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INFORMATION TECHNOLOGIES IN THE AREA OF EDUCATION: MAIN DIRECTIONS OF APPLICATION

TECHNOLOGIE INFORMACYJNE W EDUKACJI – GŁÓWNE KIERUNKI ZASTOSOWAŃ

Streszczenie

W artykule dowodzi się, że jednym z obszarów organizacji środowiska edukacyjno-informacyjnego, jest dołączenie do procesu kształcenia specjalistów sektora edukacyjnego technologii informacyjnych i komunikacyjnych. Porównuje się tradycyjny system edukacji i nowoczesny system otwartej edukacji. Analizuje się takie pojęcia jak: informatyzacja, technologia, technologie informacyjne, nowe technologie informacyjne, środowisko informacyjno - edukacyjne, komputerowe nauczanie na odległość. Biorąc pod uwagę organizację środowiska informacji i uczenia się w placówkach edukacyjnych rozpatruje się środki organizacyjne, koncepcje technologii sieciowych i multimedialnych w ramach procesu edukacyjnego. Odkrywa się także przeszkody dla powszechnego wprowadzenia technologii informacyjno-komunikacyjnych w procesie uczenia się. Charakteryzuje się rolę programów komputerowych w nowoczesnej edukacji.

Słowa kluczowe:

technologie informacyjne i komunikacyjne, proces uczenia się, przygotowanie fachowców, ciągły, otwarty proces edukacyjny, kształcenie na odległość, poprawa jakości kształcenia.

Abstract

The paper argues that one of the directions in the organization of the IT and educational sphere is the introduction of information and communication technologies to teacher training processes. The author of the paper compares the traditional educational system with the modern system of open education. The paper explores such concepts as IT implementation, technology, information technologies, new information technologies in training, information and educational environment and distance education.

Taking into consideration the organization of educational processes in pedagogical institutions, the author researches the organisational means and concept of network and multimedia technologies in the context of the organization of educational processes, and indicates some obstacles on the way to the widespread introduction of information and communication technologies into educational processes. Also, the role of computer programs in modern education is examined in the paper.

Key words:

information and communication technologies, educational processes, preparation of specialists, continuing open education, distance education, upgrading of education.

The world feels the deep modern civilization dependence on the personality's abilities and traits in the XXI century. The possibility of constant development of society, successful overcoming and in the future protecting from global crises is directly related with gained educational level of society. That's why the problem of finding a new educational paradigm the rapidly changing world is the most actual. And the teacher training system needs to corrected, renewed, and re-designed with preservation and developing the most perspective forms, methods and structures.

1. The classic type of scientific rationality emerged in the XVII–XIX centuries, is the core of education.
2. Mechanic and determinative world view which supports and determines technocratic thinking culture are formed.
3. Oriented on transforming ready-made knowledge and solving certain problem methods with the unambiguous answers which are usually known in advance to the teacher is predominant.
4. The artificial (formal) correlation of socio-humanitarian and scientific-technical components in the educational content, certain rupture between spirituality and professionalism in practice take place.
5. Alternative to traditional education with its philosophy of rigid differentiation of methods of familiarization with the world by civilization can only be open education, based on the integration of different methods of familiarization with the world [35].

The philosophy of open education today is a “radically new perspective organization of the educational process, a new philosophy, strategy and tactics of the relations and interactions of consumers and producers of educational services in a market economy, free civilization choice of priorities and actions. Its appearance is connected with the growing interest of people in getting a higher level education, dissatisfaction with realization of the educational needs through basic education, and high level of educational product [45].

As for the latter aspect, specialists distinguish these attractive features: inter-subject links; methodological pluralism; openness of the learning process; forestalling character (focus on the problem of the future of information civilization); increased access to education (through the information and communication technologies usage); possibility of continuous and rapid renewal and replenishment of knowledge by correspondence; noncompetitive entry to higher educational establishment; creativity as a necessary condition for enhancing creative work; freedom in choice of the individual study program of the proposed set of courses; freedom in choice of the learning rate through accepting students throughout the educational year and non-fixed terms of education; freedom in choice of place for studying, etc. [17].

