resources necessary to develop and achieve its goals in the field of quality. Quality management is the coordinated activity of directing and controlling an organization in relation to quality.

REFERENCES:

Berdiyeva M. *Дидактические параметры дошкольного развития детей на этапе дошкольного образования. Педагогическая наука. Москва, - 2011. - №6. Стр. 17-19*

Berdiyeva M. Pedagogical Support And Development Of The Intellectual Opportunities Of Children In Preschool Education.

Berdiyeva M. Ways of Intellectual Developing Children at Preschool Educational Institutions., www.auris-verlag.de Eastern European Scientific Journal. Ausgabe 1-2019. ISSN: 2199-7977. P. 230-233.



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ORGANIZATION OF MULTIMEDIA EDUCATION IN PRESCHOOL EDUCATION

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ABSTRACT

In this article we will talk about the methodology of the organization of multimedia education in preschool education and its role in the education of children. Due to the lack of methods for their use in the educational process in MTCs, educators are adopting multimedia tools as multimedia technology. The term "pre-school education" was introduced by the decision of UNESCO in 1997 and forms the first stage of the system of continuing education. The evidence described above shows that the formation of computer literacy in children of MTM, teaching them to behave in an elementary way with the computer and preparing them for school education are one of the pressing issues. This is certainly a gratifying case. Since the methods of their use are not developed in the educational process, educators - educators adopt multimedia tools as multimedia technology.

KEYWORDS: MTM, Information, Technology, Computer, Education, kindergarten, intellectual, multimedia, Occupation, teacher

INTRODUCTION

Today, the realization of the intellectual potential of young people in the upbringing of a harmonious generation and their comprehensive development as a person has become a priority direction of the policy of our state. Because only physically healthy spiritual mature individuals create a great future.

Further improvement of the system of preschool education in the country, strengthening the material and technical base, expanding the network of preschool educational institutions, providing qualified teachers, radically improving the level of preparation of children for school education, modernizing the educational process In order to implement educational programs and

technologies, to create conditions for the full intellectual, moral, aesthetic and physical development of children, the President of the Republic of Uzbekistan Sh. Mirziyoyev, December 29, 2016, No. PQ-2707 "On measures to further improve the system of preschool education in 2017-2021" and September 9, 2017, "Measures to radically improve the system of preschool education No. PQ-3261 of September 30, 2018, No. PQ-3955 "On measures to improve the management of the preschool education system" was created.

Proper organization of the pedagogical process in the educational process leads to the fact that the educator acts as the main organizer or consultant in this process. This requires a lot of independence, creativity and willpower from the trainees.

In today's innovative processes, the education system will be able to absorb new information and evaluate their own knowledge, make the necessary decisions, become independent and free-thinking individuals.

The subject of pedagogy of preschool education is the study of the laws of comprehensive development of the child from birth to school. It provides for the unity of educational influence of preschool institutions and the family, the relationship between preschool and school work, the preparation of children for school, the tasks of education and upbringing in the context of social preschool education, developed its principles, content, methods, forms, and organization. It is an integral part of the preschool education system.

The theory and practice of preschool education is based on the objective of comprehensive upbringing of preschool children, the possibilities of the child and the role of upbringing him from an early age, the need to link preschool education with life, times, the decisive importance of the social environment in the formation of the personality of the child.

Currently, the development of various multimedia educational tools and their application in the educational process is developing rapidly. Due to the lack of methods for their use in the educational process in MTCs, educators are adopting multimedia tools as multimedia technology. It should also be noted that in addition to the specialized institution that produces multimedia tools, each MTM educator can use software and role-playing multimedia tools that can be developed by them. There are two types of multimedia teaching aids used in preschools:

There are tools for direct learning on the monitor screen, as well as visual aids.

One of the main objectives of computer education based on multimedia technology in preschool institutions is to guide children from preparing for school education. Therefore, it is important to develop a training form, content, method of conduct and evaluation criteria. Secondly, although some MTM are provided with computers, the methodology of their use in the educational process has not been developed. Therefore, the development of the methodology for the use of computer in the educational process under MTM conditions is one of the pressing issues. As noted above, when using multimedia technology during training, the content of the training will be deepened and transferred to the account of saving time in the study of this or that material.

The form, content and methodology of teaching and learning in pre-school institutions traditionally have been described in many literatures. In particular, in this matter P.Yusupova's "preschool education pedagogy" is widely covered. P.Yusupova writes about the form of education: "when we say the form of Education, the activities of the educator and the children specially organized are understood and held at a certain time on the agenda."

The earlier education begins, the sooner its effect is manifested and positively affects the whole way of life of a person. The term "pre-school education" was introduced by the decision of UNESCO in 1997 and forms the first stage of the system of continuing education. This is certainly a gratifying case. Since our current era is the age of technology, it has been stated that "computerization and informatization of educational processes at all stages will be carried out" in Article 9 of "national program of training of personnel" with the aim of increasing each educator in harmony with the Times. It was also noted in UNICEF's "child-oriented education program" that the use of new pedagogical technologies in the educational process of MTMs is an urgent issue.

The evidence described above shows that the formation of computer literacy in children of MTM, teaching them to behave in an elementary way with the computer and preparing them for school education are one of the pressing issues. Young children will be curious about the surroundings, events and employees, things and items. They like to see everything holding, fumbling, walking and coming to action.

Computer games increase this curiosity of educators. As a result, their mental development goes into shape. The fact that multimedia computer games increase the curiosity of educators is manifested on the basis of the following: 1) the fact that the object of the game displayed on the screen is given the effect of animation, and they are constantly moving and polished; 2) in Volume; 3) in Music; 4) in animation; 5) in the cartoon.

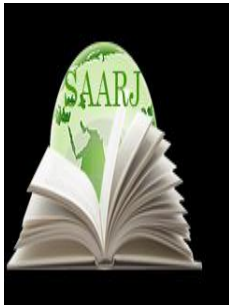
The methodology for the preparation of Multimedia tools and the formation of computer literacy of children personal computers are the main technical means of multimedia technology. When using mtms in the educational process, additional tools are required - compact discs, various presentations, slides, etc. Educational materials in Multimedia media have a dynamic character, they will be given by animation. The traditional visual materials used in the education system have a static character.

For example, during the teaching of the educator a letter A in the traditional way, the child shows his form made of paper or cardboard (a static tool). When displayed through Multimedia, the letter A vibrates on the computer (monitor) screen, attracting the attention of children (dynamic motor). Currently, the development of various multimedia educational tools and their application to the educational process is rapidly developing. Since the methods of their use are not developed in the educational process, educators - educators adopt multimedia tools as multimedia technology. When it comes to the Kezi, it should also be noted that in addition to a special institution that produces multimedia tools, it is possible to use software and role-playing multimedia tools (DVD-discs) that each MTM educator can prepare themselves. A DVD video disc has several advantages as a technical tool of multimedia. Using the disk, it is studied.

LIST OF USED LITERATURE

1. <https://whatsappss.ru/uz/sovety/upravlenie-doshkolnym-uchrezhdeniem-pri-pomoshchi-ikt-buklet-ispolzovanie-ikt---tehnologii-pedagogom-do.html>
2. <https://hozir.org/multimediali-darslarni-tashkil-etish.html>
3. <https://uzjournals.edu.uz/cgi/viewcontent.cgi?article=1042&context=gulduvestnik>

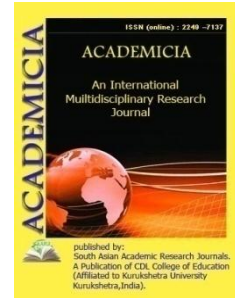
4. <https://community.uzbekcoders.uz/post/maktabgacha-ta-lim-muassasalarida-axborot-texnologiyalaridan-foydalanishnin--5f2640418f509e50bd17f8fa>
5. <https://cyberleninka.ru/article/n/maktabgacha-ta-lim-samaradorligida-multimedia-texnologiyasining-o-rni/viewer>



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SEVERE CONTAMINATION OF CARPSIMON FISH GROWING IN ARTIFICIAL WATER RESERVOIRS OF SAMARKAND REGION

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ABSTRACT

There are reports of fish infection with cestodes in artificial reservoirs of the Samarkand region. According to the results of the study, the level of fish pollution with custodies in the fish farm "Otabek Dustov" in the Kattakurgan region of the Samarkand region and in the Kattakurgan reservoir studied.

KEYWORDS: *Custody, Ligula Intestinally, Botriocephalus, Invasiveness, Invasive Intensity, Intermediate And Primary Host, Helminth, Sazan, Carp, Silver Carp.*

INTRODUCTION

Today, fish products play an important role in meeting the needs of our population for protein and vitamins. That is why in recent years the Government of the Republic pays great attention to the development of fisheries. In particular, with the adoption of the Resolution of the President of the Republic of Uzbekistan dated August 29, 2020 No PP-4816 "On measures to support and increase the efficiency of the fishing industry" opportunities are being create. There are also a number of factors, which hinder fish productivity. Helminthiasis is one of these factors, which has a significant negative impact on the development of the industry. Parasitic diseases of fish are not only economically harmful but also dangerous to human health. In fish, especially in diseases caused by ligula intestinally, there is a sharp decrease in the amount of protein, macro

and microelements needed by the human body. In order to solve these problems, it is important to conduct and study the bio ecological condition of water bodies, as well as in-depth research. The dynamics of seasonal infestation of fish in artificial reservoirs in the Samarkand region with helminthiasis, the spread of diseases in water bodies and the rate of damage almost not fully understood.

Currently, practical work is being carry out on fish farms in Samarkand and other regions to implement these decisions and decrees. However, in some fish species raised in artificial reservoirs, custodies from helminthiasis, especially in carp, have a negative impact on fish productivity, reducing their marketability. With this in mind, we set ourselves the goal of identifying custodies found in carp in artificial reservoirs in some districts of Samarkand region and identifying the factors that contribute to their spread, studying the dynamics of their damage and developing control measures.

Methods and scope of inspection. Our study was conducted at the Otabek Dustov Fishery, Kattakurgan Reservoir, located in the north-eastern part of the Kattakurgan district of Samarkand region. Four samples of 88 species of fish caught in the area were tested. The main methods used were organoleptic and parasitological dissection of the fish being examined.

Results and their analysis. The test results are presenting in the following table (Table 1). Of the 88 fish tested, 20 were, found to have three types of cestuses, accounting for 22.7% of the total contamination.

The degree of contamination of the tested fish with cestuses

TABLE 1

Fish type	The total number of fish examined	Thence		Custodies found		
		Damage d	%	Digamma	Ligula	Botryose gods
fish averages	33	6	18,1	2	2	2
Carp	21	4	19,4	1	2	1
Karas	12	4	33,3	1	2	1
silver carp	22	6	27,2	2	4	-
GENERAL	88	20	22,7	6	10	4

It seen from, the table that in carp, three types of custodies occur in 2 out of 6, and the intensity of the invasion is two. Only 4 out of 21 carp species have the disease, and 4 out of 12 carp species have the disease, but we can see that ligula intestinally accounted for 33.3% more. Of the 22 fish in the trout, six have the disease we encountered in our experiment, but here, too, ligula intisternalis is more common at 27.2%. Thus, in our studies, the level of centrode contamination in fish remains high.



The prevalence of fish cestodes in artificial ponds is growing every year. This is mainly due to the fact that due to the deterioration of the ecological environment and the drying up of the Aral Sea, fishing birds, which are the main hosts of cestodes, fly to artificial reservoirs, which leads to an increase in the incidence of the disease (Figure 1).

CONCLUSION

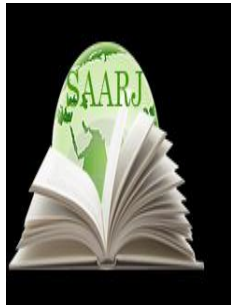
Centrode infestation in fisheries of Samarkand region averaged 22.7% of fish, infection in 4 species of fish averages 33%, silver carp 27,2 %, carp 19,4 %, sazan 18,1%.

Foydalanilgan adabiyotlar:

1. Daminov A.S., Nasimov Sh.N., Gerasimchik V.A., Eshburiyev S.B., Qurbonov F.I. “Baliq kasalliklari”, Navruz nashriyoti. Toshkent. 2020.- 219 b.
2. Haqberdiyev P.S., Tayloqov T.I. Baliqlarning parazitlar kasalliklari, O‘quv qo‘llanma, Samarqand., 2009. - 24 b.
3. Kamilov B.G., Kingerliniskiy F.U., Qurbonov R.B., Kim.,S.I., Qurbonov A.R., Valiyev J.A. Karp turidagi baliqlarni polikultura asosida yetishtirish asoslari. Toshkent, 2017. – 16 b.
4. Османов С.О. Паразиты рыб Узбекистана. – Ташкент, 1971.532 с.
5. Yuldashov M.A., Salixov T.V., Kamilov B.G. Uzbekiston baliqlari. Monografiya. – Toshkent: GOLD-PRINT NASHR, 2018.-180 b.

REFERENCES

1. Daminov A.S., NasimovSh.N., Gerasimchik V.A., Eshburiyev S.B., Qurbonov F.I. «Fish diseases», Navruz publishing house. Tashkent. 2020. pp. 219.
2. Haqberdiyev P.S., Tayloqov T.I. Parasitic diseases of fish, Textbook, Samarkand, 2009. pp. 24.
3. Kamilov B.G., Kingerliniskiy F.U., Qurbonov R.B., Kim., S.I., Qurbonov A.R., Valiyev J.A. Basics of polyculture breeding of carp. Toshkent, 2017. pp. 16.
4. Osmanov S.O. Parasites of fish in Uzbekistan. – Tashkent, 1971. pp. 532.
5. Yuldashov M.A., Salixov T.V., Kamilov B.G. Fish of Uzbekistan. Monograph. – Tashkent: GOLD-PRINT NASHR, 2018. pp. 180.



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STAKEHOLDERS ENRICHED STRATEGIES TOWARDS FUTURISTIC EMPLOYMENT GENERATION AND STARTUP SKILLS AS VALUE ADDITION TO THE CURRICULUM

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ABSTRACT

The present paper focuses on a few stakeholders' strategies towards training, placement, and entrepreneurial activities in the present world's employability market, where cut-throat competition is prevalent for value-added products with high quality and minimum cost requirements. The authors primarily demonstrate the need for value addition into the curriculum, which lays the road for creativity and innovation. Towards the end of the program, every engineering student will have enough confidence in his trade, and employers will get industry-ready students; the institution's brand image is built up, which enhances the admissions year after year. The object of the paper is to provide quality technical knowledge (It is accomplished by knowledge production, transfer, and dissemination) And Accountability at a reasonable cost to all ambitious citizens with the highest level of transparency to secure the nation's long-term economic prosperity.

KEYWORDS: Stakeholders; Startups; Skill Development; Brand Image, Entrepreneurship

1. INTRODUCTION

God has given birth to a specific skill. We are the teacher should develop that specific skill in his four years of studies so that his sustainability in his professional future is more effortless. There are different types of people taking Engineering course by force, just stepped into it because the 12th course was high And rest of them are true Engineer too Really want to do something. The engineering management search that people who are genuinely interested in Engineering. India produces much more Engineering graduates, but they complain that they are not getting skill and talent required in industries .industry need innovation skill, designing skill, technical skill, conceptual skill, managerial skill, diagnostic skill, political skill, etc. After compiling their study, he must be creative, innovative, have lifelong learning habits, etc. To gain the above skill, the student should focus on good qualities of education, strong knowledge of theory and practical, read more journals, zero backlogs, and 100% attendance, etc.

