

**MODERN TRENDS AND DEVELOPMENT FACTORS IN THE IMPLEMENTATION  
OF DIGITAL TECHNOLOGIES IN THE EDUCATION SYSTEM**

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**ABSTRACT:** The implementation of digital technologies in the education system has become a pivotal aspect of modernizing teaching and learning processes. This study explores the contemporary trends and key factors influencing the adoption and development of digital tools in education. Key trends include the integration of artificial intelligence for personalized learning, the widespread use of online platforms for remote education, and the application of virtual and augmented reality to enhance interactive learning experiences. Additionally, the role of big data analytics in assessing educational outcomes and the adoption of gamification strategies to improve student engagement are highlighted.

**Key words:** digital technologies, digital technologies in education, cloud technologies.

## **INTRODUCTION**

The socio-economic changes being implemented in the Republic of Uzbekistan have led to significant transformations in the education system. In the context of digital transformation, these changes have affected both the organizational and substantive aspects of education. On January 9, 2018, in his speech at the meeting dedicated to the development of information and communication technologies, President of the Republic of Uzbekistan, Sh. Mirziyoyev, emphasized that "the development of information and communication technologies serves the rapid development of all sectors and creates convenience for people." It is also worth noting that special attention was paid to the need for the introduction of information technologies that fully meet international standards at all levels of education during the development of the "Digital Uzbekistan-2030" program.

The modern trends and development factors of the implementation of digital technologies in the education system are very important and urgent. This is because they help improve the quality of education, make the educational process more efficient and flexible, expand educational resources, enrich the educational environment, develop collaboration among education stakeholders, and adapt education to the requirements of the modern world.

The use of the internet is considered very beneficial in studying the modern trends and development factors of the implementation of digital technologies in the education system. Through the internet, students can access various sources of information, familiarize themselves with new technologies, find courses and textbooks that match their interests, test their knowledge and skills, communicate with other students or teachers, and exchange ideas with them.

In the implementation of the modern trends and development factors of the application of digital technologies in the education system, it is necessary to support the state policies and programs of the Republic of Uzbekistan. This is because, with the decree of the President of the Republic of Uzbekistan dated April 20, 2017, No. PQ-2909, the program for the complex development of the higher education system for 2017-2021 was approved, which set goals such as radically

improving the higher education system, strengthening and modernizing the material-technical base of higher education institutions, and further introducing modern information and communication technologies.

Undoubtedly, technology plays a significant role in every aspect of life. Thanks to technology, it is possible to automate tasks that would otherwise require multiple hands. Additionally, modern technologies enable the completion of many complex and critical processes with ease and high efficiency. The application of technology has made life better. The use of technology has made teaching and learning processes more interesting. The importance of technology in schools cannot be overlooked. Indeed, with the advent of computers in education, teaching by educators and learning by students has become easier. Visual representations always have a stronger appeal than words. Using projectors and visual tools to assist in learning is another great form of technological application. Leading institutions worldwide now rely on impressive PowerPoint presentations and projections to make learning interactive and engaging. The use of technological tools like projectors in schools and universities can increase interaction and interest levels, improving motivation. Students prefer to see engaging visuals and things that encourage them to think, rather than just reading words.

- Over the past decade, the importance of the Internet has increased many times. Its role in education is now undeniable. Despite fraud and cybercrime, using the internet is very important and beneficial for students, as it helps them improve their knowledge and skills, familiarize themselves with new information and sources, expand their interests, and collaborate in various fields. Through the internet, students can receive education in any direction they choose, such as learning languages, programming, art, history, science, and more.

There are also disadvantages to using the internet, but these can be addressed or minimized. To prevent these issues, students must develop a culture of using the internet. This means:

Do not share your personal information or passwords with anyone on the internet.

- Avoid contacting unknown people or paying attention to their offers on the internet.
- Do not share your or others' images or videos carelessly on the internet.
- Do not violate your own or others' rights on the internet, and report it if you notice any violations.
- Be respectful of your own and others' opinions and thoughts on the internet.
- Do not spend excessive time on the internet or become overly dependent on it.
- Do not reduce physical activity or harm your health by spending too much time on the internet.

