

Research on the Practice of Artificial Intelligence Technology Promoting Educational Reform and Innovation

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Abstract: This article elaborates on the concept of artificial intelligence and teaching reform. This article compares the differences between traditional education and educational learning based on artificial intelligence technology. This article proposes a method of utilizing artificial intelligence to promote individual learning. This project combines the needs of teachers and students to carry out artificial intelligence teaching reform from three levels of teaching. With the integration of university technology and artificial intelligence technology, it is hoped that it can provide some reference for promoting teaching reform and innovation.

Keywords: Artificial Intelligence; Higher Education; Educational Model Reform; Personnel Training

1. Introduction

In addition to financial, the most important national basic industry - education as early as 2000, has gradually integrated with artificial intelligence. Especially since 2020, due to the impact of the novel coronavirus epidemic, the national education work has not been able to carry out smoothly in schools. In order to ensure the normal conduct of educational activities. This time, with the popularity of network teaching, the combination of artificial intelligence and teaching is getting faster and faster, and the traditional teaching model has also undergone earth-shaking changes [1]. The network platform using artificial intelligence technology has played a great role in promoting the normal operation of education and teaching. In the new era, the deep integration of artificial intelligence and education and teaching has become the most important feature of education informatization.

2. Innovative application of artificial intelligence technology in universities

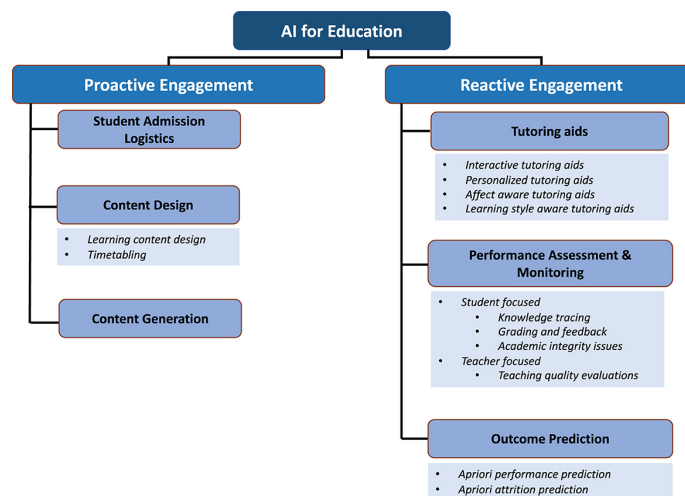


Figure 1: The transformative application of artificial intelligence in "teacher teaching", "student learning" and "mutual evaluation"

According to the latest progress of the "Blue Book on Artificial Intelligence Education 2022", in the context of "double reduction", more than 85% of schools across the country are actively carrying out "after-school 3:30" activities. On the whole, the importance of the system has been affirmed by teachers, and in practical application, more is required to get individualized evaluation and guidance. Therefore, in the era of AI, the traditional education of universities has been unable to stop the development trend that matches it. This topic combines the needs of teachers and students to carry out artificial intelligence teaching reform from the three levels of "teacher teaching", "student learning" and "mutual evaluation". Through "teaching" to make the teacher get rid of boring teaching, enhance the classroom activity [2]. Through "learning", students can carry out individualized learning and help precise teaching. Through "evaluation", students' learning situation can get real-time feedback and help improve the teaching quality. The revolutionary use of AI in the education trilogy is shown in Figure 1 (image cited from Proactive and reactive engagement of artificial intelligence methods for education: a review).

3. "Teacher teaching": Artificial intelligence assists teachers in teaching

The current education ecology is limited by resources, resulting in teachers can only do repetitive work. Roll call, review and assessment take up too much of the teachers' energy, which leads to a sense of career fatigue, and it is difficult for teachers to spend more time in the curriculum to optimize. This module uses the human-computer interaction technology in the classroom, establishes a smart assistant system, assists the teacher to have a simple conversation, and answers the students' questions; The use of network technology and VR virtual reality technology to establish virtual laboratories can give students the opportunity to try and make mistakes, thus enhancing the vitality of the classroom. This AI has helped improve the quality of education and reduce the workload of teachers. Therefore, in this integrated environment, teachers can focus their responsibilities more on the supervision and guidance of students, and help students complete the overall teaching task[3].

