DIGITAL EDUCATIONAL TECHNOLOGIES AND ARTIFICIAL INTELLIGENCE IN THE EDUCATIONAL PROCESS

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Abstract

This article examines the impact of digital educational technologies on the modern educational process and the role of artificial intelligence technologies. The systems created on the basis of artificial intelligence are analyzed, including adaptive learning platforms, automated assessment systems and solutions for adapting the learning process to individuality. The article also discusses the issues of improving the effectiveness of learning through digital technologies, expanding access to education and reducing the burden on teachers. The article analyzes global trends in the field of digital technologies in the field of education and the possibilities of their application at the local level. The authors reflect on how to provide an individual approach using artificial intelligence technologies, as well as on ways to effectively use information in the educational process.

Keywords: Digital education, artificial intelligence, educational technologies, adaptive learning, automated assessment, online learning platforms, data analysis, innovative education.

Introduction

Today, digital technologies have become an integral part of education. On the other hand, artificial intelligence (AI) technologies serve as a crucial tool for further enhancing this process. Enriching the educational process with innovative technologies not only improves students' comprehension but also creates opportunities for education tailored to their individual needs.

Artificial Intelligence and Adaptive Learning Systems

Adaptive learning systems take into account the individual characteristics of students and provide them with personalized learning plans. AI is utilized at the following key stages of this process:

- **Knowledge Assessment:** AI evaluates students' knowledge through tests or practical tasks and identifies gaps.

- **Individualized Guidance:** The system offers each student topics relevant to their needs. For example, a student struggling with complex math topics might receive more exercises in that area.

- **Continuous Improvement:** The AI system continuously updates lessons based on students' comprehension levels.

Example: Mobile apps like *Socratic* leverage AI to help students understand questions. These apps analyze queries, search for answers, and offer explanations.

Automated Assessment Systems

The benefits of automated assessment systems are extensive:

- **Clarity and Transparency:** These systems reduce subjectivity in evaluations by assessing responses based on predetermined criteria.

- **Efficiency:** In large classes, test evaluations are conducted rapidly, saving time.

- **Complex Task Evaluation:** AI algorithms can assess not only tests but also complex essays and project work.

Example: The *Turnitin* platform identifies plagiarism and analyzes the quality of written work. In Japan and the USA, some schools use AI-based essay grading technologies to evaluate both linguistic and content aspects.

Online Learning Platforms and AI Integration

Online platforms significantly contribute to the growth of digital education by providing global learning accessibility.

- **Personalization:** Each student learns at their own pace. For instance, on *Coursera*, students can pause and resume lessons.
- **AI Assistants:** AI-powered assistants like *ChatGPT* answer students' questions in real-time.
- **Analytical Reports:** Systems analyze student performance to pinpoint challenging subjects.

Example: India's *Byju's* platform uses AI to track students' learning progress and recommend appropriate classes.

Data Analysis and Educational Process Optimization

Effectively utilizing large datasets in education can yield the following outcomes:

- **Monitoring Quality:** Improves curricula and teaching methods by analyzing their effectiveness.
- **In-depth Analysis:** AI recommends solutions for enhancing education quality by processing extensive learning data.
- **Prediction:** Helps identify the likelihood of students' future success or challenges.

Example: The *Learning Analytics Dashboard (LAD)* in the USA analyzes student performance in real-time, providing teachers with a comprehensive overview of their class's status.

Application of VR and AR Technologies in Education

Virtual reality (VR) and augmented reality (AR) technologies enhance theoretical education with practical applications:

- **Experimental Environments:** VR allows students to experiment safely, such as exploring processes in a virtual chemistry lab.
- **Interactive Learning:** AR brings textbooks to life; for example, historical reconstructions can be visualized using AR.
- **Remote Education:** VR enables students in remote areas to access advanced lab experiences.

Example: The UK's *zSpace* platform uses AR and VR technologies to visually demonstrate complex scientific processes to students.

Developing New Skills with AI

AI helps students acquire 21st-century skills:

- **Creativity Development:** AI tools for graphic design or music composition stimulate creative thinking.
- **Problem-solving Skills:** Facilitates exploring diverse solutions to complex problems using AI models.
- **Collaboration Skills:** Online platforms with team projects teach students to work together.

Example: *Google AI Experiments* offers students engaging experiences to foster creativity and skill development.

Conclusion

Digital educational technologies and AI have become indispensable in modern education, playing a significant role in improving quality, enabling personalized learning processes, and expanding access to knowledge. AI-based systems facilitate teachers' and students' work by automating and streamlining the educational process. Adaptive learning platforms enhance students' performance by tailoring learning environments to their needs. Automated assessment systems ensure transparency and save teachers' time. VR and AR technologies enrich theoretical knowledge with practical experience, making learning more engaging and effective. However, for successful implementation of these technologies, it is crucial to build the necessary infrastructure, train teachers, and ensure the technologies align with socio-economic balance. Therefore, developing and rationally utilizing AI-based educational tools is a key challenge for modern education systems. In the future, integrating AI into education will contribute not only to individual success but also to societal progress. With consistent advancement and proper direction of educational technologies, the learning process becomes more innovative, inclusive, and comprehensive.

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