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SPECIFIC FEATURES OF INTERDISCIPLINARY INTEGRATION IN TEACHING NATURAL SUBJECTS

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ABSTRACT

This article discusses the issues of mastering knowledge in biology of interdisciplinary learning, also due to the fact that the object and subject of research in the academic subjects of biology, chemistry, physics are close to each other, the knowledge of the whole essence of nature in interdisciplinary communication, content, changes, occurring in processes and events, a unified presentation of general and particular concepts available in these academic subjects, which provide for the formation in interdisciplinary communication when using skills and abilities and their introduction in practice. In addition, to develop the ecological thinking of pupils in the synchronous and asynchronous communication of biology teaching, modern teaching methods were used.

KEYWORDS: *Interdisciplinary Connections, Natural Subjects, Biology, Pupils, Lesson, Means, Ecological Thinking, Synchronous And Asynchronous Learning, Environment, Integration.*

INTRODUCTION

Integrated subjects, which form the basis for the development of knowledge about nature and society in the world, are included in the curricula of many countries. This suggests that integrated subjects, especially those with a focus on the natural subjects are a key tool in shaping environmental responsibility in pupils in the global community. Therefore, the issues of harmonization of nature-society relations, establishment of serious relations with the environment in interdisciplinary relations are of great importance in the curricula and programs of secondary schools of the country.In particular, the ecological culture of pupils, their worldview, behavior, environmental protection in the teaching of biology, chemistry and

physics, the development of the content, forms, teaching methods, ways, opportunities and tools of interdisciplinary communication is one of the important issues in education and also it is considered.

A detailed study of environmental problems by pupils, the development of independent and critical thinking, an increase in environmental culture, a sense of the beauty of the environment, responsibility for the protection of nature, the correct formation of a person's worldview, the ability to distinguish and awareness of the laws of nature, have an idea of the relationship between man and nature, increase knowledge about ecological balance and others contribute to the implementation of the planned goals on the topic of ecology among pupils [16].

In the education system of the republic some stable and huge reforms are being carried out . In particular, in improving the content and quality of education in secondary schools, didactic and methodical scientists, psychologists, teachers need to pay attention to the problems of interdisciplinary communication. This is due to the fact that the rapid development of science and technology has made it an urgent problem to develop in pupils a belief based on high spirituality, free and independent thinking, ideological and political maturity, scientific outlook. Interdisciplinary communication has great potential in the development of these qualities in pupils.

International experience shows that integrated subjects, which form the basis for the development of knowledge about nature and society are included in the curricula of many countries. This suggests that integrated subjects with a focus on the natural subjects are a key tool in shaping environmental responsibility in pupils in the global community.

The natural subjects in school education reveal to pupils the current scientific landscape of the world. Therefore, the natural subjects form the natural-scientific basis of the pupil's worldview. Interdisciplinary connections should be aimed at developing pupils' generalized scientific understanding. The integration of knowledge requires a unique approach to education.

Two objective features in the development of science - differentiation (branching) and integration (joining, merging), ultimately play an invaluable role in the creation of a holistic, general scientific picture of the universe. In this context, the problems of regulating the impact of man on the biosphere, achieving a balance in the relationship between man and nature are becoming increasingly relevant.

Improving the system of environmental education in secondary schools. The implementation of interdisciplinary links in the curriculum of all subjects, including natural subjects play an important role in ensuring the integrity of this system [1].

It has no sense to understand integration without differentiation, they are inseparable categories that define each other from a dialectical point of view. According to academician I.D. Zverev “Integration is the process of creating organic connection, integrity. In teaching, it can be considered as a result of a single synthesizing course based on the combination of elements of different disciplines "[12].

Teaching biology synchronously and asynchronously with chemistry and physics provides a systematic approach to the process of developing pupils ’environmental thinking.So ,all forms of interdisciplinary teaching of biology: lessons, extracurricular activities, chemistry and physics,

necessitated the identification of opportunities for the development of ecological thinking in pupils through environmental education. In this way, it prepares the ground for the direct application of the theoretical knowledge acquired by pupils in the teaching of biology in connection with the subjects of chemistry and physics.

In exchange for the integration of subjects, the unique achievements of civilization are being achieved. Differentiation in the subjects is becoming a powerful tool for learning about the universe and changing it. For instance , molecular biology has disrupted many traditions of classical biology and radically changed their views on life processes. Physical electronics revolutionized the smallest subunits of the material world [18].

An analysis of the work experience of master teachers showed that the combination of forms and methods of environmental education in teaching biology to chemistry and physics in combination with didactic requirements gives good results.

In improving environmental education, it is necessary to pay attention to the protection of the environment, nature, man, the correct and rational use of natural resources, cleanliness. These issues should be included in the curriculum, educational programs, optional classes, the content of work plans [2].

