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Information Technology in Distance Learning

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Annotation: This article examines information technology as a tool for distance education. For this, traditional teaching methods were compared with the main educational technologies of distance learning. The pros and cons, advantages and disadvantages of receiving education at a distance are considered. Some information educational technologies were also investigated, such as network educational technologies, database management systems (Oracle, SQLserver), technology of "electronic textbook".

Keywords: information technology, IT tools, distance learning.

Many adults do not always have the opportunity and desire to attend classes at universities. The main reasons for this circumstance include, for example, having a family, family responsibilities and a permanent job. Taking into account these realities, another alternative appears - the possibility of interactive learning using the global Internet.

Traditional teaching methods have now lost their effectiveness. The search for new ways and methods of transferring knowledge and skills will allow us to keep pace with the constantly changing environment around us. New educational technologies will help not only overcome the limitations of time and space, but also qualitatively assimilate large amounts of information and knowledge. At the same time, those educational technologies that are based on modern information technologies play an important role in promoting the modernization of education.

At this time, a teacher of a higher educational institution is obliged to use distance educational technologies in his activities. Otherwise, if he does not know the basics of organizing e-learning, then he loses his competitive advantages in the professional community. It also becomes of little interest to students, since in the ways of communication he lacks such an important quality as mobility.

Obviously, for such a teacher to interact with students there is no way to create another - a virtual educational space [1].

According to the authors [2-4], distance learning is based on five main "whales", which include: corporate approach and marketing promotion, pedagogical design, learning management, educational technologies.

In turn, the main educational technologies include:

1. Networked educational technologies
2. Virtual and remote laboratory technologies
3. Technology "Electronic textbook"
4. Technologies for creating video lectures
5. Exercise technology

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6. Technology virtual training classes
7. Network communication technologies
8. Electronic learning environment technology "Moodle"

Many adults, as a rule, do not always have the opportunity and desire to attend classes in universities and traditional classrooms. The main reasons for this circumstance include, for example, having a family, family responsibilities and a permanent job. Taking into account these realities, another alternative appears - the possibility of interactive learning using the global Internet. This opportunity differs in that it provides a much broader range of communications, learning materials and opportunities for assessing the quality of learning.

A process that continues throughout our entire life is learning. This process is very important for the successful participation of a person in all aspects of the life of a democratic society, such as civil, economic, cultural and social components.

Continuous learning activities result in the development of a range of learning skills and behaviors.

All members of the rule of law have access to training. The learning process presupposes both the rights and responsibilities of all parties involved. These include both the students themselves and indirectly the corresponding educational organizations, and the persons who are entrusted with monitoring the learning process [6].

Distance learning technology is based on information technology tools. These include: web server technologies, hypertext, multimedia, email, webinars, online conferences. Educational or pedagogical technologies include: electronic textbooks, remote and virtual classrooms and laboratories, video lectures, simulators and specific information interaction technologies.

Distance learning management is a special management system for learning activities. This system contains a number of subsystems: user authorization in the system, distribution of access rights and user passwords, accounting and analysis of academic load, accounting of university students' progress.

An important component of the electronic educational environment is pedagogical design. Pedagogical design is the art of creating educational material, a necessary element of an electronic educational environment. In pedagogical design, a special place is also given to the development of control of educational activities. The educational materials of the electronic educational environment include multimedia presentations, video lectures, webinars, discussion forums and other electronic resources.

Corporate training is the training of company employees, taking into account the characteristics and strategies of specially designed programs with the necessary adaptation.

The task of marketing promotion of distance learning is the development of the service market for this educational technology [2]. In addition, the hidden mechanisms and motives of the behavior of consumers of the market for distance learning services are studied.

Theoretical foundations of distance learning.

Innovative pedagogy exists alongside traditional pedagogy. Educational activity based on innovations is carried out in the context of the division of society into the state and society, as well as the division of society itself into layers, classes, groups, etc.

This division explains the appearance in different people of many different ideas about the ways and forms of personal development. Ideas about what methods of teaching and upbringing should be used and what goals can be achieved.

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These demands of society determine the emergence of pedagogical innovative practices. They are focused to a greater extent not on the simple fulfillment of state orders, but on the development of new ideas, forms and norms for the development of both social and personal consciousness. This circumstance allows us to assert that any innovative change is the author's, personified school [6].