Thus, the involvement in the educational process of training professionals for the educational sphere of information and communication technologies is one of the promising areas of current stage organization in information-educational environment. To characterize the information society and building a concept of information-education industry the terms “computers”, “computerization”, “implementation of information”, “information society”, “information technology” are often used. They are basic, but their distinguishing in levels of socio-technical activity is one the major methodological problems [17].

Total computerization can be defined as the global production process and widespread usage of information as a public resource, based on the mass introduction of methods and tools for collecting, processing, transmission and storage, and causes profound changes in the progressive nature of the socio-economic, political and cultural structures in society that have a significant effect on the level and quality of life [21].

Today, the term “technology” can be viewed at different levels. At the philosophical level, technology is the doctrine of the best (optimal) strategies. At the interdisciplinary level – a process driven by a set of tools and methods of processing, manufacturing, changes in the state, properties, shape or raw material. At a general level, technology is defined as the branch of knowledge, methods and tools used for optimal conversion and use of matter (materials), energy, and information on the plan and in the interests of human society and the environment.

The term “information technology” in its general sense, first introduced academician V. M. Glushkov [7], giving the following definition: “Information technology – processes associated with the apperception processing of information”.

More detailed formulation was presented M. I. Zhaldak: “In the field of information technology is a set of methods and technical means for collecting, organizing, storing, processing, transmission and presentation of information that expands people’s knowledge and develop their ability to manage the technical and social processes” [8].

In the context of information processes we can say that information technology – a system of techniques and methods of collection, transfer, storage, processing, presentation and use of information through the use of modern computer and other technical equipment. Moreover, the existence of various information processes involves the use of various technologies for the collection, transmission, storage, processing, presentation and use of information.

According to the definition adopted by UNESCO, Information technology – a set of inter-related scientific, technological, engineering disciplines that are focused on using the effective organization of work for people engaged processing and storage of information; directly computing and its interaction with people and manufacturing equipment, its applications, and related all these social, economic and cultural issues. Thus, the new information technologies in education is a rational means to develop students’ creative abilities. The introduction of new information technologies in the educational process affects the nature of the educational process. The definition of „information technology” includes methods of information processing as a result of a combination of technical features of computer technology, telecommunications, computer science, aimed at the collection, storage, analysis and provision of information to consumers, regardless of distance and volume, automation of routine operations and training of analytical information for decision-making. The concept of “New information technologies education” (NITN) is a combination of modern computer technology, communications, software tools that provide the software and methodological support for advanced learning technologies. V. P. Bespal’ko , V. I. Bogolyubov, M. I. Zhaldak, H. K. Selevko and others in their research thoroughly examine issues such as the diagnosis of goal setting, consistency, efficiency, algorithmization controllability, repeatability, design correction learning effectiveness, visuality, efficiency, possibility of permanent operational feedback from the use of information technology training.

The main objective of the new information technologies is the development of an interactive learning environment control cognitive activity and access to modern information and educational resources (multimedia textbooks and teaching materials based on hypertext, various databases, educational sites and other sources of educational messages). The feature of the majority of new information technologies used in education is that they are based on modern

PCs. PC confidently entered the system of teaching tools, becoming an important element of the substantive environmental education.

The I. V. Robert books of new information technologies (NIT) refers to «software and hardware and devices that operate based on microprocessor technology, advanced telecommunications and information exchange, audio and video, providing transactions collection, production, stockpiling, storage, processing and transmission of information [42].