Experience has shown that creating methods and questions or assignments to organize pupils' independent work after selecting methods in accordance with the content of new material during the lesson, and using them in class and in extracurricular activities, serves to improve teaching. An important factor in the development of the educational process is to pay attention to the fact that the selected issues and questions are relevant to the content of the topic, they can engage pupils in independent thinking.

Since environmental education for pupils is a comprehensive problem, it cannot be implemented in the process of teaching a single subject. To do this, in the process of teaching each subject, it is necessary to provide interdisciplinary links, to equip pupils with a system of environmental knowledge and to combine it with environmental education.

I.T.Suravegina has learnt the activation of the process of teaching biology through the use of interdisciplinary links in biology lessons, increasing pupils' interest in biology and other natural subjects. From a scientist’s point of view, it’s hard to imagine teaching biology without linking it to the natural subjects. He argues that the establishment of interdisciplinary links and their skillful use serve to form a system of pupils' knowledge of nature [20].

A.N. Zakhlebny [13] develops an integrated system of nature-oriented education in secondary schools, the main focus is on the content of general skills and competencies that need to be formed in pupils within this education. He noted that the theoretical environmental knowledge generated by pupils in the field of environmental protection is divided into 3 types.They are:

1. Skills and competencies aimed at activating knowledge about the interrelationships between nature, society, man, technology and the solution of nature protection problems between them.

2. Skills and competencies to analyze and critically evaluate the results of the interaction of man, society, technology and nature, or knowledge of the nature of the contradictions in the process of organized action in each case and the ability to understand the causes of their occurrence.

3. Claims the ability to prove their views on specific opportunities and needs for solving nature protection problems, to see ways to solve them.

Today, the balance between man and the biosphere is disturbed, and unexpected threats to human life (countries, regions, societies, the integrity of the universe, the environment) arise. They pose a reasonable threat to human living conditions [10].

Hence , the research work carried out in the CIS today claims the need to ensure environmental safety and the effective use of modern forms, methods and tools in their implementation, the development of environmental protection on the basis of modern economic strategies, its application in the educational process.According to academic N.N.Moiseev, man is stable

for its development it became necessary to take into account the influence of environmental conditions on it, not on itself. If the term "ecology" until recently focused mainly on environmental degradation, the damage caused by man in this process, then in "sustainable development" - to ensure the sustainability of human life, because human development today is in the biosphere and man is an element of it. taken into account [15].

In the research work of P.A. Gulyukina, a bright sample of ecological thinking, ecological culture and interdisciplinary integration through a foreign language, that is, by teaching a subject included in the curriculum, it is impossible to form them fully, effectively and consistently. The implementation of these processes is associated with a more complex psychological - pedagogical, human behavior and actions, thinking about perfection, consistency, continuity and its dialectically interconnected content [9].

According to L.S. Astafeva's research, the process of formation of ecological thinking is organized spontaneously, which is a very detrimental factor for the ecological balance today and in the future [3].

The relevance of the choice of topic in the research work of L.R. Azizova is explained by the lack of scientifically proven mechanisms for the formation of ecological thinking and the fact that the education system is suitable for all segments. The solution of this problem requires the participation of not only educators, but also ecologists, biologists, chemists, physicists and those responsible for environmental protection [4].

According to P.I.Agalarova, the purpose of ecology is not only the knowledge, skills and abilities related to ecology, but also the formation of ecological thinking, consciousness, culture, behavior, ethics in pupils [5].

O.F.Vichkanova claims proposals on additional education in the formation of environmental culture through the organization of environmental activities. According to him, the structure of educational institutions includes extracurricular activities, clubs, centers that allow adolescents to directly participate in the environmental situation [11].

As A.O. Lagut in points out, “culture is a factor of social development. The spiritual and socio-cultural qualities of nations can have a significant impact on all of humanity. In this sense, environmental thinking is an integral part of generations' understanding and perception of the world. Ecological education and ecological up bringing servet of or this thinking ”[14].

Also, the issues of environmental protection are studied in the context of practical ecology in foreign Western countries. Environmental protection means, first of all, measures to prevent the negative and extreme negative impact of human activities on nature.

Since the 1970s, various environmental social movements have been developing in the United States. According to social demand, environmental education is included in all stages of the education system. The process of training environmental education specialists will be established.In 1990, the US Congress passed a new version of the National Environmental Education Act. Extracurricular activities based on the Open Door method are widely used throughout the country [6].

In the United States, there are educational centers dedicated to various environmental issues, and dozens of books are published each year. Among them are U. Solomon (The Three Most Important Areas of Environmental Ethics, Environmental Law, and Environmental Education) [21], M. Gray (Problems of Ecodiversion) [8], and A. Blackman (Can Environmental Action Be Protected in Developing Countries? ?) [7] is one of them.