3.1 Intelligent Assistant

"Wisdom teaching assistant" is a kind of teaching assistance service based on "conversation". In the traditional classroom, the main teaching mode is "sign-in, conference-answer-debate". In the classroom, due to the limitation of time, it is impossible to enrich the content of the course as much as possible. Therefore, the introduction of wisdom in the classroom can bring vitality to the traditional classroom and help teachers adjust their educational strategies in a timely manner. Using the class check-in function, students' attendance can be easily counted. In the answer function, it is possible to know exactly how well each student has mastered the knowledge taught in class. The atmosphere of the class can be adjusted in the discussion function. A teacher-led teaching mode with intelligent teaching assistant as assistant is established based on the powerful role of intelligent teaching assistant, which can effectively enhance the vitality of teaching [4]. Some scholars have made a case study on the assisting function of "micro-assistant" in education. Take advantage of the "check-in" function of the microtia to ensure that students can sign in within 2 minutes, thereby reducing the waste caused by attendance during class. Micro class teachers can divide students into several parts, so that everyone can learn together. During phased learning, the micro-assistant can open the exam remotely to check students' scores, progress and accuracy.

3.2 Experimental teaching process of virtual reality

The deepening and mastering of theoretical knowledge must be carried out through experiments. In the routine experiment teaching, due to the low degree of mastering the experiment operation, the loss of equipment and the waste of materials are caused. Virtual laboratory is an experimental platform based on Web network data sharing technology and established by virtual instruments such as VR/AR, which can conduct real-time simulation of experimental equipment and scenes, and students can operate and control in the virtual laboratory. This method increases the trial and error rate of students in the experiment, deepens their memory, enhances their autonomy, and enhances practical application. Some scholars have suggested introducing gesture interaction in virtual laboratories [5]. The experiment found that among the 26 students, 24 students showed strong interest in the virtual experiment based on gesture interaction, 15 students said that the process of the experiment was similar to the real experiment, 10 students said that the scene of the experiment was very realistic and had a strong sense of immersion, and 6 students

said that they hoped to do more virtual experiments based on gesture interaction. Virtual LABS can enhance students' learning experience and increase students' interest in participation.

4. "Student learning": Differentiated teaching methods stimulate students' interest

In the traditional "individualized teaching", because of the characteristics of "large classes", it is difficult for teachers to do "everything", which leads to the difficulty of "individuation". The intervention of AI extends the time and space of education and improves the individualization of education. A kind of photo search question which can help students personalize learning resources is established. The photo search software contains a large number of question types. Students can choose various question types independently according to their own knowledge level, interests and hobbies, so as to realize the selection of educational resources. Integrating educational robots into teaching can make students' learning guidance more targeted. The educational robot can plan the learning path according to the learner's situation and interest, and help the learner to carry out adaptive learning [6]. The combination of AI and "learning" makes up for the lack of flexibility in conventional education and helps students to individualize education according to their needs and hobbies.

4.1 Teaching Robot

At present, many families are double-duty, they do not have enough time and energy to give children after-school homework guidance, and the arrival of education robots can precisely help parents carry out intelligent education work. In addition to monitoring the progress of the students' homework, it can also be used as a playmate of the students to track the students' every move, so as to grasp the interests of the students. Some scholars adopted two types of robot English speaking and listening teaching methods, Mero and Engkey, and a total of 24 students had 8 weeks of speaking and listening courses. After 8 weeks of study, students have significantly improved their pronunciation, vocabulary, grammar, oral confidence and oral communication skills.

4.2 Image search problem

Photo search questions are based on image processing technology, and the question bank established by big data is used as the standard to search the content of photos, so as to find similar types of questions. The teacher's explanation of the wrong questions is not accurate, and the way students make mistakes and the types of questions are not consistent [7]. Image search questions can be used to solve similar questions one-on-one. The proper use of photos to search for topics can shorten the distance between students. The process from taking photos to getting answers is also faster.

5. "Mutual evaluation": Teachers evaluate students' learning outcomes, and students can also evaluate teachers' teaching methods

In traditional education, the evaluation experiment is more inclined to the final evaluation. Usually, students have to go through a stage from test, evaluation, feedback to improvement, and teachers can only give feedback based on students' homework, exam results and other single data. This evaluation process is static, fixed, and single, it cannot track everyone, nor can it fully grasp the development of everyone. The introduction of big data has realized individualized, convenient and real-time collection, which meets the needs of individualized education [8]. The combination of artificial intelligence and teaching evaluation can achieve the purpose of combining learning evaluation, so that every student can improve their core quality in the evaluation process, and carry out continuous improvement of their learning in the evaluation feedback. Analyze the initial value of dynamic students' situation - call the teaching mode - record the learning state - feedback the current state, so as to achieve effective, flexible and personalized evaluation feedback in the whole process. Students can be accurately corrected, and their situation can be timely feedback to the teacher, so as to achieve the purpose of dynamic feedback on homework.