Currently, developed and maintained a significant amount of their ZNIT fleet changes almost every year. Using and used NIT, and can potentially be used in education, computers of all sorts (from “great” to “Palm-top”), display, printer, memory, input devices in a computer language scanner, keyboard, databases, knowledge bases, multimedia systems, videotext, teletext, TV-Inform, computer networks, electronic mail, electronic conferencing, information retrieval systems, digital cameras, expert training systems, output devices, graphics, hypertext system, TV, radio, telephone, fax, voice mail, newsgroups, bulletin board navigation software on the Internet, automated libraries, educational programs, publications, CD-ROM, OCR systems, software systems (programming languages, compilers), speech synthesizers for text, means for transmitting data station (KH, UKH, satellite), pagers, of “virtual reality”, GIS and others.

This list is not exhaustive, but it gives an idea of the diversity of systems and NIT. Using the above ZNIT provides:

- Intensification of all levels of the educational process;
- Development of diverse student;
- Preparing graduates for life in the information society;
- Implementation of the social order, due to processes of global information.

Thus, based on the foregoing, it can be noted that the new information technologies in education - a new organization of education using modern technological tools, especially computer technology, which significantly affects the content and teaching methods, makes available members of the educational process of new teaching aids and teaching.

The potential of new information technologies in education opens the following options:

- Improving the methodology and strategy selection of educational content, changes to teaching traditional subjects;
- Improving the effectiveness of teaching, its individualization and differentiation of new forms of interaction in the learning process and change the content and nature of the teacher and the student;
- Improvement of educational process, its planning, organization, control, modernizing governance arrangements education system.

Sustainable development of information technology fundamentally involves the formation of a new educational system that can provide a large number of people providing educational services of high quality while reducing unit costs of education. Not the teacher who uses the new hardware in the old educational system that is used in teaching practices, economic arrangements and work organization, and one that operates in the new educational system, vital to the functioning of education in today’s world. Thus, the use of new information technologies in education should be seen as a strategic decision focused on the formation of a new educational system [38, p. 9-12].

But the use of new information technology only leads to the solution of urgent problems of modern education as the development of technology education subsystem is accompanied by radical changes in all other subsystems: pedagogical, organizational, economic, and transforms the theoretical and methodological foundations of the educational system [30]. Thus, the new

technology can be effective only in education, when they are not artificially fit into the existing system of education, and includes as an organic element in the new system, which contributes to:

- Disclosure, preservation and development of individual students' abilities;
- Formation of students cognitive skills, self-improvement;
- Integration study of reality, continuity of relations between the natural sciences, engineering, humanities and arts;
- Disclosure, preservation and development of individual students' abilities;
- Formation of students cognitive skills, self-improvement;
- Integration study of reality, continuity of relations between the natural sciences, engineering, humanities and arts;
- Constant updating of dynamic content, forms and methods of learning and education.

We emphasize that modern information technologies offer a set of tools for the development of educational innovations, namely, providing information in different forms with different graphics, sound and video effects, the possibility of modeling educational dialogue with the computer, business games and more. Scientists stresses the importance of using these tools in the development of content specific classes, study subjects according to educational goals facing authored training material [32].

There are several areas of modern information technology in higher education, covering the four most significant area [16].

1. Engineering and computer science as objects of study.

Historically, the emergence of computers in education has been connected with learning the basics of computer technology, first in the teacher education system, and then the total. The study of computer science and informatics, as well as learning any other discipline or group of disciplines at different levels of education is directly related to the issue of educational content in general. The presence of a school subject in terms of training students in general and teacher education is determined primarily by objective current and future needs of socio-economic and scientific-technical progress, personal preferences educational needs of students. However, in spite of the importance of teaching and methodological problems associated with finding effective ways to study a particular subject, it is essential to justify the very feasibility of the introduction of this discipline in education, especially education common to limit overloaded «traditional» subjects of science and Humanities.