1.1Syllabus

Syllabus Update, need-based delivery, course module must be applied engineering, Quality Professors; Engineering Colleges shout not as Profit centers, innovative mindset, and research. A syllabus should not design with specific textbooks and laboratories exercises. Upgrade the quality of the syllabus to global standards.[1,2] It must be industrial Employability and Entrepreneurship, Research & Innovation ecosystems, **vocationa lisation**, and startup.[1] shown in Fig.1

This may be accomplished by doing the following steps:

1. Process of teaching and learning that is innovative
2. Integrity education for employees
3. Project-based and allocated resources learning is focused.
4. Specialized programs are being offered
5. Changes in the job market should be recognized
6. Research and development learning opportunities

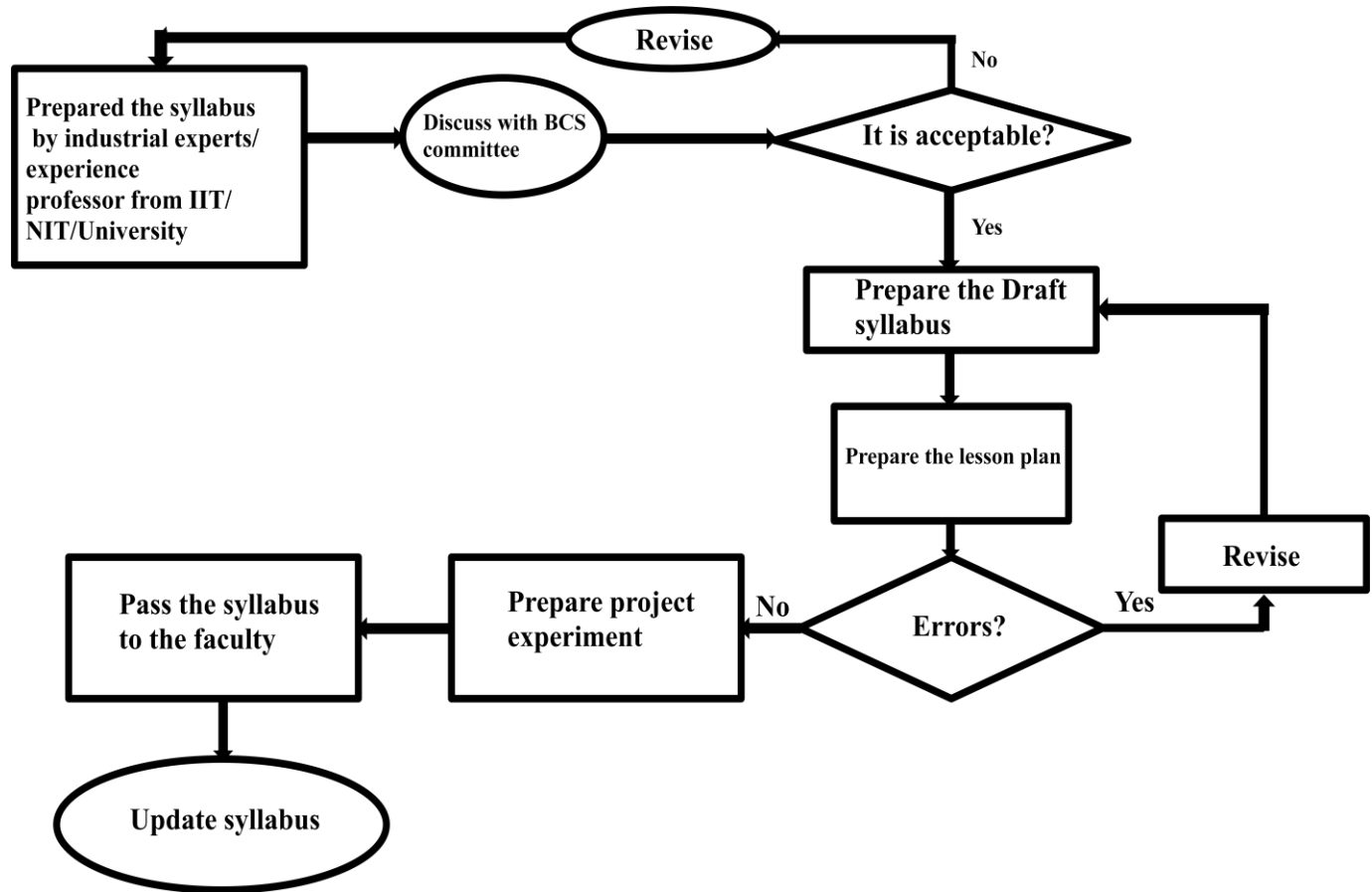


Fig. 1 Process for Preparing Syllabus

1.2 Faculty members' upskilling

Faculty members' abilities to be up-skilled the cornerstones of any educational system are teachers. Improving teacher quality will have a direct and significant influence on students' learning abilities[10]. In 2019, Prof. Anil Sahasrabudhe, Chairman of the AICTE, declared that technical instructors must also complete an eight-week course on "Orientation to Technical Education and Curriculum Aspects." "Communication Skills, Modes, and Knowledge Dissemination"; "Instructional Planning and Delivery"; "Technology Enabled Learning and Life-long Self-learning"; "Efficient Student Assessment and Evaluation Modes"; Three weeks of internship, as well as creative problem solving, innovation, and meaningful R&D.[3] The quality of technical teachers will undoubtedly improve as a result of this. As a result, training and skill development for faculty members should be prioritized to improve the quality of engineering education[4]. After a course's curriculum has been analyzed, interpret the learning results. In light of the learning outcomes, choose appropriate teaching approaches and tactics. Make a sittingdesign for the classroom, laboratory, workshop, and technology -based learning. For reinforcement of learning, link classroom delivery to appropriate assignments, examinations, and other activities. In addition to the classroom[5].

1.3 Skill development

Skill development (Most likening Area of the student), M.O.U. with industry towards skill development in college as similar to industry (every lab in college should be a slight manufacturing hub), Identify Industrial skill sets to be developed and practice in four years of his studies.[6]

Engineering education has become a manufacturing industry rather than learning and researching academic institutions. Quality of teaching and learning [6]. The motive of setting up such institutions in the private sector Apart from these queries. The majority of laboratory exercises are standardized, regardless of the engineering field. Experiments are usually carried out in groups rather than individually on the training apparatus[7]. This technique of educating and instructing has created several minor-sized businesses that provide ready-made equipment for setting up laboratories for the experiments specified.[7] This practically kills the enthusiasm to learn in a group and creative thinking. The creativity and ability to apply the learned skills are totally absent in the curriculum design. Research and entrepreneurship are not part of the curriculum at all practically nullifies divergent thinking. Lack of applied skills has been one factor affecting India's contribution towards quality research outcomes in precision and intellectual domains. Though the current population appears tech-savvy and well-informed through the internet, mobile, etc., it's failing in terms of innovation. The use of technology is somewhat limited to searching information but creating such platforms. Localized innovative products were addressing local issues.[8] This is clearly reflected in terms of research output; product. Though India has been aspiring for the same, the education system has failed to deliver the necessary basic solution for a localized problem in so many years. Still, India imports most of the finished products and services from developed countries. With 1.6 million engineers churned out every year's not even a single product has been invented or exported in the last decade. This is due to a lack of quality in the education system[8-9]. The key parameter required for upskilling the faculty ,its process and outcome explain in Tab.1 and the source of skill development shown in table 2.

TABLE 1 REQUIRED FOR UPSKILLING THE FACULTY

Sl.No.	Key parameter required for upskilling the faculty	Process for upskilling	Outcome
1	Technical education and program orientation	Attending different orientation programs hosted by various sectors of the National agencies like MHRD, AICTE, U.G.C., DTE, NITTTRs, ISTE, DTE , Technical Institutes – I.T.I.s, Polytechnics, Engineering colleges, Universities, I.N.I., Excellence in Technical Education. - N.B.A., NAAC -	Adoption of the Curriculum Enhancement of life capabilities Establishment of a standard of excellence helpful suggestions from various perspectives Personality evaluation

2	Skill, Mechanisms, and Information Exchange in communication	Listening Speaking Reading and Writing	Improving the efficacy of teaching and learning, as well as incorporating media to increase classroom engagement.
3	Planning and delivery of Instructional material	After analyzing a course, interpret the learning outcomes. Prepare session plan Get comments to help you develop.	For reinforcement of learning, link classroom instruction to pertinent assignments, exams, and other activities. For a successful teaching-learning process, supplement classroom presentations with suitable media and tools.
4	Learning enabled by technology and Long term self-learning .	Identify free and open-source software [FOSS], open educational resources (O.E.R.), and other digital tools for establishing an active learning environment on the internet. Take advantage of MOOCs and webinars to improve your expertise. For professional development, use a variety of online journals and other learning tools.	Using a variety of instructional tools, create excellent courses. Create a variety of qualitative and quantitative techniques and tools for a technology-enabled learning environment. Advancement of knowledge Developing Educational Materials Social Networking Implementation
5	Evaluation and assessment of student.	use essential aspects of evaluation procedures. Create evaluation systems for convergent and divergent questions. Determine the validity of your question.	Updating syllabus. Preparation of question paper Linking with other courses Integrate various assessment software solutions for classroom teaching and learning that are relevant.
6	Long-Term self-learning	Gain a better grasp of how technology may help you connect CONTENT and CONTEXT during the teaching-	Case studies Designing course Interviewees from the stakeholders.

		learning process.	
7	New technology, Significant R&D, and Innovative	R&D Through Team Work Choosing a Research Design and Defining a Procedure Data collection and data analysis Research Report Writing and Research Report Evaluation	Establish excellent R&D teams Enhance the technical education system's different sub-components

1.4 Positive outcomes of the quantity based educational system

The growth of a number of engineering colleges has been such a pace that it has become a business model in the last two decades in India. But addressing the quality of education is a complex problem. It has to be validated with respect quality of human resources generated and its contribution towards the overall development of a country[10-11]. Quality of education also reflects the overall development of a country and not just as per economic data. Gross Domestic Product (G.D.P.) is just an economic indicator to measure the wealth of a nation. Human development index (HDI), quality of R&D measured in terms of import and export imbalance, number of patents filed, number of noble laureates, number of products invented, number of innovations can give an overall aspect of educational outcomes. This part of the critical review focuses on the not so positive outcomes of the quantity based educational system[12]

1.5 .Entrepreneurship

interdepartmental association towards product design, development, marketing, and revenue earning., Encourage stipends on the sale of products to students, create web of all available students with specific skills such that industries approach that department employment, Create solutions that can address local needs.[13]

Suggestions to increase students' tendency towards Entrepreneurship, Innovate for Digital India Challenge, India emerge and grow to become a top consumer market, Established startups to mentor and talk to people based on the rising number of startups (over 4200), India is the world's fifth-largest country. Entrepreneurs act as change agents in a country's economy. Micro enterprises assist in stimulating the growth process by affecting macroeconomic factors. The entrepreneurs also can create a spark for a developing country like India; it is necessary to restructure the economy [14-15]. This survey and additional research aimed to elicit the thoughts of current adolescents on the way to entrepreneurship and their preferences at the entry near in toward entrepreneurship. The overall study shows us that Indian adolescents haven't wholly reached the expectations of their involvement in entrepreneurship, which ought to be required in this present scenario.[18] Research findings suggest more and more new entrepreneurs be evolved from Indian youth by improving their notions about entrepreneurship and thus abolish the problem of unemployment in India.

The rate of unemployment is higher in rural than urban territories, and the rate of female unemployment surpassed the rate of male unemployment. In scenarios like this, there is a solid requirement for entrepreneurship in our nation. India needs work producers rather than work seekers. When we see the primary reasons for unemployment, we will discover the absence of employment opportunities, skill crises, high development of population, and moderate development of industrialization. The rate of joblessness has become speedier for individuals with practically no education than for those with some education. The government has not been able to give enough openings for work to all the jobless, and in the meantime, the unemployed youth populace has been expanding step by step. An entrepreneur is a person who works together with all assets, steps up with regards to begin something new, takes risks, gives work to numerous, and fills the gaps to make lives less demanding.[16] When we see the massive picture, we find that business visionaries can help a nation from various perspectives. It causes a nation

1. To decrease its joblessness rate (through independent work and giving work to others).
2. To wind up fiscally and technologically independent (through trading and developments)
3. One single entrepreneurial unit impacts such a significant number of lives and offices directly or indirectly; it also gives money-related security.
4. Income to the government drastically improves because of taxes paid directly and indirectly.
5. Foreign cash flows to the economy through fares (directly) and so on.

Thus an entrepreneur helps a nation in its general monetary improvement. In such a circumstance, the advancement of business is particularly required in a nation like India. As we already discussed in India, a larger piece of the populace is youth.[16] They have the potential for statistical profit, which happens when the extent of working individuals in the whole populace is more than the rest. It means that more nationals can work, be gainful and contribute to the countries' financial improvement. When more youngsters progress toward becoming business visionaries, at that point, the issue of unemployment can be lessened to an enormous degree.

TABLE 2. THE SOURCE OF SKILL DEVELOPMENT AND TRAINING PROGRAMMES UNDER VARIOUS DEPARTMENTS

Sl. No.	Department	Source Of Technical Development	Duration Of Training (Long-Term/Short-Term)
1	<i>Human Resource Development</i>	Polytechnics Institutions , pharmacy Institution, hotel Management Institution, architecture Institution	4-12month
		Community Polytechnic Scheme <i>NPTEL</i>	
	<i>Human</i>	National Institute of Open Schooling-Distance Vocational Education Programmes [Practical training through Accredited Vocational Institutes(AVIs)] National Programme on Earthquake Engineering Education(NPEEE)	FDP short-term and long-term programmes

	Resource Development	Modular Employable Skills(MES) Crafts Instructor Training Scheme(CITS) Advanced Vocational Training Scheme and Hi-tech Training Scheme <i>Supervisory Train in</i> <i>Women Training Institute</i> <i>Central Staff Traini and Research Institute</i> Model Training Institutes and Model Industrial Training Institutes.	1 year Short Term courses Long and short term Long and short term Short Term(1-3)years
2	Information Technology	DOEACC-,O "level CEDTI	Flexible duration Short courses
3	Labour & Employment (DGET)	Craftsmen Training Scheme(CTS) Apprenticeship Training Scheme(ATS)	Six months to Three years Sixmonthsto4years
4	Rural Development	National Institute of Rural Development (NIRD) Swarnjayanti Gram Swarozgar Yojana(SGSY) RUDSETI Strain Skill developmentof BPL @50000perannum	Short term Courses Need based short term Short term Short term
5	MSME [Small Industries Development Organisation(SIDO)]	Entrepreneurship Development Programme, Skill Development Programme(SDP), Management Development Programme	Both short term and long term
6	Textiles	Decentralized Training Programme, Weavers "Service Centers, Cooperative Training, Powerloom Centers, Indian Jute Industries Research Association, Central Wool Development Board, Central Silk Board, Training Centers for Handicrafts, North-eastern Handicrafts and Handlooms development Corporation Apparel Export Promotion Council(AEPC)	➤ Mainly short term (15 days to 3 months). ➤ SomecoursesunderHandicraftsareof1yearduration. 3 monthsto1year
7	HUDCO	640 Building Centers (HUDCO) Company run schools (NBCCHCC, L&T, ECC etc.) & Association etc. Construction Industry Development Council (CIDC) & others	Short term courses Short term courses 1 month to 6months

1.6 Culture of Innovation

To foster a culture of innovation. Establishment of the center of excellence lab such that publication product and pattern are delivered, Detailed D.P.R. to be prepared by R and D cell, and appropriate funding to be raised.

1.7 Center of Excellence (C.O.E)

A Center of Excellence (C.O.E.) is a (Normally, they are tiny) group of committed professionals administered from a single location apart from the functional areas they serve within a practice or organization [117]. The C.O.E., also known as a competency or capability center, is frequently the team that is at the forefront of experimenting with and implementing new technological tools, approaches, or practices Streamlining the contributions of resources with high-demand and distinctive knowledge or abilities across a wide variety of areas to optimize the company or practice.[17] Improving efficiencies and using reused assets to improve R.O.I. Improving efficiency and utilizing reusable assets to reduce delivery delays, development expenses, and maintenance costs.

2. Implementation of Advance Technology

The launch of many programs by the government to bring more people under the banking purview has resulted in the transformation of rural economies, focusing on a unique - 5M strategy- Manpower, Money, Meet up Events, Money and Market Access, The need for deep technology and digital is essential, cyber security, cryptology, block chain technology.

The growth of several engineering colleges has been such a pace that it has become a business model in the last two decades in India. But addressing the quality of education is a complex problem. It has to be validated for the quality of human resources generated and its contribution to its overall development.[18] Quality of education also reflects the overall development of a country and not just as per economic data. Gross Domestic Product (G.D.P.) is just an economic indicator to measure the wealth of a nation. Human development index (HDI), quality of R&D measured in terms of import and export imbalance, number of patents filed, number of noble laureates, number of products invented, number of innovations can give an overall aspect of educational outcomes[17-18]. This part of the critical review focuses on the not-so-positive outcomes of a quantity-based educational system. The the quality of outcome is improved as per the given the fish digram Fig 2.

Along with AICTE, technical universities in each state are responsible for administering and maintaining technical education quality. Engineering Institutions in India Engineering Institutions Quantity Indian Institute of Technology 23 N.I.T. 30 IIIT 4 Other Public/Private Universities for Technology 117 State rung Government Engineering Colleges 33 Private run Engineering Colleges / Technology Management institutes 700.