Traditional teaching methods have now lost their effectiveness. The search for new ways and methods of transferring knowledge and skills will allow us to keep pace with the constantly changing environment around us. New educational technologies will help not only overcome the limitations of time and space, but also qualitatively assimilate large amounts of information and knowledge. At the same time, those educational technologies that are based on modern information technologies play an important role in promoting the modernization of education.

The use of information and communication technologies helps to improve the quality of education. The world of technology allows learners and learning providers to leverage their vast resources to achieve their goals. Collaborative learning and self-learning based on the use of modern information technologies will become more effective.

In the modern world, indicators of successful learning are not only the presence of certain academic skills, but also the skills of self-regulation and collaborative learning. Therefore, today the most competitive specialists are those who have the opportunity to lead and direct their training. Mobile technologies in multimedia mode allow teaching outside the bounds of time and space. Several studies [6-7] have shown that the use of these technologies contributes to an increase in students' enthusiasm for learning.

Access to quality education is a need for hundreds of millions of people in various countries. This need is not fully satisfied by traditional methods and teaching aids. It is clear that the growth of non-formal learning opportunities is essential for public education systems.

For the category of people who have a job, a family to support, or have other personal circumstances, as well as for people with disabilities, online or distance learning is ideal. You can even study abroad without leaving your place of residence. Prestigious universities from different continents have become available for study. A prerequisite for distance learning is the ability to access the Internet with good bandwidth. Thanks to this opportunity, you can visit online classrooms, receive advice and conduct discussions with your classmates and teachers both offline and online.

Table 1 provides a comparative description of traditional and distance learning.

At the heart of modern distance learning are the following elements:

Comparative characteristics of traditional and distance learning

Types of training	Traditional teaching	Distance learning
Educational connection	Lectures, conferences	Electronic textbooks, video lectures, online conferences, virtual educational environment
Practical lessons	Seminars, projects, theses	Virtual training, webinars, interactive tasks
Skills	Memorization and retelling	Independent fulfillment of tasks, development creative approach
Control	Polls, tests, checking, tests, exams	Automated knowledge check, work with virtual tasks

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Additional sources of information	Printed materials, open educational resources of the Internet	Electronic publications, educational portals

- information transmission medium (mail, television, radio, information communication networks);
- teaching methods that depend on the technical medium of information transfer.

You can study remotely both according to a specific schedule and at your own pace. The advantage of distance learning technology is its adaptability. Online learning allows you to study in the current mode and at the same time, without interrupting your studies, to perform other activities. In most cases, there are no fixed deadlines for completing study assignments. Fixed dates are usually exam dates and tuition fees. Unlike studying in a traditional college or university, education via the Internet is more accessible. But this is not always the case, since the learning conditions are determined by each university independently [6].

Networked educational technologies.

Provided that modern means of information technology are used, the idea of obtaining education at a distance is gaining special popularity both in the whole world and in Uzbekistan in particular. Distance education can solve the problems of training and advanced training of those people who, for one reason or another, are deprived of the opportunity to attend classes in the classrooms of the university. Thus, due to the rapid growth in the volume of information useful for successful labor activity, as well as in connection with the continuous development of both information technologies themselves and the corresponding technical means, it is obvious that distance education is becoming very relevant in our time.

Network technologies based on global computer networks are the technical foundation of distance education. One component of all the opportunities that these technologies have to offer in the course of distance learning is e-mail. In addition, with the help of the global Internet, everyone can take part in conferences and seminars, as well as in the learning process to use various information resources, such as reference books, tables, electronic catalogs and other graphic, audio and video materials. It has been practically proven that the Internet as a means of distance learning, makes it possible to use a sufficient number of teaching and testing tools, allows communication between teachers and students [3].

Despite this, it cannot be argued that a computer is a full-fledged replacement for a "live" teacher. In the learning process, the computer is used as a tool. As before, the teacher himself should lead the educational process. Distance learning based on network technologies makes it possible to implement a differentiable approach, which takes into account the degree of mastering of the studied interval and the level of achievement of intermediate goals. In addition, a student, in accordance with his level of training, can independently choose an individual mode of mastering the educational material.

Advanced multimedia tools make the process of distance learning more visual and interesting. Multimedia technology makes it possible to use all educational materials (text, presentations, images, graphs, tables, audio and video recordings), as well as animations in an interactive mode.

Despite the stage of formation and the "young" age of distance education, this learning technology has great prospects. In contrast to the simple transfer of the necessary information to students through the global network, it is necessary to develop such an electronic methodological

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manual that would allow students to independently acquire knowledge and improve their skills.

