

The Impact of AI Application in Education on Teachers and Teaching

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Abstract:

In the increasingly developing AI environment, more and more AI tools have flooded into various fields of people's lives, and the issue of how to use AI reasonably has received widespread attention. However, there are still shortcomings in the practical application of AI in teaching. This article analyzes how teachers should use AI reasonably in teaching. This article argues that the use of AI can help teachers achieve personalized teaching, whole-process teaching, and more. There is a significant improvement in efficiency and effectiveness when teachers use AI for teaching tasks. However, improper use can also lead to issues with academic ethics and standards. Based on this, this article believes that teachers can consciously introduce the use of AI in the teaching process to improve teaching content and enrich teaching forms. At the same time, teachers should also focus on improving their information technology to better integrate AI with traditional teaching, enhance their professional competence and teaching ability, and help students achieve better learning outcomes.

Keywords: AI; teaching practice; teacher development

1. Introduction

AI encompasses the widest knowledge, the latest technology, and the most comprehensive thinking available today. The recently emerging ChatGPT is a typical example of AI. Artificial intelligence models such as ChatGPT can almost meet all the basic needs of people in daily learning. It is no longer just a simple search engine like a website. It is an artificial intelligence that can 'understand' what people are saying and provide feedback. In recent years, some people have called AI the "new oil" of this era [1]. This indicates that the importance of AI to people is self-evident. Against the backdrop of the rapid de-

velopment of AI, it has gradually permeated into the process of education and teaching. The application of artificial intelligence in education is also a widely discussed topic. Studies have shown that if students are allowed to use AI for learning, their academic performance will greatly improve. Experimental data shows that with the assistance of AI, after one semester of learning, students' learning outcomes have increased from 50% accuracy to 62.5% accuracy. After two more years of use, the students' grades improved to an accuracy rate of 85% [2]. This is a significant improvement. For individuals, using AI in learning and education will have a positive impact. And the problems it brings cannot be ignored. The impact of

AI on students also poses challenges to teachers' professional development and teaching practices to a certain extent.

The challenges of artificial intelligence in the field of education have also been reflected in technological perspectives, the roles of teachers and students, and social ethical issues. These findings can provide valuable references for educational researchers, students, and artificial intelligence developers who plan to contribute to related research. Furthermore, educators need to collaborate with artificial intelligence engineers to address the gap between technology and teaching [3]. How to apply AI in education? How can AI assist teachers? How can AI be used to maximize the efficiency of teachers? These are all issues worth exploring.

2. The Impact of AI Usage on Teachers

2.1 The Relationship between Teachers and AI

In the theory of teacher development in universities, it has been mentioned that the Western teacher development system currently needed in China can be roughly divided into the following categories: one is training focused on basic classroom teaching skills, and the more common methods include simulated teaching, classroom videos, public teaching observation classes, teaching consulting, etc. The second type refers to various teacher development seminars organized by schools or departments, including seminars, workshops, and teacher development seminars (such as teaching reform seminars and academic seminars). The third type of teacher development system focuses on popularizing modern technology and providing instrumental platforms to teachers [4]. From this, it can be seen that with the increasing development of technology, the inevitable topic in education and teaching is the emergence of artificial intelligence. How to effectively utilize artificial intelligence and make it a tool for teachers is a very important research direction.

Therefore, the relationship between teachers and AI has become the primary concern for new AI teaching. How teachers use AI can be specifically divided into two parts: how teachers should use AI to improve their abilities and how teachers should use AI to improve students' learning quality. Firstly, discuss how teachers can use AI to enhance their abilities. A very hot topic nowadays is: Should AI replace teachers? Many people's answers may be 'no', and there may also be a portion of people's answers is 'yes'. AI and teachers are not a replacement or completely unrelated relationship, they should be more like a mutually supportive relationship. Teachers should use AI to improve themselves, rather than being completely replaced

by AI or holding a completely pessimistic attitude towards the use of AI.

