

THE IMPORTANCE OF TEACHING "ENGINEERING ENGINEERING COMPUTER GRAPHICS" IN HIGHER EDUCATION INSTITUTIONS

Dilshod Xamidov

Trainee teacher of Gulistan State University

email: dilshod970422@gmail.com, tel: +998 93 9170107

Abstract: In order to develop spatial imagination in the student's mind, the article mentions that, first of all, interest in science is formed in him, and based on this interest, he acquires knowledge and remembers it, it is observed that knowledge accumulates and becomes skills and competencies. It is known that one of the conditions for perfect acquisition of knowledge about modern technology is to increase graphic literacy, that is, to know how to read and execute drawings. That is why drawings are the basis of drawing - drawing requires a thorough study of geometry.

Keywords: Computer, drawing, engineering, graphics, AutoCAD, modeling.

Today, in our country, which is accelerating on the path of innovative development, education of a mature generation, education of enlightened and highly moral citizens is one of the priority directions of our state policy. It shows that the tasks defined by the President in 5 important initiatives aimed at meaningfully organizing the free time of the population and youth and ensuring their employment are the requirements of the present time.

The fact that the use of computer technology is the result of productive work and activity requires its use in all areas and constant learning of new possibilities. The priority set in order to "fundamentally improve the higher education system, based on the priority tasks of socio-economic development of the country, fundamentally review the content of personnel training, and ensure the creation of necessary conditions for the training of highly educated specialists in accordance with the level of international standards" one of the directions, special attention is paid to the purposeful and effective organization of the system of using computer technologies in the educational process. This not only penetrates all aspects of activity on a large scale, provides a high-quality and fast working method, but also becomes of great importance in the emergence of new professions. Confirmation of the above ideas is manifested in the field of engineering computer graphics. In this field, to establish the teaching of "Engineering computer graphics" in our country and foreign countries and to design a methodical system of teaching: V. Arefeva, K.A.Grebennikov, I.V.Grigoreva, V.V.Koreshkov, A.N.Kostikov, O.A.Krainova, M.V.Matveyeva, L.Ya.Nodelman, L.V.Pavlova, Y.I.Pritula, E.I.Roziyev, Y.M.Tretyakova, L.M.Turanova, T.V.Chemadanova and others; on improving the teaching methodology of graphic subjects: T.V.Chernyakova; on the problems of using computer technologies: Ya.Blaus, A.D.Botvinnikov, V.Vinogradova, J.J.Dzhanabayev, N.D.Yadgarov, A.S.Kamenev, I.Ye.Malahotkina, K.R.Ovchinnikova, A.K.Khamrakulov, T.Rikhsiboyev and others conducted research.

The purpose of teaching "Engineering computer graphics" is to ensure the competitiveness of the personnel being trained, to create conditions for them to achieve positive results by using modern scientific and technical achievements in practice, and to educate specialists of the new field with intellectual potential. For this purpose, it is necessary to teach contemporary subjects using modern techniques and technologies in the educational process. Therefore, professors and teachers should undertake the responsible and at the same time urgent task of wide use of information, communication and pedagogical technologies in the educational process in order to provide modern knowledge and skills to today's students. This, in turn, requires professors and teachers to be skilled masters of their profession,

to embody pedagogical skills, to have sufficient knowledge and skills in the use of computer equipment and technologies, to be far-sighted, and to In other words, dedication is required.

At this point, is the currently used pedagogical system able to meet the above-mentioned requirements for training specialists in this field or not? How can the educational system be brought to higher levels by introducing methodological ideas and methods? reasonable questions arise.

To answer such questions, revision of methodological aspects and methodical approaches of teaching "Engineering computer graphics" to students of higher education institutions, re-development, justification and education of the components of the teaching methodology of the subject based on three-dimensional modeling application to the process, determination of modern pedagogical conditions that allow training a qualified specialist in the field of engineering computer graphics, development of electronic developments (teaching and methodological support, training manual and methodical instructions, etc.) and their teaching It can be answered by introducing the training process and preparing a competitive specialist in the conditions of the current labor market.

Although "engineering computer graphics" has not been established as a discipline for a long time, one of the main reasons why it has developed in such a short time is that it is possible to achieve high results with less time. This situation led to the development and widespread popularity of science. Today, the subject of "Engineering computer graphics" remains convenient and effective not only for informatics and information technologies, but also for other specialties. For example, construction of building structures, architecture and design, communication and informatization, construction of hydrotechnical structures, construction of roads and railways, and other developed directions are being studied as a very desirable field. In "Engineering computer graphics" the possibilities of computer modeling of graphic works and problems are used. It is the next stage of the science of "Drawing geometry and engineering graphics", without mastering it, it is impossible to learn the science of "Engineering computer graphics". One of the most advanced and popular CAD programs produced by the Autodesk company in the study of "Engineering Computer Graphics" can be widely used in teaching the subject of "Engineering Computer Graphics", in which the rules for setting dimensions, standards, finding a third view of a drawing based on two views, cutting and sectioning, line types, and similar basic rules, it is completely wrong to carry out planned design work.

