

General Discussion of Relationship Between Artificial Intelligence and Education and the Effect of Artificial Intelligence on Education

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Abstract: In recent years, with the rapid development of science and technology, a series of different tools have come into sight of people. Currently, with the rapid development of science and technology, classes and schools are in great revolutions. Also, a series of high-tech tools with AI is integrating the region of education, in which the classes and teachers are facing great challenges in the aspect of stages, teaching approaches, etc. It is true that such tools help teachers as well as students enhance their working efficiency. However, Artificial intelligence also brings a series of troubles in the region of education like moral issues and cheating as well as over-reliance on technology when people are using them improperly. In this case, people need to bring some approaches into the application of Artificial Intelligence to guide people to apply Artificial Intelligence Properly. Therefore, educators should emphasize the norms of AI use, and learners should focus on strengthening academic self-discipline.

Keywords: Artificial Intelligence, Education, Class Performance

1. Introduction

Artificial intelligence (AI) is a strategic technology leading a new era of technological, industrial, and social revolution and is having a significant and far-reaching impact on the transformation of education, economic development, social progress, and the international political and economic situation [1]. Currently, AI has been applied in a wide range of industries and stimulates the productivity of different industries.

From the 1960s, after the invention of the term "Artificial Intelligence" in 1956. Early AI research started by focusing on symbolic reasoning and problem-solving, which laid the foundation for AI's potential in education. During the early exploration period, a series of experiments involved teaching machines had been applied to solve problems through rule-based approaches, however practical use in education was limited due to hardware constraints.

At the beginning of the 21st century, The proliferation of the internet enabled the integration of AI into e-learning platforms like Blackboard and Moodle. Till 2020, during the COVID pandemic period, mobile learning accelerated the adoption of AI in education, with tools like AI-driven proctoring, automated grading, and virtual assistants becoming standard. At the same time, a bunch of concerns around topics like data privacy, algorithmic bias, and the ethical use of AI in education prompted

various discussions on responsible AI practices. Also, in 2023 AI-powered chatbots and language-processing tools have been completely developed, which suggests the foundation of a mature AI system application in the aspect of education.

There was different research in the aspect of artificial intelligence and education. A paradigm of intelligent tutoring systems (ITSs) that can process natural language has been introduced by Devasani [2]. The method uses a lattice-style table-driven interface to create templates that outline a collection of necessary concepts that must be included in a student's answer to a question, as well as a set of concepts that are erroneous and represent a student's misinterpretation. Also, in the Peninsula, there were 3 axes of application of artificial intelligence in the aspect of education, which concentrates on simulating human intelligence and work patterns, applying artificial intelligence to teaching and learning, and addressing the issues facing education in the age of artificial intelligence, particularly the potential for students to become overly dependent on it, neglecting their ability to think critically and solve problems, and the potential for them to be exposed to false or biased information [3].

Different people must learn the importance of artificial intelligence for several reasons. Firstly, in recent years, science and technology related to AI are developing rapidly, soon a series of artificial intelligence-based tools will be widely applied to the region of education, which will cause different problems in aspects of ethnicity and morality in the aspect of education. Thus, studying the relationship between artificial intelligence and education can help teachers and researchers find approaches to solve or avoid such problems. Additionally, self-studying and lifelong studying are becoming popular among younger generations, which requires them to follow up the current trends. In this case, as a widely discussed topic and tool, artificial intelligence can help people enhance their efficiency in searching and selecting information via analyzing data, knowing the relationship between artificial. Intelligence and education can help people make full use of artificial intelligence as well as its related tools.

2. AI Technologies

2.1. Overview of AI Technologies

After the integration of artificial intelligence into education, a series of new technologies have been created. Firstly, Talha et al have developed a chatbot that incorporates Natural language Process(NLP) a technology enabling machinery to understand, analyze, and interpret human languages, in which Chatbots will work on numerous amounts of text data input and are designed to understand human languages to mimic and generate text with similar patterns, enhance operational efficiency and undertake more ambitious and imaginative projects [4]. Additionally, Salloum et al have introduced various applications of ChatGPT in the aspect of education, in which he mentioned the potential of ChatGPT in revolutionizing medical education is evident [5].

