



Article

The Role and Impact of Digital Technologies in Modern Education

Rakhimov Odil¹, Rakhimov Zafar Odilovich²

1. Associate Professor of Samarkand State University, Republic of Uzbekistan
 2. Associate Professor of Kimyo International University in Tashkent Samarkand branch, Republic of Uzbekistan
- * Correspondence: zafar_r80@mail.ru

Abstract: This article examines the fact that today's digital technologies have become an integral part of the education system, their significant role in improving the quality of education in the process of digitizing education, raising young people to be socially active and digitally literate, as well as the formation of a digital educational environment and new pedagogical approaches. The impact of innovative technologies such as artificial intelligence, blockchain technologies, virtual and augmented reality on education is also analyzed.

Keywords: Informatization, Digital Technologies, Digitization of Education, Information and Communication, Competence, Artificial Intelligence, Virtual Reality, Digital Transformation, Pedagogical Digital Literacy, Socially Active Youth, Improving the Quality of Education, Digitization, Digital Education, Artificial Intelligence, Virtual Reality, Digital Education, Distance Learning, Innovation

1. Introduction

The modernization of the education system in the Republic of Uzbekistan and the rapid development of digital technologies are one of the important directions in the country's development strategy. In particular, there is a growing need to improve the quality of education through the widespread introduction of digital educational tools and create a knowledge system that is in line with global trends. As in all areas of human activity, innovations are being introduced into higher education that form a modern specialist, increase the knowledge, skills, and competencies of students, and master new types of activities in all sectors of the economy, and in general, aimed at a new development of human activity. Because in today's era of rapid development, society needs qualified specialists who think actively, create innovative ideas, and effectively apply them in practice.

In today's era of globalization, digital technologies are developing rapidly and require keeping up with the times in every field. In this era, when the speed of obtaining and using information has increased significantly, the use of digital technologies in the education system is of great importance in improving the quality of education and educating socially active youth. This, in turn, did not ensure that the quality of education was so high.[1]

Modern specialists must ensure the transition of society to a digital era aimed at increasing production efficiency and human needs, as well as creating new types of activities. To do this, it is necessary to move from the stage of informatization, which serves to develop traditional education, which trains specialists, to the stage of digitization. If the informatization of education was the basis for the transition of education to a new stage,

Citation: Odil R., and Odilovich R. Z. The Role and Impact of Digital Technologies in Modern Education. Web of Scholars: Multidimensional Research Journal 2026, 5(2), 191-195.

Received: 14th Feb 2026

Revised: 5th Mar 2026

Accepted: 10th Apr 2026

Published: 12th May 2026



Copyright: © 2026 by the authors. Submitted for open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>)

then the digitization of education is designed to train specialists who can freely use mobile and Internet technologies, improve the quality of continuous education using distance e-learning, and meet the requirements of the labor market.

2. Materials and Methods

As a result of our research, the issues of the role and influence of digital technologies in the modern educational process were studied, and scientific conclusions and recommendations were developed in this regard. In the process of conducting the research, scientific abstract thinking, logical approach, comparison, and systematic approach were used.[2]

3. Results

Digitalization in education is not “preparation for life and work”, but “continuous learning and personal development throughout life”. The proliferation of global information systems and artificial intelligence techniques will help to implement the changes necessary to achieve this. In connection with the widespread introduction of cloud computing, mass high-speed Internet, smart digital tools, and virtual reality technologies, achieving this goal is especially important. In the era of digitalization, it is necessary to pay more attention to the formation of competencies and the development of adaptive skills. Reducing the number of disciplines required for study allows us to significantly deepen the mastery of the remaining material and pay maximum attention to the formation of the necessary skills.

Digital technologies are now deeply penetrating all spheres of human activity, in particular, the education system is also rapidly digitizing. The use of modern educational technologies in higher and general secondary educational institutions allows for the formation of digital competencies, automation of the knowledge acquisition process, and the use of interactive teaching methods.

Domestic and global experience shows that the availability of digital technologies for participants in the educational process is a necessary, but not sufficient, condition for increasing the effectiveness of educational work.

