

USE OF ARTIFICIAL INTELLIGENCE IN PRESCHOOL EDUCATION

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Abstract

The rapid digital transformation of the 21st century is bringing fundamental changes to all spheres, including education. As a result of the development of artificial intelligence (AI) technologies, new opportunities have emerged in the educational process such as strengthening individualized learning approaches, accurately analyzing children's developmental progress, providing methodological support to teachers, and creating an interactive learning environment. At the same time, the use of AI technologies in preschool education is not only a requirement of the modern era, but also an important tool that helps increase children's digital literacy from an early age.

Introduction

Competence, technology, method, interactive methods, project, debate, practical skills.

The 21st century is characterized by rapid technological advancement and digital transformation. Education systems worldwide are adapting to these changes by integrating innovative technologies into teaching and learning processes. Among these technologies, artificial intelligence occupies a special place due to its ability to simulate human cognitive functions such as learning, reasoning, and decision-making. Preschool education, as the foundation of lifelong learning, can greatly benefit from the thoughtful and scientific implementation of AI technologies.

Artificial intelligence (AI) refers to technologies that automate processes typically associated with human cognition, such as analysis, reasoning, learning, and decision-making. Modern AI systems are capable of performing the following functions: analyzing learners' levels and achievements, designing individualized learning pathways, providing support in areas such as language, mathematics, and logical thinking, recognizing voice, images, and movements, and assisting teachers as virtual assistants.

The rapid development of artificial intelligence (AI) technologies has significantly influenced various sectors, including education. In recent years, the application of AI in preschool education has gained increasing attention due to its potential to enhance learning quality, support individualized instruction, and foster children's cognitive and creative development. This article explores the role of artificial intelligence in preschool education, its key applications, benefits, and challenges, as well as future prospects for its effective integration into early childhood learning environments.

The field of education is one of the areas that benefits most from the development of AI. In particular, in the process of developing interest, memory, perception, and creativity in preschool-aged children, AI creates a new level of effectiveness.

The use of artificial intelligence in preschool education plays an important role in improving the quality of education, developing children's cognitive and creative potential, reducing educators' workload, and ensuring an individualized approach to learning. Through the rational and scientifically grounded implementation of AI technologies, it is possible to create new pedagogical opportunities within the preschool education system.

Artificial intelligence refers to a set of technologies, algorithms, and systems capable of performing tasks traditionally associated with human intelligence. In education, AI systems can analyze learning data, adapt content to learners' needs, provide real-time feedback, and support educators in instructional and administrative tasks. In preschool education, AI is primarily used to support developmental learning rather than replace human interaction, which remains essential at this stage.

Providing a precise definition of the term *artificial intelligence* is challenging, as there is no universal consensus on this concept within the field. However, many researchers have proposed definitions that broadly and adequately explain the capabilities of the technology. In particular, artificial intelligence has been defined as "a set of technologies, algorithms, and systems capable of performing tasks associated with human intelligence." The capabilities of AI are illustrated in the figure below

Artificial intelligence technologies have undergone numerous stages throughout their historical development. Today, AI has become a powerful tool driving revolutionary changes across all fields. It will continue to play a key role in the future of humanity by shaping the development of technology and science.

An intelligent chatbot is a program developed using artificial intelligence (AI) technologies that is designed to provide automatic, accurate, and relevant responses to users' questions. Intelligent chatbots use natural language processing (NLP) technologies to understand questions in human language and respond accordingly.

Artificial intelligence technologies offer numerous new opportunities in the field of education. The key aspects of AI integration into education include the following:

Artificial intelligence analyzes each learner's level of knowledge and provides personalized learning materials. Learners study in an educational environment tailored to their abilities and potential.

Chatbots and interactive assistants answer students' questions and provide support on a 24/7 basis. AI saves teachers' time by automatically checking homework assignments.

Artificial intelligence assists in managing overall classroom or school educational processes. This includes automated assessment of tests and examinations, analysis of students' classroom activities and learning outcomes, identification of areas where learners face difficulties, and development of recommendations to improve the effectiveness of the educational process.

AI can be used to create specialized tools for visually impaired or hearing-impaired students, as well as to develop adaptive technologies that enable interactive communication with students with physical disabilities.

Through virtual reality (VR) and augmented reality (AR) technologies, practical lessons and training sessions can be organized. These technologies enable the creation of simulated environments for early orientation of learners toward fields such as medicine or engineering.

AI-based platforms (e.g., Duolingo) help make language learning more engaging. By translating learning materials presented in different languages, they facilitate comprehension and support the globalization of educational resources. This allows access to methodological advancements from developed countries and their parallel application in the educational process.

The use of artificial intelligence technologies in education makes a positive contribution to organizing the learning process and improving educational effectiveness. For example, it reduces teachers' administrative workload, addresses individual learners' needs, supports the development of digital literacy, and offers many other benefits.

In education, artificial intelligence is being applied in areas such as automatic analysis of class attendance, detection and monitoring of bullying behaviors, preparation of scientific articles and manuals, plagiarism checking, evaluation of educational effectiveness, and other related fields.

In the 21st century, the content of education and teaching approaches are rapidly evolving. In such a dynamic context, ensuring effective learning in the classroom has become increasingly challenging. Under these conditions, organizing lessons in an interactive format through the use of artificial intelligence technologies can significantly enhance the effectiveness of professional teaching activities.

References

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