IMPROVING THE EFFICIENCY OF IMPLEMENTING ARTIFICIAL INTELLIGENCE TECHNOLOGIES IN THE EDUCATIONAL PROCESS

Shoakhmedova Nozima Khairullaevna
Associate Professor, Department of Digital Economy
Tashkent State University of Economics
E-mail: nshoaxmedova@gmail.com

Yusupova Dilbar Mirabidovna
Senior Lecturer, Department of Digital Economy
Tashkent State University of Economics
E-mail: dilbaryus86@gmail.com

Abstract

This article explores ways to improve the efficiency of integrating artificial intelligence (AI) technologies into the educational process. It analyzes AI's potential in personalizing learning, automating educational tasks, and creating interactive environments. The positive impact of digital tools on education quality and accessibility is emphasized. The study reviews Uzbekistan's ongoing reforms and international practices, highlighting the importance of modernizing pedagogical approaches and implementing AI-based methods in education.

Keywords: artificial intelligence, educational technologies, digital transformation, personalized learning, pedagogical methods, Uzbekistan, automation.

Annotatsiya

Ushbu maqolada sun'iy intellekt texnologiyalarining ta'lim jarayoniga integratsiyasi va uning samaradorligini oshirish yo'llari o'rganilgan. AI asosidagi vositalar yordamida ta'limda shaxsiylashtirilgan yondashuv, interaktiv o'quv muhitini yaratish, o'quv jarayonini avtomatlashtirish imkoniyatlari tahlil qilingan. Raqamli vositalar ta'lim sifati, qulayligi va tezkorligiga ijobiy ta'sir ko'rsatishi qayd etilgan. Shuningdek, O'zbekistonda bu boradagi islohotlar va xorijiy tajribalarga asoslangan tavsiyalar keltirilgan. Pedagogik texnologiyalarni modernizatsiya qilish orqali AI'ning ta'limda keng qo'llanilishi ta'kidlangan.

Kalit so'zlar: sun'iy intellekt, ta'lim texnologiyalari, raqamli transformatsiya, shaxsiylashtirilgan o'qitish, interaktiv metodlar, O'zbekiston ta'limi, avtomatlashtirish, pedagogik yondashuv

Аннотация

В данной статье рассматриваются пути повышения эффективности внедрения технологий искусственного интеллекта (ИИ) в образовательный процесс. Проанализированы возможности ИИ в персонализации обучения, автоматизации процессов и создании интерактивной образовательной среды. Отмечено положительное влияние цифровых технологий на качество и доступность образования. Особое внимание уделено реформам в системе образования Узбекистана и международному опыту. Подчёркивается значимость модернизации педагогических подходов и интеграции ИИ в образовательную практику.

Ключевые слова: искусственный интеллект, образовательные технологии, цифровая трансформация, персонализированное обучение, педагогические методы, Узбекистан, автоматизация.

INTRODUCTION

Today, great attention is being paid to the field of education in our country. The ongoing work on reforming the system is also of great importance. Integrating modern technologies into this system, as part of adapting the education system to high and contemporary standards, confirms our ideas. Artificial intelligence (AI) for secondary and higher education involves developing and implementing applications to improve student learning and the potential for positive changes in teachers' teaching methods. AI applications can provide a personalized learning experience for students and offer innovative solutions to educational challenges [1].

An essential characteristic of artificial intelligence (AI) lies in its optimal suitability for specific objectives. AI can evaluate situations and execute actions with a probabilistic chance of success. Currently, artificial intelligence can be understood as a set of algorithms designed to perform diverse tasks, implemented through sophisticated software systems. This represents human cognitive capacity's ability to manage complex problem-solving processes [2].

Integrating artificial intelligence and computer technologies within the educational sector has become an imperative response to the demands of a rapidly modernizing world. The digital transformation of education constitutes a critical component of this evolution, playing a pivotal role in enhancing the efficiency, accessibility, and quality of educational processes. As such, the adoption of AI-driven solutions is not only a reflection of technological advancement but also a strategic necessity for fostering innovative pedagogical methods and optimizing learning outcomes.

METHODOLOGY

Today, great attention is being paid to the field of education in our country. Fundamental reforms are being implemented in this sector. Cooperation is being established with foreign governments to enhance the education system's efficiency. Overall, interactive methods represent innovations in the modern educational process. Interest and attention towards applying technological, pedagogical, and informational technologies in education are growing daily [3]. Significant efforts are being made to improve and systematize educational processes in response to the demands of the time. The modernization of these processes provides us with the opportunity to access global knowledge and keep pace with a rapidly modernizing world.

LITERATURE REVIEW

One of the most popular textbooks worldwide on artificial intelligence is Artificial Intelligence*: A Modern* Approach by Stuart J. Russell and Peter Norvig. First published in 1995, the book's fourth edition was released in 2020. According to the authors, artificial intelligence attempts to understand intelligent beings and create new intelligent entities. "Although no one can predict the future in detail, computers with

high-level intelligence at or above the human level will become part of our everyday lives, and this will significantly impact the future development of civilization" [4].

