

Pedagogical foundations of the effective use of information technologies in teaching engineering and computer graphics

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Abstract: This article discusses pedagogical and organizational methods for the effective use of information technologies in teaching the subject "Engineering and Computer Graphics". The study analyzes the possibilities of interactive teaching technologies in developing the innovative and intellectual activities of future technical specialists, and provides information on the stages and principles of implementing the goal of introducing new messages, information, and indicators into their educational process.

Keywords: innovation, intellectual, interactive, technology, design, stages, media technology, principles, constructive, spatial image, skills, mental approach.

INTRODUCTION

The use of information technologies in teaching engineering and computer graphics is of great socio-pedagogical importance in the effective organization of the educational process, in the preparation of highly qualified specialists. Because information technologies are important for the development of innovation and intellectual activity of future specialists, increasing the efficiency of education and upbringing, and widely applying the results of scientific and technical progress in the educational process, they perform such tasks as searching for, collecting, sorting, processing and appropriately using the necessary useful information. Also, in teaching specialized subjects, pedagogical technology, computer technology, information technology, innovative technology, etc. develop knowledge related to the specialty. Thus, the informatization of the educational environment, the introduction of new messages, data, indicators into the educational process and their close acquaintance with them, help to improve the level of knowledge of students, broaden their scientific outlook, bring the process of forming scientific information, the skills of independent mastery, and the content of education closer to the world level. In this regard, in the teaching of Engineering and Computer Graphics, information technologies as a means of education enable future specialists to develop knowledge, skills and competencies, work with applied programs, determine the level of student mastery, process learning outcomes, select the optimal path in teaching, collect, transfer, store and process them. As is known, the development of science and technology has led to a sharp increase in information. The use of the Internet, which is one of the information technologies, creates good opportunities for this.

RESEARCH METHODOLOGY

Currently, such local-local networks are widely used in the teaching of Engineering and Computer Graphics, in educational production processes, and new information and data are obtained. For example, Internet technologies provide information exchange services from any corner of the world via computer tools through various messengers called providers. Searching for and using the necessary information from the WWW sites of http: sources on the Internet, you can get various news, data, information, even literature and lecture texts related to education. Information technologies provide the establishment and management of students' logical thinking in the educational process, as well as the organization of group or individual classes. Therefore, the use of information technologies in the educational process is the main basis for teaching special subjects. Information technologies are a system of pedagogical and scientific knowledge, which improves the quality of objectivity, originality, stability, creation, dissemination and use of innovations in the field of information technology, technologies, scientific research, and serves as the main source for increasing the volume of material studied in classes, accelerating the pace of teaching, and solving pedagogical problems. On the basis of information technologies, such tasks as introducing innovations into the educational process, organizing organizational, planning, mass relations, implementing long-term information, taking initiative, and educating the student's personality are implemented. Therefore, the use of information technologies in teaching Engineering and Computer Graphics is associated with the development of new methods and ways of teaching, the use of interactive methods. The word "interactive" comes from the English word "Interactive" and means interacting or being in a conversation, dialogue (communication) mode with something (for example, with a computer) or with someone (with a person). So, interactive teaching is dialogic teaching, in which the activities of the teacher and the student are organized and predictable. The essence of interactive teaching is that in the learning process, all students are involved in the process of perception. They have the opportunity to understand and reflect on what they know and think. Creativity is formed on the basis of the collaborative work of students with teachers in the process of perceiving and mastering educational material, and their knowledge of the subject of Engineering and Computer Graphics is developed. In this, the readiness of students is taken into account and their activity in the process of performing exercises is determined. Of course, in this, the teacher of the subject of Engineering and Computer Graphics must clearly show his students the object of study, ensure long-term retention of educational information in memory and form skills for its appropriate use, and provide complete information on the subject of study. From organizers and providers of distance learning services www.e-muhandislik.uz, mail.ru, rambler.ru, etc. are gaining importance. The possibility of computer

videoconferencing through computer networks is great. If we take into account the capabilities of the computer, this type of communication can create many conveniences. Technical progress has led to such opportunities that it is possible not only to conduct independent learning, but also to conduct the lesson itself without a teacher. Of course, the absence of the teacher's participation is conditionally taken into account. Because, even if the teacher is not in the audience, he can conduct education from a certain distance. That is, he teaches remotely, driving a car. Experiments have shown that distance education is possible even with the help of audio tools. Distance education is widely used today. Therefore, the formation of innovative technology for the teacher of Engineering and Computer Graphics is an important socio-pedagogical phenomenon. In this regard, the development of the effectiveness of innovative technologies and their implementation functions, organizational and pedagogical aspects in the field of engineering and computer graphics serves as an important resource for teachers. Because innovative technologies require the implementation of tasks such as modernization of educational materials, increasing the cognitive activity of students, using interactive teaching methods and developing tools and methods to control their knowledge, developing independent work skills and forming creative thinking. Another advantage of distance learning is that it is independent of space and time, that is, it can be implemented anywhere and at any time.

