

The Influence of Artificial Intelligence on the Education System

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Abstract: The rapid development of artificial intelligence has had a huge and far-reaching impact on the field of education. The deep integration of artificial intelligence and education has promoted the emergence and development of artificial intelligence educational applications. Today's AI is not only a tool to enhance the learning experience, but also an important promoter of changing traditional teaching models and educational management methods. This article explores the acceptance and views of AI in different cultural backgrounds, and deeply analyzes the ethical issues that may arise in the application of AI in education, such as academic misconduct, algorithmic bias, and data privacy protection. Studies have shown that AI can help improve the personalization and efficiency of education, but its widespread use may cause students to rely on technology and weaken their critical thinking ability. In addition, if the bias in the algorithm is not effectively controlled, it may exacerbate inequality in education. The significance of the paper lies in providing theoretical support for the combination of AI and education, and putting forward constructive suggestions for balancing technological progress and human education elements in the future.

Keywords: Artificial Intelligence, education, personalized learning.

1. Introduction

Artificial intelligence refers to the technology and methods that enable computers to simulate human intelligence, aiming to enable computers to learn, think, reason and solve problems like humans. At present, the application fields of artificial intelligence are very wide, from health care (assisted disease diagnosis, medical robots), finance (risk, credit assessment), transportation (autonomous driving, smart logistics), agriculture, entertainment to smart homes, bringing convenience and innovation to people's lives and work [1].

In addition, artificial intelligence is changing many fields, especially education. Artificial intelligence makes personalized learning easier to achieve by adjusting the educational experience to meet the needs of individual students. Adaptive learning systems use artificial intelligence to understand students' strengths and weaknesses and provide tailored resources and guidance [2]. For example, online platforms such as Khan Academy use algorithms to recommend specific courses and exercises to help students learn at their own pace. In addition, as these technologies continue to develop, the scope of artificial intelligence's impact on various aspects of education has become increasingly apparent. This prompts us to study how artificial intelligence is not only a tool for enhanced learning, but also a powerful asset for improving management efficiency.

Therefore, this article mainly focuses on analyzing and trying to summarize the current application status of artificial intelligence in the field of education and some of the controversies and problems therein. The research focuses on the role of AI in enhancing personalized learning, simplifying administrative tasks, and changing the roles of teachers and students [3]. It also examines different cultural views on AI, ethical issues, and the future possibilities of AI in education.

2. Literature Review

In their paper, Professor Liang and Professor Liu mainly revealed the three major elements and driving forces of artificial intelligence, elaborated on four specific application forms of artificial intelligence in the field of education, and pointed out its future development trend [4]. In the paper, Professor Liang first summarized the development history of artificial intelligence technology and the three major technical elements supporting the development of artificial intelligence, including cloud computing capabilities, data volume and algorithm models, providing a solid theoretical and technical foundation for the practical application of artificial intelligence in various fields of life and work. In addition, Professor Liang focused on analyzing the four application forms of the combination of artificial intelligence and education, including intelligent tutor system, automated evaluation system, educational games and educational robots. The intelligent tutor system (ITS) has evolved from early computer-assisted teaching. It simulates human teachers to achieve one-to-one intelligent teaching and is a typical application of artificial intelligence technology in the field of teaching. Compared with traditional teachers and learning machines, ITS respects students' individual characteristics more, pays attention to students' learning styles, interests and specialties in one-to-one intelligent teaching, and provides them with corresponding learning methods, learning resources and learning companions. In short, the ITS system supported by artificial intelligence technology provides learners with more personalized learning services. Automated evaluation systems, including the "automatic homework evaluation system" and the "automatic oral evaluation system", have greatly improved the efficiency and level of teaching activities and reduced the workload of teachers. Finally, Professor Liang put forward his own views on the future development trend of artificial intelligence in educational applications: under the guidance of artificial intelligence technology, education should develop towards informatization, reform the education model, and improve the quality of education services [4]. Overall, Professor Liang and Professor Liu made a good summary of the application status and development trend of artificial intelligence education, and believed that artificial intelligence technology has a huge driving and promoting effect on the education system (teaching level, teaching services, and teaching methods), but lacked analysis and suggestions on possible problems in its technical application.

