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Use of Digital Technologies in Education

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Abstract: *The purpose of the article is to disclose the problem of using information technology in general education organizations. Based on the analysis of the regulatory framework, scientific and methodological literature on the research topic, the specifics of the implementation of information technologies in the study of individual subjects was determined. Particular attention is paid to the impact of computerization on the quality of education; examples of the use of information technology in education are disclosed. The article describes three main components of information technology as a complex of hardware, software and organizational and methodological support; the description of analog and digital information technologies is presented.*

Keywords: *information technology, information, graphics, students, system and application programs, the educational process, computerization, e-learning.*

I. Introduction

In fact, innovation (in-new) appears in the Latin language somewhere in the middle of the XVII century and means the entry of a new into a certain sphere, implantation into it and the generation of a whole series of changes in this sphere. And this means that innovation is, on the one hand, the process of innovation, implementation, implementation, and on the other hand, it is the activity of turning innovation into a specific social practice, and not at all an object.

Innovation activity in its most complete development involves a system of interrelated types of work, the totality of which ensures the emergence of real innovations. Namely:

- research activities aimed at gaining new knowledge about how something can be ("discovery"), and how something can be done ("invention");
- project activities aimed at developing specific, instrumental and technological knowledge on how, based on scientific knowledge, it is necessary to act in the given conditions in order to get what it can or should be (an "innovative project");
- Educational activities aimed at the professional development of subjects of a certain practice, at the formation of each personal knowledge (experience) about what and how they should do in order for an innovative project to become a reality ("implementation").

THE MAIN PART

Currently, many citizens of our country are actively showing interest in the modern education system. Often, many of them are parents of schoolchildren who are concerned about the education of their children. Even people who are not directly connected with the educational process can notice problems in the field of education, but they most acutely feel the existing problems and contradictions, of course, teachers. Information technologies are used in all spheres of human activity, distributed through information flows in society, form a global information space. Today in the world they are becoming more widespread, because society needs to update information. Almost all spheres of society use information technology. A central part of this process is the computerization of education. To date, the Ministry of Education of the Uzbekistan pay great attention to the informatization of the educational process, since the use of information technologies significantly increase the number of pedagogical methods of teaching students. In 2002, the Ministry of Education of the Uzbekistan developed: "The draft federal component of the state educational standard for general education in computer science and information technology".

ANALYSIS OF THE LITERATURE ON THE SUBJECT

The problem of improving the educational process with computer support received wide coverage in the works of famous domestic and foreign scientists: Ya.A. Vagramenko, A.I. Berg, B.C. Gershunsky, V.M. Glushkova, M.Ya. Dovgyallo, I.V. Robert; V.V. Rubtsova, A. Bork, I. Marev, V.V. Lapteva, E.S. Polat, A.A. Verbitsky, I.V. Kuznetsova, Yu.I. Bogatyreva et al. The problems of computer training were solved mainly in two directions. The first is connected with the study of the basics of computer science, computer engineering and programming (A.A. Kuznetsov, Yu.A. Pervin, I.V. Robert, S.A. Beshenkov, I.M. Bobko). The second direction - the use of a computer as a means of educational and cognitive activity - arose in due to the fact that there was a need to use a computer when teaching other subjects (E.I. Kuznetsov, M.P. Lapchik, Yu.S. Branovsky, VV Pasechnik).

At the same time, the theoretical basis of these studies was the psychological pedagogical theories and scientific works of domestic and foreign scientists in the areas of educational content (B.S. Gershunsky, K.D.Ushinsky, I.G. Herbart, M.N. Skatkin et al.), educational process (Yu.K. Babansky, M.A. Danilov, L.V. Zankov,

M.I. Makhmutov et al.), pedagogical design (V.P. Bederkhanova, A.A. Ostapenko), the creation and use of funds training (B.C. Lednev, TS Nazarova, SI. Shakhmaev and others), computerization and informatization of education (V.P. Bespalko, V.M. Monks, D.B. Epiphany, I.N. Antipov, I.M. Bobko, Ya.A. Vagramenko, K.K. Colin, E.I. Mashbits, A.P. Ershov, A.Yu. Uvarov, E.I. Kuznetsov, M.P. Lapchik, V.G. Razumovsky, I.V. Robert, E.G. Skibitsky, B.E. Starichenko), the psychology of perception of information (L. S. Vygodsky, P. Ya. Halperin, A. N. Leontyev, S. L. Rubinshtein and others), pedagogical reflection (B.G. Ananyev, I.S. Ladenko, V.V. Rubtsov, etc.), designing pedagogical systems, including those with computer support (I.I. Ilyasov, N.V. Kuzmina, G.N. Alexandrov, T.S. Nazarova, T.L. Shaposhnikova, A.I. Arkhipova, SP. Grushevsky, T.G. Vezirov). The theoretical foundations of building innovative educational technologies and educational complexes are presented in the works of A.I. Arkhipova, SP. Grushevsky, T.L. Shaposhnikova. An analysis of recent studies (V.A. Pozdnyakov, E.M. Razinkina, S.G. Grigoriev, V.I. Dorotyuk, I.M. Bobko, etc.) suggests that the problems of innovation in the structures of educational process, including in the field of creation and application of new learning tools and technologies from computer support.

