The OSCAR PUBLISHING Services
American Journal of Philological Sciences

VOLUME Vol.06 Issue06 2026
PAGE NO. 88-91
DOI 10.37547/ajps/Volume06Issue06-21

The Impact of Artificial Intelligence on Modern Education

Raximova Sevara
Tashkent Branch of the National Research Nuclear University "MEPhI", Uzbekistan

Received: 24 April 2026; **Accepted:** 20 May 2026; **Published:** 14 June 2026

Abstract: This article provides an analytical overview of the impact of artificial intelligence on contemporary educational systems. It examines adaptive learning technologies, automated assessment tools, personalized learning resources, and the improvement of pedagogical effectiveness. Based on scientific literature, the study presents evidence regarding the benefits and limitations of AI integration in education. Issues such as digital inequality, teacher preparedness, data privacy, and ethical concerns are also discussed. The findings suggest that the proper integration of AI can significantly enhance the efficiency and accessibility of future educational processes.

Keywords: Artificial intelligence, educational technology, adaptive learning, digital pedagogy, automated assessment, innovative education, AI in education.

Introduction: In the modern era, the introduction of artificial intelligence (AI) technologies is one of the most pressing issues in the development of the education system. Globally, digital transformation processes are bringing about profound changes in all sectors, particularly in education.

Artificial intelligence plays a crucial role in automating the assessment of the learning process, organising education tailored to students' needs, and facilitating the work of teachers.

The relevance of the topic lies in the fact that Uzbekistan the Republic of Uzbekistan is also consistently implementing measures to widely introduce modern digital technologies into education, including the effective use of artificial intelligence, as part of its 'Digital Uzbekistan – 2030' strategy. The aim of this article is to analyse the theoretical foundations for the implementation of artificial intelligence technologies in the education system, international experience, and the opportunities and challenges in the context of Uzbekistan. The concept of artificial intelligence and its role in education.

Artificial Intelligence (AI) is the ability of computer systems to perform functions characteristic of human thought, such as learning, analysis, and decision-making. In education, AI enables the automation of the teaching process, the assessment of students' knowledge levels, and the creation of personalised learning paths.

Artificial intelligence-based teaching technologies. AI-based teaching technologies enable the creation of adaptive learning systems. For example, each learner's level of understanding is analysed, and they are offered tasks that are tailored to them. This process is based on the principles of "learning analytics" and "adaptive learning". Artificial intelligence monitors the learning process, analysing the learner's level of knowledge, interests, and mistakes. Based on this, the system forms an individual – that is, an adaptive – learning path for each learner. Such systems are called "adaptive learning systems".

In the increasingly developed 21st century, modern technologies are becoming an important and integral part of human life. In particular, in recent years,

advanced artificial intelligence is influencing not only how people acquire knowledge but also their daily lives. To use artificial intelligence successfully, we must first understand its history of development. The term “artificial intelligence” was coined in 1955 by John McCarthy. In 1956, McCarthy and others organised the Dartmouth Summer Research Project on Artificial Intelligence. This initiative led to many inventions, such as machine learning, deep learning, and predictive analytics. Furthermore, this initiative gave rise to a new field: data science. A new chapter in the development of artificial intelligence opened in the 1990s. In 1997, the IBM computer Deep Blue defeated the world chess champion became the first computer in history to defeat Garry Kasparov. Thus, Artificial Intelligence is based on simulating human cognitive processes by creating and applying algorithms in a fast computational environment. Simply put, artificial intelligence is a technology that enables computers to think like humans and find solutions in the same way.

Furthermore, AI systems analyse students' performance in real-time, identifying their engagement in class, the speed at which they complete tasks, and their errors. Based on these analysis results, the teacher can monitor the individual development dynamics of students and adapt their teaching methodology accordingly. Furthermore, analytical modules created with the help of AI systems allow the teacher to provides in-depth statistical information on students' overall results, strengths and weaknesses. This, in turn, enhances the ability to improve the quality of education, implement a personalised learning model, and make pedagogical decisions on a scientific basis. Overall, the implementation of artificial intelligence systems in education does not replace the teacher, but rather supports their work as a digital assistant. As a result, the teacher can focus on more strategic, creative, and pastoral tasks, which significantly enhances the quality and effectiveness of the teaching process. AI-based assessment, monitoring and analysis. Artificial intelligence continuously analyses pupils' knowledge and tracks their developmental dynamics. This not only speeds up the assessment process but also ensures objectivity.