2.2. Educational Theories Relevant to AI Implementation

2.2.1. Experiential Learning

Popularized by David Kolb in the 1980s, experiential learning is an interactive approach to education where learners gain knowledge and skills through direct experience, reflection, and application. In this case, AI-powered simulations and virtual reality platforms create immersive scenarios that mimic real-life challenges, allowing learners to practice skills in a controlled yet realistic setting. Also, AI systems can analyze learner behaviors, provide immediate feedback, and tailor experiences to individual needs, enhancing the personalization of the learning journey. Through tools like intelligent tutors and augmented reality, AI also bridges the gap between theory and practice, fostering deeper understanding and retention. This synergy of AI and experiential learning empowers students to

develop critical thinking, adaptability, and practical skills essential for success in complex, real-world contexts.

2.2.2. Constructivism

Constructivism is a learning theory emphasizing that individuals actively construct their understanding and knowledge of the world through experiences and reflection. Rooted in the works of Jean Piaget and Lev Vygotsky, emphasizing that learning is actively built by connecting new information to prior knowledge. Constructivism helps students promote exploration, problem-solving, and collaboration, encouraging learners to take ownership of their learning. The teachers play a role as facilitators, guiding students to discover concepts independently. This approach helps students deeper understanding, critical thinking, and the ability to apply knowledge in real-world situations. In this case, AI can stimulate the constructivism of students by summoning different possible problems in their process of studying as well as searching for proper exploration content for students.

2.2.3. Self-Determination Theory

Self-Determination Theory provides a powerful lens for understanding and improving student motivation and learning outcomes. Through building environments that support autonomy, competence, and relatedness, teachers can foster intrinsic motivation and help students master the skills and mindset for lifelong learning more efficiently. When combined with modern AI tools, SDT principles can revolutionize personalized education, which aims to make learning more engaging, effective, and fulfilling.

2.3. AI Application of Artificial Intelligence on Education

A variety of tools combined with artificial intelligence has been applied to the region of education. According to Hwang et al, by incorporating human intelligence, a computer system could serve as an intelligent tutor, tool, or tutee as well as facilitating decision-making in educational settings [6]. The integration of AI and education will bring new opportunities to improve the quality of teaching and learning, so artificial intelligence indeed has a wide range of applications in the aspect of education. On one hand, Artificial intelligence can recommend different learning content such as video. The Luwan No 1 Central Primary School (Huangpu District, Shanghai) is a public school integrating AI in its school resource management as well as its teaching and learning - a digital model that may then be extended to other schools [7]. At the same time, a type of AI Chatbot system is also applied by students. For instance, ChatGPT is a text-generative AI to process and generate text, it is well-suited for language learning. Opportunities include writing academic papers, language translation, interactive learning, and automatic essay assessment. It can also increase the productivity of educators and can be used for personalized feedback [8]. Also, the powerful searching and recommending ability can help different learners broaden their horizons of learning. Just as Huang et al mentioned, personalized video recommendation systems constitute a useful learning tool for individuals with middle and higher levels of learning motivation [6].

3. Merit and Demerit of Artificial Intelligence Application in the Aspect of Education

The intervention of artificial intelligence in education has many impacts on both teachers and students. In this part, the research will discuss different merits and demerits of the intervention of artificial intelligence in education

3.1. Merit of AI Application in the Field of Education

3.1.1. Merit to Students

The intervention of artificial intelligence has brought students a series of benefits. Firstly, artificial intelligence can enhance personalized learning by helping students select online learning content with higher equality. Just as Kothari et al mentioned, the forms of AI enrooted in learning can be considered as a talk into cheat sheets by assuming the job of a tutor for a student for the difficulties he is confronted with [9]. This is known as "Mastery Learning". With artificial intelligence included tools, students can learn under the guidance of AI instructors and the learning content it summoned uniquely for individuals.

