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## **Information technology and its importance in modern teaching methods**

The article explains the concept of «informatization». One of the priority directions of informatization of the society is the process of informatization of education, which involves the use of information technologies, methods and means of informatics to implement the ideas of developing education. Multimedia technology is considered, which has special didactic capabilities. The application of multimedia technology in the educational process is shown, which significantly increases the motivation and interest of students, as well as the level of mastering the necessary knowledge and skills. The definition of the term «information technology of training (ITO)» is proposed in the modern understanding as a pedagogical technology using special methods, software and hardware (cinema, audio and video facilities, computers, telecommunication networks) to work with information. The authors pay special attention to one of the main points—the importance of information technologies for teaching as an application of information technologies for creating new opportunities for transferring knowledge (teacher's activity), perception of knowledge (learner's activity), assessing the quality of instruction and, of course, educational process. The main goal of the informatization of education is identified, which consists in preparing the trainees for full and effective participation in the everyday, social and professional life activities in the information society.

*Keywords:* informatization, information technologies, information space, communication technologies, education modernization, software, multimedia technologies, multimedia, multimedia presentations, multimedia lessons.

The modern society is in a state of transition from the industrial to the information stage of its development, which is characterized by the shift of the center of gravity to the production, processing and the fullest use of information in all types of human activity. This lies in the basis of the informatization process, information becomes a strategic resource of society, turns into a commodity product.

All the information, accumulated by mankind by the end of the twentieth century and newly generated, is translated into a computer representation. There are global information networks emerging, which cover users' workplaces and their households. These trends are due to the urgent need to increase the amount of information available, the variety of forms of its presentation [1].

«Informatization», in the broadest sense of the word, is a process of restructuring the life of society based on the increasingly complete use of reliable, comprehensive and timely knowledge in all socially significant types of human activity. This process involves the restructuring of the instrumental basis of human activity in various subject areas on the basis of the ubiquitous dissemination of information technology.

An educated person of an «information» society should be able to do the following:

- access the databases and information services;
- understand different ways and forms of data representation;
- know about the existence of publicly available sources of information and be able to use them;
- be able to evaluate and process the data available to him or her from various points of view;
- be able to use statistical information analysis techniques;
- be able to use the available data when solving the problems he or she faces [2].

Informatization is accompanied by rapid introduction of electronic computing in all areas of human activity and development of communication systems, leading to the creation of a computer-information environment and accelerating the turnover of knowledge. This process initiates radical changes in the structure of social production: the nature of technological processes changes rapidly, which requires constant updating of knowledge and skills for mastering new technologies, raising the requirements for the level of general cultural and general scientific training of all social production participants. This means that during the working life most of the social production participants will have to repeatedly change their qualifications, replenish their knowledge, master new types of activities. Therefore, the information society is also often called a «learning society» [3].

In the coming decades, the intellectualization and humanization of labor, the improvement of its technical base, the expansion of individual capabilities, the enhancement of the personal significance and responsibility of each social production participant will remain the leading factors of the scientific and technological revolution.

That is why one of the priority directions of the computerization of society is the process of informatization of education, which involves the use of information technologies, methods and means of informatics for realization of the ideas of developmental learning, intensification of all levels of the educational process, increasing its efficiency and quality, training the younger generation for a comfortable (both in psychological and practical terms) life under new conditions [4].

The rapid expansion of the use of computers and their peripheral equipment has led to the emergence of new commonly used concepts: «information-based learning technology», «computer-based learning technology», «new information technology» in education (NIT). As a synonym for NIT, such a notion as «computer technology» very often appears, however, in the first notion, the object of technological processing – information (in terms of education – educational information) is emphasized, and in the second – the technical means of implementing information technology – the computer. Here it is important to emphasize that not only computers are the technical means of NIT education. The NIT assumes the use of a whole variety of modern information processing devices, including computers, their peripheral equipment (video materials, printers, devices for converting data from graphic and audio presentation to numeric and vice versa, etc.), communication equipment, video equipment, etc. This is the technical base of the process of informatization of society unfolding before our eyes [5].

Information-based learning technology can not be studied and explained outside the process of general technological development, which is inherently a deep social process. The reduction of information technology exclusively to technical progress, the refusal to consider it in the context of complex economic, social, political, cultural and social development, limit or even make it impossible to study the phenomenon of new education technology, both in complex and in specific cases. Therefore, proceeding from the fact that the technological revolution is a process of global social transformation, it is necessary to assume the following: the education system will enter the XXI century, enriched by radically altered philosophy, goals, structure, content, organization and methods of education and upbringing that have emerged as a result of the introduction of new information technology in educational institutions [6].