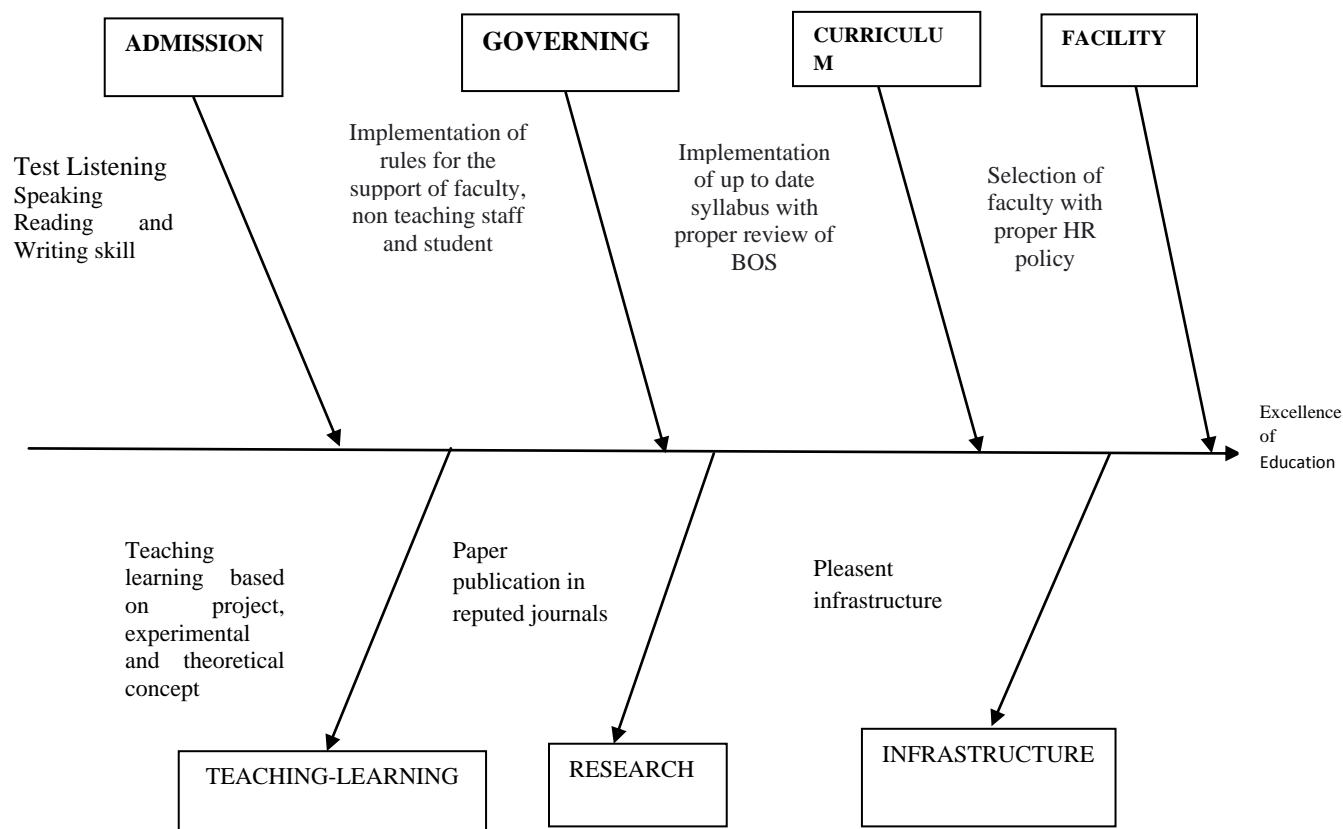


Fig.2 Excellence in technical education

2.1 What is the best way to persuade industry professionals to join the team?

The growing competition among professional technical educational institutes to build industry-ready engineering graduates establishes a robust situation to develop local tie-ups with industries. Student expands their industrial knowledge with industrial exports.[19]

2.2 How to create a persuasive case for bringing in industry expertise.

The growing rivalry among higher education institutions to produce business-ready graduates puts pressure on them to form closer links with industry. Getting on-board, either as a permanent professor or as lecturers upon this side, people with engineering expertise is one method for colleges to tap into the most up-to-date industry knowledge and exposing them to practices. Individuals with experience in the business are aware of current trends, methods, and processes. As a result, they're best suited to giving students an inside look at how businesses operate or sharing news from research laboratories. According to Ashok Mittal, Chancellor of Lovely Professional University, their first-hand expertise transfers into more vital information delivery skills. And the knowledge they provide is invaluable. Inviting industry leaders to speak on campus as guest lecturers can also help with campus recruitment.[18-19-20] According to Dr. Banerjee, state institutions can only afford to do so little to publicize their courses and facilities. Welcoming high-ranking engineering representatives to speak with scholars benefits raising knowledge and opening doors to new campus recruitment opportunities regularly. Employing subject specialists as a part of your team is undoubtedly a proud moment if you can get the right

people on board to teach the essential courses while maintaining their enthusiasm. Here are some suggestions for successful industry recruitment:

2.3 Ascertain that they are enthusiastic about academics

Teachers serve as role models for students. They have enormous sway on the following generation. It's a tremendous duty to shoulder, and it stands out from the rest of the industry. As a result, prospective faculty members must demonstrate a commitment to developing young minds and positively impacting the community. The creation of the transition from permanent engineering participation to academia is a huge step. A potential applicant always has the will to pursue fulfillment from incorporeal benefits and knowledgeable achievements.[20] Asking inquiries such as, "What inspires you?" What are your career aims and goals? Individuals who will become successful academicians can be identified during interviews.

2.4 Make them offers they'll be unable to reject

Make them offers they'll be unable to reject. Money is a significant motivation for industry professionals to leave their jobs and pursue academic careers, whether full-time or part-time. It also raises a lot of questions. According to Mittal, despite a significant increase in faculty compensation, industry experts continue to have misgivings about being appropriately compensated for their contributions.[21] He suggests assessing potential faculty members' merit and providing them a commensurate package. The remuneration is reasonable at this level. To entice people to transfer from industry to academia. [21]Affordably low UGC-mandated honoraria for visiting academics might also be a turnoff. Following U.G.C. rules is not enough to recruit specialists, according to Karnataka University's experience. As a result, starting this year, the institution will set aside funds to provide such services.

2.5 Demonstrate to them what they stand to gain

The deficiency of attraction and enthusiasm connected with learning is another typical barrier for industry professionals to enter higher education. Go-getters look for industrial jobs because they believe they will provide them with challenges and new experiences, and ample compensation if they do well. Demonstrating your dedication to research can help you land a faculty job and recruit industry talent. Individuals with academic interests generally desire to contribute to the current body of knowledge by doing cutting-edge research. In reality, it works in both directions. A research-based approach mindset is among the most popular crucial traits to aspect aimed at in a potential professor today because the information is no longer viewed as static. The quantity and quality of research conducted by a university improve its reputation and interests brilliant students. Making a caring atmosphere

Attracting industry talent requires an atmosphere in which recruits may reach their full potential. Mittal believes that providing vital Infrastructure and research facilities focused on physical and information technology will interest professionals with practical experience. It is also critical to invest in faculty development. Institutes offer regular F.D.P.

2.6 Make use of technology to connect with professionals.

Instructors may now teach any course from a distance, including across borders, without wasting time on travel thanks to information and communication technology (I.C.T.). Nonetheless, Dr. Chiplunkar feels that modern I.C.T. technology is best suited to enhance rather than replace

traditional classroom instruction. The University of Calcutta puts together an online system with a central hub to service its whole faculty. Thenovelapparatus will increase the number of possibilities for resource individuals to join the team. The nearby industrial employees are restricted because most big businesses are based in the north or west of the country. However, bringing in guest speakers from other areas of the country might be costly. We will be able to invite such specialists via web-conferencing without paying hefty fees[.21] The guest speaker can use the internet conference rooms that most organizations now have. If necessary, invitees get authorization from their bosses to give guest lectures and habit the company's web-conferencing system. In terms of collaborative Inputs, using technology for video lectures or tale presence may occasionally outperform live classes, especially if you have many campuses

3. CONCLUSION

Higher education in India has grown-up at a remarkable speed in the six decades since independence, but it is not equally available to all. In India, there is a essential to expand the amount of colleges and the excellence of higher education. To meet and exceed future demands, it is critical to revisit financial resources, workforce development, quality requirements, applicability, technology, and, lastly, responsiveness.

To make India's educational system more internationally relevant and competitive, new and transformative approaches must be used from primary to higher education levels. The quality and status of higher education institutions must be improved. Colleges and universities should have a decent infrastructure to attract students. For improved quality and collaborative research, The government should encourage cooperation among Indian higher education institutions and top foreign institutes, as well as establish linkages among national research laboratories and research centres at top institutions. There is a need to concentrate on graduate students by offering them courses in which they may succeed. And develop a better understanding of the topic to find jobs after being hired by firms, reducing the need for an unneeded rush to higher education. Preferential treatment, profit processes, and other such things should be eliminated from the educational system. Higher education should take an interdisciplinary approach so that students' knowledge is not limited to their particular topics.

However, worldwide competitiveness, changing global circumstances, job market demands, and the introduction of new technologies provide problems that need a review of current curricula and their future relevance. As a result, there is a pressing need to relocate higher education institutions, technical teachers, and Update and develop curriculum to increase 21st-century abilities for other professions and colleges.

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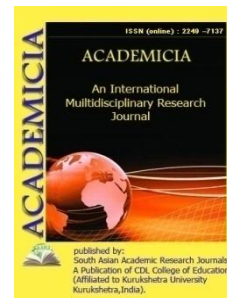
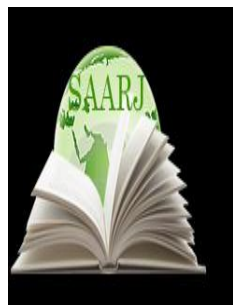
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REFERENCES

1. Dr.S.PavaiMadheswari a, Dr.S.D. Uma Mageswari b a "9th World Engineering Education Forum 2019, WEEF 2019 Changing Paradigms of Engineering Education – An Indian Perspective" R.M.K. Engineering College Thiruvallur district-601 206, India, b R.M.K. Engineering College Thiruvallur district-601 206, India, Available online at www.sciencedirect.com Procedia Computer Science 172 (2020) 215–224.

2. Handbook On Technical Teacher Training Modules.
3. An Introduction <http://naac.gov.in/index.php/resources#books>.
4. The Importance of Technical Education for the Development of Society, December 2015, Acta Technologica Dubnicae 5(3), DOI: [10.1515/and-2015-0070](https://doi.org/10.1515/and-2015-0070), License [CC BY-NC-ND 3.0](https://creativecommons.org/licenses/by-nc-nd/3.0/).
5. Acherjee and Kumar, 2016, Dr.BappaAcherjee and Prof. Ashutosh Kumar, Department of Production Engineering and Department of Mechanical Engineering, Birla Institute of Technology, <https://www.thehighereducationreview.com/magazine/higher-professional-education-in-india-a-critical-review-WQSS724597993.html>.
6. Dr. Tarananum, Dr. Mohammad JunaidAlam, Dr. MridulDharwal, Dr. Rupendra Prakash Yadav, "Economics Of Faculty Crunch In Higher Education In India: A Qualitative & Quantitative Paradigm", International Journal of Advanced Science and Technology, Vol. 29, No. 6s, (2020), pp. 2753 – 2761, ISSN: 2005 -4238 IJAST.
7. Younis Ah mad Sheikh (2017), "Higher Education in India: Challenges and Opportunities", ISSN 2222- 288X (Online), Vol.8, No.1, 2017 - 1735 (Paper).
8. SantoshiSen Gupta, Aarti Sharma, AlokGoel&MridulDharwal (September 2019), "Different people, different strokes: comparison of job and personal resources across diverse employee demography in the shipping industry", published in Jo urnal of Maritime Affairs, Special Issue.
9. Sweta Bhattacharya (July 2015), "A Study on the Higher Education System in India and Factors Affecting the Choice of Teaching Career in I.T. Education", published in Mediterranean Journal of Social Sciences MCSER Publishing, Rome Italy, Vol.6 No 4 S1, ISSN 2039 -2117 (online) ISSN 2039-9340 (print).
10. Shaguri, Obadya Ray, Higher Education in India Access, Equity, Quality, EAN World Congress Scholar, Global Access to Postsecondary education, 2013.
11. Nexus Novus, Higher Education Opportunities in India, <http://nexusnovus.com/higher-educationopportunities-india>, Jul 26, 2013 accessed on 30/07/2016.
12. Hannon, V. and Peterson A (2017), Thrive: Schools Reinvented for the real challenges we face, Innovation Unit Press, London, http://www.innovationunit.org/wp-content/uploads/2017/04/Thrive_Preface.pdf (accessed on 15 December 2017).
13. James, M. et al. (eds.) (2011), The Framework for the National Curriculum: A Report by the Expert Panel for the National Curriculum Review, Department for Education, U.K., https://www.researchgate.net/publication/258423191_The_Framework_for_the_National_Curriculum_A_Report_by_the_Expert_Panel_for_the_National_Curriculum_Review (accessed on 18 December 2017).
14. Cunha, F., J. Heckman and S. Schennach (2010), "Estimating the Technology of Cognitive and Noncognitive Skill Formation", Discussion Paper Series, No. 4702, I.Z.A., Bonn, <http://ftp.iza.org/dp4702.pdf> (accessed on 18 December 2017).

15. A Skilled Workforce for Strong, Sustainable and Balanced Growth: A G20 Training Strategy International Labour Office – Geneva, 2010 ISBN 978-92-2-124277-2 (print) ISBN 978-92-2-124278-9 (Web pdf)
16. Foray, D. and J. Raffo (2012), "Business-Driven Innovation: Is it Making a Difference in Education?: An Analysis of Educational Patents", OECD Education Working Papers, No. 84, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5k91dl7pc835-en>
17. James, M. et al. (eds.) (2011), The Framework for the National Curriculum: A Report by the Expert Panel for the National Curriculum Review, Department for Education, U.K., https://www.researchgate.net/publication/258423191_The_Framework_for_the_National_Curriculum_A_Report_by_the_Expert_Panel_for_the_National_Curriculum_Review (accessed on 18 December 2017). Kautz, T. et al. (2014), "Fostering and Measuring Skills: Improving Cognitive and Non-Cogni
18. National Education Policy 2020
19. The National Skill Development policy in India 2009
20. Ministry of Micro, Small & Medium Enterprises, (An ISO 9001 : 2008 Certified Organisation), Udyog Bhawan, New Delhi - 110011.
21. Santoshi Sengupta, Aarti Sharma, Alok Kumar Goel, Mridul Dharwal, "Different people, different strokes: comparison of job and personal resources across diverse employee demography in the shipping industry", September 2019, W.M.U. Journal of Maritime Affairs 18(3), DOI: [10.1007/s13437-019-00177-9](https://doi.org/10.1007/s13437-019-00177-9)



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AN OVERVIEW OF CYBER-CRIMES AND ITS IMPACT ON ECONOMY UVAYSI'S ROLE IN EPIC WRITING

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ABSTRACT

The article is dedicated to the epics "Prince Hasan" and "Vokeoti Muhammadalikhan" by the famous Uzbek poet Jahonotin Uvaysi. Their place in Uzbek literature is defined. There is provided information about the literary environment of Kokand and the history, genesis and methods of artistic expression of "Karbalonoma epics" in Eastern literature. The role of Uvaysi's work in the development of epic poetry is discussed.

KEYWORDS: *Karbalonoma, Tradition, Plot, Vazn, Manoqib, Mysticism, Epic, Praise, Na't, Sulh, Narration.*

INTRODUCTION

Epic is the largest and most perfect genre in our classical literature. Creating it requires a unique artistic preparation from the creator. For this reason, the poet's maturity in poetry is also determined by his skill in epic writing.

It is known that Uzbek epic poetry developed under the influence of folk epics and traditions of epic writing in the classical literature of the East. "Representatives of the school of epic poetry of the XVIII-XIX centuries took an innovative approach to epic poetry. They enriched it thematically and ideologically. They made new discoveries in plot and compositional construction"[E. Ibrohimova, 1986, 18]. Some poets of this period (Nishoti, Hazikh, Uvaysi) took plots that were popular in all-Oriental literature, introduced into them the spirit of the period in which they lived [A. Qayumov, 1961, 357], and on this basis created their own epics. Such a tradition has existed and continued in the literature of the peoples of the East for many centuries. In particular, the epics included in "Khamsa" are very different in terms of artistic spirit and

ideological interpretation, but in terms of plot they are close to each other. The stories of Yusuf and Zulaikha, Ibrahim Adham have also been the basis for many works of art for centuries as such traveling plots.

The stories and narrations about the fate of the grandsons of the Prophet Muhammad (s.a.w), the children of Ali and Bibi Fatima, Prince Hasan and Hussein, were also the basis for the creation of many works of art.

Epics on this subject are called "Karbala-nomalar"¹ in our literature. There are many copies of them in Eastern literature, both in prose and poetry. Some have known authors, some have unknown authors, and some have been written in the form of folk books. Fuzuli's prose work "Hadiqat us-suado" is also written on this topic. The most complete and famous of such sources is the work of Hussein WazKashifi (1440-1505, Herat) "Ravzat ush-shuhado". It is dedicated to the history of Islam and our Prophet Muhammad (s.a.w). These pages of history tell the story of the martyrs who sacrificed their lives in defense of the honor, faith and justice of Muslims. In the play, the narrations received through the Qur'an, hadith and various other famous sacred words are retold in an impressive style, artistically. Kashifi's work has been translated from Persian into Uzbek several times. Among them are the prose translation of Muhammad AyubKashgari "Tazkirayianbiyovaavliyovashuhado" (XVIII century, Kashgar), the poetic translation by Sabir SaykhaliHisari (XVIII century, Hesar).

Especially in the XVIII-XIX centuries, the creation of works in this direction became widespread. by KholisTashkendi's "QissaiKarbalo (The Story of Karbala)", "Qissai Imam Hasan and Imam Hussein", "Qiyomatnoma", "Musibatnoma" works; Bibi Hajar's Qissai Imam Hussein; Nisa's "Death of Imam Hasan and Imam Hussein"; Hani's "VoqeaihoilaiKarbaloypurbalo" is a unique example. Works based on this plot have been created by artists such as Khasta, Kul Suleiman, Kazakh poet JusipbekShaykhul Islam oglu.

JahonotinUvaysi, a prominent representative of the Uzbek literature of the XVIII-XIX centuries, is a poet who was able to demonstrate his skills in more than a dozen active lyrical genres. At the same time, he was able to prove that his talent in epic poetry did not lag behind his lyrical skills. Three epics of the poet have come down to us: "Shahzoda Hasan", "ShahzodaHusayn" and "VoqeotiMuhammadalikhan".

Manuscripts and lithographs of the poet's works dedicated to Prince Hassan and Prince Hussein do not contain the names of epics by the author. This is why there is so much diversity in the literature on this subject. The poet's works are variously called "KitobiUvaysiy", "Karbala-noma", "Qissaipurgussa". Literary scholar E. Ibrahimova suggests naming it "Epic about Prince Hasan", "Epic about Prince Hussein" [E. Ibrohimova, 1960, 38-44].

Methods

One example of epic poetry of the first half of the 19th century is Uvaysi's epic about Prince Hasan. In the play, the poet created the image of a just and peaceful ruler Hasan. The main essence of the epic is to promote goodness and justice. It is well known that Islam is a religion that is mainly engaged in the propagation of goodness and perfect morality. Therefore, such ideas are predominant in the works about "princes".

