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USAGE OF COMPUTER TECHNOLOGIES IN TEACHING ENGINEERING AND COMPUTER GRAPHICS

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Abstract: This article presents recommendations for organizing the educational process based on advanced pedagogical approaches and modern computer technologies, as well as methods to achieve high qualifications in education.

Keywords: computerization, information technologies, technical means, educational tools, computer graphics.

In our country, the process of technical and technological modernization depends on the technical literacy of the personnel. This article provides algorithms and methods for solving problems of adapting educational programs to modern educational standards through a revision of the theoretical and practical foundations of the subjects "Engineering and Computer Graphics" in the education of students in construction and professional-technical fields. Radical reforms are also being carried out in the education system, aimed at achieving a common goal - the formation of a broad-thinking, creative, and competitive specialist, a successful individual. Nowadays, computers and information technologies have become the most effective tool in all areas of human activity. There is much talk about information and communication technologies (ICT) these days. In all areas of education, ICT offer wide opportunities to enhance the effectiveness of teaching and upbringing.

The globalization of information exchange, along with the rapid increase in the quantity and quality of scientific innovations in the fields of science, technology, and production, raises the urgent task of promptly and thoroughly informing students about them. Meeting this need positively will primarily be achieved through the educational process, which serves as a convenient and acceptable way to acquire scientific-theoretical and practical knowledge.

In the era of global globalization and rapidly developing society, information technologies become the key to enhancing the productivity of humanity involved in processes of information exchange, education, and production. The computerization of education is primarily aimed at efficiently selecting the necessary information for learning, adapting it to the learning format, providing this information to students to improve the learning process and knowledge acquisition, as well as enhancing professional training and the quality of specialists. The use of information technologies in the educational process aims to adapt to global standards of information technologies, capable of meeting the challenges of the global community in improving the quality of education and the training of specialists.

Based on research in the development of technology in the educational sphere, it can be concluded that the necessity of effectively integrating computer technologies into the educational system is justified by the following aspects:

- Firstly, the unlimited technical capabilities of the computer in interaction with long-established technical teaching tools and educational materials in education;
- Secondly, considering the role of information technologies in the development of technical progress, the issue of training personnel with modern knowledge in the field of information technologies is being brought to the forefront.

According to leading researchers, computer technology in educational tools, methods, forms, and content contributes to:

- identifying and developing students' individual abilities corresponding to their personal qualities;
- fostering students' ability to learn and strive for excellence;
- constantly updating methods, forms, and content of education and upbringing.

The development of students' intellectual activity is closely related to educational tools. However, the quality of educational activities is determined not by the quantity and variety of technical teaching tools and information technologies, but rather by students' ability to clearly choose and use educational materials in accordance with the specific lesson objectives and the understanding of the teacher.

Successful use of teaching tools involves providing the necessary educational materials for effective use of teaching methods. Educational tools include equipment, laboratory equipment, information and technical tools, handouts, visual aids, symbols, video and audio materials, computers, and projectors.

The modern computer has entered the educational process as a didactic teaching tool. Its broad capabilities and ease of use distinguish it from other tools.

The activities of a teacher in organizing the educational process using computer technologies include:

1. Motivating and stimulating students' activity;
2. Managing the interaction between the knowledge enriched through computer technologies and students;
3. Problem-solving and conducting discussions;
4. Providing assistance to students in situations where computer technologies cannot help;
5. Analyzing and drawing conclusions during task completion.

Many pedagogues and researchers believe that an educational environment using computers can lead to several challenges:

- Difficulties for students in trying to visualize a large volume of interconnected data on a small computer screen;
- The risk of simply transmitting information to students through computer technologies;
- Excessive algorithmization of thinking processes and reinforcement of logical thinking;
- Reduced social interaction due to students being distanced from each other and reduced interpersonal communication;
- Excessive engagement with computer work by students may lead them astray from the main educational goal;
- The potential for the emergence of social stratification (not all students have personal computers).

Computer graphics is one of the rapidly developing new information technologies and defines the content of the modern automated design system. The modern automated design system is an electronic system that cannot operate without computer technology, thanks to the wide range of

database utilization and efficient methods of geometric object modeling. The use of information technologies is not new, but it has become an integral part of modern engineering education, as teaching engineering disciplines nowadays is inherently linked to the necessity of using new information technologies in response to existing socio-economic needs.

Therefore, the development of students' knowledge and skills in the field of computer graphics and the achievement of educational goals have become one of the relevant issues of today.

Based on the above ideas, computer graphics can be used in teaching technical drawing in two ways:

1. After students have acquired specific graphical knowledge and skills, they can start learning computer graphics, which can significantly simplify their understanding of computer graphics elements. Effective use of computer graphics requires the organization of special study time or independent study sessions and the completion of graphic tasks using computer graphics.

2. Introducing all elements of computer graphics from the beginning of the academic year and simultaneously studying the entire subject using computer graphics is a new approach that allows students to engage more actively with the computer and delve deeper into the fundamentals of drawing. However, there is a risk that students may become engrossed in computer work, and drawing (both on paper and in software) as the main focus of their activity may take a back seat. Additionally, for successful utilization of the entire subject through computer graphics, it is essential for the instructor to be a specialist in the field of computer graphics.

LITERATURE:

1. Rahmonov I. Tests on Technical Drawing Course and Computer Graphics. - Tashkent: Uqituvchi, 1996. [1]
2. Rikhsiboyev T. Computer Graphics. - Tashkent: 2006. [2]
3. Ruziev E.I. Scientific and Methodological Foundations of Training Graphics Teachers in Higher Education Institutions: Pedagogical Sciences Dissertation. - Tashkent: 2005. [3]
4. Taylakov N.I. The Content and Teaching Methods of "Computer Graphics" Course in General Education Schools. // Physics, Mathematics, and Informatics. - Tashkent, 2004. - No. 1. [4]
5. Mullahmetov R., Nizomov Sh. Materials of the Republic Scientific-Practical Conference. - Tashkent, 2015. [5]