The most significant changes as a result of the development of information technology will occur in the following four areas:

- modernization of macro - and microstructures;
- differentiated orientation to individual and group teaching methods;
- effective use of modern means of communication in the learning process;
- expanded use of various teaching aids and forms of so-called «mobile learning».

Based on the consideration of the process of informatization of education as a complex in its essence, the determining trend is the creation of an environment model, within the framework of which effective cooperation of the educational process participants is carried out. In this regard, there is a tendency to use the modes of study aimed at the independent acquisition of knowledge based on the use of developed forms of hyper- and multimedia technologies, which combine the audio, graphic, animation, video capabilities of the computer [7].

The education is facing the task of mastering pedagogical information technologies (by which we will understand the complex, integrative learning process using information and computing technology), introduction of intensifying methods and forms into the educational process. There is a need to accelerate the adaptation of teachers and learners under the conditions of rapidly developing scientific fields and pedagogical knowledge.

The information technology means are of a dual nature: on the one hand – this is the subject of study, on the other hand – a means of teaching. The teacher is ceasing to be the primary source of information, turning into an intermediary, facilitating its acquisition [8].

Conventionally, we can distinguish a number of stages in the informatization of education:

1. Computers are used as a subject of study within the school computer science course.
2. Use of computers in traditional courses.
3. Use of computers in the professional work of the teacher to remove the routine load.
4. Mastering of new means: multimedia technologies, local and global databases, organization of network projects, etc.

With the increase in the volume of scientific and professional knowledge, there is a need to create a single information space for pedagogical information.

Under the information space of some object (or a set of objects) is understood the totality of all information components of this object (or a set of objects), regardless of the ways and means of displaying these components.

In the education system, individual information components of the information space are being developed today. For example, information databases with statistical data of educational and methodical, personnel, material and technical condition of educational institutions of the regions are created, telecommunications facilities are used to transfer the management and methodological information [9].

As relevant as ever is the problem of the use of information technology tools (hardware and software) for processing of professionally important information. In general, the processing of pedagogical information can be understood as follows:

- the process of processing the teaching material by the teacher and presenting it in a form understandable to the student;
- the process of analyzing learning outcomes.

The rapid entry into our lives of information and communication technologies (which took less than a generation) was made possible by the widespread use of personal computers and the creation of the global Internet network. The changes taking place have only one historical analogue from all the discoveries that previously influenced the worldwide exchange of information and knowledge (telephone, radio, television). The life of society was similarly affected by the invention of Johann Gutenberg in the 1440s – the printing press.

The printing press changed the world drastically: it ensured the rapid creation and distribution of materials, contributed to the improvement and unification of fonts, which greatly facilitated the reading of printed books in comparison with manuscripts. Books became cheaper, and the number of publishers grew rapidly. For instance, 30 years after the invention of the printing press only in Venice, which back then was one of the recognized European cultural and shopping centers, more than 150 presses were in operation in printing houses. Undoubtedly, all this contributed to a wider dissemination of knowledge and, accordingly, greater accessibility of education, the achievements of science and culture.

Later on, the discovery of Gutenberg entailed the development of forms of communication, dynamic exchange of information — from newspapers to television and the Internet [10].

The question of the role of modern information and, more recently, communication technologies in improving and modernizing the existing educational system has remained relevant for the last two decades. However, it became of the greatest acuteness during the introduction of relatively inexpensive and therefore affordable personal computers, integrated into local networks, and having access to the global Internet network. Successful implementation of the program for the modernization of secondary education, largely based on its computerization and «Internetization» will not only require modern technical equipment for educational institutions, but also the appropriate training of teachers and organizers of the education system [11].

In order to understand the role of information technology in education, it is necessary to understand the essence of this concept.

When speaking of information technology, in some cases, there is a certain scientific direction implied, in others it is a specific way of working with information: it is both a set of knowledge about the ways and means of working with information resources, and the way and means of collecting, processing and transmitting information to obtain new information about the object being studied [12].

In the context of education, we will be guided by the latter definition. In a sense, all pedagogical technologies (understood as methods) are information ones, since the educational process is always accompanied by the exchange of information between the teacher and the learner. But in the modern sense, information-based learning technology (ILT) is a pedagogical technology that uses special methods, software and hardware (films, audio and video facilities, computers, telecommunications networks) to work with information.

Thus, the ILT should be understood as an application of information technology in order to create new opportunities for transferring knowledge (teacher's activity), perception of knowledge (learner's activity), evaluation of the quality of education and, of course, comprehensive development of the learner's personality during the educational process. The main goal of the informatization of education is «in training the students for full and effective participation in the everyday, social and professional life activities in the information society».