RESEARCH METHODOLOGY

Computer technology has penetrated and continues to penetrate into all spheres of human activity. It is impossible to imagine a single industry in which electronic computers were not used. The education sector was no exception and was also computerized. Moreover, computers are not considered as an additional means of learning, but as an integral part of the holistic educational process, designed to significantly increase its effectiveness. But to solve educational issues, the computer is not always fully used. This is due to the fact that information technology has not yet found its proper application in school. In schools, not all of its computer technology capabilities are realized. Many teachers are new to new information technologies and do not have information on how to use them in teaching. In most cases, computer lessons are taught at a computer school by virtue of the specifics of their training, which poorly represent the conditions necessary when using computer technology to teach specific subjects. The emergence of new computer technologies also has a significant impact on the expansion of the number of educational topics in the framework of computer science training. The problem of the widespread use of computer technology in the educational sphere has recently been of great interest in Russian pedagogical science. It follows that the computer science teacher must constantly improve his knowledge and teaching methodology. But not all educators are ready for this. Sometimes teachers say the following: “We have not been taught this. We were not given such material. This was not in the courses”.

But, nevertheless, the requirements for modern teachers require teachers to have competencies in the field of self-education. Main part. Modernization of the education system expands the potential for innovative development of society. It is based on the implementation of new conceptual approaches to the development of education. Putting IT into practice is one of the most important areas of modernization. It allows not only to increase the level of training, but also to develop information competencies, to reveal the intellectual potential of the individual. In the last decade, school education has undergone large-scale computerization: more and more classrooms are equipped with computer tools; more and more media resources are offered teaching aids. Now it is impossible to imagine a school classroom without a teacher's computer, interactive whiteboard and other computer equipment. Information technologies include methods and methods for collecting, accumulating, storing, searching, processing, analyzing, issuing data, information and knowledge in accordance with the requirements that are presented to users based on the use of software and hardware. There are the following three main components of information technology: a set of technical means; software; organizational and methodological support systems. Using communication tools and information carriers, information technologies provide an opportunity for people to be aware of events not only of the current time, but also of the past. Information technologies are divided into two types: analog; digital. Analog technologies present information in the form of a continuous random variable; Digital information technologies use a discrete method of representing information in the form of binary arithmetic. The digital presentation of information protects against interference to a greater extent, including when transmitted over communication channels. Thus, information technology and computer science are closely interconnected. Computer science is the science of the methods, means, and technologies of their automation, creation, and functioning. Computer science as an academic subject encompasses content that can shape students' thinking. For example, these are the topics of “concepts”, “structuring of information”, “reasoning”, etc. Thus, computer science as a school subject is called upon to form, with its content, methods of working with information and thinking methods.

ANALYSIS AND RESULTS

At computer science lessons, a systematic perception of the world develops, the development of common information links of various natural and social phenomena, a systematic thinking develops, the level of which is largely determined by the ability to quickly process information and make reasoned decisions based on it, which requires additional opportunities from schoolchildren and teachers - application of all new teaching methods and means. The experience in teaching the subject of computer science demonstrates that often teachers of computer science do not realize the rich reserve of their subject and do not set the goal to participate in the development of the mental functions of students during the study of the subject of computer science and ICT. Computer technology can be of great help in every school subject, providing the opportunity to demonstrate graphic, audio and video files. In addition, there are many different programs with which you can comprehensively consider models of objects, simulate any phenomenon or process, make any complex calculations and provide detailed analytics. This all allows you to significantly save time, which is often lacking, this allows you to do something that in real life is often either difficult or impossible at all. For example, in biology classes, the task is to consider plant growth. In real conditions, this would take more than one month, but with the help of computer technology you can simulate plant growth and track the key stages in just a few minutes. Or in chemistry, when you need to mix the reagents and track the chemical reaction. In reality, these same reagents, preparation would be needed, and the mixing process is fraught with at least minimal, but danger. With the help of computers, this is all done instantly. And another example, this time from mathematics. After a long solution to the example, it turns out that the answer does not converge. Instead of solving from the very beginning, you can simply enter this example into a computer; it will solve the example in a split second and will give a detailed solution and answer. After analyzing the solution, you can find an error in your calculations and return to that place to make corrections. In essence, such training at present is not complying with the requirements of the second-generation GEF. Recall that this is a normative document necessary for implementation, which contains requirements to form cognitive, in-depth, logical, comprehensive educational actions for students, such as comparing, generalizing, concretizing, analyzing, synthesizing, summarizing a concept, etc. These actions must be applied during educational activities, that is, when learning new things, performing training activities, solving problems. For the practice of training, this means the need to organize appropriate intellectual activity at all stages of the lesson and in lessons of different focuses. In modern education systems, the most common multifunctional office applications and IT tools are: spreadsheets; text editors; presentation preparation programs; organizers; database management systems; graphic packages. The use of IT in the educational process helps: improve the cognitive activity of students; consider modeling and visualization of complex processes and phenomena; show interest in the study of individual subjects; use the Internet when finding the information you need. Advantages of using IT: use of audio and video information during classes; mastering the subject using graphic information; the possibility of using a differentiated approach to students of different levels of readiness; the possibility of the most rapid contact between teachers and students. All the advantages that information technology gives us undeniably facilitate the learning process. The main pedagogical goals of information technology in the lessons develop the personality of the student, which includes: the development of communication skills, the development of creative thinking, the ability to make unusual decisions in complex role-playing situations; improving knowledge in experimental activities. The potential of information technologies in modern Russian education is determined by a wide line of development of the human individual. The issues of developing information technology resources mostly attract the attention of Russian educators who are working on the concept of “electronic pedagogy”. They believe that information technology provides many benefits for

