INTRODUCTION

Information and communication technologies are gradually, actively and constantly interspersed and integrated into all spheres of human activity and society, becoming a powerful catalyst and a determining source of their objective development. This process is called the informatization of society, and the society itself acquires signs of information. Informatization of society presupposes advanced informatization of the branch of science and education, where, basically, the cognitive, personnel and scientific and technical foundation of informatization itself is formed as a process and socio-economic phenomenon, the future of the achievements and development of society as a whole is laid (KOEDINGER, CORBETT, 2006).

Computerization of education is a basic component of the process of its informatization, which is associated with the creation of an information and communication learning environment, the formation of its system-wide software and hardware computer elements - computer and computer-oriented teaching aids, computer networks and telecommunications, including within the framework of global computer networks, ensuring the possibility of their operation, maintenance, updating and development (LEMKE, 1990). That is why the problems of computerization of aids to navigation should be given priority attention by all educators, the whole society, and this process itself should be controlled by state and local authorities.

In scientific discourse, computerization is usually considered as a process of penetration of computer technology and information technologies into various spheres of human life. Computerization is a central and prerequisite for the development of information interactions that determine the formation of the life of a modern person. (CHEREMNYKH, POLIUKH, 1987). The introduction of computers in various areas of management and material production, improving their technical base and equipping them with modern communication means increases the efficiency of accumulation and processing of information, becomes a factor in increasing the efficiency of managerial interactions and the reliability of feasibility studies of economic development projects, provides for the accuracy and timeliness of assessments of economic risks in case of changes in market conditions. The computerization of information processes is a socially significant phenomenon called informatization (DESMET, AELTERMAN, BASTIAENSENS, 2015).

Technologically, informatization is the process of developing communication, automation and simplifying access to information. It is clear that computerization has not bypassed such an important area of human life as education. Computerization and informatization have created new opportunities in the field of education. The use of computers expands the possibilities of active forms of classes in classrooms, allows you to simulate the processes studied to create situations close to reality (GRAESSER, JEON, DUFTY, 2008). The use of the Internet and multimedia technologies radically expands the possibilities of distance learning.
Computerization of education remains a topical issue today. The use of information technology facilitates and improves the educational process, activates and stimulates the mental activity of students and allows you to diversify and improve the effectiveness of the educational process. But, despite the potential and accumulated experience in the field of computer training, there remains a set of unsolved problems that arise when introducing information technologies into the educational process (OROMA, WANGA, NGUMBUKE, 2012).

Unfortunately, the process of organic combination of technical and pedagogical sciences from the point of view of the development of theory and practice of implementation of computer (multimedia) teaching aids is not as powerful as expected; and how it is dictated by the needs of modern society. The slow pace of introducing computerization of the teaching process in higher education is due to reasons of a different nature and scale (KEMPPAINEN, 2006).

On the one hand, there is a sufficient number of different types, types of computer programs, on the other hand, there is a weak scientific and pedagogical substantiation of their application in the process of training students. A significant part of computer tools and developments introduced by higher educational institutions in the pedagogical process are offered at the initiative of young scientists and researchers as part of individual scientific research. The above indicates the absence of a unified approach to using the capabilities of computer technology in the learning process. Consequently, there is a need to develop and formulate general and uniform normative pedagogically expedient requirements both for individual tools and for their complexes and systems.

THEORETICAL BASIS AND MATERIALS

The intensive process of computerization of education poses a number of economic, technical, social, psychological and pedagogical problems for modern teachers that require solution. The use of computer technology in the educational process opens up great opportunities for the development of cognitive abilities - from sensory-perceptual to speech-thinking forms. In the wide distribution and use of technical means, optical and acoustic technology, programmed teaching, cinema, television, computers, modern research scientists see one of the main factors in improving the quality of teaching and upbringing both in general education and in higher education (GREIFF, WÜSTENBERG, HOLT, GOLDHAMMER, FUNKE, 2013).