The use of digital technologies is especially relevant in connection with the widespread introduction of cloud computing, mass high-speed Internet, smart digital tools, the use of artificial intelligence methods, and the widespread introduction of virtual reality technologies. Today, the development of digital technologies has led to a transition in developed countries from mass production of standardized products to flexible production of customized products that can be used on a mass scale.[3][4]

At the same time, work has begun in the education sector to transition the educational process to a result-oriented and student-oriented organization. Each student undergoes thorough natural science and humanitarian training and develops modern competencies. The situation with problems arising in the educational process is being resolved gradually and not yet completely, but this is not the most important thing, but it is necessary to continue to develop and master various forms of education in the era of digital transformation; The active use of digital technologies in the educational process, today the idea of the place and role of digital technologies in the educational process has once again become clear. They began to be seen as a means of transforming education and transitioning to a personalized organization of the educational process without lagging behind in learning. Changing expectations for their distribution and prospects for their use are discussed. The use of digital technologies in education changes the requirements for students' skills, since this requires not only reading, writing and calculation, but also the ability to organize information sources, collect, evaluate and use information.[5]

4. Discussion

Until recently, people talked about the informatization of education, since this term was understood as a set of measures to change pedagogical processes based on the introduction of information products, tools and technologies in the process of education and upbringing. The Russian Pedagogical Encyclopedia defines the informatization of education in a broad sense as a complex of socio-pedagogical changes associated with the replenishment of educational systems with information products, tools and technologies; in a narrow sense, it considers the introduction of information media based on microprocessor technology into educational institutions, as well as information products and pedagogical technologies based on these tools.

The main areas of application of information technologies in education are:

- development of pedagogical software for various purposes;
- development of educational websites;
- development of methodological and didactic materials;
- organization and conduct of computer experiments with virtual models;
- implementation of targeted information search.

Today, society has moved to the next stage of development of new technologies.

The first was the creation of a steam engine;

the second - electrification;

the third - informatization;

the fourth - digitization, that is, the era of big data and technologies based on it.

Digital technologies, on the one hand, help to further increase the volume and efficiency of production, and on the other hand, they allow for an individual approach in various areas. For example, with the help of 3D printing, it is possible to produce complex devices in a single copy, which was impossible in traditional production.[6][7]

Initially, digitalization was limited to the automation of technological processes, the widespread use of social networks, the emergence of the Internet, mobile communications, smartphones, and the increase in the number of consumers using new technologies. However, digital technologies are rapidly becoming part of human economic, political and cultural life, and education is now also being digitized.[7] The digitization of education leads to changes in the labor market, educational standards, identifies needs for the formation of new human competencies, and helps to reconsider the role of the educator and reorganize the educational process, as well as to a fundamental, qualitative reconstruction of the education system.[8]

The digitalization of education directly depends on the level of mastery of digital technologies by the educator, and is carried out with the aim of effectively using them in the educational process. The formation of competencies in educators, such as operating in the digital information flow and mastering new technologies, is one of the necessary tasks in the digitalization of education.[9]

In the modern education system, artificial intelligence and automated systems are helping to create educational programs tailored to the individual needs of students. With the help of these technologies, each student is provided with educational material that matches his level of knowledge, and the effectiveness of education is increasing. Digital technologies, in particular, virtual and augmented reality technologies, are used to simulate practical training. For example, surgical operations are conducted in a virtual environment at medical universities, and in the engineering field, the opportunity has been created to study complex systems through 3D modeling.[10][11]

In addition, with the development of 5G technologies, distance learning has become even higher quality, and students have the opportunity to participate in online classes via high-speed Internet in any conditions. The integration of modern learning platforms in the

educational process serves to make the learning process more efficient and convenient. Also, the effective use of digital technologies, training students to work independently, select information, and participate in project activities helps to form their modern competencies.[12][13]

The process of digitization of the economy, education, and any other areas of human life involves the formation of a digital culture in a person, that is, it allows competent use of new opportunities and integration into the environment of an information society. It can be said that digitization has the following characteristics:

- Any person, enterprise, or organization anywhere in the country and at any time can obtain any information and knowledge necessary for life using social systems for an appropriate fee or free of charge, and will be able to solve problems of personal and social importance;
- it will be possible to create advanced infrastructures that will ensure the creation of national information resources in the volume necessary to ensure the constantly accelerating scientific, technical and social progress in society;
- will ensure the rapid automation and robotization of all sectors and branches of production and management in society, etc.[14][15]

5. Conclusion

Thus, despite the rapid expansion of the use of digital technologies and their active use in the educational process, the number of those who can successfully solve complex problems in an environment saturated with them is only a small part of the educated, but in recent years their number has been increasing. The work of the education system should be changed in such a way that the general literacy of graduates of educational institutions and the ability to solve non-standard problems are higher than those of modern intelligent computer systems. Teachers should show students how to properly use technology to support their education, how to interact with these technological tools and devices for educational purposes, then the number of such graduates will increase and the new digital divide will narrow.