"Prince Hasan" is devoted to a religious theme. It describes the life of Imam Hasan. However, this is not the only purpose of the poet from the work. In it, as in his poetry, the main intention of

the poet was to open the eyes of his contemporaries, to reflect on them with the lessons learned from the poem. The main idea of the work is embodied in the image of Hasan. The poet has two sides to the emblem for artistic purposes. The first is to illuminate the character system as a king, and the second is to describe his image as an ordinary man, a person.

The poet was able to perfectly illuminate the biography of the main character in both directions. In the play, we can imagine him as a man of all-round character. In one place, Hasan's character as a person is described as follows:

Xushxo'yluqikitobasig'mas,
 Shirin so'zinikixalqbilmas.
 Ham erdimalihu, ham fasihdur,
 Yeryuzidago'yiyoMasihdur [QissaiImom Hasan,1837,201].
 (Kindness does not fit in the book,
 The people do not know sweet words.
 He was both a malihu and a fasih,
 He is the Messiah on earth.)

This epic was written at the end of a single copy of the poet's office No. 1837, kept in the manuscript fund of the Institute of Oriental Studies named after Abu RayhanBeruni. The Poet's Office ends on page 187 of the manuscript. It is acknowledged that the date of its compilation was 1274 AH, 1857 AD, and its secretary was MuhammadShahYunus Khan ibn EshanhojaEshan:

“RaqamqildiMuhammadshohYunusxon
 Ki, nurichashmEshonxojaEshon.
 - 1274/1857 ”
 (Muhammad Shah Yunuskhan accounted,
 That light of eyes EshonkhojaEshan)

After a blank page, page 189 is turned and the epic "Qissai Imam Hasan" begins. The title of the epic is written in pencil, not by the secretary, but by the pager. Beginning on page 190, the main text of the work begins with a basmala. The work is clearly, beautifully, literally copied. There are almost no entries in the borders. Only in some places are some spelling errors corrected in the margins. On page "A" there is a race. However, on page B, this is not the case. Each page contains 17 bytes, only 13 bytes on page 1 (page 190) and 15 bytes on page 2 (page 191).

RESULTS AND DISCUSSION

The volume of the epic is 1450 lines, 725 bytes. It begins with 26 lines of praise and 20 lines of naat. Chahoryors are then described in 48 verses. Then begins the description of events related to the main plot of the epic. Initially, the birth dates of Imam Hassan and Hussein, the process of choosing a name, are skillfully described at the level of a dramatic scene.

Uvaysi emphasizes that the epic was written on the basis of manoqibs:

Ko'bdurkimanogibichrabuso'z,

Gar ummatesangeshattikibko'z[QissaiImom Hasan,1837,197]..

(This word is in the manaqib,

If you are an ummah, listen and look.)

As the poet points out, information about the lives of Imam Hasan and Husseyn has come through many manaqibs. Interesting stories about their complex, arduous, and glorious ways of life are prevalent among the people. For this reason, many works of art in the prose and poetry path on which they are based have been created. Although historical events were the basis for the birth of information about them, they cannot be accepted in a purely historical, scientific aspect. Because they were reworked by the creators. In showing his contemporaries how not to lose himself in the face of life's hardships and shortcomings, and how to overcome them with courage and skill, the brothers described the lives of imams as role models and lessons.

As mentioned above, the creation of this type of epics was influenced by Kashifi or Sabir Saikali epics, which were widespread in Central Asia. But when we compare these epics, we see that Uvaysi's works have many places that differ from them. This shows that the epics created by the poet are original works, in which the creative skills are fully reflected:

1. First of all, they are created in different weights. The work of Sabir Saikali (1793-1796) is written in the purpose of the Hazajimusammanimaksur (V - - -/ V - - -/ V - - -/ V--), as for the epic of Uvaysi, it is written in Hazajimusaddasiahrabimakbuzimakhzuf (- - V/ V - V - / V - -).

2. The events described in Prince Hasan in the Saikali epic are shorter than in Uvaysi's work. In Uvaysi, the legends about the life of Prince Hasan are more numerous and the events are described in more detail. In particular, the work begins with the narrations about the birth of Hasan and the choice of a name for him. In Saikali, however, the events began a little later, with the death of his father, Hazrat Ali, and the replacement of Prince Hasan as the ruler of Kufa.

3. In Saikali's epic, Hasan goes to Mawsil, to the friend's house, where he is poisoned 3 times; then 3 cases of poisoning and death by his wife, the punishment of his wife is described. Uvaysi narrates in detail that Hasan was the ruler, Muawiya, the ruler of Damascus, attacked Kufa with 60,000 troops, and Hasan went against him with 40,000 troops. The poet emphasizes that Hasan was a supporter of peace. Without thinking of his own glory, he prioritizes that the blood of the people should not be shed in vain. In this connection, the poet describes the prince's beautiful character, his perfect morals. Hasan creates an example for his contemporaries in the language:

“El sudiniistagumshabiro'z,

Bu so'znideyman shahi dilafro'z.

Oldimdabuelsalomato'lg'ay,

Yo'qxohishimo'lsaelparishon,

To bo'lmasafitna, bo'lsaimkon.

Gar fitnalig'sulhbehroq,

Har vaqtdeganImomiofoq[QissaiImom Hasan,1837,204]”.

These images, in a sense, connect the events of the work with the time of the poet. It shows his attitude to the struggle for the throne, for the state, in the social process. It is obvious that he puts peace, tranquility and health in the forefront.

4. In Saikali, Hasan's wife is called Asma. In Uvaysi it is called Juda (She describes Asma as described as the nanny of princes). While Saikali describes Asma's severe punishment, Uvaysi does not cover the process. In the poet's epic, the story ends by describing Hali's conversation with Juda after her poisoning. Hassan's death is also not described. When reading the end of the epic, the question arises as to whether this work was not completed at first. But we conclude that Uvaysi preferred to conclude the epic in this way, leaving it to the reader to conclude and learn from it in a manner peculiar to the poet's style. After the epic in the manuscript, another work of the poet, "The story of Muhammadalikhan" is quoted, which indicates the end of "Prince Hasan".

In the Uvaysi epic, several narrations related to the life of the princes are narrated. Initially, their disappearance is narrated. The poet notes that this narration was narrated by Ibn Abbas. Ibn Abbas was one of the great Companions, the teacher of the Makkah school of the three schools of tafsir. He then pays special attention to the martyrdom of Hazrat Ali and the enthronement of Prince Hasan on the throne of Kufa, and the use of this to draw the army of Muawiya, the governor of Damascus, who was in constant conflict. Apparently, Uvaysi narrates the narrations with certainty from authentic sources, in relation to specific individuals.

The composition of the epic is unique. As the main plot is told, lyrical digressions are given. They are sometimes told in the language of the poet, and sometimes in the language of the protagonist - Hasan. Then, in the style of folk epics, the narrator is addressed and returns to the leading plot:

“Roviyqalamingnitezyuritgil,
Xunobaijigardinonchayutgil...[QissaiImom Hasan,1837,212].

Or:

“Roviyyanaso'zboshig'akelg'il,
Shahzodakaromatiniayg'il...[QissaiImom Hasan,1837,210]”.

Lyrical retreats play an important role in the epic. They serve both to enrich the plot of the work and to serve as a lyrical relation. It is as if the poet connects the events with his time. It shows them the attitude of the poet.

Lyrical retreats are given in a variety of genres and forms. There are ghazal, masnavi, fard appearances. The individual genre is used in one place. It is written in the healthy weight of the hazajimusammanisolim(mafoiylun-mafoiylun-mafoiylun-mafoiylun; V - - - V - - - V - - - V - - -).

Even after the lyrical retreats in the ghazal genre, the thoughts are directly linked to the plot of the epic:

“Ammodedilarkiholtilida
Kechdikibubaytpokdilida:
“Vafoko'ztutmag'ileldinkiolaminvafosiyo'q,
G'aribo'lmaynetarya'nikishi gar asnosiyo'q.

Tutubhurmatkanora, elarosidinvafochetti,
 Bu kunuzgilko'ngilharikkisidinkimbaqosiyo'q.
 Nazarsolsangagarchandekibuyolg'onchiolamg'a,
 Aningjuzdardiranjimehnatjavrijafosiyo'q"[QissaiImom Hasan,1837,207]"

This lyrical retreat is created in the ghazal genre. It is written in the healthy weight of the hazajimusammanisolim. It is not in vain that the ghazal is given in the language of the protagonist. This weight plays an important role in conveying the pain and suffering in Hasan's heart. The protagonist's philosophical thoughts about the universe and man also have a universal meaning.

In some places a lyrical retreat is also given from the poet's language. In particular, the lyrical retreats given after the events of 3 times given by his friend that he was not affected by the poison, his friend's letter to Sham to Muawiya, and the man who took him to be eaten by a wolf on the way are given in the poet's language. He draws a generalized conclusion, a lesson, from the relationship between Hasan and his friend and its consequences. It serves as an example and guide for people at all times:

Gar qilsasitamkishikishig'a,
 Go'yositamaylamisho'zig'a[QissaiImom Hasan,1837,209].

(Translation: If a person oppresses someone,

It's as if the oppression is self-inflicted.)

Here the lyrical retreat given from the poet's language is the same as the weight of the epic. The use of different weights in the epic served to reveal the general rhythm of the work, the mood and processes in it. The weights and genres used are not random. Perhaps they were all used for a specific purpose. The author has played an important role in shedding light on his views.

It is known that in Uzbek classical literature, epics are written mainly in 7 weights. "The weight of the hazajimusaddasimahzuf, which is widely used in epic poetry, is the weight" [D. Yusugova, 2011,98]. However, when Uvaysi chooses the weight for his epic, we see that it comes from the content of the work. In this regard, the poet-teacher follows the path of the poet Navoi. We know that the epic "Layli and Majnun" is tragic in terms of plot. For this reason, it is written in the weight of hazajimusaddasiahrahimbuzimahzuf(maf'ulu - mafoilun - fauvlun; - - V V - V - V - -), which is convenient for expressing the sad state of mind. Taking into account the sad and tragic ending of the plot in this epic, Uvaysi also creates it in the weight of "Layli and Majnun", that is, in the mahzuf of the last syllable of the hazajimusaddasiahrahimbuzimahzuf. In some places, he uses other variations of hazaj in order to express different moods.

In addition to the use of the style and composition of folk epics in the creation of the epic, the poet also uses folk proverbs:

"Chahqozsakishikishig'a, eyyor,
 O'ziyiqilur",-deganmasalbor"[QissaiImom Hasan,1837,212].
 (If a man digs a well,

he himself will fall)

As the poet describes the symbols and events in the epic, it is felt that he approached each of them from a unique point of view, from a different point of view. In particular, Prince uses the traditional style of classical literature when describing the image of Imam Hasan. Drawings on his image are represented by traditional metaphors, comparisons and means of artistic representation:

“Keldilarimomishahsuvori,
Kunxiraetardiguluzori.
Qulerdisanubar ul xiroma,
Abro’sig’achokerdixoma.
Maherdiqoshida soya yanglig’,
Lab olidala’lsangixorayanglig’.
Zulfinqoshidaxaserdisunbul,
Lafziolida gung erdibulbul”[QissaiImom Hasan,1837,214].

But this is not the case in the description of the main events in the plot. The poet seems to have avoided the use of the silent, artistic allusions of the word. In our opinion, the author has taken such a path in order to convey the plot to the reader in a clear and understandable way.

In literary criticism, Uvaysi's epics are evaluated differently. Some studies also suggest that poetic epics are shallower in terms of artistic skill than poetry. However, all of these criteria are, to a certain extent, balanced by Oybek's conclusions. It clarifies our understanding of her work: “However, I do not think it is true to say that the poet's epics are inferior to his poems. The poet's epics Hasan and Hussein are highly artistic epics written with great skill. There is a lot of religious mood, but the poetess created these works with her heart because she has sincere feelings, tender feelings and deep feelings” [Oybek, XIII tom, 1989, 402] When we studied the epic, we witnessed that Oybek's views were not unfounded. Perhaps, due to the demands of the time, its creation on the basis of religious stories may have led to such an assessment. However, if we look at the work in terms of plot, composition, artistic design, content and ideology, we can see that it is a work that can meet the high requirements of art. The above-mentioned examples show the poet's fluent language, unique artistic means of expression, and a pleasant folk style.

The events of the epic end in a tragic mood. It is as if with Hasan's death, evil seems to have triumphed over good. But Uvaysi used the epic, which was based on a historical event, to express his views on goodness. From the poet's point of view, goodness always wins. His victory is in eternal stability, in eternity. Evil is always defeated. His defeat lies in being exposed by goodness. In the boundless hatred of the people for him. Uvaysi was able to convey these views to the reader with his skill. Therefore, at the end of the epic, we feel a growing sense of confidence in the eternal triumph of goodness in our hearts, despite the death of Prince Hassan. This is a product of the poet's skill.

The epic "VokeotiMuhammadalikhan"was also copied along with Uvaysi Devon. He arrived unfinished. It is kept at the Institute of Oriental Studies under inventory number 1837. The text of this epic consists of 14 pages in the manuscript (pp. 233-246). Each page has 22 lines of text.

So, the part of the epic that has come down to us is 208 lines, 104 bytes. The first bytes of the work consist of praise and notes (). Then Muhammadalikhan talks about his lineage. Some important points in the biography are remembered. The reasons for sitting on the throne are mentioned. Finally, attention is drawn to the main event that led to the writing of the epic - the Kashgar invasion. It is not divided into chapters.

There are several characters in the epic. Their nature, especially the character of Muhammadalikhan, is vividly expressed. In his style, the peculiarities of folk epics stand out.

But the epic does not end. This is probably due to the defeat of Muhammadalikhan in this war. Hakimkhan Tura's historical work "Muntahabut-tavorikh" gives detailed information about this march: "They immediately took control of Kashgar province, and the next day surrounded Gulbog fortress like a ring, and began the siege and war. Days later, the siege was extended to three months. With no action was it possible to capture the Gulbog fortress. Without choice, he evacuated several thousand people and returned to Hokand with their heads bowed" [Муҳаммадҳақимхон тўра, 2010,629].

Is'hakhonJunaydullahojaogluIbrat's "Farg'onata'rifi(History of Fergana)" (1916) also contains some important information about Muhammadalikhan and his history. In particular, the historian comments on the war of conquest in Kashgar: he did not achieve the nickname of Gazi without fighting. In fact, Amir Timur's grandson did not achieve the title of a ghazi, but in sermons and verses he was described as a master, but they did not call him a ghazi [Ibrat, 1991, 292].

In Hakimkhan Tora's work, it is said that Khan began to march to the Gulbog district of Kashgar, and in Ibrat's "History of Fergana" this situation is further clarified. In other words, IsobekMehtar and Buzrukkhan Tora, who were expelled from Kokand by Muhammadalikhan in 1832, merged and occupied the Gulbog district under Chinese rule. In our view, because of their conflict with them, the khan organized a march against them. But, as mentioned above, it ended in defeat: "O'ninchiyili (Muhammadalixonhukmronligining, ya'ni 1832 yil) Isobekmehtar ham qochib, Koshg'arboribdur. Buzruksonto' railanbirgalashib Xitoynimahkumidagi Gulbog'nimuhosaraqilibdurlar (Translation: In the tenth year (of Muhammadalikhan's reign, i.e. 1832) IsobekMehtar also fled and went to Kashgar. Joining with Buzrukkhan Tora, they invaded Gulbog, the district of China)"[Ibrat, 1991, 296].

It seems that such information in these historical works, to a certain extent, serves to enrich our understanding of the reason for the writing of Uvaysi's epic "VokeotiMuhammadalikhan (The Story of Muhammadalikhan)", its history and the reasons for its incompleteness.

CONCLUSIONS

As a result of studying the evolution of genres in Uvaysi's creative heritage, we came to the following conclusions:

Each genre in the poetry of the poet, the history of its perfection, the special study of its peculiar new aspects, is extremely relevant. Because the interpretation of this heritage in this context provides an opportunity to find solutions not only to Uvaysi, but also to many genre-related problems of Uzbek classical literature.

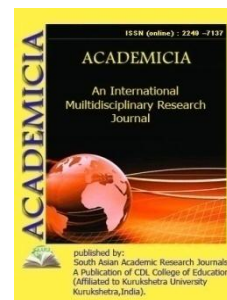
Uvaysi was able to show his unique talent in epic writing with three epics he created during his creative activity. In the works of the poet, we witness the embodiment of the traditions of classical poetry of the East and the style of expression typical of folk epics.

The author's epic "Qissai Imam Hasan" differs from other epics on this topic by many peculiarities. The principles of the poet's weight selection and use of artistic means are reflected in the poem.

The epic is of great importance for us today with its work that promotes the ideas of universal morality, such as purification of heart, living with the grief of the people, kindness, generosity, forgiveness, devotion. Thus, a comprehensive study of Uvaysi's work allows us to conquer many unexplored frontiers not only of the poet, but also of Uzbek classical literature. It leads us to the comprehensive, deep thinking world of our ancestors.