2.2 Logic of Teachers' Use of AI

The second point, which is also the most discussed issue, is how teachers can use AI to improve students' learning quality. In February 2023, the Chinese Ministry of Education passed a series of reforms, including a stricter home tutoring permit system aimed at reducing obsession with exams. Earlier this month, the government also released a set of guidelines that focus more on sports, ethics, and art education rather than exams [2]. This means that education should not only focus on hardcore learning content but more importantly, educators should pay attention to students' personalized development. And AI can meet this requirement very well. It is difficult for teachers to achieve personalized teaching goals based on the Chinese large-class teaching model. In this context, AI can be introduced into students' learning. From ChatGPT to other specialized learning AI, these AI can tailor their personalized learning plans for students and provide timely feedback on all their questions or ideas. To achieve the integrated development of teachers themselves and the use of AI, and improve the quality of teaching and the effectiveness of teaching management.

2.2.1 Improvement of teaching efficiency

The improvement of teaching efficiency can also be divided into different sections. One is the improvement of teachers' efficiency in the teaching process, and the other is the improvement of students' self-learning efficiency after class. AI can provide certain technical support for teachers during the teaching process. Take the simplest thing as an example: making courseware. Before each class, the teacher needs to create courseware, make their own PPT, or some other materials that they need for the class. This is a very time-consuming and torturous process. Many teachers understand certain knowledge points in their minds, but they may not be able to effectively incorporate them into their courseware or teaching. However, using AI to assist in making courseware will not have this problem. Through good communication with AI, it can understand the teacher's meaning well and help the teacher create their own courseware PPT. The presentation of AI algorithm logic can enable the expression of some knowledge points to produce more concise and understandable content through input into AI models. Meanwhile, the use of AI will also promote educational equity to a certain extent. Based on the goals of artificial intelligence in education, AI may be particularly helpful in achieving some of the global education goals set by the international community in Sustainable Development

Goal 4: “Ensure inclusive and equitable quality education, promote lifelong learning opportunities for all” [5].

2.2.2 Implementing Personalized Teaching

The use of AI can also help teachers achieve personalized teaching. Bloom’s research shows that compared to traditional whole-class teaching, the learning benefits of combining personalized tutoring with mastery learning are two standard deviations higher [6]. AI can participate in teaching and help teachers carry out personalized teaching based on students’ characteristics. Students can ask AI tools for personalized questions during their learning process. This mode greatly improves learning efficiency. Meanwhile, based on the vast database of AI, the answers to these questions are often very standardized. Meanwhile, the quality of students’ learning will also improve due to the use of AI [7]. Research has shown that experimental subjects using AI learning have the highest self-feedback and learning outcome scores after one week of self-directed learning. The feeling of the experimental subjects is that using AI for learning has very convenient features, and searching for words or grammar knowledge points is extremely efficient. The experimental results show that students using AI have better learning efficiency and quality than those using traditional learning methods. The point to consider is the self-discipline of students when using AI.

3. Inspiration and Suggestions

3.1 Enrich Teaching Methods and Achieve Personalized Teaching

Firstly, teachers can consciously introduce the use of AI in their teaching. Introducing AI into teaching can effectively enrich the teaching mode. The previous teaching model was generally limited to a simple teacher-led teaching mode, neglecting the self-management and self-learning of students themselves. Students should be allowed to use tools for self-learning. That is to say, teachers should consciously introduce AI for teaching assistance and management during the teaching process. The idea is essentially to design intelligent teaching agents (IPAs) that can model, predict, and monitor relevant learner behaviors, abilities, and psychological states in various educational activities, and provide personalized assistance and feedback accordingly. The introduction of AI means more diverse learning methods and modes. Students can use AI to help them set their learning plans according to their own needs, conduct data queries through AI, use AI tools to answer their questions in class, and use AI to complete some huge numerical calculations. Students can

skip the waiting and searching stages and instead, directly acquire and consolidate knowledge. And teachers should also assist students in understanding and using AI. AI is flexible and versatile, and its flexibility determines that it can accomplish many things that human teachers cannot do or are not very easy to do. Artificial intelligence can help promote collaborative learning. One of the most revolutionary aspects of computer-supported collaborative learning is when learners are not in the same location. It provides students with variable options for the time and location they wish to study [8]. Using AI to assist students in learning can also help them quickly adapt to the rapidly developing AI environment, allowing them to have a preliminary understanding of AI in advance. Crossing the boundaries of a person’s desires in a certain area, making them unfamiliar and unaware of the things in that area, the more likely they are to make mistakes in these things and fields.