The culture of using the internet allows students to fully benefit from its advantages and avoid its shortcomings. This enhances their quality of life and helps them adapt to the modern world.

Today, the internet is present in almost everything we use. From televisions to game consoles and smartphones, the internet is everywhere. Projectors and online degrees have now become a widespread phenomenon. People want to take online courses to earn certificates and degrees. The best institutions offer excellent online programs using various applications and the internet. This is a concept that continues to grow with more support and awareness.

The 21st century is often considered the age of technology. Today, technology plays a crucial role in our lives. It is seen as the foundation for economic growth. An economy without technology will never develop in today's world. This is because technology makes our work much easier and requires less time. The impact of technology can be felt in all possible fields, one of which is education. Connecting to the internet and being online day and night provides great convenience with technology, as students can find various forms of help, study guides, and other types of supporting materials, which can be used to improve and enhance their academic learning.

The term "technology" is derived from the Greek words "techno" (craft, master) and "logos" (study, science). Digital technology refers to the tools, software, and systems used to store, transmit, process, and display information in the form of numbers or codes.

When discussing digital and education, the entry of digital media into the education sector has increased. This entry has led to students being able to stay online day and night and access various forums for assignments or help. As the power of digital technologies increases, more applications are available to assist students in their development and learning. Transmitting knowledge has become much easier, more convenient, and efficient. This means that our minds are more likely to function faster when using modern technologies, regardless of which part of life they apply to. Relying on and being connected to such innovations, which make life an easier and smoother journey, is inevitable today, even in schools, universities, and colleges.

Today, students can use technology in the following ways: In the field of education, the use of modern technological tools has been increasingly favored by students, and it has been found that using these tools increases their learning and interactivity.

Education is the field of upbringing. One of the main tools in education is didactic materials. Didactic materials include the changed forms of educational content such as slides, diagrams, tables, tests, virtual laboratories, and more. The opportunity to use computers in creating such materials is vast, and in the future, it is possible to modify and improve these materials further. In addition, it creates opportunities for distance learning and independent study.

The rise of digital education systems has been greatly aided by the opening of Wi-Fi zones and IT parks. Educators are now able to enhance their ability to work with digital technologies and organize various open courses online. This, in turn, leads educators to work more on their skills, and due to competition, it improves the quality of education. Additionally, digital technologies contribute to the implementation of artificial intelligence technologies for detecting tax evasion, preventing fraud, analyzing data, automating repetitive processes, and enhancing transparency. Big data also allows for the storage, processing, and better prediction of revenue, as well as improving document exchanges between taxpayers and tax authorities. Ta'lim muhitini raqamlashtirish turli shakllarda amalga oshirilishi mumkin:

Translating existing educational materials into electronic environments, including lectures, presentations, textbooks, independent assignments, and knowledge management tools.

Creating an interactive electronic environment for teacher-student interaction, including the creation of electronic classrooms for teachers, conducting webinars, organizing discussion forums, etc.

Creating new types of learning tools: electronic textbooks, electronic problem-solving books, video lectures, an electronic task database, computer games.

Creating fundamentally new forms of education by using the capabilities of the electronic environment – expanding the spectrum of information transmission, modeling various situations during role-playing games, simulating competitive games, etc.

Students around the world, while attending school, can "meet" with their classmates via video conference without leaving the classroom and discuss problems together in groups. This helps enhance communication skills and global awareness among students. Researchers have found that the use of ICT leads to more collaboration among students both inside and outside the school, and creates more interactive relationships between students and teachers. Due to the rapid expansion of knowledge, teachers address the huge problems society faces. Modern technologies demand that teachers learn to use these technologies in their lessons. Thus, these new technologies increase teachers' need for professional development.

The advantages of e-learning include:

- Solving access issues in education: Removing regional barriers to access knowledge, removing time limitations—accessing information at a convenient time for the user; fractional access by dividing classes into blocks; utilizing the knowledge of highly qualified teachers.
- Expanding choice: The ability to choose a teacher and presentation method; focusing on logic, visuals (associations), or practice (cases, tasks); choosing the method of material assimilation: auditory, visual, motor skills, or interactive participation; the ability to select the depth of material assimilation—extensive courses; the ability to select a convenient method for managing knowledge: tests, tasks, free essays, projects, interactive AI conversations, etc.
- Expanding forms and tools for knowledge transmission: In addition to traditional lectures, performances, and seminars, using project works, group debates, role-playing, and competitive games, including virtual participants, etc.
- Socio-economic advantages: The ability to form social intellectual networks; relative affordability (high investments and low operational costs).