REFERENCES:

1. A. Kayumov. Kokand literary environment. Tashkent, 1961, 357
2. Literary types and genres. 3 volumes. Volume 2 Lyrics. T.: Fan, 1992.
3. Э. Иброҳимова, М. Мирзаев. Compositional features of the poem. Literary heritage. A collection of scientific works. T.: 1986, 1 (35), 18-b.
4. Э. Ибрагимова. About the stories of Uvaysi. Journal of Uzbek Language and Literature, 1960, No. 6, pages 38-44. R. Orzibekov. Lirikada kichik janrlar. T.: Fan, 1976.
5. D. Quronov va boshq. Adabiyotshunoslik lug'ati. T.: Akademnashr, 2013.
6. Мухаммадҳакимхон тўра. Мунтахаб ат-таворих. Т.: Янги аср авлоди, 2010, 629.
7. Ибрат. Фарғона тарихи/ "Мерос" туркуми. Т.: Камалак, 1992.
8. Shayx Ahmad Taroziy. Funun ul - balog'a. T.: Xazina, 1996.
9. Uvaysiy. Devon. T.: Fan, 1963.
10. Rumi Jaloliddin. Uchmoqqa qanot yo'q (J. Kamol tarj.). T.: Adabiyot va san'at, 1994.
11. To'laganova U. Ritm – asar jozibasi. "Jahon adabiyoti" jurnali, 2004, sentyabr.
12. Serikova L.N. Struktura i spetsifika farda Alishera Navoi. V kn.: Малые формы лирики Alishera Navoi. T.: Nauka, 1981.
13. Jalolov T. O'zbek shoiralari. T.: Fan, 1980.
14. Rumi Jaloliddin. Masnaviy hikoyalariga sharhlar. T.: Muharrir, 2011.
15. Д. Куронов ва бошқ. Адабиётшунослик луғати. Т.: Академнашр, 2013.
16. Қиссаи Имом Ҳасан. Ўзбекистон ФА Абу Райхон Беруний номидаги Шарқшунослик институти қўлёзмалар фонди. Инв. рақам 1837/1.



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THE STRUCTURAL MODEL OF METHODOLOGICAL TRAINING OF TEACHER IN TEACHING BIOLOGICAL SCIENCES

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ABSTRACT

The article deals with the composing of methodological modes of methodological training of biology teachers, including methodological, scientific-theoretical, peredmetical blocks. The model is a number of parameters: the requirements, knowledge, skills and qualities to the specialist, social and psychological qualities, take into account the effectiveness of methodological activities.

KEYWORDS: *Biology, Content, Methodical, Model, Pedagogical, Student, Methodist.*

INTRODUCTION

Methods of teaching biology in higher educational institutions are carried out within the structure of specially organized educational training of students. Elements of this structure are the goals of education, achieving them in the course of training of students. In addition, it includes the system of training courses, school, internship, course, and graduate work, the sequence, time and volume of study is determined in the curriculum. Each of them includes a certain content, as well as in certain organizational forms. The element of this structure is the system of monitoring the learning of educational content.

Literature review. The final result of methodological training in higher education institutions is the fact that graduates are prepared for teaching biology. To date, there are no objective criteria that characterize the level of methodological training of graduates.

According to experts, in general, higher education institutions can be considered satisfactory in the preparation of future biology teachers. However, methodological training in the sorting of various components of future biology teachers took the next place after science and psychological-pedagogical training.

Scientific novelty of the article. The main objections to methodological training sessions are not to know the insufficient knowledge of practical learning techniques and does not know certain normative documents on the organization of the educational process. Professional culture and professional knowledge occupies a unique position.

The components of professional culture are divided among the following: professional biological knowledge - the foundations of biological sciences, professional skills, tasks, content, personal features of professional significance, professionalistic features of professional activities - a person-oriented description Setting the desired target in the ability to design pedagogical activities and the educational process. Methodists point out that the school biology course is insufficient in terms of the content of the school and is not possible to design a lesson training material, so in the content of the school, they consider focus on the problems of school biology course.

As you can see, evaluation of the results of the professional training of teachers' teachers is primarily done within the framework of a methodological training system. These include: a quality new description of the biological content of the school, enriching the educational process with the ability to design the learning process independently and practical teaching methods.

According to demands, elements that allow methodical training, the elements that allow the teaching process to shape the training process in each student are not disclosed. According to teachers for pedagogical specialties, the main shortcomings of the methodological training of biology teachers are: not aware of the content of school biology, identification of means of achieving school biology, large difficulties in choosing them, organization of them and is notable to equip.

The purpose of the biological teacher in the higher education is to create conditions for students to develop the necessary activities in the successful implementation of practical activities at a modern school. Thus, the contradiction is determined between the two functions of the system of methodological preparation: creating conditions for mastering the methodological experience accumulated and ensuring an advanced study advanced study. In the system of methodological training, the knowledge system, on the one hand, is generalized on the one hand, on the other hand, on the other hand enriched with the news that requires constant understanding.

Analysis and results. The objectives of methodological preparations are primarily concerned with the development of certain types of practical activities. A number of cases in this problem: the combination of theoretical teaching and practical classes, the use of teaching technologies in the system and such similarities can be highlighted.

All changes in the system of the school biological education will show the general trend of the educational process to the reader. Methodological and methodological and teaching of the methodology of the school is aimed at the needs of each student's development.

In higher education, scientific-oriented methodology will be studied, where the main focus will be on biological composition and students are not discussed by its development mechanisms. This direction is reflected in the name "Biology learning methods" being implemented in the system of methodological training. Teaching means activity of the teacher. Therefore, the teaching activity is analyzed, and the student's activities are left out.

The new trends of teaching biology in general secondary education require a new look at biological content related to the discrimination of profile. Great attention is paid to the analysis of biological content in the educational process of students, and most of the time will be divided into this. The formation of these skills takes most of the time of reading. It should be noted that students assess their professional activity by analyzing the activities of teachers.

In some universities, students' choosing special courses will be significantly increased to satisfying their interest in professional and education.

Theoretical analysis of the preparation of biology teachers allowed to develop a systematic design methodological mechanical package of methodological conceptual ideas and principles in the system of methodological training of biology teachers in a continuous education system.

Among the leading ideas in choosing the teaching methodology of the teacher, the following opinions can be highlighted: the future reflects the ability to improve their professional skills. Biological education, focusing on the changing needs of modern schools and societies, offers various options for the preparation of biology teachers. Competition - reflects the use of knowledge obtained in solving methodological problems; Integrative Biology, pedagogy, and intercompasse offers the implementation of the biological training preparation system of teachers' methods of biology teachers.

It is known that the social order defines the requirements for the vocational training of modern biological teachers.

The scientific-theoretical and methodological basis of professional training of future biology teaches is blocks of biological sciences, pedagogy, psychology and methodological methodology. The scientific-theoretical training of methodological training of biology teachers ensures the implementation of the main purpose of methodological education.

A modern training room for the teaching of biology should be from the following components: educational equipment, specialized furniture, technical equipment and functional interior tools.

The holistic methodological system of biology teachers - didactic principles, curricula, curricula, textbooks, textbooks and manuals. Varogging in the preparation of biology teachers can be done through special circles, specialties and additional education.

In addition to the effective structure of teachers of biology, the efficiency of the correctly established classes - methodical research, methodical research, methodical projects, field experience, etc., will increase significantly through similar similarities. It is done with a unified system and stratified teaching.

The set of methodical equipment provides basic knowledge, skills and qualifications of students, the formation of worldview, creative thinking, and forming integral thinking.

Based on the functional work of leading methodist biologists and structure of teaching the educational content, we have developed a structural and functional model of methods of biology.

It is:

- Methodical knowledge;
- Scientific-theoretical knowledge of knowledge;

- Includes science and methods of knowledge.

Methodical block embellishes the problems of the current stage of school biological education reform.

The scientific-theoretical block is systematic knowledge in the field of teaching methods of teaching biology, that is, the basic principles of teaching, teaching, developmental and educational functions, the system of teaching aids, control functions, target determination function.

The subject-methodical block synthesizes knowledge of biological and environmental education and methodological training, and it is aimed at developing the professional composition of the teacher.

The system of multifunctional training of biology teachers determines professional pedagogical activity at various preparatory levels.

The following conditions are set for methodological training of biology teachers:

- Ensuring unity in the interpretation of ecological and biological concepts in the educational process;
- determination of the content of environmental and biological education, theories and concepts;
- Continuity in the study of concepts in the study of all departments of biological sciences;
- Use of a personal, active approach in teaching and educational process.

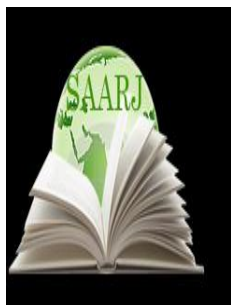
Methodological preparation of biology teacher: determined by motivation, cognitive and activities components. These components have a great impact on the efficiency of the development of teacher's methodological training. These components are used in choosing the content of educational and pedagogical tasks in the methodological training of biology teachers.

CONCLUSION

Thus, the professional methodical training of teachers of biology can be expressed in each stage with a system characterized by a flexible module consisting of blocks and modules that provide certain knowledge.

REFERENCES:

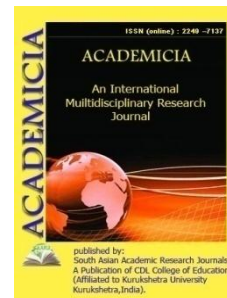
1. Verzilin N.M., Korsunskaya V.M. General methodology for teaching biology. A textbook for ped students. inst. in biology. M.: Education, 1983, -384 p.
2. Zagvyazinsky VI, Atakhanov R. Methodology and methods of psychological and pedagogical research. M., "Asadema", 2001, - 206 p.
3. Karimova M.H. Peculiar aspects of improving the science of biology. Coverage is part of a part-time language. №5. 2020.
4. Karimova M. X. The role of the combination of structural components in the teacher's methodological training system. Public Education. №6. 2021, -35 b.



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INFLUENCE OF SOWING TERMS AND NORMS ON CROTALARIA JUNCAE GRAIN YIELD

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ABSTRACT

The article describes the impact of non-traditional legumes Crotalaria juncea on the optimal sowing time and norms of the number of legumes, the number of grains in legumes, 1000 grain weight and grain yield. It is scientifically substantiated that it is possible to get an additional yield if Crotalaria juncea was sown 10 kg per hectare in early May (1-5.05), the number of legumes would be 15, the number of grains in legumes would be 4.1, the weight of 1000 grains would be 4.9 g compared to the variant sown 20 days earlier and higher to 9 pieces, 2.8 g in proportion to the variant sown 10 days early and as well as it is possible to get the yield at the rate of 5,2-3,8 c/ha when sowing 14 kg of seeds per hectare for a period of 1-5.05 compared to the early sown variants during the same period; 1.9 c/ha compared to the variant planted at 10 kg per hectare; 3.3 c/ha compared to the variant planted at 18 kg for a quality seed crop.

KEYWORDS: *Crotalaria Juncea L., Meadow Alluvial Soil, Planting Time, Norm, Legume, Number Of Grains, 1000 Grain Weight, Yield.*

INTRODUCTION

Rapid population growth in the world, lack of food stocks, long-lasting drought in Australia, rising demand for food in countries such as China and India will require further planting of cereals and legumes. expanding the fodder base requires expanding the type and area of high-calorie fodder as well as food crops to ensure food security and keep it stable.

In order to provide our people with food, address protein shortages, provide livestock with nutritious food and increase soil fertility, it is necessary to increase the number of high-yielding, high-calorie new varieties and kinds of legumes. In exchange for expanding the area under legumes, first of all, it will provide the population with nutritious and high-quality products, and livestock with cervitamine, mineral-rich feed and increase soil fertility. This is one of the legumes.

Extensive research is being conducted in the world on advanced technology for growing non-traditional legumes, especially *Crotalaria juncea*. Taking advantage of the potential of crotalia, relying on the scientific basis of specific cultivation technologies, they produce environmentally friendly grain and hay crops and mature fiber products of species and varieties suitable for soil and climatic conditions, rich in protein and vitamins. At the same time, as a result of research on improving agrotechnologies for the cultivation of high-yielding varieties of crotalia, i.e. correct timing and norms of sowing, optimization of mineral and organic fertilizers and the correct application of crop rotation, restore and increase soil fertility, provide livestock with nutritious feed, quality fiber Scientific research is being carried out on

LITERATURE REVIEW

Foreign scientists as A. Abdul-Baki, H. Bryan, A. Maroyi, G. Baird, C. Cook, Danielle, S. Gumari from, G. Zinati, C. Cook, C. Orwa, G. White, J. Haun, S. Sarkar, S. Hazra and others carried researches on the study of biological and morphological features of non-traditional legume crotalia plants, development of seed, selection and cultivation agro technologies and scientists of our republic M. Aberkulov, A. Kiderbaeva, D. Asilbekova, N. Ulchenko, N. Rakhimova, A. Nigmatulaev, A. Glushenkova fulfilled their scientific works on the issue in question..

Crotalaria juncea L. is a tropical Asian plant of the legume family. The origin of *Crotalaria juncea* is India, where it has been cultivated since the early days of agriculture. It was first reported in Sanskrit literature in 400 BC [11].

In some literatures, [7] the origin of *Crotalaria juncea* is not clear, but it has been cultivated in India since ancient times. According to L. Mannetje [8], this tropical plant came to the West from South Asia in the 19th century.

According to M. Tripathi, B. Chaudhary and others [13], *Crotalaria juncea* L. is a multi-purpose tropical and subtropical legume grown in many countries, especially in India, for high quality fiber. The crop is grown for green manure, to improve the reclamation condition of the soil

According to C.Cook and G.White, L.Purseglove [6; 9], *Crotalaria juncea* is a plant which ecologically cleans the land and biologically controls weed in agriculture.

According to M. Tripathi [13], green biomass production from *Crotalaria juncea* planted in India before the monsoon ranged from 22 to 27 t/ha. In Cuba, 3.4 tons of hay was harvested from two

crops. In Thailand, when rice is grown as green manure, a high quality crop of 2 t/ha is obtained in 6-8 weeks.

Indian scientists R. Ulemale, D. Giri and R. Shivankar [12] studied the effects of planting time, seed size and amount of phosphorus fertilizers on *Crotalaria juncea* yields. Biomass and seed yields were found to be high when 30 cm of furrows were planted early and 75 kg of phosphorus was applied.

In the research of A. Abdul-baki and others [4] *Crotalaria juncea* was harvested 100 days after planting and grown for another 70 days to increase the amount of nitrogen in the soil. Because *Crotalaria juncea* blooms 100 days after planting and begins to collect biomass.

In the experiments of M. Aberkulov and others, [1] it was found that the thicker the *Crotalaria alata* plant, the faster the growth of the plant, but the flowering and ripening periods are delayed by 2-3 days or even 4-5 days. [2] Experiments have also shown that *Crotalaria alata* can be planted as a siderate crop and replaced with cotton or rice to produce a good harvest.

The staff of the Institute of Plant Chemistry of the Academy of Sciences of the Republic of Uzbekistan D. Asilbekova and others [3] studied the chemical composition and nutritional value of *Crotalaria alata*. According to her, the protein content of plants grown in Tashkent was 9.3-13.5%, fat 2.3-3.7%, klechatka 22.5-28.9%, ash 10.4-15.3%.

Based on the analysis of the above literature, it can be said that *crotalaria juncea* is a crop that fully meets the needs of our people and has not been fully studied scientifically, it is important to improve agronomic techniques and introduce the results into production. The analysis of the literature shows that no research has been conducted on agronomic techniques, timing and standards of cultivation of non-traditional legumes – *crotalaria juncea*, which are grown as a main and secondary crop in different soil and climatic conditions of the country. Scientific works abroad have focused on its biology, the physiological processes that take place in it, and its role in increasing soil fertility.

Materials and methods: Research methods were carried out on the basis of the “Methods of State Variety of Agricultural Cultures” (1964, Moscow: Kolos), “Methods of agrochemical analysis of soil and plants” (1977, Tashkent), “Methods of agrophysical research” (1973, Tashkent).

Also, phenological observations, biometric measurements and determination of productivity were carried out on the basis of manuals “Methods of field experiments with grain cultures” (1971), “Methods of conducting field experiments” (UzPITI, 2007).

Field experiments were conducted in the conditions of degraded, saline meadow alluvial soils of Khorezm region. In the experiment, *Crotalaria juncea* was planted in three different periods (10-15.04; 20-15.04; 1-5.05) and three different norms (10; 14; 18 kg/ha) and the effect of sowing time and norms on its growth, development and yield studied.

The obtained results. It is known that the weight of a crop is determined by the quantity and quality of the elements harvested in the crop. In *Crotalaria juncea*, too, grain yield depends on the yield elements formed in the plant, i.e. the number of pods and the weight and quality of the grain in it. In turn, the quality of the harvest elements depends on the timing and rate of sowing the seeds.

The yield of legumes is also related to the number of grains and the weight of the grain. However, the abundance of grain is not always the basis for high yields. This is because only if the weight of the grain is at the level of demand, it will ensure a rich and high quality crop. How full the ripe grain is can be estimated based on the weight of 1000 grains. For this reason, the study of the number of grains in *Crotalaria juncea* legumes and the degree to which grain weight depends on planting dates and norms is of great scientific and practical importance.

In *Crotalaria juncea*, the emergence of both buds, flowers and pods in a single bush during the entire growing season was observed, and the formation of legume was detected in early June. The newly formed pod was light green in size, measuring 0.5-2 x 0.5-1 cm, and contained 6-8 seeds. The legumes are light brown when ripe and 3-4 (6) cm long. In the experiment, it was observed that 18-67 legumes were formed in one bush of *Crotalaria juncea* during the application period. Inside the pods were found grains (seeds) with a diameter of 4-6 mm, up to 6-14 gray-olive, dark gray, dark brown and black. 90% of the seeds ripen in mid-to late October.