The systematic research in the field of application of information technology in education has been conducted for more than forty years. The education system has always been very open to the introduction of information technology in the educational process, based on software products of the broadest application. In educational institutions, various software complexes are successfully used — both relatively accessible (text and graphic editors, tools for working with tables and preparing computer presentations), and complex, sometimes highly specialized (systems for programming and managing databases, packages of symbolic mathematics and statistical processing) [13].

At the same time, these software tools have never satisfied all the needs of educators. Since the 1960s, a large number of specialized computer systems have been developed in scientific centers and educational institutions in the United States, Canada, Western Europe, Australia, Japan, Russia and a number of other countries, specifically for the needs of education, aimed at supporting various aspects of teaching and educational process.

Development of full-fledged software for educational purposes is a costly matter, since this requires the joint work of highly qualified specialists: psychologists, subject teachers, computer designers, programmers. Many large foreign companies and a number of domestic producers of software products finance projects aimed at creation of computer-based training systems in educational institutions and conduct their own development in this field.

The software used in the ILT can be divided into several categories:

- teaching, monitoring and training systems,
- systems for information retrieval,
- modeling programs,
- microworlds,
- cognitive tools,
- tools of universal character,
- communication tools.

The specificity of new information technologies lies in the fact that they provide tremendous opportunities for users — teachers and students [14].

It is obvious that the twenty-first century requires fundamentally different approaches to education. Education should be developmental in terms of developing independent critical and creative thinking. It is necessary to have a broad informational field of activities, various sources of information, different views, points of view on the same problem, inducing the students to independent thinking, searching for their own reasoned positions. For this, methods and means of instruction that are adequate to the goal are also necessary.

Particularly rich didactic possibilities has the multimedia technology, which is an interactive combination of text, graphics, sound, video and animation on the basis of a single interactive software.

Multimedia technologies are successfully used now in the field of education and vocational training, because multimedia-based media can, in some cases, significantly improve learning efficiency. It has been experimentally established that, in the oral presentation of the material, the student perceives and is able to process up to one thousand conventional units of information per minute, and when «connecting» the eyes – up to 100,000 such units [15].

Multimedia is:

- a technology describing the order of development, operation and application of tools for processing different types of information;
- a special generalized kind of information that combines both traditional static visual (text, graphics) and dynamic information of different types (speech, music, video clips, animation, etc.).

Under the conditions of the information society and the informatization of education, the independent continuous replenishment of knowledge and its application becomes a person's need throughout his or her life. Therefore, when discussing the didactic and methodical aspects of using computer and multimedia resources in general secondary education, the main emphasis is on organizing self-cognitive (individual and/or group) activities of students, developing critical thinking, a culture of communication, and the ability to perform various social roles [16].

The methodology of using multimedia technologies implies the following:

1. improving the teaching management system at different stages of the lesson;
2. strengthening the learning motivation;
3. improving the quality of education and training, which will increase the information culture of students;
4. Demonstration of the capabilities of the computer not only as a gaming tool.

Multimedia lessons help solve the following didactic tasks:

- acquire the basic knowledge of the subject;
- systematize the acquired knowledge;
- develop self-control skills;
- form a motivation for learning in general and for informatics in particular;
- provide methodological assistance to students in independent work on educational material [17].

This technology can be regarded as an explanatory-illustrative teaching method, the main purpose of which is to organize students' learning by communicating the educational material and ensuring its successful perception, which is enhanced by the connection of visual memory. It is known (studies of the «Eurolinguist» institute, Netherlands) that most people remember 5 % of what they heard and 20 % of what they saw. Simultaneous use of audio and video information increases memorability up to 40 -50 %. Multimedia programs present information in various forms and thereby make the learning process more effective [18].

Students are attracted by the novelty of multimedia lessons. During such lessons, a real communication environment is created, in which students tend to express their thoughts «in their own words», they willingly perform assignments, show interest in the material being studied, they lose fear of the computer, they learn to work independently with educational, reference and other literature on the subject. Students have an interest in getting a higher result, willingness and readiness to do extra tasks. When performing practical actions, self-control manifests itself.

It should be noted that the stage of motivation in this case is increasing and carries a cognitive load. This is a necessary condition for the learning success, since without the interest in replenishing the missing knowledge, without imagination and emotions, the creative activity of the student is inconceivable [19].

The structural layout of the multimedia presentation, with the use of hypertext links, develops system, analytical thinking. In addition, through the presentation, you can use a variety of forms of organization of cognitive activity: frontal, group, individual.

Presentations accompanied by beautiful images or animations are visually more attractive than static text, and they can maintain the proper emotional level, complementing the material presented, contributing to the improvement of learning efficiency.

The use of multimedia allows students to work with learning materials in different ways: the student decides how to study the materials, how to use the interactive possibilities of information technology, and how to work together with his fellow students. Thus, the students become active participants of the educational process [20].

