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ARTIFICIAL INTELLIGENCE IN EDUCATION: ADVANTAGES AND DISADVANTAGES

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Анотація:

Штучний інтелект (ШІ) активно змінює сферу освіти, пропонуючи як значні переваги, так і певні виклики. У цій статті розглядається роль ШІ в навчальному процесі, зокрема його здатність покращувати освітній досвід завдяки персоналізованим програмам, автоматичному оцінюванню та оптимізації вибору курсів. ШІ сприяє розвитку дистанційного навчання та зменшує адміністративне навантаження на викладачів, дозволяючи їм більше уваги приділяти викладанню та взаємодії зі студентами. Водночас існують занепокоєння щодо можливого зниження рівня соціалізації та критичного мислення студентів. Повна заборона використання ШІ в освіті є недоцільною, однак важливо забезпечити його етичне та відповідальне застосування. Основним викликом залишається пошук балансу між використанням можливостей ШІ та збереженням важливих людських аспектів навчального процесу.

Ключові слова: Штучний інтелект, освіта, персоналізоване навчання, автоматичне оцінювання, дистанційне навчання, критичне мислення, етичне використання ШІ, залучення студентів, академічна доброчесність, ШІ в освіті.

Abstract

Artificial intelligence (AI) is increasingly transforming the educational landscape, offering both significant advantages and notable challenges. This paper explores the role of AI in education, highlighting its ability to enhance learning experiences through personalized programs, automated grading, and optimized course selection. AI facilitates remote learning and reduces educators' administrative burdens, allowing for greater focus on instruction and student engagement. However, concerns persist regarding its potential to reduce social interaction and hinder the development of critical thinking skills. While the complete prohibition of AI in education is neither practical nor beneficial, its ethical and responsible use must be emphasized. The key challenge lies in striking a balance between leveraging AI's capabilities and preserving essential human elements in the learning process.

Keywords: Artificial intelligence, education, personalized learning, automated grading, remote learning, critical thinking, ethical AI use, student engagement, academic integrity, AI in education.

The term *artificial intelligence (AI)* refers to the ability of a computer or a computer-controlled machine to perform tasks that traditionally required human intelligence. Today, this term is used to describe the development of advanced systems capable of exhibiting cognitive processes characteristic of human intellect, such as logical reasoning, generalization, analysis, information acquisition and processing, experiential learning, and knowledge expansion.

In essence, AI encompasses a broad range of algorithms and machine learning tools capable of rapidly acquiring and processing information, recognizing patterns, optimizing processes, and generating predictive insights. The term *artificial intelligence* was introduced by Alan Turing in 1950 and was first used in his academic paper *Computing Machinery and Intelligence.*

Neural networks, a fundamental component of AI, are trained on vast datasets, known as *training data.* These networks analyze data, identify underlying patterns, and use these insights to predict various outcomes. This principle forms the basis of modern chatbots, which have become widely adopted, as well as AI-driven algorithms that generate unique texts, recognize images, and analyze and describe objects within visual data.

AI systems operate based on three fundamental capabilities:

- **Learning** – The collection of data and the development of rules for its effective application.
- **Reasoning** – The selection of optimal algorithms to achieve desired outcomes.
- **Self-correction** – Continuous refinement and fine-tuning of algorithms to enhance accuracy and effectiveness.

AI in Education: A Present Reality, Not a Future Prospect

The integration of AI into education is no longer a distant possibility but an existing reality. A recent survey conducted among students at Stanford University found that nearly 20% of respondents had already utilized AI to assist with homework, examinations, and academic projects.

Furthermore, a survey of educators in the United States revealed that two-thirds of teachers had encountered instances where students had used AI to complete assignments without permission. This trend continues to grow, and it is evident that a substantial number of students in Ukraine and other countries are already engaging with AI-driven tools, with this number expected to rise further in the near future.

Given this reality, debating whether AI should be prohibited in education is no longer a pragmatic discussion. Such arguments are reminiscent of past debates surrounding the use of Wikipedia in academic settings, which ultimately proved unproductive.

It is imperative to recognize that AI applications will become increasingly prevalent in both daily life and professional environments. In all likelihood, their use will become the norm within the coming years. Consequently, acquiring the ability to utilize AI ethically and effectively is a crucial skill, much like learning to responsibly use Wikipedia or other digital resources.

On the one hand, AI-powered applications have the potential to mitigate academic dishonesty by reducing instances of students outsourcing assignments for monetary compensation. On the other hand, they introduce new ethical challenges that must be addressed proactively.

Findings from the Stanford University survey suggest that students frequently employ AI to generate ideas for academic essays and receive instant automated feedback on their written work. In this context, AI tools should not be discouraged but rather leveraged to enhance the learning experience.

However, the use of AI to generate fully completed essays or assignments is unequivocally inappropriate. Therefore, one of the primary challenges facing the academic community is the need to establish ethical guidelines for AI usage in education.

Advantages of AI in Education

AI is increasingly being implemented in the educational sector, offering significant benefits to both students and educators. While AI cannot entirely replace human instructors—despite ongoing research into AI-powered teaching systems—it serves as an invaluable tool that enhances various aspects of the learning process.

One of the most straightforward applications of AI in education is **automated grading**, which minimizes human bias. By eliminating subjective influences, AI ensures accuracy and fairness in assessments, leading to objective evaluation and precise grading.

Although AI integration in education is still in its early stages, it is already facilitating the selection of optimal courses and learning pathways tailored to individual student needs. AI-driven systems analyze previous academic experiences, recommend effective learning sequences, and provide personalized suggestions for further exploration of specific topics. Similarly, educators can leverage AI tools to refine their teaching methodologies, ensuring greater effectiveness and engagement.

The key advantages of AI in education include:

- **Personalized learning experiences** – AI-driven systems can create customized educational programs aligned with students' interests, learning styles, and proficiency levels.
- **Enhanced remote learning** – AI facilitates high-quality online education, improving accessibility and efficiency in distance learning environments.
- **Automation of administrative tasks** – AI alleviates educators' workloads by handling routine responsibilities such as grading, enabling teachers to dedicate more time to instructional and creative aspects of education.

Disadvantages of AI in Education

Despite its numerous advantages, the increasing reliance on AI in education presents several concerns, including:

- **Reduced social interaction** – The growing use of AI-driven learning tools may lead to diminished interpersonal communication between students and educators, potentially hindering the development of essential social skills.
- **Challenges in critical thinking development** – Excessive dependence on AI may impede students' ability to engage in independent problem-solving and decision-making, as AI-driven solutions could facilitate automatic problem resolution without necessitating deep cognitive engagement.

Conclusion

To maximize the benefits of AI while mitigating its potential risks in education, it is essential to maintain a **balanced approach** that integrates AI-driven technologies while preserving meaningful human engagement in the learning process. By establishing ethical guidelines and fostering responsible AI usage, the academic community can harness AI's capabilities to enhance educational outcomes while safeguarding essential cognitive and social skills.

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