



## The Role of Digital Technologies in the Education System

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### Abstract

*The purpose of this article is to analyze the introduction and use of information and communication technologies (ICT) in the special disciplines of higher education, to teach teachers how to improve the effectiveness of teaching and learning through information and communication technologies. This article discusses the issues of improving the knowledge and skills of students through the use of modern information and communication technologies in the preparation of specialists, increasing students' interest in the educational process and the ability to apply their knowledge in practice in the future. The focus is on the need to develop appropriate strategies for a new educational role and, in addition, to enhance the role of learners in integrating information and communication technologies into the educational process. The role and perspective of the teachers was very important, highlighting them as key players in the process. The data show that there is a belief that the use of information and communication technologies in the educational process will help increase the effectiveness of education and facilitate the organization of the educational process. In particular, it shows that the contribution of information and communication technologies to the improvement of the educational process in educational institutions, where information and communication technologies is an innovative factor, is high. Achieving this high level means that the educational institution must not only modernize technological means, but also change the models of teaching.*

### Introduction

Advanced countries and regions, which are working effectively to introduce digital technologies in education and create a digital learning environment, are showing high quality education results (Hinostroza, 2018). In particular, the introduction of digital technologies in the educational process in Uzbekistan has become one of the priorities in the development of higher education.

A number of studies and reports in recent years have highlighted the potential and benefits of information and communication technology (ICT) in improving the quality of education. ICT is seen as a “key tool for building a knowledge society” and, in particular, as a mechanism for reviewing and changing education systems and processes, leading to an increase in the quality of education for all (Umarova, 2020).

The European Commission encourages the use of information and communication technologies (ICT) in the educational process through an action plan for e-learning, one of its goals is to “improve the quality of education through access to resources and services, as well as distance sharing and collaboration” (Sangrà & González, 2010).

The level of development of modern society is determined by its intellectual potential, namely, its ability to produce, assimilate and practically use new knowledge and technologies. At the same time, the natural basis of modern society is primarily education,

and therefore, the process of modernization of the education system should not only match, but also outstrip the development of society as a whole.

The rapid development of digital technologies in the modern world requires pedagogy to keep up with trends (Umarova, 2020).

## **Methods**

The development of the vocational education system in the modern world is associated with the widespread introduction of information and communication technologies (ICT) into the educational process, without the use of which a modern specialist of any profile is unthinkable in their professional activities.

Solving this problem requires an integrated approach, which is possible when using new education technologies (in particular, e-learning), reforming the vocational education system taking into account promising technological structures of the economy and, as a result, creating network structures based on new ICTs.

The use of ICT at all stages of the educational process allows to instill in future specialists the skills of collective work within the framework of electronic network structures, to teach the promotion of their own knowledge and skills in the market of highly qualified personnel through the electronic space.

## **Results and Discussion**

The use of ICT in education is based on solving the following tasks: Development of multimedia electronic educational resources (EER), including a laboratory workshop (including network), electronic educational and methodological complexes, electronic control and measuring materials etc, Introduction of e-learning systems and development on their basis of methodological aspects of using e-learning technology (Azad, 2011). Organization of regulated access for students to information and educational content, including an automated laboratory practice (ALP), industrial equipment operating on the basis of IT technologies etc. Informatization of education is nothing more than the process of creating a scientific and educational information environment (SLEI) (Zhang & Wang, 2018). This process is not only associated with the development of the necessary material and technical base of the education system, but also involves the preparation of educational and methodological materials of a new generation, the formation of a fundamentally new teaching culture in the context of the use of the information educational environment.

The spheres and methods of using information technologies are very diverse and allow: (1) Change the nature of the development, acquisition and dissemination of knowledge; (2) Provide opportunities for updating learning content and teaching methods; (3) Expand access to general and vocational education; (4) Without diminishing the need for teachers, change their role in the educational process (constant dialogue, transforming information into knowledge and understanding).