developmental learning. The most common now is distance learning. Representation and opinion on the rationality of this form of training are very different, and often completely diametrical. This is because until recently, almost any teaching methodology was considered remote, in which at least a small fraction of the materials were handed over for independent study. Distance education is increasingly associated with a closed learning system. In it, the main means of communication for the provision of information is the worldwide network Internet. A specially designed shell should provide a set of tools that allows you to teach individually, provides the information support necessary for studying, checking and self-checking, a system of final control measures, etc. For this, the funds are quite enough, given the variety of already created computing technologies. Distance learning considers the interaction of the teacher and students at a distance between themselves, which reflects all the components inherent in the standard learning process. The idea of using computers in schools, where teacher substitution is required to some extent during blended learning in primary school, or as compensation for the professional unpreparedness of a part-time teacher, is not entirely new, but no less promising. Many universities already have an e-learning system, with the help of which students have the opportunity to study not only at the university, but also at home. Distance learning is more important for rural students than for their peers in cities. Distance education provides equal educational opportunities for all comers. Thanks to this type of education, you can enter any foreign university and get a diploma that will be appreciated. The positive side of distance learning is the choice of place and time of the educational process. An obstacle to the development of distance education is the low awareness of people about this system. But, despite this, distance education is gaining fame. It is believed that in the near future, about 40-50% of people will study remotely. The international Internet provides great opportunities for educational institutions. Widespread, safe, it gives the most convenient opportunities for organizing distance learning. The Internet provides several types of services, among which there is the possibility of installing a distance learning support system. It is important to note the presence of a computer in the school with access to the worldwide network.

This will make it possible to use the educational institution as a local center of an open education system, which will enable applicants to continue their education at a distance in various professional and higher educational institutions. Computers play a huge role in education. They save time, automate many processes, conduct quality control of knowledge, contribute to better assimilation of knowledge, etc. But no computer can fully function without a person sitting behind it, because no matter how good the computer means, no one will teach children better than a teacher. Also, information technology makes it possible to develop game methods and organize training as a collective activity of students. The place and role of information technology in modern society is high, because the role of information is high. Information technologies in education make it possible to diversify the palette of forms and teaching methods for a more detailed amount of information due to such an important component of the educational system as visibility, which information technologies can fully provide. One of the modern ways to improve the educational process at school is to informatize education, and in particular, use information technology. Informatization of education includes not only the informatization of education. This is the informatization of educational activities, monitoring and measuring learning outcomes, educational processes, extracurricular, research and scientific and methodological activities, as well as organizational and managerial activities. Information technologies in the educational process help to absorb information more deeply while studying subjects and facilitate the work of teachers in the course of classes. Conclusion Thus, the informatization of education leads to the transformation of certain aspects of the learning process. The activities of the student and teacher are being converted to informatization. The student can use a large amount of various information, collect it, process it. The teacher is freed

from routine activities and gets the opportunity to explore the learning process, track the development of the student. Basically, teachers are not ready for the transition from established teaching methods to the use of information technology in the educational process. Computers are used primarily as an additional learning tool. The use of information technology helps to improve educational activities, increases the quality of the learning process and enhances the effectiveness of students' individual activities.

Also, the use of information technology in the educational process trains qualified specialists in the development and application of modern technologies and means of informatization of education. Informatization of education means focusing on a new quality of education. The school is obliged to prepare graduates for a successful life and work in conditions of an excess of information. Information and communication competence, which was previously the property of a few, should now be available to everyone. This requires updated education standards. Computerization of education is a process of change. School informatization is undoubtedly expensive thing. As a result of the analysis of modern directions in the development of the process of informatization of education, its rational organization in the interests of the future scientific, technical, socio-economic and spiritual development of society is a complex and highly relevant scientific, organizational and social problem. To solve this problem, continuous interaction of specialists in the field of education, as well as effective support of this interaction from the state is necessary. In addition to the main educational function, information technology develops the student's creative skills and broadens his horizons. In addition to the main subjects, the student can receive additional education, for example, start learning some programming language, use online courses, simulators, and communicate in any social network.

IV. Conclusion. You can get knowledge regardless of place of residence and age. Currently, the worldwide network and various software products are diverse in their assortment. It is precisely because of the development of information technology that the idea of continuous continuing education is fully realized. Also, information technology to a greater extent argues people to learn, conduct various research projects, create innovative projects and articles. Thus, the use of information technology in the educational process is necessary to prepare students for life and work in the modern information society.

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