The introduction of innovative technologies such as artificial intelligence, blockchain, virtual reality is helping to improve the quality and efficiency of education. Training pedagogical personnel, further expanding technological infrastructure, and integrating international experience remain important tasks for the further development of digital education in the future.

REFERENCES

- [1] A. Akmalova, A. Xaydarov, and G. Pardayeva, "Oliy ta'limni raqamlashtirish sharoitida talabalarning intellektual salohiyatini rivojlantirish," *News of the NUUZ*, vol. 1, no. 1.1, pp. 40–43, 2024.
- [2] M. O. Tursunov, "O'zbekistonda oliy ta'limni raqamlashtirish: yutuqlar va muammolar," *Scientific Progress*, vol. 4, no. 2, pp. 213–217, 2023.
- [3] O. Rakhimov, "Innovatsion ta'lim texnologiyalarining ta'lim sifatini oshirishdagi o'rni," in *Proc. Int. Sci.-Practical Conf. "O'zbekistonda turizm sohasini rivojlantirishda tabiiy va etnografik resurslardan samarali foydalanish muammolari"*, SamISI, 2019.
- [4] O. Rakhimov, "Ta'lim muhitini avtomatlashtirish," in *Proc. Republican Sci.-Tech. Conf. "Iqtisodiyot tarmoqlarining innovatsion rivojlanishida axborot-kommunikatsiya texnologiyalarining ahamiyati"*, vol. 1, Tashkent: TATU, 2022, pp. 597–599.
- [5] O. Rakhimov, *Fizika. I tom: Mexanika va molekulyar fizika*. Samarkand: Turon Nashr, 2022.
- [6] Z. O. Raximov, *Socio-economic problems of hotel industry development in the field of tourism*. Samarkand: SamISI, 2021.

-
- [7] Z. O. Raximov, *Entrepreneurship in tourism*. Samarkand: SamISI, 2019.
- [8] R. Z. Odilovich, "The mechanism of implementing the goals and strategies of the strategic plan in the development of the Samarkand tourist destination of the Republic of Uzbekistan," *Hunan Daxue Xuebao (Natural Sciences)*, vol. 49, no. 9, 2022.
- [9] R. Z. Odilovich, "Socio-economic basics of using the authority of Samarkand tourist destination in the market of tourist services in Uzbekistan," *Hunan Daxue Xuebao (Natural Sciences)*, vol. 49, no. 9, 2022.
- [10] Z. O. Rakhimov, "The role of information support in the strategic planning of tourism destinations," *Builders of the Future*, vol. 2, no. 2, pp. 236–241, 2022.
- [11] Z. O. Rakhimov, "The importance of the development of the digital economy in the field of tourism in Uzbekistan," *Builders of the Future*, vol. 2, no. 2, pp. 221–227, 2022.
- [12] Z. O. Rakhimov, "Turizmda strategik rejalashtirish tizimini axborot va kadrlar bilan ta'minlash yo'nalishlari," in *Proc. Int. Sci.-Practical Conf. "Bukhoro turistik erkin iqtisodiy hududini yaratish imkoniyatlari va rivojlanish istiqbollari"*, Bukhara: BukhDU, 2017, pp. 368–372.
- [13] Republic of Uzbekistan, "Law of the Republic of Uzbekistan 'On Tourism'," Dec. 5, 2019. Tashkent: Vedomosti Oliy Majlisa, 2019.
- [14] President of the Republic of Uzbekistan, "Decree No. UP-5611 'On measures for the accelerated development of the tourism industry of the Republic of Uzbekistan'," Jan. 5, 2019.
- [15] R. Xaitboyev, *Ekologik turizm*. Toshkent: Fan va texnologiyalar nashriyot-matbaa uyi, 2021.