# Modern Educational Technologies

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**Abstract**

*The article provides an overview of the technologies used in higher education institutions for the management of e-education, such as: educational technology, adaptive technology, personalization of learning using cloud technologies and big data technologies.*

**Key-words:** Technology, Educational Technology, Information and Communication Technologies, Distance Learning, e-education, Cloud Technologies, Cloud Computing, Big Data in e-education, Adaptive Technologies in e-education.

## 1. Introduction

The "Action Strategy" on five priority directions of development of the Republic of Uzbekistan for 2017-2021 defines the most important tasks for updating the methodology, creating conditions for the training of qualified specialists at the level of international standards. Resolution of the President of the Republic of Uzbekistan No. 2909 "On measures for the further development of the higher education system" is aimed at increasing the level of reforms carried out in this direction.

The development of modern Uzbekistan requires the development of new innovative technologies in teaching subjects of the system of higher pedagogical education. Improving education is impossible without the widespread use of modern information and communication technologies. In light of these requirements, the modern system of higher education puts forward the task of using information and communication technologies as a necessary component of the professional activities of future specialists.

## 2. The Main Results and Findings

To implement the cognitive and creative activity of students in the educational process, modern educational technologies are used, which make it possible to improve the quality of education, more effectively use study time and reduce the proportion of student's reproductive activity.

The word "technology" comes from the Greek word: "techne" - art, skill, skill and "logos" - science, law. Literally "technology" is the science of craftsmanship.

Educational technology is a process system of joint activities of a student and a teacher in the design (planning), organization, orientation and adjustment of the educational process in order to achieve a specific result while ensuring comfortable conditions for the participants.

The COVID-19 coronavirus epidemic has accelerated the implementation of a number of processes, the implementation of which was at the stage of discussion, reflection and critical analysis some time ago. Distance education, discussed in our Republic over the past 20 years, became a reality in April 2020. Only a few months of distance education provided rich material for studying the consequences of a total transition from classical forms of education to innovative ones.

Higher education implies a continuous independent training system aimed at training qualified personnel capable of taking any field of activity to a new level. With the development of information and communication technologies in the higher education system of Uzbekistan, large-scale work is being carried out to modernize it, develop science, and introduce modern forms and technologies of education. One of the most actively developing areas of the modern education system is the implementation of educational programs using e-learning and distance educational technologies.

Until now, distance learning has been intensively developed all over the world. During this time, many countries, in particular the United States and Great Britain, have successfully worked out the technology of this training. In Uzbekistan, this form of education received the opportunity to be

introduced into the higher education system during the COVID-19 pandemic and is a priority in public policy.

Distance learning technologies are understood as educational technologies implemented mainly with the use of information and telecommunication networks with indirect (at a distance) interaction between students and teachers.

The versatility and complex systems of distance education require high-quality work of all its components. This innovative technology has a number of qualities that make it very effective when working with university students.

The pandemic has led to an experiment on an unprecedented scale in which all levels of education around the world either ceased to operate for a period or attempted to provide a seamless learning experience with technology. The introduction of distance learning into the higher education system of Uzbekistan during the COVID-19 pandemic made it possible to determine the advantages and disadvantages of this form of education.

The advantages of distance learning are due to its new functions, expanding the capabilities and service of providing educational services to the student using a flexible lifelong education system. The remote form of conducting classes enables each student to undergo training, observing the rules of isolation during the quarantine period. Thus, students live in different regions of Uzbekistan, provided that educational centers are concentrated in large cities.

During the quarantine period due to the pandemic, distance learning is one of the most acceptable forms of education that can ensure the continuity of the educational process. Developed and applied modern forms of education allow us to make the educational process open, understandable and as close as possible to the traditional form of education. The possibility of introducing this technology makes it possible to define new approaches to the educational process in universities, making it possible to cover all students in the educational space of the university, while maintaining the continuity of learning.

When teaching on educational programs using e-learning distance educational technologies, the following models can be implemented:

- Fully distance learning of the student;
- Partial use of distance learning technologies that allow organizing distance learning for a student.

Fully distance learning implies a learning mode in which the student masters the educational program completely remotely using a specialized remote shell (platform), the functionality of which

is provided by the organization. All communications with the teacher are carried out through the specified shell (platform).

With partial use of distance learning technologies, the educational program is implemented by alternating face-to-face classes with distance learning.

The application of these models by an educational institution depends on each specific case:

- From the developed regulatory framework (local acts of the organization regulating the procedure and features of the implementation of educational programs using e-learning, distance learning technologies);
- On the availability of the necessary material and technical base;
- From the appropriate level of the organization's personnel (whether administrative and pedagogical workers have an appropriate basic or additional professional education);
- from the organization of training and methodological support of pedagogical workers (advanced training of workers who carry out training in educational programs implemented using e-learning, distance educational technologies).

E-learning is understood as the organization of educational activities with the use of information contained in databases and used in the implementation of educational programs and information technologies, technical means, as well as information and telecommunication networks that ensure the transmission of this information through communication lines, interaction between students and pedagogical workers ...