Unfortunately, the process of organic combination of technical and pedagogical sciences from the point of view of the development of theory and practice of implementation of computer (multimedia) teaching aids is not as powerful as expected; and how it is dictated by the needs of modern society. The slow pace of introducing computerization of the teaching process in higher education is due to reasons of a different nature and scale (LEVY, MURNANE, 2003).

The process of computerization of education, first of all, includes the availability of information technologies, or rather a set of relevant technological and software tools, to all participants in the educational process. Computer technologies in teaching are aimed at collecting, processing, storing, distributing, transferring and presenting information for those who use them. Purposeful use of information technologies ensures the development of the following functions (KRYSHTANOVYCH, KOTYK, TIURINA, KOVREI, DZHANDA, 2020; FISCHER, GREIFF, FUNKE, 2012):

- informational, that is, the provision of the necessary educational material and information on the educational process;
- educational - the use of technology as a simulator for the acquisition and consolidation of skills in practical application and memorization of theoretical material. Also, some technologies allow for educational experiments and business games for training;
- controlling - as a means to control the assimilation of educational material and determine the level of knowledge of students;
organizational, which provides the ability to simultaneously test the knowledge of all students and save time to test their work.

Most often, the educational process uses multimedia and technology. Multimedia tools, training is a set of hardware and software tools that allow the user to communicate with a computer using a variety of natural environments: graphics, hypertext, sound, animation, video. It is worth noting the following ways to use multimedia in teaching (Kyllonen, 2009):

- use of electronic textbooks, encyclopedias and the like;
- creation of illustrative material;
- creation of multimedia presentations;
- use of video and audio materials in the classroom;
- use of two-dimensional and three-dimensional animation (for dynamic illustration of educational material).

The presence of multimedia technologies also expands the possibilities of the educational process. They allow you to save time in preparation for the lesson and during it, provide the ability to edit information in real time and the ability to illustrate educational material. The use of multimedia technologies is also effective due to the fact that they can simultaneously influence different systems of human perception. And according to statistics, if a person hears, sees and discusses material, then her memorization level rises to 70%. Another important feature of these technologies is the ability to make them interactive, that is, to provide the student not as a passive observer, but as a participant, thereby increasing interest and motivation in the educational process (KALYUGA, 2009).

The organization of the educational process from the standpoint of a systematic approach, in our opinion, allows you to thoroughly determine the role, functions of computer tools in teaching, formulate requirements for them, as well as criteria for the effectiveness of their use. The famous scientist Moshe (2001) considers it expedient to distinguish between two main directions of computerization:

1. Computerization of education, that is, the provision of universal computer literacy.
2. Computerization of the educational process itself, i.e. the use of a computer as a means of increasing the effectiveness of teaching, especially since the invention of a multimedia computer, one of the most perfect products of technical progress, has expanded the possibilities of presenting educational information due to the combination in one user product of text, graphics, audio and video information, animation, opportunities for user feedback, interactivity properties. In the functional structure of training as a management process, several basic and interrelated functions and stages are distinguished. These include goals, information, forecasting, decision making, organization, communication, control, and correction. By this functional structure, computer tools can be considered as a system of pedagogical communication tools. The specific functions of such means are due to the interconnection of the communication link with all other management functions. In general, computer tools have their main purpose to enhance informational influence between all participants in the educational process in the system of direct and reverse communication channels functioning in the structure of the pedagogical system (KRO'NER, Plass, Leutner, 2005).

For a teacher, a computer is a powerful learning tool, facilitates the process of creating educational material, demonstrating it, presenting it in expanded or compressed form, with or without illustrations. In the educational process itself, it allows you to remove the most time-consuming work from the teacher, for example, training exercises in which the computer itself controls and requires repetition of the task until the student’s indicators are as close as possible to what is necessary (PERKINS, SALOMON, 1989).

International telecommunication projects are becoming more widespread, and students, gaining access to professional banks and databases, master scientific problems, work in small research teams, exchange results with other researchers in their field. The use of well-
structured information stored in databases is a means of testing one’s own hypotheses, helps the student remember information, contributes to the formation of techniques for performing logical operations of analysis, comparison, etc.