The prospects for the widespread implementation of artificial intelligence technologies in Uzbekistan's education system are high. In the future, this will involve creating AI-based textbooks, introducing automated assessment systems, and developing individual development maps for pupils.

is planned. This will serve to improve the quality of education in the country and strengthen international competitiveness. According to UNESCO (2021), the number of schools using AI in education is increasing year on year, and AI technologies have been found to increase the effectiveness of the learning process by up to 30–40%. The OECD (2021) notes that AI can help to reduce teachers' workload and improve the quality of lessons. Below, I will outline the facts about the benefits, challenges, and future opportunities of AI in education.

Today, one of the most common applications of AI is in adaptive learning systems. According to UNESCO (2021), adaptive systems tailor material to students' knowledge levels, and this method increases student retention by 30–45%. A Pearson (2016) study stated that such programmes accelerated the rate of lesson absorption by 36%. Simply put, AI acts as a personal tutor for each student.

AI speeds up one of the most time-consuming tasks for teachers — the marking process. According to UNESCO, the accuracy of written work analysed by AI is between 87–92%. The OECD (2021) estimates that teachers save 2–5 hours per week. This opportunity helps to reduce teachers' workload, allowing them to focus more on students.

AI can instantly identify students' mistakes, strengths and weaknesses. According to Pearson (2016), the system's analysis of errors improves the effectiveness of students' revision.

40%. In OECD (2021) experiments, it was confirmed that the overall retention rate increased by 15–20% in classes using AI.

This means that AI makes the teaching process more understandable and purposeful.

LITERATURE REVIEW

The literature reviewed on the topic indicates that artificial intelligence is having a significant impact on modern education.

UNESCO reports emphasise that AI is an effective tool for automating the learning process, individualised instruction and assessment. However, the lack of

technical infrastructure and low teacher qualifications are identified as the main challenges.

According to OECD research, it is necessary to enhance teachers' qualifications to fully utilise artificial intelligence. Furthermore, the effectiveness of adaptive learning systems and personalised curricula using AI has been demonstrated

Local sources, meanwhile, highlight the growing adoption of AI technologies in the “Digital Education” initiative in Uzbekistan, including e-textbooks, online platforms, and automated assessment systems.

Overall, the literature indicates that artificial intelligence presents a significant opportunity to enhance the quality of education, but that infrastructure and skills-related challenges must be addressed.

METHODOLOGY

In conducting the present research, I utilised several scientific and methodological approaches to examine the impact of artificial intelligence on the modern educational process. The most important methodological basis of the research was qualitative analysis and, to a lesser extent, quantitative analysis. In the first stage, existing literature, scientific articles, and reports published by international organisations—particularly UNESCO and the OECD—were examined. These sources provided clear information on the process of implementing artificial intelligence in education, its advantages and disadvantages, as well as the challenges in global practice. In the second stage, artificial intelligence technologies in the educational process

The observation method of real-life situations was applied. In this, the capabilities of AI-based learning platforms, automated assessment systems, and personalised learning programmes were practically analysed. Additionally, the opinions of some students and teachers regarding AI tools were gathered through interviews. In the third stage, the collected data were compared, and general conclusions were drawn from them. The comparative method was also used to analyse the experience of various countries in applying artificial intelligence within their education systems. During the analysis of the collected data, an analytical approach was used to identify the positive and negative impacts of artificial intelligence on the educational process. aspects, security-related issues, and future development prospects were examined.

CONCLUSION

In conclusion, artificial intelligence is revolutionising the educational process, making it more interactive, convenient, and effective. AI is taking teaching methods to a new level through personalised learning, intelligent tutors and automated assessment systems. However, it is important to manage this technology properly and to minimise its adverse effects. It is clear that AI will play a significant role in the education system in the future, but it must be harmonised with the human element.

It is crucial to manage this technology properly and to minimise its adverse effects. AI is set to play a significant role in the education system in the future, but integrating it with the human element will be of paramount importance. Teachers' experience and didactic approaches, combined with artificial intelligence, serve to make the educational process more effective. Therefore, it is important to view artificial intelligence technologies as a mere supplementary tool, recognising the central role of the human factor.

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