It is known that various graphic programs are used in the teaching of "Engineering computer graphics", and all of them have the ability to model graphic images. In the course of completing tasks related to engineering graphics, when students have difficulty visualizing their image, i.e., spatial visualization, it is necessary to solve the problem of building a model of a detail drawing through one view. In the process of solving, a full picture of the given detail appears and students' interest in science increases. Modeling can be done through various graphics programs. All of them have their own characteristics. For example, the ability to solve engineering problems using the AutoCAD graphics program using fast and convenient methods; The ArchiCAD program is a reliable program for architects, which is used in the design of construction structures; 3DMax, Corel Draw, Adobe Illustrator - vector three-dimensional and two-dimensional modeling programs, the presence of the ability to create moving images, etc.

Choosing the most suitable graphic programs, depending on the assignment of topics in the educational process, and using their capabilities as a pedagogical technology can not only increase students' interest in science, but also serve as the best tool for developing creative activity in science.

According to M.V.Matveyeva: the illustrative function of engineering computer graphics is fulfilled during the study of ready-made graphics, animation and video educational materials. If they acquire knowledge by creating a mathematical model of the studied object, the cognitive function of engineering computer graphics is fulfilled. Illustrative and cognitive functions of engineering computer graphics are conventionally distinguished. On the one hand, even a simple graphic image can cause a

new idea to be born in a student or open up new aspects in him. On the other hand, the cognitive function is not always fully realized, for example, when the student reflects only the already known features of the studied object, only the illustrative function is performed. The Korean scientist Z.Zuo conducted scientific research on the introduction of computer technologies into the teaching process of "Engineering computer graphics" and the improvement of teaching. In his scientific research work, he scientifically justified the need to conduct "Drawing geometry and engineering graphics" in harmony with the subject of "Engineering computer graphics".

The Indian scientist J.Rush in his scientific research showed that the main goal of teaching "Engineering computer graphics" should be to develop creative activity in students on computer design of production issues.

Although Spanish scientists L.T.Erig, H.J.Chery, R.L.David conducted scientific research on the use of three-dimensional interactive graphics for teaching equipment manufacturing processes, three of them tried to use the dimensional modeling tool, but issues such as development of students' spatial imagination, development of creative activity in computer design were not sufficiently researched in it.

The analysis of the carried out studies showed that the problem of developing the technology of designing the model of creative activity of students and the development of the methodical system of teaching, using the possibilities of various graphic programs in the teaching of "Engineering computer graphics" in higher education institutions, has not been researched as a research work. The fact that the problems in this regard have not been scientifically and pedagogically solved, that students in higher education institutions cannot fully understand the purpose and content of the teaching of engineering computer graphics, and that they lack spatial imagination in modeling issues related to their specialty using the capabilities of various graphic programs. , the fact that computer design of problems in "Engineering computer graphics", which is an integral continuation of "Drawing geometry and engineering graphics", is not up to the level of demand, creates a number of problems in providing specialists in the fields directly related to engineering computer graphics, which is entering our republic.

According to the results of the conducted research, in the teaching of "Engineering computer graphics" in higher education institutions of the republic:

The teaching process of "Engineering computer graphics" in higher education institutions is not included in the standard system of lectures, practical and experimental classes; that the possibilities of graphic programs are not used at the level of demand in the development of creative activity of students in the subject of "Engineering Computer Graphics";

Lack of scientific-methodical manuals and textbooks in the field of "Engineering Computer Graphics";

Absence of intersubject communication in the teaching of graphic arts;

- Lack of qualified personnel teaching graphic arts;

- Lack of teaching hours of graphic subjects;

- Absence of electronic textbooks and educational programs necessary for teaching science;

- Defects such as the fact that the generalized methodical system of graphic tasks is not up to the required level have been identified.

Therefore, it is necessary to improve the effectiveness of graphic education in the development of spatial imagination and creative activity of students in the subject of "Engineering computer graphics", by using a three-dimensional modeling tool with the capabilities of graphic programs, to develop students' spatial imagination and perfect work in graphic programs. the opportunity to develop skills will

expand. Therefore, in the research work, the criteria of the level of development of spatial imagination (pedagogical-psychological, didactic, technical) of the students of "Engineering computer graphics" in higher education institutions are clarified. Improving the quality of teaching engineering computer graphics in higher education institutions (pedagogue, learning-knowledge, electronic evaluation of mastery level, creative activity) based on an integrated approach. Development of a model for the development of creative activity of students in the subject "Engineering computer graphics" based on prioritizing three-dimensional modeling (educational-methodical, pedagogical-psychological, personal-positive qualities, demonstrability). Based on the technology of designing the teaching process of "Engineering computer graphics", its methodical system is used to eliminate problems such as improvement through visual modeling in the field directions (use of electric power, hydrotechnical structures and pumping stations in the water industry, water industry melioration) taking into account the necessity and based on the above-mentioned points, the topic of the research was named "Methodology of using a three-dimensional modeling tool in the teaching of engineering computer graphics".

Progress continues to "intellectualize" computers, to eliminate the barrier between man and computer. Computers accept information from handwritten or typed text, shapes, human voice, recognize the user by voice, and translate from one language to another.

The architecture of new generation computers includes two main building blocks. One of them is a traditional computer, but at the moment it is not connected to the user. This communication is carried out by a unit called a smart interface. Its task is to understand a text written in natural language and containing a problem statement and translate it into a program that can be run on a computer.

Currently, many areas of human activity are connected with the use of computers. Why are these electronic machines so deeply embedded in our lives? Everything is so trivial. They perform regular calculation and design work, freeing our brain for more necessary and responsible tasks. As a result, fatigue is dramatically reduced and we begin to work more efficiently than without using a computer.

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