Gressard and Loyd (1985) emphasized that the teacher's attitude toward computers is a key factor in successfully implementing ICT in education. They noted that teachers do not always have a positive attitude toward computers, and their negative attitude can lead to the failure of computer-based projects. The use of ICT for education presents useful feedback through various interactive functions, focusing on the student. ICT enables students to explore and learn new teaching methods supported by constructivist learning theories, rather than just memorization and recall. ICT has a significant impact on education in terms of knowledge acquisition and retention for both teachers and students. It eliminates the synthetic differences between theory and practice, promoting an integrated approach to teaching and learning that, unlike traditional classrooms, encompasses various aspects with focused attention. In the educational context, the use of ICT enhances the opportunities for education and improves its relevance and quality.

Today, "cloud" technologies are actively used in all developed countries. Cloud technology is actively entering the education system as well. Cloud technology refers to the provision of computer resources via the internet as a service. In this technology, users have access to their data over the internet, but they do not manage it, nor do they know the infrastructure, operating system, or software being used to store it. The term "cloud" here refers to the complex infrastructure that hides all the technical details. There are the following types of services in cloud technology:



IaaS (Infrastructure as a Service) – This is when the cloud provider rents out servers, storage, networks, and other infrastructure resources to the user. The user can install and manage their own operating system and software.

PaaS (Platform as a Service) – This is when the cloud provider offers programming environments, libraries, tools, and other platform resources to the user. The user can create and use their own applications, but does not manage the infrastructure.

SaaS (Software as a Service) – This is when the cloud provider provides internet-based applications to the user. The user can use the applications, but cannot install, update, or manage them.

The advantages of cloud technology are as follows:

- The ability to scale resources up or down on demand.
- The ability to access resources remotely.
- The ability to share resources.
- The ability to pay for resources on a rental basis.
- No need to spend on managing resources and ensuring security.

Disadvantages of cloud technology:

- Internet connection availability and quality are required.
- Trust in the cloud provider is necessary for data security and privacy.
- The user cannot control the service quality provided by the cloud provider.

There is a dependency on the cloud provider's service agreement.

Education is of significant importance in both corporate and academic settings. In the former, education or training is used to help employees perform tasks differently than before. In the latter, education is aimed at stimulating interest in students' minds. In both cases, the use of technology helps students better understand and retain concepts. Technological developments such as digital cameras, projectors, brain training programs, computers, PowerPoint presentations, and 3D visualization tools have all become great resources for teachers to help students easily understand concepts. There are no geographical limitations. Moreover, some websites, such as [www.zoom.com](http://www.zoom.com), are used to help students learn foreign languages online by connecting them with teachers from other countries. ICT tools assist in calculating and analyzing information obtained for exams, as well as computerizing reports on students' activities, making them convenient for inquiries. Unlike memorization or rote learning, ICT increases student engagement, as students choose what to learn at their own pace and work on real-life situations. ICT encourages collaboration and cooperation between students, teachers, and others, regardless of distance. It also gives students the opportunity to work and collaborate with people from different cultures. The role of technology in education is defined by four qualities: it is integrated as part of the curriculum, as part of the teaching system, as a tool for instructional support, and as a means to enhance the overall learning process. Thanks to technology, education has shifted from passive and reactive to interactive and aggressive. Technology positively impacts education but can also have negative effects. Teachers and students must use it to their advantage and eliminate the shortcomings that hinder the achievement of excellence for many students and schools. Thus, it is

time for every country to introduce a more technologically equipped education system in the future.

In conclusion, it is necessary to adapt the education system to the digital generation through the widespread and effective application of innovative educational technologies and didactic models based on information and communication technologies. At the same time, an active approach based on research should be used in the educational process, which can help develop students' skills in scientific research and shape their creative abilities and critical thinking, based on IT competencies.

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