To get a high and quality grain crop from *Crotalaria juncea*, it is necessary to correctly determine the timing and rate of planting. This is because when *Crotalaria juncea* is grown at different times, the influence of physiological processes during the formation of grains in the legumes is strong, resulting in the complete formation of some grains and the immaturity of some grains. For this reason, the formation of legumes, the number of legumes, the number of grains in legumes and the weight of 1000 grains were studied when *Crotalaria juncea* was grown at different times and norms.

According to the results of the experiment, in the case of September 1, the number of legumes produced per plant according to the options was 30-52; the number of grains in legumes was 8-13.5 grains, the highest results were observed in the variants of *crotalaria* sown on the 1st of May, the number of grains compared to the variants sown in the early period was 9-15 grains; the number of grains in legumes was found to be 2.6-4.1 grains higher.

The effect of sowing times on the number of grains and legumes was observed significantly. That is, when *Crotalaria juncea* was planted on April 10-15, the number of legumes produced per plant was 30-37, the number of grains per pod was 8-9.4, while the number of legumes planted 20 days later (1-5.05) was 42 -52; the number of grains in legumes was 11.6-13.5 and the number of grains in beans was 9-15 grains and the number of grains in legumes was 3.6-4.1 grains higher than in the early sown variants (Table 1).

TABLE 1 NUMBER OF LEGUMES, NUMBER OF GRAINS IN LEGUMES AND WEIGHT OF 1000 GRAINS IN CROTALARIA PLANTED AT DIFFERENT TIMES AND NORMS (2019)

Versions	Planting time	Planting norm, kg/ha	Number of legumes, pieces	Number of grains in legumes, pieces	Weight of 1000 pieces of grain, gr
1-version	10-15.04	10	37	9,4	36,0
2-version		14	36	9,0	35,3
3- version		18	30	8,0	35,0
4- version	20-25.04	10	43	10,7	38,1
5- version		14	40	10,2	36,6
6- version		18	35	9,0	35,7

7- version	1-5.05	10	52	13,5	40,9
8- version		14	50	13,0	39,5
9- version		18	42	11,6	38,4

The lack of biometric indicators in plants planted in the early period can be explained by the fact that *Crotalaria juncea* is a heat-loving plant and the temperature in these periods was insufficient.

Even when *Crotalaria juncea* was planted at different planting rates, the legumes and number of grains in legumes was studied and when sown at the rate of 10, 14, 18 kg per hectare on May, 1st, the number of legumes was 42-52 and the number of grains in legumes was 11.6-13.5. It was found that the number of grains in legumes and legumes decreased with increasing planting norms and high results were observed in *Crotalaria juncea* in low-planted varieties. It was found that with the increase of the sowing rate from 10 kg to 18 kg, the number of pods decreased by 10 units, and the number of grains in pods decreased by 1.9 units.

After the crop was fully ripe, 1000 grain weights were determined in all variants before harvesting. According to the data obtained, the weight of 1000 grains was 35.0-40.9 g according to the options, and with the early planting of the plant and the increase in the norms, a decrease in the weight of 1000 grains was observed.

The reason for the decrease in biometric indicators with the increase of planting norms is the decrease in nutrient area. This is due to the fact that both when sowing 10 kg per hectare and when sowing 18 kg per hectare, the same amount of mineral fertilizers, water and the same agro-technical measures were carried out.

The main task of agricultural research is to scientifically substantiate the impact of agro-technical measures and external factors on crop yields.

It should be noted that different effects of planting time and norms on plant growth, development, yield, and biometric performance were ultimately reflected in the grain yield of crotals.

Grain yields vary depending on cultivation technology, soil and climatic conditions. 450-900 kg per hectare in South Africa; 555-1000 kg in Colombia; In Hawaii, 1460-2240 kg of grain was harvested [5; 10].

Crotalaria juncea has a grain yield of 9.6-18.8 c/ha when sown at different planting times and rates, with a high yield of *Crotalaria juncea* observed in Option 8 (18.8 c/ha) with 14 kg of seeds per hectare on the 1st of May, at the same rate. 5.2 t/ha compared to variant 2 planted 20 days earlier; 1.9 c/ha compared to option 7, where 10 kg of seeds were sown per hectare; 18 kg of seeds per hectare were sown with an additional yield of 3.3 c/compared to variant 9 (Diagram 1).

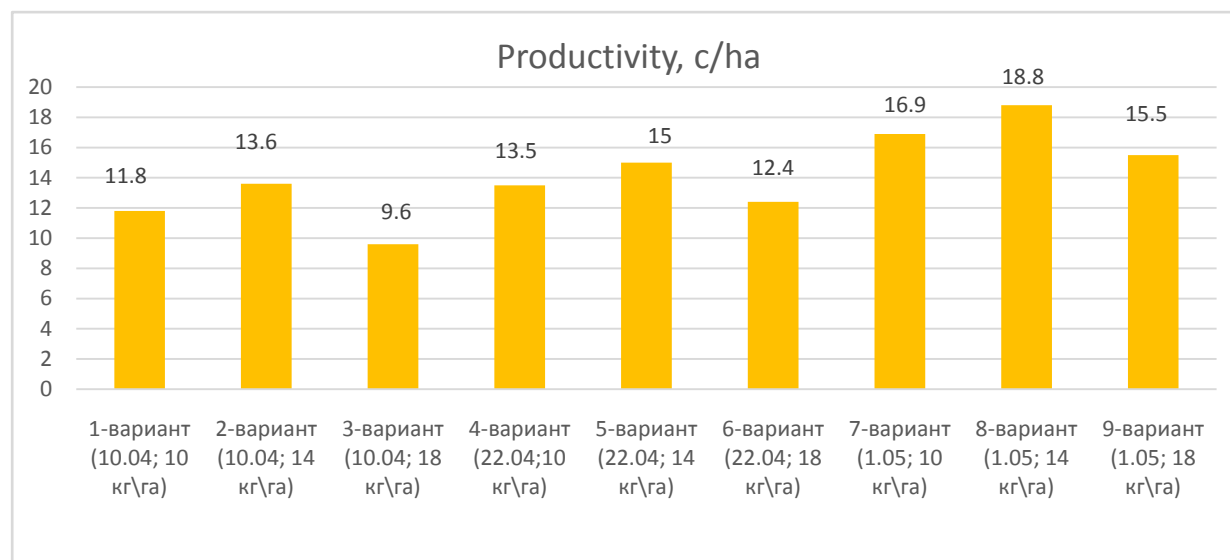


Diagram 1. Influence of sowing dates and norms on grain yield

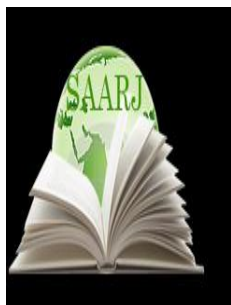
CONCLUSION

So, in the conditions of degraded meadow alluvial soils of Khorezm region, when planting *Crotalaria juncea* plant, sowing 10 kg per hectare in early May (1-5.05) is a guarantee to get a higher grain yield – 14 kg per hectare and high quality seed yield.

REFERENCES

1. Aberkulov M., Nazarov H., Isomiddinov N. Krotalyariya osimligining osish dinamikasini organish. "Kadrlar tayyorlash tizimida – agrar ta'lim, fan va ishlab chiqarish integratsiyasi" – International scientific-practical conference dedicated to the 75th anniversary of the academician A.I. Imomaliyev. - Tashkent, 2006, 177-179 p.
2. Aberkulov M., Kiderbayeva A., Tursuniov Q. Krotalyariya osimligidan siderat sifatida foydalanish imkoniyatlari. Materials of international scientific-practical conference "Sostoyaniye selekcii I semenovodstva khlopchatnika I perspektivy yeyo razvitiya. – Tashkent, 2007, - P. 270-272.
3. Asilbekova D.T., Ulchenko N.T., Rakhimova N.K., Nigmatulaev A.M., Glushenkova A.I. Lipidy semyan *Crotalaria alata* i *Guizotia abyssinica*. Khimiya prirodnkh soyedeneniy. – Tashkent, 2005, №5. – 488-489 p.
4. Abdul-baki, A.A., H.H. Bryan, G.M. Zinati, W. Klassen, M. Codallo, and N. Heckert. Biomass yield and flower production in sunny hemp: Effect of cutting the main stem. J. Veg. Crop Sci. 2001.7:83-104.
5. Baird, G.B., M. Rodriguez, B. Martinez, and P. Sanchez. 1957. *Crotalaria juncea*-a green manure. DIA Boletin de Divulgacion 2. Havana, Cuba.
6. Cook. C.G and White G.A. *Crotalaria juncea*: a potential multi-purpose fiber crop. In J. Janick (ed.), Progress in new crops. ASHS Press, Arlington, VA. 1996. p. 389- 394

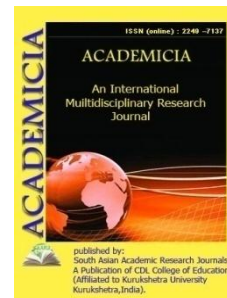
7. Duke J.A. 1983. Handbook of energy crops NewCROP(New Crops Resource Online Program), Purdue Univ. Center for New Crops and Plant Products.
8. Mannerje L.T. *Crotalaria juncea* L. FAO. Accessed 25 June 2012.
9. Purseglove J. W. Tropical crops: Dicotyledons. Longman Group Limited, London. 1974.
10. Rotar, P.P. and Joy R. 'Tropic Sun' sunny hemp, *Crotalaria juncea* L. Univ. of Hawaii, College of Tropical Agr. and Human Resources, Tropical Ag. and a series of 36 studies on human resources. 1983. 7. Pp.
11. Sarkar S. K., Hazra S. K., Sen H. S, Karmakar P. G., Tripathi M.K. Sunnhemp in India. ICAR-Central Research Institute for Jute and Allied Fibres (ICAR), Barrackpore, West Bengal. 2015.
12. Ulemale, R.B., Giri, D.G., and Shivankar, R.S. Effect of sowing date, row spacing and phosphate level on biomass studies in sunn hemp. Journal of Maharashtra Agricultural Universities. 2001. 26 (3): PP. 323-325.
13. Tripathi M. K., Chaudhary B., Sarkar S. K., Singh S. R., Bhandari H. R., Mahapatra B. S. Performance of sunn hemp (*Crotalaria juncea* L.) as a summer season crop for fibre. J. Agric. Sci., 2013. 5 (3): PP. 236-242.
14. UDK:631.548.1



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APPROACHES TO THE DEVELOPMENT OF INCLUSIVE COMPETENCE IN PREPARATION OF FUTURE TEACHERS FOR PROFESSIONAL ACTIVITY

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ABSTRACT

This article addresses one of the most important issues related to the active introduction of inclusive education, the training of teachers to work in an inclusive environment. Professional standard "Teacher (pedagogical activity in the field of preschool, primary, general secondary education) (educator, teacher)" related to pedagogical activity on design and implementation of educational process in preschool, primary, general secondary education generalized labor tasks are described.

KEYWORDS: *Individual Development Of Children, Activities In Inclusive Education, Individual Educational Needs, Professional Training Of Teachers, Competent, Poly-Paradigmatic, Person-Centered, Active, Variable, Acmeological, Axiological, Ontological, Systematic, Anthropological, Incidental, Interdisciplinary, Socio-Cultural, Cultural, Contextual Approaches.*

INTRODUCTION

The needs of inclusive education are also reflected in the professional standard in the form of psychological and pedagogical, including the need to master and use inclusive technologies. This is necessary to work with students with different contingents in a targeted and targeted manner, to develop and develop individualized educational programs for children, to know and understand what individual educational needs are related to.

There is no doubt that the training of teachers who are ready to implement the requirements of the professional standard requires new approaches to the organization of pedagogical training in all areas of vocational education, including in the field of professional development. This is evidenced by the survey conducted on March 24, 2016 at the Southern Federal University

(Rostov-on-Don) as part of the regional forum of principals of inclusive schools. Of the 105 principals surveyed in the Rostov region, 99% answered positively to the question about the need to train young teachers in activities aimed at educating children with disabilities and / or disabilities. Recommended options for such training include: additional education through certification, higher education, professional development courses, vocational retraining, and more.

We focus on higher education as a training of educators to operate in an inclusive education environment in our own interests.

At present, researchers prefer to resort to classical approaches, which allow to consider the process of organizing the professional training of teachers in the context of higher education. Among them, we distinguished competent, poly-paradigmatic, personality-oriented, active, variable, acmeological, axiological, ontological, systemic, anthropological, incidental, interdisciplinary, socio-cultural, cultural, contextual, and others.

The competent approach is currently being studied by scholars not only as the organizational basis of vocational training, but also as a methodological period in the development of the theory of vocational education. This is an “approach that recognizes that learning outcomes are important outside the education system”. It is aimed not only at deepening human knowledge and developing skills, but also at shaping a certain type of behavior, and the knowledge, skills and abilities acquired in it are practical, in our case, pedagogical activity.

A competent approach implies changes in the organization of the educational process in pedagogical education. The essence of the organization of the educational process is to create conditions for students to form an experience of independent solution of various professional tasks and problems that make up the content of education.

A competent approach means “a set of general principles for setting educational goals, choosing the content of education, organizing the educational process and evaluating learning outcomes” [4, p. 3].

According to scientists, “improving the training of university graduates on the basis of a competent approach is impossible without the introduction of innovative technologies that provide professional preparation, optimization of didactic goals and systematization of teaching materials, technologicalization of the pedagogical process in higher education. ... Competences only in the implementation of projects during student activities; when problem information is insufficient and in non-standard learning or real-world situations; it is manifested in the solution of tasks that require a combination of knowledge and experience, as well as the student's behavior and personal and other capabilities.». Thus, the resources of a competent approach in the course of our research define one of the important conceptual directions of designing a model of teacher training in the design of an inclusive educational environment.

In the field of education, there is now a “fully legitimate phenomenon” called polyparadigm. In the author's understanding, it is understood as a process of "historical birth, application and competitiveness of educational paradigms as different options for finding optimal forms of organization of educational processes in transitional cultural periods" [4, p. 49]. The author notes that “in the post-modern reconstruction period, the promotion of conflicting paradigmatic trends and models of education in Russia not only reveals the phenomenon of polyparadigm, but also

the need to build a unified educational environment and develop a common strategy for development. is becoming a process ”[5, p. 57].

Polyparadigmallik I.A. Kolesnikova, G.B. Kornetov, I.B. Nordman, O.G. Prikot, I.G. Fomicheva, E.A. It has been the subject of research by many famous scientists such as Hamburg and others. E.A. At the heart of the typology of pedagogical paradigms proposed by Yamburg is the principle of logical complementarity, arising from the rules of cognitive and private philosophy of education. I.A. Kolesnikova, G.B. Kornetov, O.G. Prikot and other scholars present polyparadigm as a form of coexistence of several methodological systems that form a coherent, complete model of the educational process through pedagogical theories, technologies, teaching and learning. In this regard, I.G. Fomicheva has an interesting idea. He argues that the existing universal paradigm as a single methodological framework can be replaced by many educational systems that have the right to co-exist in a common environment.

We I.B. We agree with Nordman that the main strategy for the development of education today is “the harmonization of educational paradigms”. We therefore view the polyparadigmatic approach as the theoretical basis for the design, organization and implementation of the teaching process in a high school setting.

S.B. According to Begaliev, a person-centered approach can be seen as a complex multidimensional process. According to the author, “the theoretical foundations of a person-centered approach apply to the teaching of students in all educational institutions, including high school”. K. Rodgers's Rules of Humanistic Psychology, L.S. Vygotskiy, P.Ya. Galperin, A.A. The ideas of the Leontevs, E.V. Bondarevskaya, V.V. Serikova, I.S. Yakiman's concept of person-centered learning defined the general idea of a person-centered approach: “The procedural aspect of teaching is expressed in the change in motivation to acquire and apply knowledge in a person-centered environment. That is, the acquired knowledge should allow the student to apply them in practice by expressing their personality. In our opinion, a person-centered approach determines the professional training of teachers in the field of inclusive education to develop the spiritual qualities of the individual, his emotional, aesthetic, creative abilities and potential, which will serve as a basis for the formation of future humanistic pedagogical positions.

The active approach in all its partially transformed forms (project-activity, personal-activity, reflexive-activity, system-activity, etc.) is aimed at organizing the process of professional training of inclusive education teacher in such a way that he is an active subject of learning, work and communication. he understands and implements the set goals, monitors and tracks the process of personal professional development, analyzes and critically evaluates the results of his activities.

The alternative approach is viewed, on the one hand, as an “emergency socio-pedagogical phenomenon manifested in the form of a negative response of society and education to new socio-economic and psychological conditions,” and, on the other hand, is seen as a mechanism for shaping its flexibility and professional mobility.

Acmeological approach, S.P. According to Begaliev, "it implies a new paradigm in improving the training of future professionals." Its use in the organization of the process of professional training of teachers for an inclusive school involves taking into account the important pedagogical conditions of motivation and needs for achieving high results of personal

professional development, striving for creative activity, realization of personal intellectual and creative potential.

The axiological approach is an integral part of the humanistic pedagogical tradition. According to him, man is "the highest value of society and the only goal of social development." Under this approach, the future educator of inclusive education is a holistic individual who is ready to accept students with special educational needs, who belong to a different type of thinking and who have an inclusive pedagogical culture as the owner of valuable qualities. The axiological approach, which is considered as the main goal of our study, is a key link in the set of methodological approaches that determine the characteristics of professional training of teachers in the higher education system.

The ontological approach studies pedagogical processes from the perspective of their participants-subjects. Under this approach, the system of training future educators leads to the emergence of a subjective opinion that determines their attitude to the world, people and themselves in a broad inclusion. This creates the conditions for the formation of a person with a unique outlook, and such a person is in an ontological reality situation, which includes the subject itself, the subject environment and living conditions, which are characteristic of an inclusive society.

