

ARTIFICIAL INTELLIGENCE (AI) IN EDUCATION: BALANCING BENEFITS AND CHALLENGES IN TEACHING AND LEARNING

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ABSTRACT

Education has seen huge changes in the 21st century, with a paradigm shift in the methods of teaching and learning. The impact of Artificial intelligence (AI) tools on education has been a topic of debate with the rise of these tools, particularly advanced language models. Although integrating AI into the classroom is thought to be an option for obsolete educational approaches, issues with information learning, academic integrity, critical thinking, and interactions between educators and students are raised. This article explores the benefits and challenges of AI in teaching and learning based on various perspectives. Diverse perspectives on the impact of AI in teaching and learning balance the benefits of increased productivity and creative learning opportunities against major concerns about academic integrity, skill development, and moral issues. Careful planning and strategy are required to strike the correct balance between the benefits and drawbacks of artificial intelligence in education. Teachers, IT specialists, legislators, and other important stakeholders can employ AI to enhance instruction while managing associated dangers if they collaborate. The primary goal is to create an educational system in which AI is used as a useful tool to help teachers and students do their best work in a constantly evolving digital environment.

Keywords: Artificial intelligence (AI), teaching and learning, benefits, challenges

Introduction

Artificial intelligence (AI) has been used in education, particularly in classroom discourse, as technology has advanced (Wang et al., 2024). When AI first emerged, it was referred to as self-improving automatic machines that were created to address issues that were previously exclusive to humans. AI is rapidly transforming various sectors, and education is no exception. In recent years, the approaches to teaching and learning have evolved beyond our expectations (Shaziayani et al, 2023). The integration of AI in teaching and learning processes promises to revolutionize how education is delivered, personalized, and managed.

The idea of artificial intelligence dates to the early 1950s, when Alan Turing suggested that a system could be considered “intelligent” if it could replicate human behavior (Russel and Norvic, 2016). Several definitions and applications of AI in education have been proposed over the years.

Recently, Popenici and colleagues defined AI as “computing systems that can engage in human-like processes such as learning, adapting, synthesizing, self-correcting, and using data for complex processing tasks” (Popenici et al,2017).

Artificial Intelligence has tremendous potential in education; applications include individualized learning environments, intelligent tutoring systems, automated grading, and predictive analytics. Artificial Intelligence (AI) can analyze large volumes of data to find patterns, forecast events, and offer previously unreachable insights by utilizing machine learning algorithms and natural language processing. With the use of these tools, educators may more effectively assess the strengths and weaknesses of their students, modify their lesson plans in real time, and offer focused assistance where it is required.

Every aspect of socioeconomic life is revolutionized by artificial intelligence, which also smoothly integrates virtual reality and communication technologies. AI has transformed education, changing not only the system but also how people learn, share knowledge, think, and advance civilization. However, a significant challenge remains: the educational sector has yet to fully embrace the value of technology in teaching, leading to prolonged delays in the integration of AI into educational practices.

This article discusses the advantages and challenges of AI in teaching and learning. By understanding the role of AI in education, we can better prepare for a future where technology and human ingenuity work hand in hand to enhance the educational experience.

Benefits of AI in Teaching and Learning

Artificial Intelligence (AI) has had, and will continue to have, a significant impact on Higher Education (HE) in recent months (Lee et al., 2024). AI has great promise for educators and students, ranging from customized learning programs to streamlined administrative procedures. However, it also presents several challenges that need to be addressed to maximize its potential. In this article, we will explore the advantages and disadvantages of AI in teaching and learning. The benefits of AI are:

1) Personalized Learning

According to Olga and Nadezhada (2022), Personalised learning is a trend in the modern educational system related to the global digital transformations of all aspects of socio-economic life. The introduction of artificial intelligence technologies makes it possible to increase the efficiency and quality of education focused on the needs and demands of students. Besides that, AI enables educators

to customize learning programs to each student's needs, allowing them to follow their own learning curve and preferred method.

2) Always-on access

Learning has been transformed by AI-powered educational systems and services that offer constant access to resources and assistance. Due to the 24/7 operation of these tools, students can participate in education at their convenience, regardless of their schedules or time zones. Students from different geographical locations and with different requirements will particularly benefit from this accessibility, which gives them the freedom to learn, work together, and access resources whenever and wherever they choose. Thus, by breaking conventional barriers of time and place, AI-driven educational technologies greatly help democratize education and creating a more inclusive and accessible learning environment on a worldwide scale.