The e-learning system is a software product, access to this learning system is carried out via the Internet or via a local network, in free mode or from user authorizations - by login and password. Most often, an Internet browser is used to access the training system. The teacher places educational material, creates tests using the built-in student testing system. After that, each user is given their own set of lessons to learn. The results of the educational process are analyzed by the teacher, forming answers and looking at the test results.

Important elements that determine the readiness of modern educational organizations to implement electronic technologies are:

- Availability in the educational institution of a local network with Internet access;
- Availability of electronic educational and methodological complexes;
- Developed and tested tasks for intermediate and final certification in subjects;
- System of automatic check of tasks;
- Availability of electronic simulators (tasks, exercises, laboratory and practical work, etc.);

- The presence of a system capable of providing virtual interactive interaction of all subjects of the pedagogical process.
- The e-learning system provides such opportunities as:
- Structuring of educational material by lessons and courses;
- Each student, depending on his level of knowledge, is provided with his own set of lessons and courses;
- Built-in testing mechanism allows you to check the acquired knowledge;
- Convenient analysis of learning outcomes - the e-learning system allows the teacher to generate student testing reports;
- As a rule, the training system also stores the history of the educational process of each student and allows you to conveniently convert it into Excel tables or into a Pdf document.

It should be noted that an important element of electronic educational technologies is the ability of students to work independently with educational material and methodological literature.

## 3. Benefits of e-learning Technologies

The educational process, in which electronic educational technologies have been introduced, has a number of significant advantages:

- Flexibility of the education system;
- Modularity of programs. Electronic educational technologies provide for the study of an academic discipline in modules (blocks), each of which is logically completed. The modules are full of various practical tasks that contribute not only to the assimilation of the topic, but also to the development of students' creative abilities, which they show in the process of completing tasks;
- Parallelism and range of actions (territorial coverage). This advantage is based on the fact that students can acquire knowledge, work with educational products not only within the educational institution, but also at home;
- Profitability. One of the most important advantages is that students can use not only educational products that are available on the basis of the educational institution, but educational products of other educational organizations in the framework of cooperation. This is especially true for school graduates who can use the resources of the university library to prepare for admission. [3].

In the e-learning environment, there are a large number of different types of data, both structured and unstructured, which are difficult to process using traditional statistical methods. Big data processing technologies such as NoSQL and Hadoop are used to process such data. Big data analysis enables educators to get information about learners in a timely manner and allows them to customize their learning strategy. Using big data, educators have the rare opportunity to track students throughout the process and see how well they perform on tests or how quickly they completed complex course modules. This will enable them to develop more personalized eLearning courses.

E-learning is practiced in the world in the form of various models, its main components are virtual teaching materials and communications. It is based on interactive multimedia solutions that attract the student's attention, stimulate his ability to understand and interpret learning outcomes [1; 2]. Multimedia solutions can be of the following types: audio; image (graphics, drawing, sketch, model); video (video file, video conference); text with links, allowing you to consult other documents for the analysis and interpretation of images, music, sounds or videos and to further refine the textual content.

Another development of information technology in education is the use of cloud computing, which allows teachers, students and leaders of the education system to gain access to educational resources. It was revealed that the use of cloud technologies leads to a significant reduction in material costs for the purchase of expensive equipment and software; educational content from the cloud can be obtained from any device (laptop, smartphone, tablet, etc.) and at a convenient time for the student, it is enough to have an Internet connection and a browser.

Cloud technologies are a technology for remote storage and processing of information, that is, the provision of computer infrastructure and services to the end user via the Internet [5]. Cloud computing (OV) is a model, the main purpose of which was to provide convenient and ubiquitous access on demand of the client to the information on the network, which can be quickly provided to the user with minimal costs [6; 7]. The functioning of the cloud provides for the unlimited storage of the downloaded data.

Developing and implementing successful e-learning systems requires technologies that allow an arbitrary number of users to work with them, providing a good learning environment. It is shown that to date, a fairly large number of software and technical developments have been created and implemented that implement various mechanisms for introducing information technologies into the educational process. One of these developments is the use of adaptive technologies in the educational process, which allow the learner to adapt to the educational material, choose the appropriate method

of mastering the material, and regulate the intensity of training at various stages of the educational process.

The technology of individualization of training (adaptive) is a technology of training in which an individual approach and an individual form of training are priority (I. Unt, VD Shadrikov) [9; 10]. The individual approach as a teaching principle is carried out to a certain extent in many technologies, therefore it is considered a penetrating technology.

Adaptive teaching technology was developed and introduced into the educational process by A.S. Granitskaya [8]. The creation of technology is caused by a number of pedagogical problems and the desire to use the idealized possibilities of both the entire educational process and a single lesson. The purpose of the technology is to teach the techniques of independent work, self-control, methods of research, in the development and improvement of skills to work independently, to acquire knowledge and, on this basis, to participate in the formation of the intellect of the student, in the maximum adaptation of the educational process to the individual characteristics of students.

## 4. Conclusion

Thus, the use of modern ICT tools in e-education makes it possible to increase the efficiency of the educational process, increases the pedagogical impact on the formation of the student's creative potential. To improve the efficiency of e-education, it is necessary to use modern ICT technologies: in the educational process (cloud technologies, adaptive technologies, etc.), for which it is necessary to develop scientific and technical cooperation of educational institutions on this issue.

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