The systematic approach explores the importance of professional training of teachers to work in an inclusive education environment as an integrated system of elements designed to form the personal and professional qualities of teachers willing to work in diverse and diverse inclusive education institutions.

The anthropological approach allows to determine the amount of "humanity in man ...", "to look at man as the main goal and the highest value" [2. 62 p.] Serves as a basis for the formation of humanistic pedagogical thinking and value attitude towards each child, including students who are developing as individuals with special educational needs.

We consider the incidental approach as a basis for the implementation of meaningful and procedural reforms in the training of teachers in higher education. The peculiarity of this approach is that its etymology does not have the same meaning. On the one hand, it may be based on a specially organized phenomenon that models the conditions necessary for the formation of this or that professional quality. On the other hand, it may be based on the phenomenon of daily coexistence in an environment that does not involve the implementation of a specific plan, order, or project proposed by someone outside, but can be a guarantee of the life activities the student aspires to. In the course of our study, we focus on the third option of understanding the eventual approach. It combines deliberately organized events that naturally take place in the eventful environment of student life.

The interdisciplinary approach serves as the basis for a holistic understanding and perception of the surrounding being. In the framework of our research, an interdisciplinary approach is implemented in the design of curriculum materials for the basic education program in terms of understanding inclusion in terms of diversity by involving data from all disciplines in the field of research in this emergency.

The socio-cultural approach is based on the rule that human nature is determined by a set of biological, social and cultural factors and is manifested in the process of interaction with society

and all its various aspects. In this regard, based on the methodological area of the socio-cultural approach, we supplement the content of professional training so that the future teacher of an inclusive education system can feel like part of an updated, inclusive system of community values.

The cultural approach is very close in content to the socio-cultural approach, but it reflects the leading role of culture in the education of the individual. RFA academician E.V. Bondarevskaya's personality-oriented cultural concept is a clear proof of this.

The phenomenon of creating culture is based on the creation of a special environment for cultural exchange in the educational process of higher education, which implies the possibility of "growing" individual cultural values. The use of a cultural approach as a methodological basis for the formation of a system of teacher training in inclusive education is achieved by creating pedagogical conditions that support the cultural and creative goals of students, where the process of formation of a future teacher focused on the values of inclusive pedagogical culture.

Fundamentals of a contextual (thematic) approach A.A. Developed by Verbitsky, it is one of the crucial components of planning and organizing the educational process in high school. M.N. According to Shvetsova, contextual teaching "allows students to feel that science is relevant to a particular field, which serves as a tool for them to achieve their chosen professions". In order to sustainably develop students' learning and inclusive competencies, we rely on the basic principles of a contextual approach, creating a situation for them to "dive" into a career-oriented environment.

We have reviewed all of the approaches listed above and tried to assess the possibilities and options for using them as methodological foundations for professional training for educators to operate in an inclusive education environment. Each of them, in isolation, in our opinion, has great potential in specific aspects of the training of an inclusive school educator, which can be covered in detail only in the context of a separate fundamental research. For this reason, despite the large number of methodological bases for professional training of teachers to work in an inclusive education environment, we have identified the following basic approaches that underlie the development of a model of professional training for teachers to design an inclusive education environment: axiological, cultural, competent, personal and event. We will try to comment on our choice.

The axiological approach defines the content aspects of professional training aimed at forming a valuable core of the future educator's personality. Knowing, understanding and accepting the values of an inclusive society, forming a personal inclusive worldview, following the principles of inclusion in practice are the main results of using an axiological approach in preparing educators to work in an inclusive education environment. At the same time, based on the values of inclusion in general, we study this approach as the basis for the formation of an inclusive culture of the educator, which allowed us to apply the cultural approach later.

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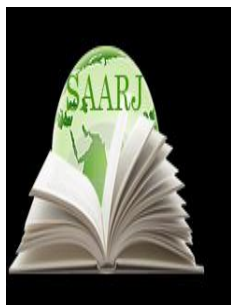
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REFERENCES:

1. Voznyak I.V. Inclusive Education: How to Train Teachers? // Psychological and pedagogical journal GaudeamuS. 2016. No. 1. Vol. 15, pp. 37-41.
2. Goryunova L.V. The logic of the deployment of the educational process at the stage of transition to a new type of pedagogical education // Modern problems of science and education. 2015. No. 6-0. P. 564.
3. Gorbunova N.V. Preparing future teachers for work in an inclusive environment // Problems of modern pedagogical education. 2017. No. 54-1. S. 88-96.

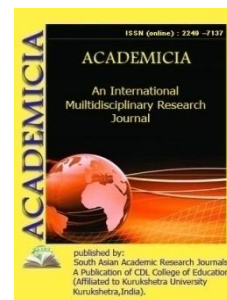
4. Kochetova N.N., Maslieva S.N. Personal model of training a future teacher at work in an inclusive education // Education. The science. Innovation. 2015. No. 1 (39). S. 49-58.
5. Mallaev D.M. Problems and Prospects of Russian Inclusive Education // Inclusive Education: Problems and Prospects: Materials of the II International Educational Forum, in 3 volumes. T. 1. - Rostov-on-Don: Publishing house of the Southern Federal University, 2015.



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IMPROVEMENT OF MANAGEMENT TECHNOLOGY ON THE BASIS OF IMPROVED MODELS OF INNOVATIVE DEVELOPMENT OF TEXTILE ENTERPRISES

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ABSTRACT

This article examines the use of modern management methods to improve the efficiency of management at textile enterprises, and based on the use of improved models, proposals for improving the technology of managing innovative development at the enterprise are developed.

KEYWORDS: *Enterprise, Management Efficiency, Innovative Development, Management Technologies.*

INTRODUCTION

In order to adapt to a highly changing market economy, every industrial enterprise will need to make effective use of all available resources and opportunities. Improving the production efficiency of many textile enterprises operating in the Republic of Uzbekistan depends not only on the effective use of existing opportunities, but also on the organization of management of production processes on the basis of advanced models used in world practice. Therefore, an objective assessment of the effectiveness of enterprise management through a comprehensive study is one of the important factors in further improving the economic situation in the country. The third direction of the "Action Strategy for the five priority areas of further development of the Republic of Uzbekistan in 2017-2021" set by President Sh. Mirziyoyev is called "Strategic directions to increase the competitiveness of the national economy on the basis of modernization" [1]. Therefore, the use of modern management methods in ensuring the innovative development of textile enterprises, which are one of the key sectors of the economy of the republic, is gaining importance.

Analysis of the relevant literature.

The results of the analysis show that there are many sources in the economic literature and practice that deal with the problems of identifying, analyzing, and enhancing production efficiency. In this regard, the use of certain indicators in the practice of enterprises is established. Isaev R.A. The study of the development of textile clusters in the Republic of Uzbekistan focuses on strategic management [2]. This author studied the issues of improving the organizational and management mechanisms for the implementation of development strategies of textile enterprises in the integrated system of quality management and strategic management in the textile industry of the Republic of Uzbekistan [3].

Improving management efficiency in industrial enterprises, especially in the textile industry, is of great importance today. Therefore, the use of improved models in the search for opportunities to increase management efficiency is important.

The EFQM Excellence Model, a business improvement model developed by the European Foundation for Quality Management, has been in existence for more than 13 years since the early 1990s and is a generalized model of an ideal management system for organizations focused on sustainable development and competitiveness. The model is based on a philosophy of overall management quality and production quality, and is based on a systematic approach to management that takes into account the interests of all stakeholders in the organization. Since 1992, based on the EFQM model, competitions on management systems of various organizations have been held in many European countries [5,6]. The use of the EFQM model involves researching and measuring enterprise management capacity, evaluating the system performance of any organization, including model management, which can help in the implementation of so-called “self-assessment” work. However, in any competition, including the main European EFQM European Award, self-esteem is often overlooked. Competitive assessment is taken outwardly, while “self-assessment” is essentially an independent study of the enterprise management system by their managers. When the improvement model was presented in Europe as a European quality award model, it immediately went beyond the ‘quality’ competition, and these organizations began to be seen as a tool to assess their level of development relative to benchmarks, identify strengths of management systems and identify areas for improvement. .

The use of the EFQM model involves researching and measuring enterprise management capacity, evaluating the system performance of any organization, including model management, which can help in the implementation of so-called “self-assessment” work.

Research methodology

The research methodology is a dialectical method, and methods such as selective observation, comparison, and expert evaluation were used in the research process.

Analysis and results

We will look at a number of features that make it appropriate to use a ‘business model’ to manage an enterprise’s innovative self-development. According to G. Chesbro, the business model has the following features [7]:

1. Creating the essence of value proposition, i.e. the value that proposition creates for users based on this technology.

2. Identify the market segment, i.e. identify the users to whom this technology is useful and the purpose for which it is to be used.
3. Identify the composition of the enterprise value chain required to create and distribute the offer and the additional assets required to support the enterprise's position in that chain.
4. Identify the mechanism (s) of earnings for the enterprise and evaluate the composition of costs and target gross profit when using the offer, taking into account the options of the proposed value proposition and the structure of the value chain.
5. Describe the company's position in the value chain that connects suppliers and customers, including identifying potential additional participating firms and competitors.

In the task of technologicalization of solutions in the management of innovative self-development of the textile enterprise, it is necessary to determine the overall algorithm of such a solution that meets the requirements of objectivity, consistency, strategy and speed of implementation. Objectivity requirements can be achieved using the EFQM model.

Self-assessment processes can be implemented in a variety of ways. There are several ways to conduct a self-assessment. The choice of a particular method depends on the influence of a number of factors - the size of the enterprise, resources, areas of activity, organizational culture, etc., primarily on the objectives of self-assessment. The methods are not completely independent and can be used in conjunction with each other.

The most complex and labor-intensive method is the imitation method of participation in the competition. The method requires a lot of time resources, the involvement of specially trained specialists, but it is a precise method.

A method of imitation of participation in a competition. The method is based on self-assessment to prepare a bidder's report in the prescribed form, including the areas of activity and results for all components of the model, described in accordance with their content. The preparation of such a report involves a great deal of organizational work, with particular emphasis on designing a self-assessment process that includes the distribution of responsibilities and authority among employees to gather information on criteria. In this case, the criteria should cover the indirect activities of the textile enterprise from different angles, rather than the activities of individual departments. Thus, the effectiveness of self-assessment is strongly dependent on a properly chosen approach to shaping the self-assessment process, which requires the specific knowledge and skills of its participants. There will be concerns about the accuracy of the evaluation results and the consequent wrong decisions. At the same time, the method of imitation can serve as a basis for the formation of a reflexive-creative management mechanism in competition.

Proforma. A proforma is a special form designed to facilitate self-assessment based on evaluation criteria and areas. When a textile enterprise prepares a report in accordance with the established requirements, the method is closest to the method of self-assessment in award competitions. The difference is that it significantly reduces the time required to prepare a report, as well as includes evaluation elements in the form of an analysis of strengths and weaknesses, similar to the SWOT-analysis matrix. Completing the proshalk requires a significant understanding of the evaluation model, which is its undoubted advantage. Depending on the purpose of the self-assessment, enterprises use different modifications of the plans.

Matrix. The method of using a matrix (building tables) is one of the most common methods. It has various improved forms. The method involves the development of a special achievement chart of a textile enterprise based on an award model. The table contains a number of statements

about the achievements of the textile enterprise, which will be presented in ascending order of importance on the selected scale. The preparation of the table is carried out before the self-assessment and by professionals who are well acquainted with the award model and the actual state of affairs in the textile enterprise. In the self-assessment, individuals, based on the data in the table, record the achievements of the textile enterprise at the scale levels and express their mutual agreement with the level formulas given in the table.

Survey. Questionnaire is basically a type of matrix method. The method of conducting a self-assessment using a questionnaire requires a lot of initial preparation related to the preparation, distribution and processing of questionnaires. The questionnaires are developed based on the structural criteria and evaluation directions of the award model. Typically, the process of developing a survey includes: determining the form and content of the application to the participant in the survey process; choose the type of questions; formulation of questions; developing a questionnaire form. A typical example of an open questionnaire is a questionnaire to assess the criteria of the group "Opportunities" in the diagnostic model of T. Konti [8]. In assessing these criteria, there may be significant differences in the perception of activity by the 'internal supplier' and the 'internal consumer', which requires additional attention.

The strategy can be used to periodically implement the consistency requirement, consistently apply prepared expert evaluation procedures, and synthesize the results of the implementation of decisions made. The demand for speed is met, for example, by the technology and possible automation of expert evaluation procedures performed using an electronic software package. Many researchers and practitioners point out that the top management of textile enterprises understand the importance of self-assessment in developing objective criteria for performance, but this is not always the case in effective solutions.

It only makes sense to master the self-assessment and conduct it regularly when it becomes a necessary condition for the textile enterprise to activate its innovative self-development. In this case, self-assessment is carried out on a regular basis, which allows the enterprise to identify development trends and make adequate and timely strategic decisions, on the other hand, the results of self-assessment will be the basis for formulating annual action plans to improve performance.

The main reasons for this situation are that the management and staff of the textile enterprise are not sufficiently prepared in terms of the methodology of applying the models. While the main purpose of self-assessment is to participate in competitions and receive awards, there is no continuous process of performance improvement based on self-assessment. The algorithm shown in Figure 1 aims to overcome these shortcomings. The object of research was selected several enterprises that are part of the Association "Uztextile Industry", and the calculations were carried out on the example of "SANAM" Limited Liability Company (LLC).

This enterprise is one of the leading textile enterprises in the Republic of Uzbekistan. In this textile enterprise, the self-assessment method for enterprises based on the improved EFQM-model developed by us was applied in 2020. Within the framework of the EFQM-model, the use of the method of self-assessment in the search for unused internal opportunities in the textile enterprise was implemented.

Reporting on Form № (Report F.№1) involves recording the status of “Anyway” work in a textile enterprise, which in fact corresponds to the act of “self-determination” of managers (Figure 1).

№Report on Form 1. Based on the main processes of reflection of this meeting, the main meta-processes of reflexive-creative activity in management are formed. It all starts with a general idea of the development of a textile enterprise and the identification of the main results it wants to achieve. Thus, the beginnings of defining a reflexive position are: the strategic goals and strategy of the enterprise; the position of managers on the EFQM model as an enterprise development model and a systematic basis for demonstrating all activities in the enterprise.

The approaches used by management today emerge at the intersection of three vectors: the results vector as a result of the approaches applied in a particular field of activity; a vector for assessing the state of affairs in strictly defined areas of activity determined by the criteria of the model; a vector of requirements to describe activities in a particular field, defined by methodological requirements to represent a particular topic.

The most difficult part of starting to apply the EFQM model is to take an appropriate reflexive position to “correct” the situation in this enterprise. This requires a clear understanding of the basic concept of the EFQM model - the ‘Approach’.

Form №2 reporting (F.№2-report) is done during the self-assessment process and is aimed at identifying a list of areas for improvement. Each of these areas will be reviewed and given priority. The most important directions (priorities) form a group of important factors (GOIF) for achieving strategic goals. This activity corresponds to the act of ‘self-regulation’. The report form №2 can be a priority list of project ideas that form the basis for the initial cycle. №2 report form can be a list of project ideas that are distributed according to their importance in laying the foundation for the start cycle.

The report on Form №3 (F.№3- report) can be considered as the result of the initial cycle. Project priority ideas include pre-project research, the development of a project concept, the decision to open a project and include it in the company’s development project portfolio. The list of project concepts that form the basis of the project portfolio defines the structure of Report 3.

