



THE ROLE OF ARTIFICIAL INTELLIGENCE IN THE EDUCATION SYSTEM

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ABSTRACT	KEY WORDS
<p>This scientific article provides a comprehensive analysis of the role, significance, and development prospects of artificial intelligence (AI) technologies in the modern education system. Within the context of digital education, the opportunities for individualized instruction based on AI, automated knowledge assessment, monitoring of the educational process, and optimization of pedagogical activity are examined. Furthermore, the challenges arising during the implementation of AI technologies in the education system and scientifically grounded solutions to overcome them are discussed.</p>	<p>Artificial intelligence, digital education, individualized learning, automated assessment, education system, innovative technologies.</p>

Introduction

In the context of an information-driven society, the demands placed on the education system are steadily increasing. The modern labor market requires highly qualified specialists capable of independent thinking and possessing digital competencies. Consequently, modernizing the educational process and implementing advanced technologies has become an urgent task.

In recent years, the rapid development of artificial intelligence technologies has brought about fundamental changes in the field of education. AI has expanded the possibilities for personalizing the learning process, accurately analyzing students' knowledge levels, and improving the quality of education. The purpose of this article is to scientifically analyze the role of artificial intelligence in the education system.

The Concept of Artificial Intelligence and its Stages of Development

Artificial intelligence is a complex of technologies aimed at performing processes inherent to human mental activity (learning, analysis, decision-making) using computers and software systems. The concept of AI emerged in the mid-20th century and today continues to evolve based on machine learning, neural networks, and Big Data.

While AI technologies in education were initially used as automated testing systems, they are now widely integrated in the form of smart learning platforms, virtual tutors, and adaptive learning systems.

Key Directions of Artificial Intelligence in the Education System

Organization of Individualized Learning

One of the most significant advantages of AI is the ability to provide individualized education. AI-based systems analyze each student's knowledge level, interests, and learning pace to provide tailored educational materials. This helps students master knowledge more effectively.

Automated Assessment Systems

AI creates opportunities for the automatic evaluation of tests, written assignments, and practical tasks. Such systems reduce subjectivity arising from the human factor and ensure the accuracy and speed of assessment.

Virtual Tutors and Intelligent Assistants

Virtual tutors and chatbots operate on the basis of AI and respond to students' questions in real-time. This supports independent learning and reduces the teacher's workload.

The rapid development of digital technologies has led to the emergence of new teaching forms and tools in the education system. Virtual tutors and intelligent assistants are becoming essential components of modern education. They assist students in the process of independent learning, enabling the personalization and increased efficiency of the educational process.

The Concept and Tasks of Virtual Tutors

Virtual tutors are digital systems based on AI technologies that serve to advise, guide, and reinforce students' mastery of educational materials. They analyze the student's level of knowledge and provide individual recommendations.

The main tasks of virtual tutors include:

- Explaining and interpreting educational materials;
- Assigning tasks for independent study;
- Assessing and monitoring the level of knowledge;
- Recommending educational directions suited to the student's interests.

Intelligent Assistants and Their Significance in Education

Intelligent assistants (chatbots, voice assistants) provide instant answers to students' questions, direct them to educational resources, and assist with organizational matters. By operating 24/7, they ensure the continuity of the learning process.

Intelligent assistants offer the following advantages:

- Assisting students in independent learning;
- Saving the teacher's time;
- Enabling rapid communication during the learning process;
- Serving the effective organization of distance education.

Virtual Tutors and Independent Learning Skills

Virtual tutors play an important role in developing students' independent learning skills. They encourage students to evaluate their own knowledge, identify errors, and correct them. Through this, skills such as responsibility, self-control, and independent decision-making are formed in students.

Current Problems and Limitations

There are certain challenges in applying virtual tutors and intelligent assistants in education. These include a lack of technical infrastructure, data security, the transparency of AI-driven decisions, and issues of pedagogical control. Additionally, there is a risk of students becoming overly dependent on technology.

The Impact of Artificial Intelligence on the Pedagogical Process

AI technologies are fundamentally changing the pedagogical process. The teacher is no longer just a provider of knowledge but acts as a manager and facilitator of the learning process. With the help of AI:

- Students' mastery levels are constantly monitored;
- Problematic topics are identified;
- Opportunities for lesson planning and optimization are created.

As a result, the educational process becomes more effective and flexible.

Challenges in Implementing Artificial Intelligence in Education

Several problems exist in implementing AI technologies into the education system. These include:

- Insufficient development of technical infrastructure;
- The need to increase the digital literacy and qualifications of educators;
- Information security and personal data protection issues;
- The risk of over-reliance on technologies.

To overcome these problems, it is necessary to develop the digital environment in educational institutions, organize professional development courses for educators, and strengthen the regulatory and legal framework.

Prospects for the Development of the Education System Based on AI

In the future, the use of AI technologies in the education system is expected to expand further. Smart learning platforms and educational environments based on virtual and augmented reality (VR/AR) will bring the quality of education to a new level. Simultaneously, AI will serve the global integration of the educational process.

Conclusion

Artificial intelligence is becoming an integral part of the modern education system. It plays a crucial role in personalizing the learning process, increasing its efficiency, and implementing innovative approaches. Through the scientifically grounded and rational application of AI technologies, the potential for improving educational quality and training competitive personnel will expand.

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