2. A computer as a means of improving the efficiency of educational activities.

This is where her role as computer science and considered as a component of the educational system, which is able not only to make radical changes in the understanding of the category «medium» on the process of education, but significantly affect all the other components of a local educational system: objectives, content, methods and organizational learning, training and development of students in educational institutions at any level and profile. The computer thus becomes extremely promising tool that can really provide the necessary changes in the progressive development of society, the means of improving its integrative intellectual capacity, intensify its scientific, technological and economic activity.

3. A computer as a means of improving the efficiency of research activities in education.

Modern research, especially interdisciplinary research, complex, already can not succeed without the full information support. This involves finding sources provide the most «fresh» and high-tech information, sample selection and evaluation of information, its storage, providing

the appropriate level of classification of information and freedom of access to it from potential consumers finally prompt submission of the required information to the user upon request.

4. Computer and Information Sciences as a component of education and educational administration.

This area of information related to the process of decision-making at all stages of the educational activities – from the everyday work of school management to control the entire industry at the state level.

Creation of a common information environment, which is defined as “a set of software and hardware, information networks, organizational and methodological elements of higher education and applied information on subject areas used by different users for different purposes and in different ways”.

Concept of information environment was first proposed A. Schroeder [47, p. 19-27], which is rightly considered the information environment, not only as a conduit of information, but also as an active component activities that affect its members. Study the information environment occurred in different ways, among which we can distinguish three main ones:

- The information environment as an activity - a person is a party to the communication process. In the center is placed a person's ability to present personal knowledge in the form in which it can be transmitted through a communication channel, and by taking the information back to turn it into his personal knowledge;
- The information environment as a system of historical patterns of communication;
- The information environment as an information infrastructure created by society to implement communication activities on a scale corresponding to the level of development of the society (publishers, libraries, information centers, data banks, the media, etc.).

In shaping the information environment of learning activities involved:

- Lecturer (defines the content of the course, the selection of textbooks, teaching methods, communication style, etc.);
- Teaching staff of the institution (establishes general requirements for students with traditions of a particular institution, form relationships teaching and student groups, etc.);
- State as a social institution (defines material support education in general, the social order on the formation of a system of knowledge and beliefs).

The term “information-educational environment” means systematically organized aggregate of data, information resources, interaction protocols, hardware and software and organizational methods that are focused on meeting the educational needs of the users. In a narrow sense, information and educational environment to understand some way linked educational institutions that are in the information exchange organized by special software [47, p. 19-27].

In terms of technology information and learning environment can be represented as software and telecom environment, providing a single technological means of the educational process, its information and supporting documentation in the Internet any number of schools, regardless of their professional specialization and level of education [2].

The concept of information-learning environment also includes terms that provide education at the level of the social process [36]:

- Availability of tools “communication” of human culture for storage, structuring and presenting knowledge gained, but also for its transmission, processing and enrichment;
- A system of independent work by working with information;
- The presence of intense relationships (vertical and horizontal) between the study process.

In the information-learning environment typically are five blocks [29]:

- Value-target - a set of goals and values of teacher education, which may be important to achieve the goal of training and education;
- Software and methodical - all the necessary information on possible strategies, forms and training programs;
- Information and psychological – a system of knowledge and skills of the student, which is the basis of his professional activities, and determines the properties of the cognitive activities that affect its efficiency;
- Communication – a set of forms of interaction among participants of educational process;
- Technology – System learning tools used in information-learning environment (eg, the use of new information technologies, such as telecommunication networks).

Given the organization of information-educational environment in teacher education institutions need to consider the means of implementation, ie to reveal the concept of networking and multimedia technologies in the context of the educational process.

It is important to note that the success of the use of ICT as a means of education depends on a clear understanding of the place they should occupy in the complex set of relationships that occur in the system of interaction “teacher – student” [29].