In distance education through global networks, when developing electronic textbooks, it is necessary to pay attention not only to their content, but also to interactive means and methods that will allow students to learn more creatively and independently.

Despite the emergence and development of National Open Education Platforms, many universities prefer to accumulate educational and information resources on their own servers for teaching students using distance technologies. Such networks of educational institutions are called local. Some universities have several local networks at their disposal. United local networks of an educational organization located in different buildings, both within the same city and in different cities, are called corporate. The network technology used in the global network can also be successfully used in local and corporate networks. This technology, transferred to a local network, is called Internet technology. Thus, a local or corporate network with this technology is referred to as the Internet.

On the Internet, it is possible to use any number of servers, the content of which is viewed using the browsers of other computers. Unlike the global network, the entrance to the local network is open to any user of this network. On the Internet for external users, a restriction is imposed on access to information. Some types of information may also have access restrictions for some users of the local network. As well as in the global Internet network, any computer in a local network has its own IP-address for communication both inside the local network and outside it. The exchange of information between computers in the local and global network is carried out using special devices, the so-called routers and switches. Local network servers are divided into types: Web, Mail, FTP, Proxy and others. As a rule, the names of computer programs are hidden under the English abbreviations of the names of these servers.

The architecture of LAN web servers is similar to that of wide area networks. LAN Web servers also host, access, and search information on their pages. Mail server Mail server makes it possible to exchange e-mail, and also organizes the distribution of information according to the list. When sending an e-mail message, you can attach an attached computer file that contains any kind of multimedia information. The FTP (FileTransferProtocol - File Transfer Protocol) server stores files that the user needs for related activities. There are no specific requirements other than the requirements for WAN Web servers for Education Web servers. The speed and the required memory capacity of these servers depends on the amount of stored information. With large amounts of data, for high-quality operation of the servers, it is recommended to use a RAID system. This system allows you to provide quick access to information that is stored on multiple hard drives. This information is duplicated in order to improve the reliability of the server. The database occupies a special place in the distance education system of the university. Special programs, the so-called DBMS (database management systems) can create and use databases to operate. One such system is Oracle, which creates high-capacity corporate databases. The software market is represented by DBMS offers from several large world IT companies, for example, Microsoft offers its own DBMS - SQL-server.

The basic technologies of the Internet include:

- Information technology based on the use of hypertext, multimedia, Web-servers;
- Means of transferring information in the form of files, e-mail;
- Specialized software.

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- On the basis of the didactic properties and functions of these technologies, the main elements of the educational system are created:
- Electronic teaching materials;
- Communication tools for messaging and knowledge control;
- Educational process management tools;
- Automated workplaces for teachers and students;
- Electronic dean's office, etc.

The eLearning platform can be deployed on a distance learning web server. This technology will make it possible to place on the network, as well as distribute training courses. In addition, it is necessary to ensure the study of educational material in an interactive mode. Also, distance learning network technologies allow students to interact with the administration, teachers and with each other.

All didactic tools that make up the electronic educational environment are created on the basis of IT technologies. These tools include: electronic textbooks, problem collections, tests, simulators, virtual laboratories.

There is no doubt that in the learning process a very important role is played by online and offline communication types, both between students and teachers, and between students themselves. Obviously, the state of a person isolated from teachers and fellow students is accompanied by unpleasant subjective mental sensations or experiences. Information interaction with network learning technology is based on the following set of techniques, procedures, tools and methods: e-mail, forums, chats, audio and video conferencing. Next, we will consider in more detail the main "corpuscles", or didactic teaching aids that can be used in distance learning technology [8].

Electronic textbook technology.

The term "electronic textbook" appeared relatively recently, but has already firmly taken its place in our lexicon. This term, by different people, depending on the individual qualities of each, is interpreted differently. So what is meant by an electronic textbook?

Some of the authors regard the electronic textbook as an ordinary textbook provided with illustrations, only not on paper, but in electronic format. You can navigate between the different parts of such a tutorial using hyperlinks. Another part of the authors compare the electronic textbook with a kind of universal complex. This complex is an automated training system or an electronic training course. It includes a theoretical part, practical tasks, a knowledge assessment system, and a laboratory practice. There are authors who have expanded the concept of an electronic textbook. We supplemented it with the ability to search for information from a specific area of knowledge, bringing it closer to the concept of "electronic library".