Examples of international experience in education development today include the practical implementation of projects developed with a creative approach and adaptation to contemporary needs. Notable initiatives include the "Preschool Institution Development Program for 2017–2021" and the Presidential Decree of the Republic of Uzbekistan "On Measures for Further Improvement of the Education System" dated 2016. Additionally, the Resolution PQ-2707 of December 29, "Radical Improvement of the Preschool Education System," and Decree No. PK-3261 of September 9, 2017, "Measures for the Radical Improvement of Preschool Education Management," and Order No. PF-5198 of September 30, 2017, has been enacted.

ANALYSIS AND RESULTS

Based on these aspects, the innovation grounded in artificial intelligence technologies proves to be highly suitable for developing business models, products, and service methods and creating a favorable ecosystem in priority industries and sectors. Actions toward implementation have been initiated across numerous fields. The reason is that, thanks to artificial intelligence technologies, we can surpass our current perspectives and achieve significant results.

In the rapidly evolving modern era, the role of computers and other advanced technologies is incomparable. Every country has such a modern technological sector, and significant importance is attached to the development and implementation of artificial intelligence technologies in science and education. This direction is a key driver for the advancement of these sectors.

It is undeniable that information technologies are rapidly developing within the education system, and their adoption expands the scope of modern technological applications. Various branches of contemporary information technologies in education evolve concurrently and can be distinguished individually. Thanks to these processes, effective results and achievements can be attained. Today, unique innovations are occurring in all sectors of our country, including the education system.

Applying new pedagogical technologies and their integration into educational processes remains one of our primary objectives, especially with the ongoing incorporation of innovative educational technologies into everyday life. Rapid adoption and theoretical analysis, synthesis, and communication of these emerging pedagogical and informational technologies to students is a pressing challenge. The prospects for developing pedagogical technologies are critically analyzed, focusing on their theoretical foundations as applied to the educational process, ensuring the implementation of practical approaches. In other words, alongside changes in the theoretical basis of pedagogical technologies, their "problem zones" may evolve throughout the educational process. Organizing education based on a technological approach offers a positive solution to several didactic challenges and requires successful implementation [5]. Integrating such methods into the education system yields promising results, which are becoming increasingly evident.

- **Educational Software Tools:** The introduction of software tools designed for educational purposes serves as a foundation for learning and information processing. This includes the creation of methodological complexes, instructional-demonstrational structures, and integrating computer tools that expand educational capabilities.

- **Use of Methodological Complexes:** Employing these complexes in student learning involves gathering and storing information about process patterns, facilitating a deeper understanding of their essence. This fosters intellectual and creative development in students, enabling them to realize their potential and acquire independent knowledge.

- **Multimedia Systems:** The use of computers and audio-video information in multimedia systems allows for integrating various modes of information transmission. These systems combine diverse representations (textual, graphical, audio, visual) through software and hardware components, offering interactive communication with users [6].

Many scientists are advancing artificial intelligence (AI) technologies and advocating for modernization through AI.

Research outcomes in artificial intelligence focus on understanding the workings of the human brain, aiming to unravel the mysteries of human cognition and create machines capable of human-like intelligence. The fundamental possibility of modeling intellectual processes arises from the assumption that any brain function is strictly deterministic and can be expressed using a finite set of terms; thus, any cognitive activity described in a semantic language can, in principle, be transferred to an electronic digital computer [7]. This process represents a fusion of humans and technology, where technology reduces human labor. Artificial intelligence systems are products of human thought processes, transforming into forms of intelligence.

This orientation toward AI within the education sector enables system improvements and digitization. Currently, significant work is being undertaken in this area.

These efforts demonstrate AI's vital role in modern education, confirming its positive impact on system improvement. Developing this field extensively and integrating AI technologies into educational practices remain among our most promising achievements.

Young people with modern education are simultaneously keeping pace with rapidly advancing times. The widespread adoption of AI is one of the most effective steps toward new achievements. In recent years, strategic initiatives and continued efforts have been taken in this direction within our country, resulting in notable transformations in the education sector. Continuous and effective education systems, comparable to those in developed countries, are realized through regular technology upgrades and qualitative reforms. Significant improvements have been achieved in education and workforce training. Many effective works and reforms have been organized, including technology transfer into education. It is important to emphasize that artificial intelligence holds a rightful place in the modernization of the education system.

CONCLUSION AND SUGGESTIONS

In conclusion, it should be noted that digital technologies are widely used in education, and it is necessary to implement and transition the education sector to digital technologies. The development of information technologies in individuals, their autonomous career choice and professional self-development, as well as the enhancement of professional skills, play an increasingly important role and influence that cannot be denied.

Today, significant attention is paid to the education system in our country. Engaging young people in the education system and helping them to organize their time meaningfully is one of the priorities. Numerous spiritual and educational initiatives are being established within the education sector, including youth roundtable discussions. The reason is that the upbringing of modern youth is not only the responsibility of families and schools, but has become one of the pressing everyday societal challenges.

Currently, we are developing science and living in a dynamic society where our youth keep pace with the times. Many young people spend time using various entertainment networks to engage meaningfully with their time, which, in turn, directs modern youth toward the education sector. Naturally, this influence may also have adverse effects. From these perspectives, properly guiding youth towards educational processes is essential.

Artificial intelligence development and integration in education require adapting education to meet contemporary demands and enable widespread implementation.

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