Norbert Wiener [6] formulated the position that the technical means used the culture of a society, have some influence on the dominant ways of thinking. Information technologies have the ability to not only change the very nature of associated activities, but also provide both direct and indirect effects on human personality, which could then be detected also in those activities that are directly unrelated to their applying. The author explains this by saying that the human perception of the world and mainly caused by the limited means which it uses in various forms of the activity. During the study on the basis NITN man using new means entering new categories that provide new understanding of the world picture that later, of course, will affect others, not just education, field of activity.

S. I. Zhozhikova also notes that “the development of the global Internet is beginning to influence all aspects of human life” [9, p. 68-70]. The Internet as component, as a instrument of information technology, requires special attention in the study of psychological and educational aspects of the use of information technology in education. We can not agree with this statement, whose authenticity is obvious and needs no further proof. In addition, some authors [1; 49] point to the limited computer resources young people who prefer entertainment sites, computer games, aimless “roaming through” on the websites messaging “chat”. However, these issues are matters of research Information Cultural Rights, which is the only part of his general culture.

The main obstacle to widespread and massive introduction of information and communication technologies in the educational process is not only weak physical infrastructure and lack of necessary funding, but the lack of professional and psychological readiness of teachers to use them. Psychological and pedagogical studies carried out in line with the psychological theory of human activity and the theory of learning activities show that the optimal model to be considered a three-stage development of information technology in education. [4]

The first step – the development of basic computer literacy and information culture. The second stage – the development of new fields of knowledge by a computer. The third stage – the student learns to build and manage the most important industrial processes and civil rights activities through extensive familiarization with the spheres of professional activity by computer simulation. At this stage of information are used to develop the skills of self-education. Experts in the field of education informatization are four stages of the interaction of teachers with personal

computers. The first stage is characterized by the internal resistance of teacher implementation process computers in the learning process, which relies on the fact that these processes it MKO. The second stage starts from the start you learn to use a personal computer. At this stage, the teacher feels fear comparative nature: how to keep up with peers in the development of the computer. Third – comfortable – a stage characterized by complete development process, and fears are only possible through comparison with students who are always ready to present “surprises.” The most valuable is the fourth stage, in which the teacher acts are the creator of new or improved teaching electronic information tools. The author’s work in this area strengthens the authority of the teacher as the master of the situation in the classroom, since these teachers move forward computerization of real learning. Thus some notable contradictions between the subject vehicle and the second model. This is due primarily to fears of teachers caused by uncertainty in the ability to adequately handle the processes of development computer.

A characteristic trend in recent years is the use in education institutions of information technology, which include the most modern achievements of science, including web technology, where access to information resources of the client application - Web browser and data management based on the use of services and protocols Internet and interact with the specialized servers, web servers. One reason for the demand for this technology is the reduction in the share of universities of classes with teachers that leads to a significant increase in the role of teaching the educational process, many of the teachers who transfer in information protection. Another reason for the extensive use of web technologies is the fact that the Internet accumulated a huge amount of information, the appropriateness of the use of any educational purpose is justified especially at the stage of implementation of new educational programs as an educational and methodological framework has not yet been established.

In this approach, the Internet is seen as a medium that does not know “ready-made”, but provides a great opportunity for those who can actively search for information, analyze, and think independently. In the scientific literature and the media are increasingly used term “educational online space”. Internet space – it’s not just a set of educational resources of the Internet, but also a new, detailed in the “infosphere” dimension of education that has developed an infrastructure that includes [26]:

- Technical and technological means of the Internet;
- Human resources involved in the processes of education and information education;
- The system of relations in a community of professionals working in education, drawing on new information technologies and the Internet.

The most characteristic features of online learning is the flexibility, modularity, mass. On this basis a skilful organization of work and of course, some cost education through the Internet is able to provide [18, p. 52-58]:

- Individual approach to a student;
- Parallel studies with other activities of the student;
- Cost-effectiveness study in general and the individual in particular;
- Social equality students regardless of residence, social status, health status,
- A new creative role of the teacher curriculum development and coordination of the cognitive process.