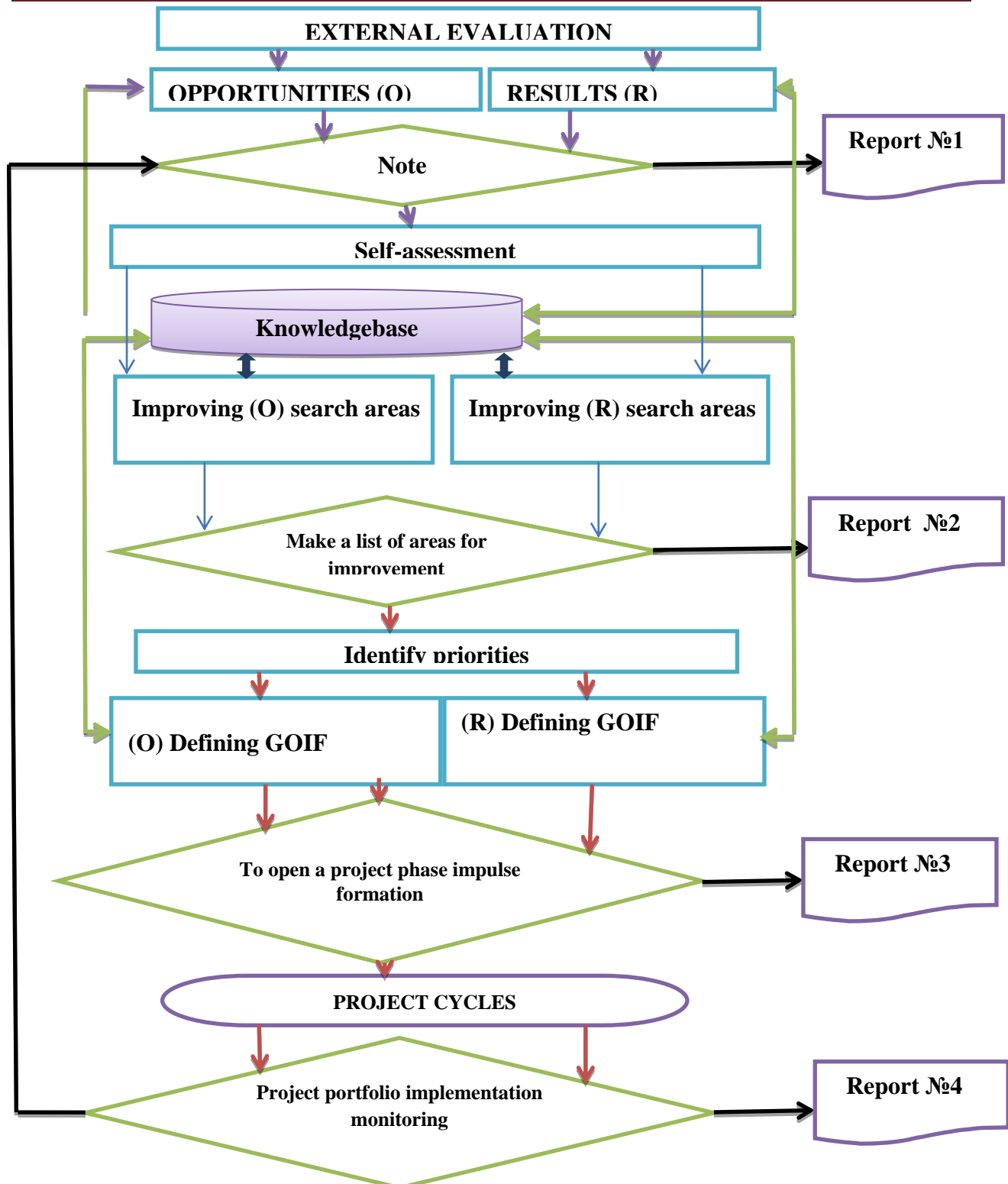


Figure 1. Algorithm for making decisions on innovative self-development of the textile enterprise (author's development)

№The report in Form 4 refers to the results of monitoring the portfolio of development projects. Depending on the project management practice in the textile enterprise, the report may take various forms, reflecting the characteristics of the development project portfolio, its monitoring and presentation of results. From the point of view of the general methodological approach, this cycle corresponds to the act of “self-transformation” of a textile enterprise, renewal or renewal of its business model.

The implementation of self-assessment in the limited liability company "SANAM" allowed to find directions for improving a number of business processes in its activities. The next step was to identify priorities for improving the activities of the textile enterprise. The self-assessment process should identify areas of activity that can be improved, from issues that require strategic solutions to specific tasks that can be addressed quickly. In this regard, there is a need to identify areas where the development of the textile industry plays the most important role. A more in-depth analysis of the results was carried out in order to improve the quality of activities in the textile enterprise, to identify important priorities for further increase its efficiency.

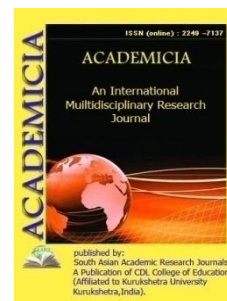
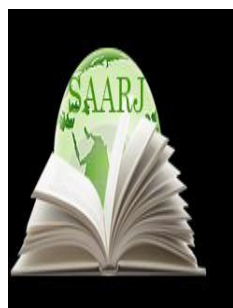
CONCLUSIONS AND SUGGESTIONS

Thus, the proposed algorithm provides a general view on the management of innovative self-development of the textile enterprise, the accumulation of existing experience and "best practices" of enterprises, the organization of work to take into account periodic changes in all components of the model, as well as knowledge base expert groups allows you to customize based on. All this allows to overcome the negative impact of the factors inherent in the self-assessment methodology associated with the difficulties of choosing a model that meets the needs of the company and the diversity of indicators that do not make it difficult to interpret the observations individually. allows to increase efficiency, provides flexibility in today's rapidly changing market economy, creates conditions for the application of cost-effective technologies in the production process.

REFERECE

1. Decree of the President of the Republic of Uzbekistan "On the Action Strategy for further development of the Republic of Uzbekistan". // Xalqso'zi, 08.02.2017 y. №28 (6722).
2. Isayev R.A. Issues of developing textile clusters in Uzbekistan // International Journal of Research in Management & Business Studies (IJRMBS 2019). Vol. 6 Issue 3 July - Sept. 2019. - R.9-12.
3. Isayev R.A. Improvement of mechanisms for the implementation of integrated system strategy in textile enterprises // International journal of research in management & business studies. IJRMBS Vol.8 Issue 1, Jan to March 2021. - P. 24-26.
4. Total quality management practices and organizational performance: the mediating roles of strategies for continuous improvement.
5. The EFQM Excellence Model // Public and Voluntary Sector Version. - The European Foundation for Quality Management, 2003.
6. Antonova I.I. Vseobshchee upravleniye kachestvom. Osnovopolozhnik vseobshchego menedjmentakachestva / I.I. Antonova, V.A. Smirnov, S.A. Antonov. - M.: Rusayns, 2016. - 168 p.

7. Chesbro G. Open innovations. Creation of profitable technologies / per. s angl. V.N. Egorova. - M.: Pokolenie, 2007. - 336 p.
8. Konti T. Self-esteem in organizations: per. s angl. - M.: Standards and quality, 2000. - 328 p.



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EFFECTIVENESS OF APPLICATION OF EFQM-MODEL IN INTEGRATED MANAGEMENT IN TEXTILE ENTERPRISES

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ABSTRACT

This article examines the effectiveness of the use of modern management tools in the implementation of an integrated system of quality management and strategic management in the textile enterprises of the Republic of Uzbekistan.

KEYWORDS: *Quality Management, Strategic Management, Innovation, Management Quality, Development, Efficiency, Effectiveness, Modern Management Support, Self-Evaluation.*

INTRODUCTION

From the first years of independence in the Republic of Uzbekistan, economic reforms in all sectors of the economy, including the cotton sector, are aimed at further deepening. Great attention is paid to economic policy in this area, the implementation of structural changes in the production of the industry, ensuring the freedom of producers, the introduction of various forms of ownership and improving the logistics, financial and economic relations between farms,

organizations and enterprises. Improving the work of enterprises, giving them freedom, improving their management system will allow them to produce better quality products, resulting in increased production efficiency. There is a growing need in Uzbekistan to increase the production of high value-added export-oriented finished products based on deep processing of raw cotton. Successful implementation of such huge tasks requires the development of concrete measures to ensure more rational use of unused internal potential based on the use of modern management tools in the textile enterprises, which are one of the leading sectors of the economy. In this regard, the development of science-based proposals and recommendations to increase the application of advanced models in the management of innovative self-development of textile enterprises is one of the most pressing issues today.

Analysis of the relevant literature

The results of the analysis show that there are many sources in the economic literature and practice that deal with the problems of identifying, analyzing, and enhancing production efficiency. In this regard, the use of certain indicators in the practice of enterprises is also established. Isaev R.A. The study of the development of textile clusters in the Republic of Uzbekistan focuses on strategic management [1] and the improvement of organizational and management mechanisms for the implementation of an integrated systemic strategy in the textile industry [2]. Yusupov S.Sh. and the main directions of the development strategy of textile enterprises [3]. However, the systematization of the sources studied has led to the conclusion that many authors have only considered some aspects of management effectiveness. Xakimov G'.Q. and the application of an improved model in improving the effectiveness of quality management in the higher education institution of the Republic of Uzbekistan [3]. Improving management efficiency in industrial enterprises, especially textile enterprises, is of great importance today. Therefore, the use of improved models is important in finding opportunities to improve management efficiency.

The EFQM Excellence Model, a business improvement model developed by the European Foundation for Quality Management, has been in existence for more than 13 years since the early 1990s and is a generalized model of an ideal management system for organizations focused on sustainable development and competitiveness [4]. The model is based on a philosophy of overall management quality and production quality and is based on a systematic approach to management that takes into account the interests of all stakeholders in the organization. Since 1992, based on the EFQM model, competitions on management systems of various organizations have been held in many European countries [5,6]. The use of the EFQM model involves researching and measuring enterprise management capacity, evaluating the system performance of any organization, including model management, which can help in the implementation of so-called "self-assessment" work. However, in any competition, including the main European EFQM European Award, self-esteem is often overlooked. Competitive assessment is taken outwardly, while "self-assessment" is essentially an independent study of the enterprise management system by their managers. When the improvement model was presented in Europe as a European quality award model, it immediately went beyond the best "quality" competition, and these organizations began to be perceived as a tool to assess their level of development relative to benchmarking, identify strengths of management systems, and identify areas for improvement [7].

In 1997, the European Foundation for Quality Management proposed a simplified EFQM model for small businesses. Most (but not all) representatives of small and medium enterprises believe that simplified criteria make self-assessment more understandable and therefore more accurate. Indeed, it is very difficult for small companies, for example, to evaluate on the “2b” indicator. Policies and strategies are developed based on measurement, research, and data from cognitive and creative activities, which is inconvenient for them. However, although the model is evolving and slightly modified, skills to work with it have also been developed, new opportunities have emerged for its use, and many organizations have realized that this tool can be effective in improving business by sharing experiences based on benchmarking and learning best management practices. In 1999, a significant revision of the model was made and the word “business” was removed from its name (until 1999, the model was called the “EFQM Business Excellence Model”). This is primarily due to the fact that many NGOs have also seen the EFQM model as a tool for improvement and have used it successfully to improve management quality.

Research methodology

The research methodology is a method of dialectics, and in the research process such methods as experimental, selective observation, comparison, expert evaluation were used.

Analysis and results

We will consider a number of features that make it appropriate to use a ‘business model’ to manage an enterprise’s innovative self-development. According to G. Chesbro, the business model has the following features [8]:

1. Creating the essence of value proposition, i.e. the value that proposition creates for users based on this technology.
2. Identify the market segment, i.e. identify the users to whom this technology is useful and the purpose for which it is to be used.
3. Identify the content of the enterprise value chain required to create and distribute the offer and the additional assets required to support the enterprise’s position in that chain.
4. Identify the mechanism (s) of earnings for the enterprise and evaluate the composition of costs and target gross profit when using the offer, taking into account the options of the selected value proposition and the structure of the value chain.
5. Describe the company’s position in the value chain that connects suppliers and customers, including identifying potential additional participating firms and competitors.

In the task of technologicalization of solutions in the management of innovative self-development of the textile enterprise, it is necessary to determine the overall algorithm of such a solution that meets the requirements of objectivity, consistency, strategy and speed of implementation. Objectivity requirements can be achieved using the EFQM model. These are different areas of activity, forms of ownership and size of textile enterprises. According to a Financial Times survey, the EFQM model is used by 60% of the largest companies in the EU, including Siemens, Bosch, Nokia, Volvo, Yellow Pages, TNT and many other recognized world leaders.

The strategy can be used to periodically implement the consistency requirement, consistently apply trained expert evaluation procedures, and synthesize the results of the implementation of decisions made. The demand for speed is met, for example, by the technology and possible automation of expert evaluation procedures performed using an electronic software package. Many researchers and practitioners point out that the top management of textile enterprises understand the importance of self-assessment in developing objective criteria for performance, but this is not always the case in effective solutions. The main reasons for this situation are that the management and staff of the textile enterprise are not sufficiently prepared in terms of the methodology of applying the models.

The object of research was selected textile enterprises that are part of the Association "Uztextile Industry". In these selected enterprises, a self-assessment method was applied in 2020 to implement a quality management system (QMS) for enterprises based on the improved EFQM-model developed by us.

In the first phase of this process, the following preparatory work was carried out: the Quality Council was established; developed the Regulation on self-assessment of the enterprise; an action plan for the implementation of SMT at the enterprise; a working group was formed to conduct a self-assessment, consisting of heads of different levels and divisions of the enterprise, competent specialists (external experts) working in the relevant departments; the materials we provided were taken as a basis in the selection of the self-assessment model and methods; the identification of those responsible for conducting the self-assessment in accordance with the various criteria was carried out, and the persons responsible for each criterion and sub-criteria were identified; In order to learn about the procedure and methods of self-assessment of team members and employees of the enterprise, we organized seminars and trainings.

In the second - main stage of the event, a self-assessment was conducted to study the activities of all departments and structural units of the textile enterprise. Based on the analysis of the activities of textile enterprises operating in the country, we have developed an improved EFQM-model, which corresponds to it and can be used in all industrial enterprises of the country.

In the third and final stage of the event, the results were analyzed and based on the results, measures were taken to further improve the level of excellence of the textile enterprise and to develop measures based on the results of the main areas of further improvement of the enterprise. The results of the scores evaluated by the experts were processed and the results obtained were summarized.

The results of the analysis show that due to the implementation of a number of measures in this textile enterprise, the criteria of its "Opportunities" and "Results" groups had approximately equal overall scores: 311 and 303 points, respectively. Based on the values of the model criteria "levels of excellence" using the RADAR method, the initial state of SMT in the textile enterprise and its improvement are nine criteria: "Leadership", "Policy and Strategy", "Human Resources", "Resources and Partners", "Process Management", "Results for Consumers", "Results for Employees", "Results for the Company", "Basic Results of Activities".

Self-assessment of the activities of such textile enterprises was carried out at the following textile enterprises operating in the country: "Sanam" Llc, "Bek Mega Textile" Llc, "Best Color Textile" Llc, "Cotton Textile" Llc, Full Cotton Llc Betlis Tekstil "Llc.

The implementation of self-assessment in the limited liability company "SANAM" allowed to find directions for improving a number of business processes in its activities. The next step was to identify priorities for improving the activities of the textile enterprise. The self-assessment process should identify areas of activity that can be improved, from issues that require strategic solutions to specific tasks that can be addressed quickly. In this regard, there is a need to identify areas where the development of the textile industry plays the most important role.

In order to improve the quality of activities in the textile enterprise, to identify important priorities for further increase its efficiency, a more in-depth analysis of the results was carried out. The results are presented in Table 1.

TABLE 1 ANALYSIS OF THE RESULTS OF SELF-ASSESSMENT IN A LIMITED LIABILITY COMPANY "SANAM"

№	Criteria for self-assessment	The normative level of the criterion	The actual level of the criterion	Differences
1	The leadership role of leadership	10,0	7,1	- 2,9
2	Policy and strategy	10,0	6,2	- 3,8
3	Personnel management	10,0	5,6	- 4,4
4	Resources and partners	10,0	5,4	- 4,3
5	Process management	10,0	6,4	- 3,6
6	Results for consumers	10,0	6,3	- 3,9
7	Results for employees	10,0	4,8	- 5,2
8	Results for the company	10,0	6,7	- 3,3
9	Baseline results of activities	10,0	7,3	- 2,7

Source: Author's calculations.

The data in Table 1 show that the untapped opportunities and unfulfilled results in improving the quality of activities, further improving the efficiency of SANAM LLC in the following areas (criteria): In the "Capacity" direction - "Resources and partners", "Process management", "Personnel management", the lack of capacity in these criteria did not ensure the achievement of the desired goal of performance in the following "Results": "Results for employees", "Results for Consumers".

Therefore, the management and staff of SANAM LLC will have to develop and implement an action plan in these areas in the future.

CONCLUSIONS AND SUGGESTIONS.

The strategic priorities for the development of the textile industry are:

- Improving product quality and expanding the range;
- transition to innovative development;
- diversification of funding sources;
- development of material and technical base;
- Improving enterprise management.

In addition, in accordance with our proposals, the priorities of the policy of the textile enterprise in the field of improving the efficiency and quality of management were identified, which are:

- formation of a quality management system for production activities on the basis of legal requirements and generally accepted standards;
- development of human resource potential of the enterprise;
- Introduction of a quality monitoring system for training specialists using modern information technologies;
- Continuous improvement of the production process, taking into account the needs and desires of suppliers, employees, society and the state;
- Improving the competitiveness of the enterprise in regional, national and international markets of textile products;
- Strengthening the material and technical base of the textile enterprise.
- effective use of business models in order to improve the management of innovative self-development.

LIST OF SOURCES AND REFERENCES

1. Isayev R.A. Issues of developing textile clusters in uzbekistan // international journal of research in management & business studies (ijrmb) 2019). vol. 6 issue 3 july - sept. 2019. – P.9-12.
2. Isaev R.A. Journal of Contemporary Issues in Business and Government Vol. 27, No. 2, 2021/ - P.5738-5742.
3. Yusupov S.Sh. The main directions of the strategy of development of textile enterprises in the conditions of strong competition: monograph. - T.: Science and Technology, 2014.
4. KHakimov Gulom Kuvondikovich. Increasing the efficiency of higher education institution education using an improved model of quality management // international journal of scientific & engineering research volume 12, issue 2, february-2021. - p.352-356.
5. Ignateva E.Yu. Madanjment znaniy v upravlenii kachestvom obrazovatel'nogo protsessa v vysshey shkole. - Veliky Novgorod, 2008. - 280p.
6. The EFQM Excellence Model // Public and Voluntary Sector Version. - The European Foundation for Quality Management, 2003.
7. Antonova I.I. Vseobshchee upravlenie kachestvom. Osnovopolozhniki vseobshchego menedjmenta kachestva / I.I. Antonova, V.A. Smirnov, S.A. Antonov. - M.: Rusayns, 2016. - 168 p.
8. Maslov D.V., Vylgina Yu.V. Modern tools of management: model sovershenstvovaniya EFQM: uchebnoe posobie / Ivan. gos. energy. un-t. - Ivanovo, 2006. - 107 p. : il.
9. Chesbro G. Open innovations. Creation of profitable technologies / per. s angl. V.N. Egorova. - M.: Pokolenie, 2007. - 336 p.

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