RESULTS

Informatization of educational institutions is an integral part of informatization of education. One of the most important components of the informatization of educational institutions is the informatization and computerization of the educational process - the creation, implementation and development of a computer-oriented educational environment based on information systems, networks, resources and technologies built on the basis of information and communication technologies.

At the present stage of modernization of education, computerization of its objects and processes provides for the creation of an educational information environment as the most important condition, tool and result of modernization of the education system to ensure further improvement of the quality of education, creating conditions for the realization of equal opportunities for all citizens to master education at all levels and stages (GONZALEZ, THOMAS, VANYUKOV, 2005).

The main goal of informatization of educational institutions is to prepare the younger generation for full-fledged fruitful life in the information society, improving the quality, accessibility and effectiveness of education. The implementation of the main goal involves the achievement of the following subgoals (AUTOR, LEVY, MURNANE, 2003):

- the formation of the information culture of students, today is becoming an integral part of the general culture of each member of society, a characteristic feature and a necessary condition for the existence of an information society as a whole;
- creation of new and additional (due to and based on the introduction of new computer technologies) conditions for improving the quality of education;
- development of new forms of education and educational technologies, fundamentally based on computer technology, the implementation on this basis of the concepts of open and distance education, increasing accessibility and ensuring the extraterritoriality and internationalization of education;
- improvement of education management, creation of automated management systems at all organizational levels of the education system and at the level of various types of educational institutions;
- increasing the level of coordination, efficiency and controllability, ensuring the extraterritoriality and internationalization of scientific research carried out in the education system, widespread use of methods, means and technologies for project management, the formation of modern scientific tools and the expansion of the active space of scientific experiment.

The implementation of the main goal of computerization of the education system provides for the solution of the following tasks (VUILLEMIN, 1989):

- modernization of the content and teaching technologies that meet modern educational priorities, make the most of the advantages of computer technologies to improve the quality of education for children, preserve the health of students;
- achievement of the necessary professional qualifications of educators, which would enable them to implement modern models of the educational process using information and communication technologies;
- creation of a system of methodological support of education in the conditions of computerization of the educational process;
- advanced training, retraining and training of pedagogical, administrative and engineering and technical personnel capable of effectively using modern information and communication technologies in the educational process;
formation, constant expansion of the educational information space and information resources of education, the implementation in the educational information space of all connections and ensuring all interactions between the participants in the educational process, the environment;

- development of a regulatory framework, creation of a design and management system for the process of informatization and computerization;
- quality assurance, standardization and certification of information and communication technologies in education;
- computerization of the education management process.

The creation of new and additional (due to and based on the introduction of information and communication technologies) conditions for improving the quality of education is achieved by (SNOW LOHMANN, 1989):

- development and widespread introduction into the practice of education of new personality-oriented learning technologies;
- differentiation of the educational process for the fullest development of the inclinations and abilities of the individual, the satisfaction of his requests and needs, the disclosure of his creative potential;
- organizing effective collective learning activities, including extraterritorial and joint international (education without borders)
- expanding space and increasing the efficiency of free access to information (including international) educational resources, databases and knowledge, development of tools for the formation, storage, search and presentation of information educational objects, the creation of automated library systems;
- creation of a new generation of computer-oriented teaching aids, including educational software;
- development of means for assessing the results of educational achievements of students, the impact of pedagogical innovations on the results of educational activities, learning management tools.

Complexes of computer training aids in their composition and functional connections are modified and modified depending on the organizational forms of training sessions and those specific training tasks that are solved in these classes (Wilson, Brooks, 2014).

