

**POSSIBILITIES OF USING EDUCATIONAL TECHNOLOGIES IN TEACHING
STUDENTS FOR COMPUTER MODELING**

Fayzullayev Vohidjon Pulatovich

Teacher of the Department of "Exact Sciences,

Land Cadastre and Communal Services",

International Innovation University, Karshi city, Kashkadarya

Email: fayzullayevvohid5@gmail.com

Abstract: This article describes computer modeling, the use of information technologies in the educational system, and its advantages and opportunities.

Also, the importance, methods and role of computer modeling competence development of students based on educational technologies and their role in the educational process were analyzed.

Key words: pedagogical process, computer modeling, programming, simulation, interactive educational materials, project, interactive materials, technical tools, modern technologies, students, modeling, information technologies, creativity.

Аннотация: В данной статье рассматривается компьютерное моделирование, применение информационных технологий в системе образования, его преимущества и возможности.

Также проанализированы значение, методы и роль компьютерного моделирования в развитии компетенций студентов на основе образовательных технологий и их роль в образовательном процессе.

Ключевые слова: педагогический процесс, компьютерное моделирование, программирование, имитация, интерактивные учебные материалы, проект, интерактивные материалы, технические средства, современные технологии, студенты, моделирование, информационные технологии, творчество.

As is known, in the last century, computer modeling has become an integral part of the development of almost all areas of modern science. Computer simulations have become an indispensable tool for modeling systems in physics, astronomy, climatology, chemistry, biology, materials science, economics, social sciences, and engineering. In this regard, the use of modern innovative technologies in the pedagogical process requires, first of all, the development and democratization of pedagogical relations, since any pedagogical technology applied without their implementation will not give the expected results. Undoubtedly, the use of modern information technologies in schools and universities will lead to the acceleration of the educational process, increase its quality and efficiency, and the development of logical and theoretical thinking of students. This is especially important for engineering and technological educational institutions. Because it is advisable to include in the system of knowledge, skills and qualifications of future engineers, in addition to many specialized disciplines, not only simple computer literacy, but also the ability to freely operate a computer, use appropriate software to solve the problem set before the engineer, use modern graphic programs and their capabilities, and rationally use electronic information resources.

Today, all specialists studying in higher education institutions and preparing to take their place as highly potential and competitive personnel in the future must be able to effectively use computer literacy and information technologies. In addition, along with the ability to model the use of computer technologies, it is also important to be familiar with modern computer programs [1]. In the process of educational reforms, one of the directions of modernization of the educational process in the system of training bachelors in higher education institutions who have a broad outlook, are well versed in the field of future work, and are especially able to use computer technologies is aimed at developing the intellectual potential of students and forming skills for performing various independent tasks in information processing.

Due to the wide spread of various methods of using new information technologies, especially in the practice of domestic and foreign educational processes, it is worth noting that today's students know how to use computer modeling, because computer-based modeling technologies in all educational systems lead to a high level of quality of the educational process. In this article, we will focus on the possibilities of using educational technologies in teaching students computer modeling, first of all, each student should be able to correctly explain the question of what modeling is.

Modeling is the basis of designing information systems. It is often difficult, and sometimes impossible, to observe or change the behavior of real systems, processes and objects in various conditions. In such cases, the problem can be solved by creating a model of the system, process and object. By building a model, it is possible to repeatedly return the system to its initial state, as well as to observe its behavior in changing conditions.

In the process of technologicalization of education, it is possible to increase the volume of educational materials provided to students and introduce modern scientific achievements with the help of technical means [2]. Until recently, film and television as technical means of education were considered a great achievement in the education system. However, currently, computer-based modeling is gaining importance in the educational process. Similarly, computer-based simulation modeling is of great importance in the education system. From the point of view of implementation, computer-based modeling and simulation modeling perform similar tasks. That is, the demonstration of the internal and external properties of an object is shown through imitation. The role of educational means in improving students' knowledge is very large. Therefore, when creating the main means of education, that is, programs and textbooks, the author must take into account the interests and age characteristics of students, otherwise students' interest in the subject will fade away and their cognitive activity will decrease. Student activity can be achieved through the effective use of information and communication technologies in the lesson. It is precisely for such teaching processes that software is of great importance, especially in teaching English. Modeling using Adobe Flash or Macromedia Flash programs, which were chosen as the first software tool in the master's thesis, will be interesting and understandable to everyone as an innovative presentation in education.

The need to increase the efficiency of higher education has necessitated its extensive equipping with modern computer technology and its comprehensive use. Because the productive use of modern technical means of education in an innovative educational environment, first of all, ensures the technologization of education and leads to the creation of various software tools by students using computers. Also, computers can serve here as a visualization tool to accelerate the development of material, simulators for testing knowledge, and laboratory devices that simulate real processes and phenomena, which is especially important for the development of modeling skills in construction [3]. The experience of using computers in the education system shows that such modeling increases students' interest in educational material and deepens its assimilation.

The educational process conducted by professors in higher education institutions, especially in such disciplines as "Information Technologies", "Mathematical Modeling in Economics", "Physics", "Mathematics", and so on, using computer technology to model, encourage students to use modern programs and to be creative and independent thinkers, which ensures the achievement of the efficiency inherent in educational technologies. There are also a number of advantages of modeling based on computer technology:

First, safety - testing or experimenting without harm to humans or the environment.

Second, prototyping - economic savings from using models to design and test new products before the final product is manufactured.

Third, forecasting - looking into the future, highlighting possible impacts or losses, and finding solutions to problems before they arise.

Fourth, visualization - seeing, understanding, and analyzing relationships in a system. Accelerate or slow down the process in time.

Fifth, iterativeness - the model system can be repeated over and over again, changing parameters based on different scenarios. In addition, computer modeling encourages students to do research, because computer simulation is adaptive, dynamic, and interactive. Therefore, it arouses interest in research and exploration in students. In this case, students draw their own conclusions about scientific concepts and ideas by changing the values of various parameters and observing their effects.

Interactive computer simulators give students a sense of control and ownership of their discoveries, and thus increase their ability to understand and analyze data. These simulations provide an opportunity to reimagine real-world events. Therefore, taking into account the experience of developed countries, I can say that all higher education institutions in Uzbekistan should seriously consider organizing computer modeling directions. The need for computer modeling specialists in the new Uzbekistan higher education system and in the production and engineering sectors will increase significantly in the next 4-5 years [4].

In conclusion, developing and testing the most suitable model for a given system before conducting experiments using computer modeling can significantly reduce the cost of experiments. Saving on the cost of experiments using models, in turn, leads to greater economic efficiency.

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