3.2 Expanding Teaching Content

In addition, by integrating AI into the teaching process, teachers can help students access richer academic content and learning resources. Students will be able to use AI to quickly and conveniently access all existing materials available for their use. Meanwhile, the intervention of AI has also enriched the teaching content and materials. According to the traditional learning mode, learning materials generally refer to textbook content and written knowledge, but the acquisition of this knowledge has problems such as low efficiency and too single acquisition methods [9]. By utilizing AI, this problem can be effectively solved. However, at the same time, the use of AI in learning also raises concerns about academic self-discipline and academic ethics. According to the application of AI in learning, if no one guides students, or helps them understand what AI is, and how to use AI correctly, it is easy to encounter situations such as abuse of AI and academic misconduct. Therefore, teachers should pay attention to guiding students’ academic standards in the teaching process. Teachers should pay attention to encouraging students to expand their learning materials and content, but at the same time, they should strictly prohibit students from engaging in academic misconduct such as plagiarism and ghostwriting.

3.3 Enhancing Teaching Information Technology Capability

Finally, teachers should focus on enhancing their teaching information technology capabilities. The importance of information technology capabilities in today’s society is beyond doubt, and the importance of teachers cannot be

ignored. Pre-service teachers can improve the integration of information technology teaching resources and enhance their resource development capabilities through project-based learning. Pre-service teachers can collect and select digital teaching resources based on specific teaching objectives and needs. In addition, they can process existing resources or independently develop new learning resources according to specific needs. Teachers can quickly search and integrate resources through information technology such as AI, effectively improving their teaching abilities and control over teaching resources. The improvement of teaching information technology also means the enhancement of teachers' comprehensive quality. Nowadays, it is inevitable that every teacher needs to use auxiliary teaching tools such as electronic blackboards, computers, and tablets. How to use these teaching tools is an essential skill for future teachers. Proficiently using AI can help teachers quickly improve their information technology skills and adapt to the information age, enabling them to keep up with the ever-changing progress. Teachers can deepen their connections with students through the improvement of their information technology abilities. Most students are very interested in information technology and AI. If teachers can understand and proficiently use information technology, they will have many common topics with students and get along more harmoniously. When teachers maintain a positive relationship with students, they will influence students' interest in school, thereby affecting their level of achievement. Teachers who are more willing to establish connections with students are open to them, and care about them will have better opportunities to cultivate positive relationships with them. Students will also respond well to this situation, and show commitment to the classroom, and their motivation to perform well in class will increase [10]. So the cultivation of information technology skills by teachers not only means the improvement of their abilities and the diversification of teaching modes, but also means creating a good teaching atmosphere and building a friendly communication environment with students.

Teachers can utilize their information technology capabilities to improve teaching management. For example, when students engage in a specific activity, AI systems capture thousands of data points, such as what they clicked on, what they entered, which tasks they answered correctly, and any proven misunderstandings. Analyze these data to determine the next information, activities, and quizzes to be provided, to generate personalized approaches through the materials to be learned, and repeat this process. It sometimes includes a teacher dashboard so that teachers can see what grades students have achieved [11]. This is a typical example of the application of AI in education.

If teachers can widely popularize ITS and apply it to real teaching applications, it will be a qualitative change. Its essence is still to use the essence of AI to simplify the teaching process.

4. Conclusion

Although AI has its benefits in teaching, it also has its drawbacks. People's understanding of AI cannot just stay at the level of drawbacks. Teachers should be brave enough to use AI while recognizing and acknowledging their shortcomings. In the current environment, informatization and technological advancement are inevitable trends, and AI will inevitably be integrated into every aspect of people's lives, including education. On the contrary, education should be one of the first fields to be transformed by AI. Since the use of AI can enhance teachers' abilities, it is also worth exploring which specific aspects of their abilities can be improved through AI. This article argues that the use of AI has a certain positive impact on the development of education and the self-improvement of teachers. But at the same time, there will also be some challenges. Therefore, teachers need to constantly improve themselves, integrate traditional teaching models with AI technology teaching, improve teaching methods and content, and achieve self-improvement.

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