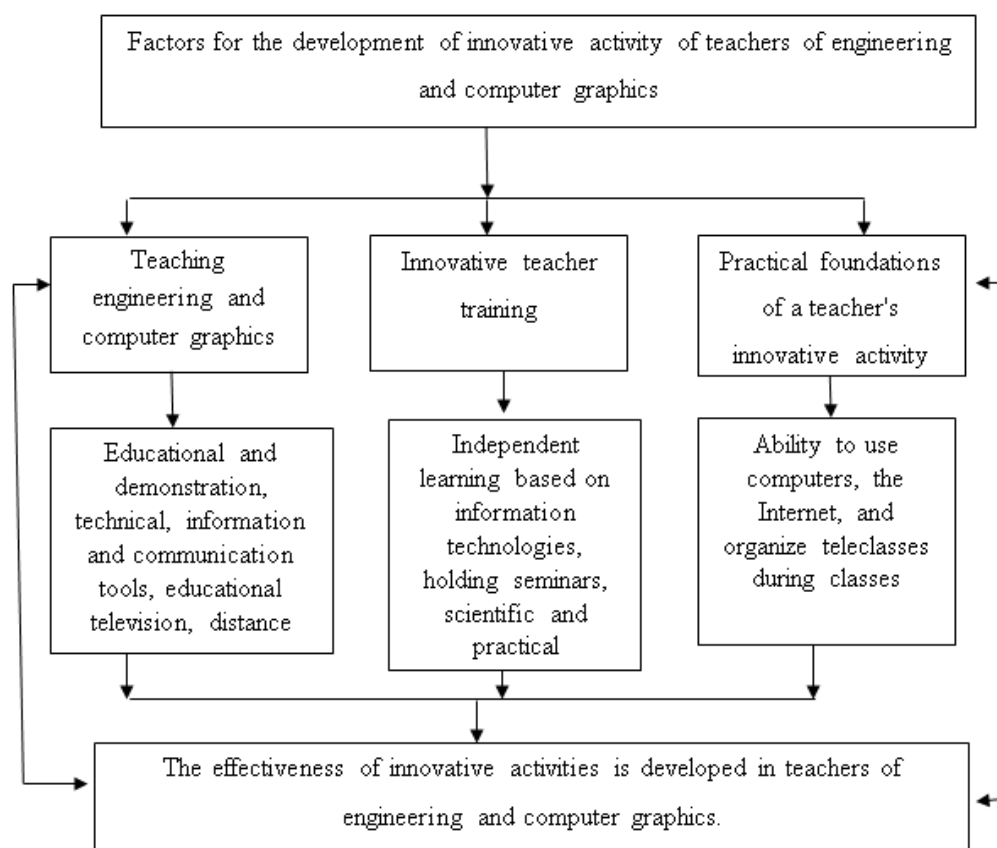


Figure 1. Factors for the development of innovative activity of teachers of engineering and computer graphics

Distance learning is widely used in teaching engineering and computer graphics to students to obtain additional knowledge.

RESULTS

One of the important features of distance learning is that the teacher and student conduct teaching work at a certain distance from each other. In this case, almost all stages of the educational process are carried out on the basis of modern information and telecommunication technologies. Recently, distance learning via the Internet is being organized to deliver the main part of educational materials to students and to convey information using the technical and software tools of the global network. The specific features of distance learning are that it creates an opportunity for students to master knowledge of engineering and computer graphics themselves through the use of modern information-delivering information technologies. Such information resources include databases and knowledge bases, computer training and control systems, multimedia, video and audio recordings, electronic libraries, as well as traditional textbooks and methodological guides. With their help, it will be possible to give video and television lectures, hold roundtable discussions, conduct video and text-based computer conferences, and even conduct daily consultations with students via computer. This will help to make education more intensive than in the traditional form of teaching and learning between teachers and students. Currently, almost all educational institutions in developed countries have established intensive telecommunication connections in the teaching process, which are able to create electronic opportunities for students to interact with each other and with teachers-advisors. The advantage of distance learning is that it allows you to quickly deliver any amount of information to different distances, quickly and easily change information via the Internet from your workplace, store specific information in computer memory at the right time, edit and develop it, access various information sources, primarily Internet websites and databases, and conferences around the world via the Internet and work with this information, organize electronic computer, audio and video conferences, communicate with engineering and computer graphics production organizations via the Internet, request information on any question through electronic conferences and copy the received materials to your diskette, and work with them at a convenient time, when and how.

CONCLUSION

The use of information technologies in teaching engineering and computer graphics is important for increasing the efficiency of the educational process, forming independent thinking and a creative approach in students. Information technologies create the opportunity to quickly search, process and effectively use educational materials. Access to global information sources via the Internet and

multimedia tools, organizing distance learning, and using interactive methods increase the level of knowledge of students and serve to prepare them at the level of modern requirements. Distance learning allows for the widespread use of modern information technologies in teaching engineering and computer graphics. This process eliminates the distance between the teacher and the student, serves to quickly deliver educational materials through global networks, consolidate knowledge using multimedia tools, and ensure interactive communication. Resources such as electronic libraries, video and audio lectures, and computer conferences provide students with ample opportunities to obtain additional knowledge, develop independent learning, and develop creative thinking. Distance learning also provides the opportunity to organize the learning process, quickly exchange and control information, regardless of space and time.

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