In *New Areas, Misunderstandings, Blind Spots and Forbidden Areas in Artificial Intelligence Education Application and Research*, Zhang and Liu analyzed and discussed the problems of essential cognition, concept attitude, practice field and application boundary in the process of artificial intelligence education application and research, and put forward some countermeasures and suggestions. By integrating the empowering, enabling and empowering artificial intelligence technology with the essence of education and proposing a theoretical framework, it has certain reference significance for the future use of artificial intelligence to optimize the educational process [5]. In short, this paper has made some new explorations based on existing research and preliminarily clarified several issues that are easily overlooked in the application of artificial intelligence in education. In response to these issues, the positioning relationship between artificial intelligence technology and education is discussed. Finally, starting from solving specific problems, the implementation strategy of the artificial intelligence education application is proposed.

From Wu and Liu's article *Building an ecosystem of "artificial intelligence + education"*, people can know that the development process of AI can be divided into two dimensions: time and

technology. In the process of development, it has been continuously combined with education, and a significant number of research results have been produced, which provides theoretical guidance for "artificial intelligence + education". This article mainly starts from the development process of artificial intelligence, analyzes the research status of "artificial intelligence + education", and tries to preliminarily build an ecosystem of "artificial intelligence + education" from three aspects: application form, technical architecture, and business trend, as well as discuss the establishment of an "artificial intelligence + education" talent training system [6]. In short, mankind is facing an era of increasingly enhanced technology, and science and technology, nature and people are accelerating effective integration. Artificial intelligence extends human physical and mental strength. Intelligent education under "artificial intelligence + education" can go beyond imagination and effectively promote the deep integration and mechanism innovation of information technology and education and teaching.

3. The Roles of AI Applied in the Educational System

3.1. Personalized Learning

A common problem with traditional education is that students have different learning needs, but the teaching methods are often too one-size-fits-all. The application of artificial intelligence technology provides strong support for personalized learning. AI can analyze students' learning habits, knowledge level and learning style to tailor a learning plan for each student. This personalized education method can better stimulate students' learning interest and potential and improve learning outcomes. Artificial intelligence can also provide intelligent learning assistance tools. In traditional education, teachers have a heavy workload and cannot meet the personalized needs of each student. AI-assisted teaching tools can provide real-time learning feedback and guidance based on students' learning situation, help students understand knowledge, digest and absorb, and provide targeted answers and guidance for learning problems. This intelligent auxiliary tool can not only improve students' learning efficiency, but also reduce teachers' teaching pressure [7].

3.2. Simplifying Administrative Tasks

AI can help streamline administrative tasks in schools and universities. Automated grading and scheduling tools reduce the administrative workload for educators, allowing them to focus more on teaching and supporting students. Additionally, AI chatbots such as ChatGPT assist students by answering questions and providing explanations, acting as helpful supplementary resources. As these innovations become more widespread, it is important to consider broader cultural and regional differences in AI adoption and perception, which vary widely between Western and Eastern education systems.

Due to cultural and educational differences, Western and Eastern countries also differ in the way they use AI in education. In Western countries, there is a strong emphasis on incorporating AI to innovate and improve educational practices. Many universities in the United States and Europe offer AI courses, reflecting a broader commitment to integrating technology into the curriculum [8]. This approach is consistent with the cultural emphasis on innovation and individualism, where technology is seen as a tool to democratize and make education more accessible.

In contrast, Eastern education systems tend to be more cautious about AI. Traditional cultural values that prioritize teacher-student relationships and moral education influence this cautious approach. In countries such as Japan and China, a strong emphasis is placed on the role of teachers as ethical mentors, which may lead to reservations about the full adoption of AI in the classroom. However, these countries also recognize the potential of AI to address educational gaps, especially in rural or underserved areas.

3.3. Changing the Roles of Teachers and Students

The widespread application of AI technology is bringing major changes to traditional education, including changes in the dynamics of teacher-student relationships and roles. In the past teaching model, teachers usually played the role of knowledge transmitters or instructors, playing a leading role in the class; while students were regarded as objects that passively accept and digest knowledge. However, this traditional teaching model has a series of challenges, such as difficulty in meeting the unique needs of each student and inability to accurately feedback learning progress.