3.1.2. Merit to Teachers

Teachers and school staff also benefit from the intervention of artificial intelligence in education in various forms. For instance, teachers can more easily grasp the instant performance of students in the class with AI help. Just as the OECD described, the Luwan No. 1 Central Primary School, the digital model as well as the series of devices like AI cameras and smart blackboards can help teachers enhance their teaching quality as well as grasp the learning condition of different students, so that teachers can arrange the teaching contents flexibly according to the information given by artificial intelligence. Also, artificial intelligence-powered VR/AR tools and gamified platforms transform traditional teaching approaches into immersive experiences like games, videos, etc., which can stimulate teachers to innovate their design of lessons, and tests. At the same time, Artificial intelligence enables schools and educators to analyze vast amounts of student performance data to make informed decisions about curriculum design and teaching methods. It helps in predicting different trends such as dropout risks, and annual profits, which allows schools to decide concerning results, which can enhance the entrepreneurship of teachers and schools.

3.1.3. Stimulate the Fairness of Education

The intervention of artificial intelligence can stimulate education equity by bringing quality education to remote or underserved areas through online platforms, where the education quality is below average and contains fewer students than developed areas. With artificial intelligence helping, not only can students and teachers obtain resources with better quality, but also with such system helping, schools in different regions can build up cooperations and communications in different forms, which can stimulate the development of education in the whole region.

3.2. Demerit of Intervention of Artificial Intelligence in Education

At the same time, there are also a series of demerits in the intervention of artificial intelligence in the region of education. Firstly, the over-intervention may cause over-anxiety and different mental problems in students, just as Chu mentioned, one of the reasons why students who learned in the real-world scenario with mobile devices obtained unfavorable learning achievements was their high cognitive loads [10]. Because sometimes students and learners often feel upset and stressed about the defect of some systems, which includes forcing clients to restart learning from the beginning of a learning chapter when clients make mistakes, even if the mistake is about the details, which seriously effect students' learning progress. Additionally, academic misconduct and cheating related to artificial intelligence bring about a series of challenges to teachers as well as current cheat detection systems, because it is more difficult to figure out the AI cheat. At the same time, children's capacity to acquire and apply critical thinking and problem-solving abilities might be hampered, and the educational

process can be undermined, if they rely too much on ChatGPT to create answers to their homework questions or finish written tasks [11].

4. Improvement Approaches to the Demerits

It is necessary to bring some approaches to the application of artificial intelligence. First of all, people ought to balance the usage of artificial applications and human interaction for the reason that students have been benefiting from mentorship, emotional support, and social interaction, which is cultivating them into mature talents in this society. In this case, schools had better establish some blended learning models where AI handles repetitive tasks while educators focus on interpersonal engagement, which can maximize the efficiency of AI usage and avoid over-reliance on AI. Additionally, program developers should make sure that AI-based plagiarism and cheat-detection tools are enhanced in different education systems. At the same time, teachers can redesign assessments to emphasize creativity, team collaboration, and practical application of students as well as minimize the effect of cheating based on artificial intelligence. Moreover, schools can launch learning content for teachers and students about AI technologies and how to integrate them effectively and properly into their teaching strategies, in this way can teachers and students raise awareness of using AI properly. Last but not least, when using AI-integrated tools. Students should follow the instructions and supervision of teachers and experts to guarantee proper usage, also students should improve their basic skills as well as academic performance to reduce their reliance on AI and AI-integrated tools while raising the awareness of using AI properly.

5. Conclusion

Artificial Intelligence has brought education into a stage of revolution and variation, helping students and learners to maximize their efficiency and their horizon of personalized learning, improve efficiency, and expand access to quality education. Also, it can satisfy individual needs, form automate repetitive tasks, and provide real-time insights, which means it is a powerful tool for teachers and the administration system in the school. However, as a technology under various doubts, its intervention in education is also facing different challenges like ethical concerns, over-reliance, and equity issues. Encountering such a challenge requires a balanced approach that integrates human oversight, ethical guidelines, and robust infrastructure. By fostering critical thinking, ensuring equitable access for students, and emphasizing the role of teachers as facilitators, it is possible to make sure that the effects of drawbacks of artificial intelligence are under control so that people can apply artificial intelligence properly as a tool.

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