3) Interactive Learning Experiences

AI powered interactive learning experiences transform education by adjusting learning routes based on individual needs, adjusting pace and content, and utilizing AI-driven analytics and adaptive feedback. Artificial Intelligence (AI) uses virtual reality and simulations to build immersive settings for hands-on learning, and natural language processing enables conversation and quick concept clarification. Gamification strategies increase user engagement by using progression and rewards. With the help of AI's data-driven insights, educators may enhance their pedagogy and encourage lifelong learning by suggesting appropriate courses and chances for skill improvement.

4) Effective Administrative Work

Automating administrative tasks through AI can significantly streamline educational processes. For example, AI is more effective than traditional techniques at handling activities like tracking attendance and evaluating assignments. Because of this automation, educators have more time spent to lesson planning, giving students individualized feedback, and creating an engaging learning environment. Additionally, AI may support the maintenance of accurate records and offer insights through data analysis, empowering educators to decide on the best course of action for their students' learning. In addition to increasing productivity, this switch from manual to automated administrative work also improves educator satisfaction and the general quality of education.

Challenges of Implementing AI in Teaching and Learning

Implementing AI in teaching and learning can bring about numerous benefits, but it also comes with a variety of challenges. Some of the challenges are listed below:

1) Educators and Students Readiness

According to Alina et.al (2023), the successful integration of artificial intelligence (AI) into education requires a robust and efficient framework, significant investments in digital equipment, and infrastructure upgrades. To guarantee the effectiveness of the system, it also entails providing training to all those engaged in the teaching-learning process. Establishing a strategic vision for AI implementation is also necessary for institutions and the educational system. This difficult transition to AI will cost money and human resources. Educators must adapt to new techniques, but many lack the training they require because of inadequate and previously unallocated funds.

2) Ethical Issues

The ethical implications of implementing AI in teaching and learning are increasingly being debated. Key topics include the accountability for the actions of algorithms, chatbots, and robots, the ethical responsibilities of AI creators and operators, as well as data privacy and security. A significant concern is that students might be tempted to cheat using highly accurate software and chatbots, such as ChatGPT, which can produce academic work for them. This temptation raises additional ethical dilemmas.

3) Data Privacy and Security

Data privacy and security are significant challenges in the integration of AI in education. Concerns included loss of privacy, confidentiality and data storage security, as they were thought to be susceptible to hackers and other people with criminal intent in the virtual world. AI systems often require large amounts of personal data to function effectively, which raises substantial concerns about educators and students' privacy. The collection, storage, and use of sensitive data, such as academic performance, personal identifiers, and behavioural patterns, necessitate stringent measures to protect against unauthorized access and misuse. Strong data privacy and security policies are necessary to protect information and preserve confidence in AI-powered learning tools.

By addressing these issues head-on, the educational industry can maximize AI's potential to improve instruction while reducing any dangers or disadvantages.

Conclusion

Artificial intelligence (AI) integration in education offers a dynamic landscape with both significant advantages and challenges. A bright future for education is presented by AI's capacity to tailor instruction, provide constant access to learning materials, generate interactive learning environments, and expedite administrative duties. These developments facilitate the creation of a more efficient,

engaging, and inclusive learning environment that meets the varied requirements of both educators and students.

However, the successful implementation of AI in educational systems is contingent upon addressing several critical challenges. Managing ethical dilemmas, protecting data security and privacy, and ensuring that both educators and students are adequately prepared are paramount. The shift to AI enhanced education necessitates large infrastructural investments, thorough training curriculums, and the creation of strong ethical frameworks to regulate AI usage.

AI in education has several advantages but balancing them all requires planning and smart thinking. Through the promotion of cooperation among educators, technologists, politicians, and other relevant parties, the educational sector can efficiently utilize artificial intelligence to improve instruction and minimize associated hazards. This collaborative effort is essential to navigate the complexities and ensure that AI integration is both effective and responsible.

The ultimate objective is to establish an ecosystem for education in which artificial intelligence (AI) serves as a helpful tool, enabling educators and students to realize their full potential in a rapidly evolving digital landscape. AI has the power to transform education and make it more inclusive, individualized, and flexible for all students by tackling the problems head-on and capitalizing on the benefits.

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