Asian Journal of Multidisciplinary Research
(AJMDR)
ISSN: 2395-1729

IMPROVING TEACHING THROUGH PROGRAMS BASED ON ARTIFICIAL INTELLIGENCE

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Abstract

This article explores the potential of artificial intelligence-based programs in enhancing the educational process. It analyzes the significance of AI technologies in improving teaching effectiveness, personalizing learning materials, and optimizing student engagement. The paper demonstrates how AI tools can alleviate teacher workload, create adaptive learning environments for students, and make the learning process more interactive. The research provides practical recommendations for the successful integration of AI-powered solutions into the educational system. Ultimately, this approach aims to significantly elevate the quality of education and learning outcomes.

Keywords: Artificial intelligence, Education, Teaching, Personalized learning, Adaptive learning, Educational technology, Digital pedagogy, Innovation.

Introduction

The transition to the digital age and the information society requires fundamental changes in the education system, traditional teaching methods are no longer able to meet modern requirements. Information and communication technologies (ICT) are playing a crucial role in increasing the efficiency and quality of the educational process, which is driving the development of new forms of continuous education, including networked, distance and innovative education (Fitzpatrick, D. London:

Routledge, 2023). In the context of these changes, artificial intelligence (AI) technologies are opening up revolutionary opportunities in the field of education, having the potential to reshape teaching and learning processes.

Artificial intelligence-based programs significantly improve academic performance by providing personalized, interactive and flexible learning experiences that adapt to the individual needs, interests and pace of learning of students. These technologies play an important role in increasing student motivation and significantly increasing the effectiveness of learning (Khosrow-Pour, M. Hershey, PA: IGI Global, 2020.)

AI is also a valuable assistant for teachers in tasks such as lesson planning, creating tests, and preparing presentations, allowing them to focus more on the quality of teaching and the all-round development of students (Holmes, W., & Tuomi, I. London: Routledge, 2022.) AI creates a flexible and inclusive learning environment, especially for individuals with disabilities and distance learners (Holmes, W., & Tuomi, I. London: Routledge, 2022.) However, the introduction of artificial intelligence into education is also associated with its own challenges and limitations. Excessive dependence on AI can reduce students' critical thinking, analytical skills, and independent thinking, as well as increase the risk of plagiarism. Therefore, there is a need to rationally manage and direct SI technologies in education, focusing not on their limitation, but on their effective use (Holmes, W., & Tuomi, I. London: Routledge, 2022.). This article aims to comprehensively analyze the theoretical foundations, practical advantages, implementation challenges and future prospects of improving teaching through programs based on artificial intelligence, and explores ways to maximize the potential of SI while maintaining the importance of the human factor in the educational process. As noted in the introduction, the

transition to an information society requires fundamental changes in education, and traditional methods no longer meet modern needs. These changes, especially those associated with globalization, technological progress and the constantly changing demands of the labor market, require students not only to master information, but also to master 21st century skills such as critical thinking, problem solving, creativity and collaboration. In this context, information and communication technologies (ICT) play a crucial role in increasing the efficiency and quality of the educational process (Fitzpatrick, D. London: Routledge, 2023.) These changes are particularly driving the development of new forms of continuous education, such as networked, distance and innovative learning, which ensure that education is available anywhere and at any time.

The importance of ICT tools in modern pedagogical practice is increasing. In particular, electronic educational resources, animation programs and interactive multimedia materials help students to better understand the material by involving many of their senses (vision, hearing, movement). This approach is based on modern cognitive theories aimed at reducing cognitive load and improving the retention of information in long-term memory. To increase the effectiveness of these resources, it is important to develop methodological standards, observe time limits for the use of animation (for example, 25-30 minutes), encourage interactive discussions and set clear assessment criteria. These practical guidelines create a solid foundation for the introduction of SI technologies in education, since SI programs often include precisely this type of interactive and multimedia-enriched electronic resources and further increase their effectiveness through automated analysis and adaptability. Educational programs based on artificial intelligence have the potential to

significantly improve students' academic performance by personalizing the learning process. Research shows that learning platforms play a key role in providing personalized, interactive, and highly adaptive learning experiences that are tailored to the diverse needs and preferences of learners (Khosrow-Pour, M. Hershey, PA: IGI Global, 2020). These platforms play a central role in increasing student motivation and significantly improving learning efficiency. For example, AI algorithms analyze each student's learning pace, style, and level of knowledge and provide materials, exercises, and feedback that are tailored to them. These adaptive learning systems help identify and address student weaknesses while further developing their strengths. From a pedagogical perspective, this approach allows for the implementation of differentiated instructional principles through AI tools, which aim to maximize the potential of each student, taking into account their individual developmental zone. AI is recognized as a valuable support tool not only for students but also for teachers. It saves teachers time by helping them with tasks such as lesson planning, creating tests, and preparing presentations (Holmes, W., & Tuomi, I. London: Routledge, 2022). This automated assistance frees teachers from administrative and repetitive tasks, allowing them to focus more on the quality of teaching and the holistic development of students. This shifts the role of the teacher from that of a transmitter of information to that of a coach, facilitator, and mentor. AI is also important in creating flexible and inclusive learning environments for individuals with disabilities and distance learners. For example, AI features such as speech-to-text, text-to-speech, visual description, and sign language translation expand access to education for students with special needs. In distance learning, AI-based chatbots and virtual assistants provide ongoing support to students, answering

their questions and directing them to learning materials, ensuring the continuity of the learning process.