Today the Internet is a universal communication and information sphere with its own specific set of information technology so that human life in the information society is organically included Internet education concept, which refers to the introduction of Internet technologies

in educational activities organized training and education of the Internet community through involvement useful cognitive and leisure activities in the web [22].

But for the widespread implementation of Internet technologies in educational activities necessary to teachers fluent basic technologies for finding information on the Internet, electronic mail, real-time communication, presenting their information in the form of Web documents (the creation of Web pages and sites) and their placement on the web [14].

Computer training programs play a special role in modern education, because they can be used for self-training on a remote computer over a computer network, ie at distance and open education [15]. The use of computer programs in the educational process becomes a means of modeling various types and forms of thought, which is able not only to initiate reproductive activities and formal logic operations, but the image-associative thinking, appeals to the emotional and meaningful ways, to an open future, to personal values [11].

In modern computer training programs implemented three levels of man-machine dialogue (reactive, active and interactive) and between the student of a personal computer. Response dialogue involves only elementary student responses (responses such as "yes" or "no" answer choice from a small set of features, etc.). Response dialogue involves selection of the many new and different features provides the ability to make independent decisions. Interactive dialogue form provides meaningful questions and intelligent answers within a certain theme. Nowadays, much attention is paid to the development of e-books from multimedia and hypermedia technologies and methods for their use in education. E-book – it's an interactive information system that provides users with access to the paging organized educational information. Electronic textbook - a combination of theoretical, reference information, practical material assignments for training, monitoring and assessing the quality of learning, which is formed by special programs that allow you to present information in the form of text, graphic images, and multimedia video and sound effects [41, p. 83-85].

The idea of "electronic textbook" computer designed to act as a tool in the study of the discipline. The advantage of this approach is a systematic approach to training, to bring together all the major blocks in one flexible, functional filling which can be constantly improved. The use of electronic textbooks allows students along with lectures and workshops led by teachers on their own to study new subjects using electronic material submitted as full training manual and assistants and the examiner [43].

Compared with the traditional textbook, electronic textbook provides: time needed to study subjects' feedback "student-teacher" to create conditions for self gain knowledge and quality learning, individualized learning through the selection of material from the computer tutorial. He is able to help every teacher in solving important didactic, methodological and psychological problems, as is the most versatile tool in the teaching learning material, allowing for the need to rapidly modify the material used [23].

E-books in order to adapt the content of the educational material to the specific characteristics of individual users are provided with a mechanism to create profiles, user settings. If this profile is stored information about the source user knowledge of the studied subject area, his experience, benefits, creativity and so on. Depending on the type of characteristics such user selects a certain style, strategy and tactics development of educational material, formed by the specific content of the learning process [44].

Thus, electronic manuals are compared with traditional print counterparts, the following advantages:

- Use multimedia capabilities enables us to lesson content more visible, understandable, interesting;
- Equipping educational material dynamic drawings enables students to experiment, to examine the phenomenon from different perspectives;
- Is able to quickly and efficiently conduct testing or use other means of checking the knowledge;
- It is possible to organize productive independent work of students, provide tips, help and much more (in print would in a similar situation to seek relevant information in books printed by going to the library, etc.)
- The use of hypertext links enables you to instantly find the required concepts in a matter of a second “flip” researched many pages of text;
- It is possible to organize a virtual laboratory work, which, for various reasons, can not take place in a real setting.

However, during the design of the learning process with the widespread use of e-learning must take into account these very real disadvantages of e-books:

- The absence in most cases the concept that lies at the based electronic textbook publishing a guide;
- A significant part of e-books (study materials) is a simplified promotional guides, enough surface that can not be a source of systematic and in-depth knowledge;
- Not all people are receptive enough text on the screen;
- There is unwise (and sometimes just bad) supply of educational material. Students are offered work for some pretty tough circuit, thus limiting their independent learning activities;
- Multimedia tools used in large quantities in the creation of e-books are often redundant. They are distracted and do not give focus. Means of expression should not replace the semantic part;
- Are online tutorials are analogous to conventional hypertext programs [46].