The most complete definition of an electronic textbook, in our opinion, was given in her research by L. Kh. Zainutdinova [2, 7]. After analyzing a large number of works by various authors, she concluded that an electronic textbook is an integrated educational software system that ensures the completeness and continuity of the didactic cycle of the learning process. Hence it follows that the electronic textbook contains a theoretical part, provides training educational activity and control of the level of mastering of educational material. In addition to this, the electronic textbook makes it possible to search for information, carries out mathematical and simulation modeling, and has various service functions. Also, the electronic textbook should establish interactive feedback with

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the learner. According to L. Kh. Zainutdinova, a modern electronic textbook should be just such a universal teaching tool.

Development of an electronic textbook is not a simple and creative process that defies strict regulation. In the public domain, there are various kinds of recommendations for the creation of such textbooks. These recommendations relate to typological models and forms of the textbook, user interface design, development of self-control systems, editing, copyright protection, etc.

If an electronic textbook is built on a modular basis, then its modules, according to the authors [2, 5], should include the following interrelated elements:

- Information learning elements with hypertext and hypermedia;
- Learning elements with visual teaching staff;
- Learning items containing dynamic demos;
- Learning elements designed for self-assessment of achievements in the current educational process;
- Learning elements designed to build practical and professional skills;
- Learning elements with the content of reference information (tables, classifiers, maps, etc.)
- Elements that allow you to search for the necessary information;
- Elements of educational discipline support (table of contents, list of abbreviations, recommendations, glossary, list of used literature, etc.)

The above structure of the electronic textbook is consistent with the definition of L. Kh. Zainutdinova. An electronic textbook is a new learning tool with new opportunities in the process of obtaining education, and not just a fragment of a book in electronic format. The electronic textbook not only provides information to the student, but also serves as a special environment in which the student is immersed. It is the model with which he checks the results obtained. Contains means for assessing his knowledge and carries out navigation activities in the information flow. As a result of the rapid development of information technology, a natural transition of a textbook from paper format to electronic one took place.

The most common way of assimilating the material of an electronic textbook is the linear route. At the same time, just like in a textbook on paper, information is viewed from beginning to end, and the student has no freedom of choice. The majority of teachers adhere to a similar method of constructing an electronic textbook. This choice is due to conservatism and a cautious attitude towards innovations. Sometimes, when studying the theoretical part, there is a need to familiarize yourself with additional material to which there is a reference in the text, for example, the title of a work by another author or any of its fragments. In addition, it may be necessary to obtain information, for example, from a reference book, dictionary, normative and technical documentation, illustrations, demonstrations, etc. Thus, the educational material should have a flexible structure, which, under the control of the teacher or as a result of the student's choice, is capable of changing “Route of movement” according to the electronic textbook [9, 10].

Because the educational information is hosted on a Web server on the Internet, a powerful tool such as hypertext can be used in the learning process. A hyperlink is a word that is highlighted in the text, and a hypertext is a text that contains such hyperlinks. The study of the material becomes convenient when using hyperlinks in training. The teacher, using hyperlinks, sends the student to the glossary to decipher special terms; when solving problems, he refers to previously studied

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theoretical material, thus prompting the student to an individual learning path. In an electronic textbook, you can easily return to the place of the text from which the link was made. Hypertext inside the e-textbook module allows the student to directly enter the required section without "flipping" through all the educational material on the screen. In a word, hypertext is a very convenient tool. In addition to the concept of "hypertext", the concept of "hypermedia" is also used. The difference between hypermedia and hypertext is that you can make a link not only to text, but also to a graphic image, sound recording, video, animation.

The main advantages of using hyperlinks, hypertext and hypermedia in an electronic textbook include:

1. Easy transition both to the object of the link and to its source;
2. Comments to the text were made without violating its integrity, since they look like links;
3. Using different links, you can master the same e-textbook material in different ways;
4. The same learning element can be referenced from different places in the electronic textbook;
5. When you move the text to another place, the link moves with the text, remaining relative to it in its place;
6. The route used in the study of any educational material can be easily recorded and reproduced many times;
7. You can make links to any kind of educational material (informational, demonstration, training, control) both within the electronic textbook itself and on the global Internet;
8. Automatic registration of traversed routes and statistical analysis of the paths chosen by students will further improve the structure of the electronic textbook [2, 4].

The possibilities of the educational process are expanded through the use of hyperlinks, creating flexible learning paths. After leaving the material on the first link, in the new text you can get to one more link. Thus, the "depth" of links in the global network is not limited by anything.

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