INTEGRATION OF ENGINEERING GRAPHICS AND DESIGN SCIENCE IN A COMPARATIVE DESCRIPTION OF METHODOLOGICAL APPROACHES

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ABSTRACT

This article provides a comparative description of methodological approaches to improving the effectiveness of teaching engineering graphics and design sciences, developing students' knowledge, skills and competencies, and integrating the content of the foundations of related sciences. It highlights the implementation of engineering graphics and design sciences as an integrative system, a comprehensive (comprehensive) view of the means of holistic and transformative teaching of engineering graphics and design sciences.

KEYWORDS: *Engineering Graphics, Design, Morphology, Modern Educational Technologies, Method, Method, Education, Upbringing, Technology, Concept, Skill, Art, Form, Project, Completion, Whole, Whole, Knowledge, Skill, Competence, Action Strategy, New Uzbekistan, Development Strategy, System, Complex Integration, Component, Structure, Function, Stage, State, Dependence.*

INTRODUCTION

The world's leading research institutions are responsible for determining the objective grounds, factors and classification of pedagogical integration, determining its morphological and instrumental-methodological appearance, developing means of technological support for pedagogical integration, characteristics of domestic and modern interactive educational methods and technologies. external factors of various alternative approaches to learning and internal factors are studied. The results of this scientific research serve to increase the effectiveness of the introduction of modern pedagogical technologies in the educational process, to ensure the quality of education.

The consistent reforms being carried out in our country to modernize the education system, create a new generation of textbooks, strengthen the material and technical base of educational institutions, equipping with modern equipment, technical means, computers, and supporting teachers expand the possibilities for the effective use of modern educational technologies in teaching.

The national basis of pedagogical technology is information about the forms and methods of implementing educational experience in different historical periods, the content and various pedagogical theories, which are the basis for the emergence of modern pedagogical technologies. Modern pedagogical technologies appeared and improved on the basis of teaching methods and

techniques carried out in different periods, folk pedagogy and the thoughts of thinkers about education.

The introduction of modern pedagogical technologies in the educational process and the achievement of its effectiveness has become an urgent need. It is known that the word "technology" is derived from the ancient Greek word "techne" - skill, art and "logos" - concept, education. The concept of "educational technology" (translated from English "edicational technology") means that information is collected related to the organization of the educational process at a high level of skill and art. Pedagogical technology is a theoretically substantiated form, methods and methods of training and education, allowing to realize pre-developed educational goals and objectives. The main problem of pedagogical technology is the choice of those organizational forms, methods and methods of education that are focused on achieving specific goals. The requirements for increasing the efficiency of education give positive results when integrating modern pedagogical technologies with modern technologies.

It is known that the term “integration”, although new in name, is quite historical in meaning. First of all, this is important in the Universe, in society, in life, in life and production, in education, or rather, integration from the microcosm into the macrocosm. Thus, integration has broad implications both historically and today. That is why the essence of the process of integration in education, its role in all spheres of life is comprehensively studied by scientists from developed countries.

According to dictionaries, the word “integration” comes from the Latin word “integratio”, which means reconstruction, restoration, filling (“integre” means complete, whole, whole. Also in other dictionaries, “integration” means interconnected development, “integration” means to combine in a single whole, to form a single whole, in field dictionaries is interpreted as “integration” - to combine the goals and factors of education into a single whole.

The current work on the creation of additional scientific and popular literature for use in the educational process and independent learning activities, increasing the ability of students to think creatively, identifying and implementing new approaches to the formation of engineering, graphic and design competencies is highlighted.

On a global scale, research is being carried out to improve the effectiveness of teaching engineering graphics and design sciences, to develop the knowledge, skills and abilities of students, to integrate the content of the basics of related sciences. This, in turn, allows students to use the knowledge and skills they have received from engineering graphics and design sciences in designing, to understand the essence, to understand, to realize their educational and educational goals.

At the same time, there is a need to improve the content of the methodological support of engineering graphics and design sciences, to integrate existing concepts into them. In the action strategy for the further development of the Republic of Uzbekistan, priority is given to “improving the curricula and programs of higher educational institutions based on the requirements of the global education system” and by decree of the President of the Republic of Uzbekistan dated January 3, 2022 No. PF-60 “On the development strategy of New Uzbekistan for 2022-2026 years" task is defined. In this regard, engineering graphics and design science it is important to integrate the content and concepts, to improve the work on the formation of practical work skills in students.

Only an integrative methodology can ensure the quality and success of the educational process, which is a complex integrative object. Academician A.P. Belyaeva substantiated the need for a new direction of integrative methodology in education and science. According to A.P. Belyaeva, in addition to systematic objects (science, technology, production, education, man, society, nature), the methodology interpenetrates, thickens, updates itself, its infrastructure of a universal type, based on integration and differentiation, becomes more complicated. there is an interdisciplinary interaction.

Comparative characteristics of methodological approaches

Comparison signs	**Approaches**		
	system	**complex**	**integrative**
Source	greek origin. system - many parts	complexus - connection, union lat.	Lat integer - integer, integer
Purposefulness	Realization of engineering graphics and design sciences as an integrative system	Using a set of tools to transform integrative teaching of engineering graphics and design sciences	Implementation of integrative education in engineering graphics and design sciences as a system and complex
"prism of vision"	A holistic view of engineering graphics and design disciplines	Comprehensive (comprehensive) view of engineering graphics and design disciplines	An integrated (comprehensive) view of the means of holistically and re-transforming the integrative teaching of engineering graphics and design sciences
Integral concept	system	comprehensive	integration
special concepts	Consistency, forming a system, integrity	Complex, complexation, complexationes	Integrity, integration, integrativity, integrator, integrity
General concepts	Components, structure, function, step, state, dependency		

Today, the main task of theorists and practitioners in the field of engineering graphics and design is to create a system of professional graphic engineers and designers in a higher educational institution. But the following problems arise when implementing this process:

1. lack of practical experience in training specialists based on the mutual integration of engineering graphics and design sciences;

2. lack of theoretical approaches to the content of their education;

3. engineering graphics and design sciences based on educational standards, no integration requirements.

Design is a synthesis of art, science and technology and covers many problems of human life. A designer is primarily an artist, but he must be able to think at the level of technical categories, be able to speak the same professional language with an engineer. In order to solve this problem, the

effective use of the concepts of design science in training sessions on engineering graphics, training sessions based on them, the creation of teaching aids and textbooks performs an important educational task.

Theoretical and practical preparation of students for future professional activities contributes to the formation of thinking and action skills. Thus, understanding the content of engineering graphics skills paves the way for future professional teaching practice. Firstly, this determines the leading role of theoretical knowledge in preparing students for the profession, as well as the integrity of their theoretical and practical training. Secondly, thinking and action as an ideal and system-subject system leads to the formation of a unit of skills. Thirdly, it shows that engineering graphics skills are multi-leveled (from reproductive to creative) and makes it possible to improve them by repeatedly repeating some practical actions.

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