Working with multimedia tools, students can influence their own learning process, adapting it to their individual abilities and preferences. They study the very material that interests them, they repeat the study as many times as they need, which contributes to a more correct perception.

Multimedia tools in education have a number of advantages in comparison with traditional printed textbooks and teaching aids:

- possibility of individualizing the educational process, adapting it to the individual characteristics of the students;
- increase in demonstrativeness of the presentation of the material with the help of several media perceived by the human;
- increase the activation of cognitive activity of students, thanks to interactivity;
- strengthening the monitoring function of the training course by using built-in tests of different levels, facilitating the activities of the teacher and creating effective feedback.

Thus, the use of multimedia technology in the educational process significantly increases the interest and motivation of students' activities, as well as the level of mastering the necessary knowledge and skills by students, as it requires them to activate independent cognitive activity.

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Б.И. Ильясова, Л.С. Заркенова, Г.К. Алшынбекова

### **Заманауи оқыту әдістемесіндегі ақпараттық технологиялар және олардың маңызы**

Қоғамды ақпараттандырудың маңызды бағыттарының бірі болып ақпараттық технологияларды, дамытушы оқытудың идеяларын жүзеге асыру үшін информатика әдістері мен құралдарын қолдануды көздейтін білім беруді ақпараттандыру үдерісі саналады. Мақалада ерекше дидактикалық мүмкіндіктерге ие мультимедiateхнологиясы қарастырылған, «ақпараттандыру» ұғымына түсініктеме берілген. Білім беру үдерісінде мультимедiateхнологиясын қолдану оқушылардың қажетті білім мен икемділіктерді меңгеру деңгейін, оқуға деген қызығушылығын арттыратындығы көрсетілген. «Оқытудың ақпараттық технологиясы» (ОАТ) ұғымының ақпаратпен жұмыс істеу үшін арнайы амалдарды, бағдарламалық және техникалық құралдарды (кино, аудио- және бейнеқұралдар, компьютерлер, телекоммуникация желілері) бүгінгі күні қолданатын педагогикалық технология ретінде анықтамасы ұсынылған. Авторлар негізгі кезеңдердің біреуіне — оқытудың ақпараттық технологияларының мәніне білім берудің (оқытушының әрекеті), білімді қабылдаудың (оқытылатынның әрекеті), оқу сапасын бағалаудың және оқу-тәрбие үдерісі барысында оқытылатын тұлғаның жан-жақты дамуының жаңа мүмкіндіктерін туғызу үшін қажетті ақпараттық технологиялардың қосымшасы ретінде ерекше зейін аударған. Білім беру ақпараттандырылуының басты мақсаты анықталған, ол оқытылатындарды ақпараттық қоғам жағдайындағы өмір сүрудің тұрмыстық, қоғамдық және кәсіби салаларына толыққанды және нәтижелі қатысуға дайындаудан тұрады.

*Кілт сөздер:* ақпараттандыру, ақпараттық технологиялар, ақпараттық кеңістік, коммуникациялық технологиялар, білім беруді жаңғырту, бағдарламалық қамтамасыз ету, мультимедиялық технологиялар, мультимедиа, мультимедиялық презентациялар, мультимедиялық сабақтар.

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### **Информационные технологии и их значение в современной методике обучения**

Одним из приоритетных направлений информатизации общества является процесс информатизации образования, предполагающий использование информационных технологий, методов и средств информатики для реализации идей развивающего обучения. В статье рассмотрена технология мультимедиа, которая обладает особыми дидактическими возможностями. Показано применение технологии мультимедиа в образовательном процессе, которая значительно повышает заинтересованность

и мотивацию деятельности учащихся, а также уровень усвоения учащимися необходимых знаний и умений. Дано пояснение понятия «информатизация». Предложено определение понятия «информационная технология обучения (ИТО)» в современном понимании как педагогической технологии, использующей специальные способы, программные и технические средства (кино, аудио- и видеосредства, компьютеры, телекоммуникационные сети) для работы с информацией. Авторами уделено особое внимание одному из основных моментов — значению информационных технологий обучения как приложению информационных технологий для создания новых возможностей передачи знаний (деятельности педагога), восприятия знаний (деятельности обучаемого), оценки качества обучения и, безусловно, всестороннего развития личности обучаемого в ходе учебно-воспитательного процесса. Выделена главная цель информатизации образования, которая состоит в подготовке обучаемых к полноценному и эффективному участию в бытовой, общественной и профессиональной областях жизнедеятельности в условиях информационного общества.

*Ключевые слова:* информатизация, информационные технологии, информационное пространство, коммуникационные технологии, модернизация образования, программное обеспечение, мультимедийные технологии, мультимедиа, мультимедийные презентации, мультимедийные уроки.

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