With the advent of the era of artificial intelligence, students' learning methods have become diversified. Storage, cloud and intelligent search have extended human memory infinitely, breaking the education method dominated by knowledge transmission. Students' ability to screen, analyze and use knowledge to solve complex problems has become more urgent. The cultivation of rational spirit, empathy and communication skills in the era of artificial intelligence also requires schools to change their education methods [9]. The most important and urgent one is the transformation of the teacher-student relationship, that is, from a teacher-centered education paradigm to a student-centered education paradigm [10]. The original coexistence model of teachers and students will be transformed into a teacher-student coexistence model in which teachers and students face learning tasks together, participate in them together, and assume different roles in the process of completing learning tasks.

4. Related Issues

The use of AI in education raises several ethical issues. A major concern is the potential for AI to facilitate academic dishonesty. Tools such as ChatGPT can generate essays or solve problems, which may lead to over-reliance on technology and result in a decline in students' critical thinking skills. In addition, bias in AI algorithms may inadvertently exacerbate inequality, especially when the data used to train these systems is unrepresentative. As these challenges highlight the complexity of AI integration, it is also critical to address data privacy and personal information security issues in educational settings.

Data privacy is another important issue. The use of AI often involves the collection and analysis of large amounts of personal data, which raises concerns about consent and misuse of information. Ensuring transparency and protecting students' data is essential to maintaining trust and respecting individual rights. As we look to the future role of AI in education, these ethical considerations highlight the importance of developing comprehensive guidelines and policies. With the development of the Internet, big data and artificial intelligence technology, the collection and storage of individual data by smart devices can be seen everywhere. And this data is also permanently stored in the cloud and is not easy to lose. However, such a large amount of big data with various types is often more likely to cause panic. As mentioned above, big data can accurately identify individual identities. If it is accidentally leaked, information is stolen, hacker virus attacks, and improper transactions between businesses, etc., coupled with imperfect data protection mechanisms and inadequate supervision and management, it may cause a series of huge harms to governments, enterprises, individuals, etc. [7].

Artificial intelligence is applied to the field of education to effectively allocate educational resources through the operation of algorithms. However, at the same time, there is often discrimination against disadvantaged groups and the stereotype of "score supremacy" in the operation of intelligent education algorithms, which to a certain extent amplifies the differences and prejudices in education.

Algorithmic discrimination refers to an algorithmic operation result with subjective discrimination due to unfair data and defects in the algorithm itself. The process of the artificial intelligence

education system entering and analyzing learner-related data and providing feedback reflects to a certain extent the gradual widening of the digital divide in education, and the intensification of the stereotype of students predicted by the algorithm, resulting in algorithmic discrimination exposing the prejudice in education.

5. Conclusion

All in all, the impact of AI on education is broad and complex, offering both opportunities and challenges. While AI can enhance learning experiences and administrative efficiency, it also raises important ethical questions. As AI continues to develop, it is essential to balance its use with human oversight and ethical considerations. Rather than replacing traditional educational methods, AI should be seen as a tool that complements and enhances the educational process. By thoughtfully integrating AI into the education system, we can use its potential to improve learning outcomes and make education more accessible and equitable.

This study still has some shortcomings. Since it is limited to the scope of weak artificial intelligence, the ethical issues involved are not complete, and the causes of the problems and the response strategies are not completely appropriate. In the era of the gradual emergence of strong artificial intelligence, new ethical issues are slowly emerging. For example, AI drawing tools and artificial intelligence chatbot ChatGPT are suspected of infringement, plagiarism, unfair evaluation and malicious competition when generating content, which seriously affects academic ethics.

Looking ahead, AI is expected to play a significant role in education, not by replacing teachers but by supporting them. AI can handle routine administrative tasks, allowing teachers to focus more on complex aspects of teaching, such as fostering critical thinking and providing emotional support. The future may involve a blended educational model, where AI and human educators work together to provide a comprehensive learning experience. Moreover, this blended approach can help address educational inequalities, making learning opportunities more accessible to a broader range of students, particularly in underserved regions.

AI also has the potential to make education more accessible, especially in underserved areas. By providing scalable and adaptable resources, AI can help close educational gaps and promote lifelong learning. However, this requires careful planning and the creation of strong ethical guidelines to ensure that AI's benefits are shared fairly. As we consider these future possibilities, it is crucial to integrate AI thoughtfully into the education system, balancing technological advancements with the human elements that remain central to effective learning.

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