With the development of information and communication tools is rapidly becoming the system of distance education, which opens up opportunities for the use of the latest teaching techniques.

The development of practice-oriented vocational training updated design and the use of continuous open education. These systems are quite common in the world: the Open University (about 300 thousand students), Open University of California and Phoenix - on-lain University (USA), Khahenskyi Open University (Germany), Catalan Open University (Spain).

Many universities, preserving and maintaining traditional system of training intensively developed and actively using distance learning technology, which is developing a system of continuous open education. Research and implementation of open education in modern practice has two areas: improvement “correspondents dialog” training and development training in “allocated” classes. Modern universities develop world “correspondent” ideas and traditions (J. Daniel). Pedagogy of synchronous learning in a “distributed” duplicate class pedagogy in the regular classroom, while the development of such ideas move towards open education takes place in the scientific writings of M. Moore (Moore). However, based on open distance learning can be asynchronous distance learning pedagogy D. Keegan (Keegan). Basic research in the field of open education published in the works of foreign scholars: B. Holmberg (B. Holmberg), D. Keegan (Keegun), M. Moore (M. Moor), A. Peters (O. Peters), J. Daniel (J. Daniel) and others. The issue of quality assurance in open distance education considered in Robinson (Robinson),

Ross (Ross), and use of the Internet in education - Groves (Groves), R. Clark (R. Clark), Peterson (Peterson) and others.

The introduction of modern information technology in education and the use of remote access to information resources, you can create a brand new “technology of distance learning”. Remote Computer Training is a training organization aimed streams and organizing the learning process information using a remote computer (server) [27].

This form of training involves a change in the whole educational structure - organization, methodology, content, functions and composition of participants in the learning process [20]. Given the strong momentum of late XX century, now distance learning is considered one of the most effective and advanced systems training, which has great potential for use in the XXI century [19, p. 59-63].

There are several definitions of distance education, consider some of them.

Under the system of distance education refers to a set of educational services provided to the general population using specialized information-educational environment, based on the means of information exchange on any distances [25].

Distance learning – a set of technologies, methods and tools, which provides an opportunity to study without going to school, but with regular consultation with school teachers or persons certified by this institution (tutors) [24].

The feature of distance education is, first, the separation (distance) student from the teacher, and secondly, autonomy (self-study option), and thirdly, the active integration of information tools and resources for learning.

The conditions necessary for the operation of distance education include: mandatory structured training and organizing the learning process on the server, a network of computer centers, management training and organizing the flow of learning information. Today distance learning is based on NITN is the leading form of training specialists of many teacher education institutions in the former Soviet Union and abroad [10; 13, p. 200-217].

The use of information and communication technologies, especially the Internet, creates conditions for the development of distance learning systems, theme of which is [40]:

- Universality information used educational resources;
- Their modularity;
- Ability to work on different hardware and software platforms in the network (eg LAN);
- Scalability of the system for use in educational institutions of different structures and sizes, with different levels and purposes of use of distance learning technologies;
- Ensure a high level of system reliability;
- Full automation of system operation and the ability to integrate with other types of information systems.

Distance learning systems have a number of features that allow you to select the distance form of education based on telecommunication technologies into a single system through:

- Intensive academic dialogue between student and teacher;
- Strengthening the foundations of education activity-based teaching material used;
- Better management of educational process with the use of modern means of communication;
- Enhance individual learning component;
- Increased attention to work with students at conferences, seminars, discussions, etc.;
- Reduce your efforts and time;

- The possibility of any person to attend any educational institution in any teacher, regardless of place of residence and location of educational institutions.