However, the introduction of artificial intelligence into education is also associated with a number of problems and limitations. One of the most important concerns is that excessive dependence on AI can reduce students' critical thinking, analytical skills, and independent thinking (Holmes, W., & Tuomi, I). If students rely entirely on AI-generated answers, they may lose their ability to independently solve problems, analyze complex ideas, synthesize different perspectives, and develop original solutions. This negatively affects their intellectual development. The increased risk of plagiarism is also a serious problem, as AI tools have made it easier to create text. This creates new challenges in assessing students' unique creative work and can undermine the principles of academic integrity. In addition, AI can sometimes provide inaccurate or outdated information, which can lead to students acquiring incorrect knowledge. This depends on the quality and up-to-dateness of the AI systems' database and requires constant monitoring. There are also technological limitations and practical difficulties in implementing educational platforms that need to be considered when using AI applications on a large scale (Khosrow-Pour, M. (Ed.). Handbook of Research on Artificial Intelligence in Education. Hershey, PA: IGI Global, 2020). These include infrastructure deficiencies, software flexibility, data privacy and security issues, algorithm bias, and user technological literacy. In particular, bias in algorithms can lead to unfair outcomes for certain groups of students. In addressing these issues, experts emphasize the need to wisely manage and direct the use of AI technologies in education, rather than restricting them. This approach aims to minimize the potential

risks of AI while harnessing its innovative potential. Approximately 60-70% of leading universities around the world, including Harvard and MIT, allow the use of AI under certain conditions. For example, AI is allowed to be used for comprehension or idea generation, but final assignments are prohibited from being completed entirely on AI. These policies aim to teach students to use AI as an effective tool, while at the same time protecting their independent thinking and creative abilities. Oxford and Cambridge universities require students to disclose their use of AI (Holmes, W., & Tuomi, I. Artificial Intelligence in Education: Pedagogical and Ethical Considerations. London: Routledge, 2022.)

This requirement of transparency ensures academic integrity and allows teachers to take into account the role of AI in assessing student work. In Uzbekistan, educational institutions also emphasize the need to encourage AI as a supportive tool, while strictly prohibiting plagiarism and analyzing and enriching work created by AI with independent thought (Holmes, W., & Tuomi, I. Artificial Intelligence in Education: Pedagogical and Ethical Considerations. London: Routledge, 2022.) These approaches show that the effectiveness of AI in education depends on how it is used, that is, how rationally and responsibly it is used under human control and guidance. The literature review shows that SI should not be seen as a substitute for the human factor in education, but as a tool that enhances the capabilities of teachers and enriches the learning experience of students. The integration of SI into education has great potential to make the learning process more effective, personalized and inclusive. However, for this process to be successful, it is necessary to comprehensively address technological, methodological and ethical issues. Existing research suggests a balanced approach, taking into account the benefits of SI, as well

as its risks. Future research should delve deeper into the long-term impact of SI in education, the specifics of its application in different subject areas, and ways to develop teachers' skills in working with SI. This includes the development of special training programs for teachers on the use of SI tools and their continuous improvement. Also, it is urgent to develop practical recommendations for improving the criteria for assessing the effectiveness of educational programs based on AI and adapting them to national educational standards. This analysis creates a basis for a deep understanding of the place of AI in education and maximum use of its potential, while emphasizing the need to maintain the central role of humans in the educational process. This article is aimed at a comprehensive analysis of the integration of artificial intelligence (AI) technologies into the educational process and its role in improving teaching and is based on a qualitative research methodology. The main approach of the study is a systematic literature review and critical synthesis of existing scientific sources. The main objectives of the study are: first, to systematically identify and analyze the theoretical foundations and types of educational programs based on AI, to create a conceptual framework for understanding them; second, to assess the practical benefits and real-world applications of AI in improving teaching effectiveness and student learning outcomes based on empirical evidence in the context of global education; third, to critically examine the important challenges, limitations, and ethical dilemmas associated with the introduction and widespread use of AI in education, including issues of data privacy, algorithmic bias, and potential impacts on human skills; fourth, to explore the changing role of teachers in AI-enriched learning environments, to propose new pedagogical strategies and models of collaboration between teachers and AI systems; and finally, to formulate future perspectives and

provide practical recommendations for the responsible and effective integration of AI into educational policy and practice. These objectives are aimed at providing a balanced, comprehensive, and forward-looking view of how AI can transform education.

Conclusion

This article has comprehensively analyzed the enormous potential of AI-based programs to fundamentally improve the educational process. The study showed the potential for significantly improving learning outcomes by providing personalized learning, increasing student motivation, and reducing the administrative burden on teachers. However, it was noted that excessive reliance on IS can reduce critical thinking, increase the risk of plagiarism, and raise ethical issues. Therefore, it is important to integrate IS responsibly and wisely into education, maximizing its benefits while maintaining the central role of the human factor. The effectiveness of IS in education in the future will directly depend on its proper management, overcoming technological limitations, and integration with modern pedagogical strategies. This requires continuous innovation and a balanced approach in the education system.

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