It should be noted that the use of ICT in the educational process allows: (1) openly plan the learning process (drawing up an individual educational trajectory - a sequence of modules from the system of training courses of the corresponding program); (2) to solve the problem of interactive communication in the interaction of the teacher and students, teacher and study group, individual student and study group; (3) to guarantee constant monitoring of the level of mastering of educational material; (4) provide students with educational materials and educational information stored on a variety of information servers and databases of telecommunication networks; (5) integrate domestic and foreign education systems,

providing students with the opportunity to get education both online and offline; (6) learn everything and always (regardless of age, qualifications, health status, working conditions, distance from the training center, etc.); (7) choose the place of study (independent choice of the territory of study).

ICT as a new educational tool lead to changes directly in learning technologies (Dabbagh et al., 2015). Today, there are several forms of organization of the educational process based on the use of ICT. One-to-one training. Individualized teaching, which is characterized by the relationship of one student with one teacher or one student with another student. The form of teaching "one to many", which is based on the presentation of educational material to students by a teacher or an expert, while students do not play an active role in the educational process. Learning "many to many", which is characterized by active interaction between all participants in the educational process. The value of these methods and the intensity of their use increase significantly with the development of educational telecommunication technologies. In other words, interactive interactions between the learners themselves, and not only between the teacher and learners, are becoming an important source of knowledge.

Below are three models of ICT application in the educational process. The distributed classroom model occurs when ICTs are used for the educational process, designed for one class, for a group of students located in different places (Sutherland et al., 2004). The typical result is a blended class that brings together traditionally enrolled and distance students. The educational institution and the dean's office control the progress. Distinctive features of this model: (1) classes include synchronous communication, students and teachers must be in a certain place at a certain time (at least once a week); (2) the number of participants varies from one to five or more; the greater the number of participants, the higher the technical, logical and cognitive complexity; (3) educational institutions are able to serve a small number of students staying in one place or another.

The self-directed learning model frees students from having to be in a specific place at a specific time (Grow, 1991). Students are provided with a set of materials, including a course presentation and a detailed curriculum, they get the opportunity to contact a faculty member who provides guidance, answers questions and evaluates work. Contact between the student and the methodologist is carried out using the telephone, computer conferences, e-mail and regular mail. Distinctive features of the self-study model: (1) there are no classes in the classroom: students study independently, following the detailed instructions of the program; (2) students interact with the methodologist and sometimes with the rest of the students; (3) presentation of the course content occurs through printed publications, computer disks or videos, which students can study at any convenient time.

The Open Learning + Class» model involves the use of a printed course presentation and other means (such as videotapes or computer disks) that allow the student to study the course at the most appropriate speed, combined with interactive telecommunications technologies to organize student communication within a distance group. Characteristics of this model: presentation of the course content occurs through printed publications, computer disks or videos, which students can study at any convenient time, individually or in a group; students periodically come together to conduct classes with the participation of the teacher, using interactive technologies (in accordance with the distributed class model); classroom activities are conducted so that students can discuss and clarify basic concepts, gain skills in problem solving, group work, laboratory work, modeling and other applied research.

## Conclusion

In short, in the organization of project-based education through the use of modern information and communication technologies in the educational process, the organization of practical and laboratory classes in specialized disciplines will increase students' creative thinking, independent decision-making and teamwork skills. It is obvious that the use of modern information and communication technologies in the training of specialists will increase the chances of achieving educational effectiveness through the organization of project-based education. Particular attention should be paid to the following pedagogical aspects of teaching, which must be adhered to by teachers when using ICT: The teacher should not be just a delivery mechanism for course content. The teacher must first of all help the students to develop their own understanding of the course material; Learning is a highly interactive process. Students bring with them a whole set of knowledge. The teacher and the student are full participants in the dialogue, during which the knowledge of each of them is transformed, refined, the depth of understanding of the material is checked; Collaborative learning is a systemic strategy where students work in small groups on one common problem. Working in a group, students cannot remain passive observers, the contribution of each of the participants is significant. Teamwork is becoming an increasingly used organizational strategy in most areas of human endeavour.

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