Thus, distance education is a qualitatively new level in the education system. General can be divided into five main points that define any distance learning system [39]:

- The existence of a teacher and a student and as a minimum, the existence of an agreement between them;
- The spatial division of teacher and student;
- The spatial division of teacher and school;
- Bi-directional interaction between teacher and student;
- Selection of materials designed specifically for distance learning.

Thus, distance learning is a teaching technology that is based on the principle of self-study and aims to creative self-identity. This form of humanistic heritage of knowledge and skills that based on the achievements of pedagogy, psychology, traditional education, new information and communication technologies creates any person subject and indicates areas for improvement, understanding of their capacity and independence, establishes guidelines to enhance the overall , cultural and professional levels, even when the learning process is independent of time, location, and most importantly, the choice of a particular educational institution. That is the main activity and positive components of the process can be called active students in choosing the direction, shape and pace of learning; opportunity to be more direct communication with educators, professionals, their associates training and expertise is in high-level cognitive activities; access to cultural and scientific achievements of mankind; increasing part of the creative learning activities through interactive, game, developing forms of employment, constant motivation for learning and revitalization (removal of possible psychological barriers in the communication process, a gradual adaptation to the educational content, etc.).

World practice of distance education provides textbooks and other printed material, transfer material studied by computer telecommunications, discussions and seminars conducted through computer communications, cable television and other technologies. Mostly used two forms of distance education, “case study” in which the student is arming the necessary range of textbooks, audio and video courses, as well as CD-ROM, and the use of telecommunications technologies to transmit educational materials, tests of the success through online technology [12].

In modern conditions of society greatly increased the demand for educational services for various types and levels from all strata of society. Distance learning allows you to receive primary and secondary education in parallel with the main human activities. The main objectives of distance education can be called [34]:

- Creating educational spaces by introducing in the educational process of modern technologies;
- independent search activity of students in the educational space, controlled and managed the institution, teacher, etc.;
- The transition from the reproductive to creative teaching method of learning by students.

Distance learning systems have a number of distinctive features [33]:

- Intensive dialogue between students and teachers;
- Strengthening the foundations of education activity-based teaching material used;
- Better management of the educational process based on the use of modern means of communication;
- Enhance individual learning component;

- Increased focus on common student work;
- Reduce your efforts and time;
- The opportunity to anyone to study in any school in any teacher, regardless of place of residence and location of the institution.

The main tasks of the teacher in distance education are [31]:

- Development of training course;
- Development of training manuals;
- Counseling and support for students;
- Monitoring learning outcomes.

Thus, the use of distance learning is a significant reduction in the cost of training, since reduced the proportion of hours that is given to full-time, and an increasing number of students, per one teacher. Reducing overhead costs, in turn, reduces the amount of annual payments of commercial education. Modern networking internet technology enables you to make more flexible training schedule, draw a contingent of students, far from major cities and universities. Any study material remains of the students in the form of e-resources (lectures, teaching materials, etc.) [37].

A gradual transition to a new level of distance education - Open Education - leads to the creation of electronic libraries and universities distributed type, which provide a real basis for the formation of a common information space, including those of its members who, for various reasons, lack of free access to education. At this the high humanistic role of new information technologies in the development of the educational sector [3, p. 5-9].

At present, due to the implementation of a number of targeted programs of the Ministry of Education, Youth and Sports of Ukraine, international projects (Soros Foundation, and others.) Regional projects and initiative programs of educational institutions is a significant progress in the accessibility of telecommunications and information technology to the field of teacher education. Thus, we can say that the foundation already established telecommunications system of open education.

However, a prerequisite for the effective use of telecommunications networks is quality content that provides support learning and research. Information and educational environment of teacher education in Ukraine is intended to fill the established channels, such information and provide qualitatively new conditions for the development of the education system [5].

The means used during training: computer education programs, distance learning, the Internet, a single information environment, general purpose tool systems, hypertext systems, hypermedia and others., Allow you to speak with confidence about opportunities of modern information technologies order to develop information and computer maintenance process of preparing future professional education sector.

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