It can be seen that the pedagogical aspects of environmental thinking and culture have been studied to some extent. However, research on the pedagogical aspects of the development of pupils' ecological thinking in the teaching of biology in secondary schools in synchronous and asynchronous connection with the natural subjects is not comprehensive.

Therefore, the implementation of interdisciplinary links in the teaching process should be considered as the interaction of different disciplines studying the material and spiritual world as a natural process of their development and a factor in developing pupils' scientific outlook and thinking.

CONCLUSION

The use of appropriate teaching methods in the development of pupils' environmental thinking in the interdisciplinary teaching of biology serves to increase the effectiveness of the educational process. Biology teachers cannot imagine the possibilities of this process because they do not have enough theoretical knowledge, skills, and competencies to make interdisciplinary connections in teaching biology. Therefore, there is a need to define environmental thinking, its components and principles of development.

Today, a biology teacher requires modern approaches, not only in the country where he lives, but also in the problems that arise in teaching biology all over the world and how important biology is for human life. To do this, first of all, as mentioned above, the importance of interdisciplinary teaching of biology increases.

REFERENCES:

1. Sh. Avazov Ecological education at school. -Tashkent: Teacher, 1992.- P-62.
2. A.T. Alimov , A.A. Rafikov Causes of environmental error. - Tashkent. Uzbekistan, 1991.P - 70 .
3. L.S. AstafievaFormation of the ecological culture of pupils of technical colleges. Diss. ... Cand. ped. sciences. - M. 2001. P-205 .
4. L.R. Azizova Pedagogical conditions for the formation of the ecological worldview of pupils of technical universities. Diss. ... Cand. pedagogical sciences. -Makhachkala, 2013. P-158.

5. P.I.Agalarova Formation of ecological culture of adolescents in educational and game activities. Abstract of thesis. dis. ... Cand. ped. sciences. - Makhachkala, 2009.P-216 .

6. American Geological Institute. Update on the National Environmental EducationAc of 1990. Retrieved September 27, 2008 fromthe **American Geological Institute Web site:**http://www.agiweb.org/gap/**legis106/neea106.html.**- 2001.

7. A. BlackmanCan Voluntary Environmental Regulation Work in Developing Countries? Lessons from Case Studies. Policy Studies Journal, 2008.36 (1): P.119 - 141.

8. Gray M. Geodiversity. Valuing and Conserving Abiotic Nature. JohnWiley&SonsLtd, Chichester. 2004. - 434 p.

9. P.A.Gulyukina Formation of an environmentally oriented experience of primary schoolchildren in the process of teaching a foreign language. Abstract of thesis. dis. ... Cand. ped. sciences. - Moscow, 2012.P -26 .

10. M.T. Gafurov Formation of ecological and economic knowledge of pupils in the process of learning natural and geographical disciplines. Abstract of thesis. dis. ... Cand. ped. sciences. - Yoshkar-Ola, 2012 .P- 24 .

11. O.F. Vichkanova Formation of the experience of environmental activities in younger adolescents in the institution of additional education. Abstract of thesis. dis. ... Cand. ped. sciences. - Khabarovsk, 2012. P-25 .

12. I.D. Zverev Ecology in school education. -M .: Knowledge, 1988 .P- 96 .

13. A.N. Zakhlebny School and the problem of nature conservation. - M .: Pedagogika, 1981.P-184 .

14. A.O.Lagutin Ecological culture as a factor of sustainable development of society. Diss. .... Cand. cultural studies. - Krasnodar, 2001.P-159 .

15. N.N.Moiseev Co-evolution and the biosphere in the age of computers. Bulletin. Academy of Sciences of the USSR. 1982. - No. 3. - P. 88-99

16. Kh.B. NorbutayevRaising the ecological culture of the student inteaching biology in connection with other disciplines. Of publication with Impact Factor. International Scientific Journal ISJ Theoretical &Applie Science hiladelphia, USA issue 06, volume 86 published June. 30, 2020.- 714-717.

17. H.T. Omonov The role of integration and differentiation of sciences in creating a general scientific picture of the world // "Social sciences and humanities in the education system." - 2007. - Issue 3. - P. 136 - 137.

18. I.T.Suravegina , A.N. Zakhlebny Environmental education of schoolchildren in extracurricular activities. Teachers' manuals. -M., 1984.P –60

19. A.U. Solomon detailed look at the three disciplines, environmental ethics, law and education to determine which plays the most critical role in environmental enhancement and protection. Environment, Development and Sustainability, 2010.12 (6): P. 1069-1080.