The functional purpose of computer learning technologies differs in relation to students and teachers. For a teacher, computer technologies are a tool of his work, for students - a means of their mental development. On the one hand, computers facilitate the learning process in the sense of increasing the efficiency of transmission of educational information, control of its assimilation, correction of various kinds of deviations in learning, on the other hand, excessive enthusiasm for the computer, its inappropriate use can become a source of loss of cognitive interests, laziness of thinking and other undesirable consequences, in those who study. For example, the benefits of using computers can be negative for students (RUBIN, FADEREWSKI, MIKULOWSKI, 2015; KRYSHTAÑOVICH, KRYSHTAÑOVICH, STECHKEVYCH, IVANYTSKA, & HUZII, 2020).

The psychological effectiveness of the introduction of computer technologies by a teacher is determined primarily by the type of curriculum, the logical structure of the academic discipline, and teaching methods. All this requires from the teacher not only a high level of methodological competence, but also high computer literacy and technical culture.

CONCLUSIONS

The analysis of modern computer technologies and their use in the educational process shows that the process of computerization has a positive effect on the educational sphere and significantly expands the capabilities of both teachers and students. The use of computer technology increases not only the effectiveness of the training itself, but also allows the use of more complex tasks. The intensive development of computer technology leads to the
improvement of not only traditional forms of education, but also distance learning and also allows you to learn on your own. This impact on education indicates the need to use computers and computer technology in teaching and to further support the process of computerization.

The intensive process of computerization of education poses a number of economic, technical, social, psychological and pedagogical problems for modern teachers that require solution. The use of computer technology in the educational process opens up huge opportunities for the development of cognitive abilities - from sensory-perceptual to speech-thinking forms. So, the computerization of education in higher education proves the advantages of introducing modern computer technologies, which makes it possible to improve the quality of education, create new means of influence, effective forms of interaction with students and ensure the basic functions of a teacher in educational institutions.

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Integrated computerization of education in the context of the intellectual growth

Informatização integrada da educação no contexto do crescimento intelectual

Informatización integrada de la educación en el contexto del crecimiento intelectual

Resumo
O rápido desenvolvimento no mundo das tecnologias de informação e comunicação permite dizer que hoje são uma das formas mais comuns de ensino. Estas tecnologias influenciam a formação de métodos e métodos de atividade pedagógica, abrem novas oportunidades de comunicação e obtenção de informação. A informatização e informatização da educação atuam como componente da tendência geral dos processos globais de desenvolvimento mundial, como base inicial de informação e comunicação para o desenvolvimento harmonioso da informação sistêmica individual e social. Preparar o aluno para uma vida ativa e frutífera em uma sociedade da informação digital moderna é uma das principais tarefas da fase moderna de modernização do sistema educacional.

Palavras-chave: Tecnologias. Sistema educativo. Crescimento intelectual. Potencial pessoal. Ciência pedagógica.

Abstract
The rapid development in the world of information and communication technologies makes it possible to say that now they are one of the most common ways of teaching. These technologies influence the formation of methods and methods of pedagogical activity, open up new opportunities for communication and obtaining information. Informatization and computerization of education acts as a component of the general trend of global processes of world development, as an initial information and communication basis for the harmonious development of the individual and social systemic information. Preparing a student for an active and fruitful life in a modern digital information society is one of the main tasks of the modern stage of modernization of the education system.

Keywords: Technologies. Educational system. Intellectual growth. Personal potential. Pedagogical science.

Resumen
El rápido desarrollo en el mundo de las tecnologías de la información y la comunicación permite decir que ahora son una de las formas más habituales de enseñanza. Estas tecnologías influyen en la formación de métodos y métodos de actividad pedagógica, abren nuevas oportunidades para la comunicación y la obtención de información. La informatización e informatización de la educación actúa como componente de la tendencia general de los procesos globales de desarrollo mundial, como base inicial de información y comunicación para el desarrollo armónico de la información sistémica individual y social. Preparar al estudiante para una vida activa y fructífera en una sociedad de la información digital moderna es una de las principales tareas de la etapa moderna de modernización del sistema educativo.

Palabras-clave: Tecnologías. Sistema educativo. Crecimiento intelectual. Potencial personal. Ciencia pedagógica.