5.1 Intelligent teaching guidance

Intelligent teaching System (ITS) is a kind of teaching software with high intelligence and humanism. According to different students' initial learning status and required pre-set knowledge, the corresponding

student models are established respectively. Learners feed their results back into the learner model to generate learning emotions, And made available to parents (Figure 2 cited in the Learning recommendation with formal concept analysis for intelligent tutoring system). This kind of learning method allows students to get personalized and interactive assistance, and also provides an effective teaching method for college teachers [9]. Compared with the traditional university classroom teaching, ITS can achieve the teaching effect similar to "face to face", and some students can get better learning results with the help of ITS. For example, at Carnegie Mellon University, the Advanced Mathematics Instructor (PUMP) developed the "Algebra Tutor PAT" to allow students to play a role in certain problems, and to use modern algebra tools to encourage students to actively solve the problem. The implementation of this model is effective from the students' academic performance and the feedback of teachers and students.

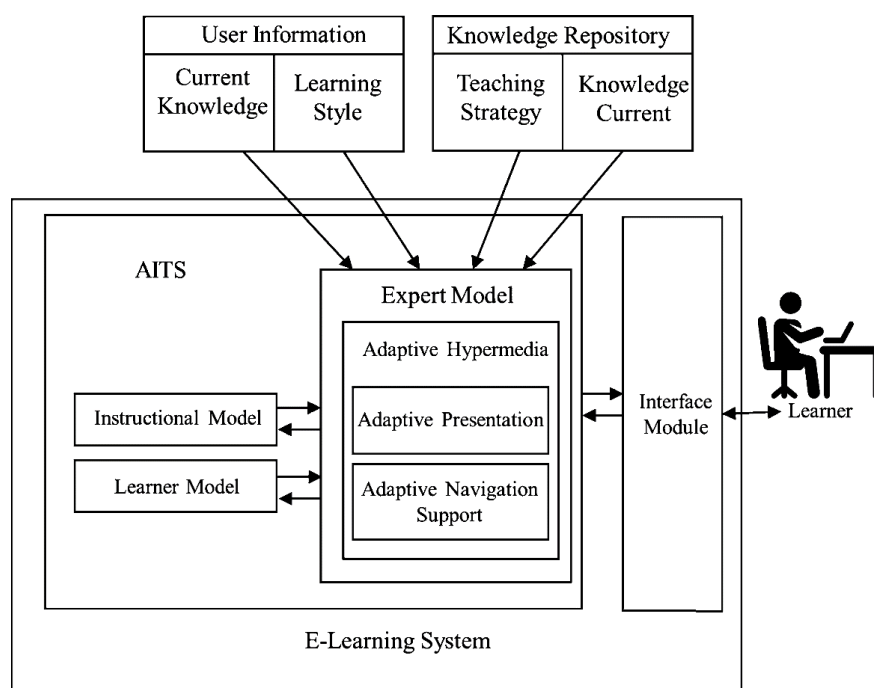


Figure 2: Intelligent tutoring system flow

5.2 Intelligent job correction model

Under the traditional teaching method, homework correction is a huge amount of inefficient repetitive work, which will not only consume the teacher's spirit, but also affect the optimization of the curriculum, and cause the feedback of learning situation behind. It will also adversely affect the new knowledge that students acquire. The application of artificial intelligence technology in colleges and universities is essentially a kind of help and alternative teaching work, and intelligent marking is an effective alternative teaching work. Teachers can follow their own learning process, publish their learning tasks on this platform, and set a time limit for the end of learning. After all the tasks are completed, the system grades them and sends the results to the teacher. Homework intelligent marking is of great help to the teacher's time for marking and reduces the teacher's work pressure. In addition, through the analysis of wrong questions, it provides students with targeted guidance. Therefore, the use of intelligent comments to replace manual comments among teachers and students is very popular.

6. Educational model evaluation cases

Taking a writing course in an English class as an example, this paper introduces a teaching evaluation method based on intelligence. Artificial intelligence is used to evaluate students' learning situation, and the analysis results of learning situation are reported back to the teacher. The "Error rate analysis Table of Writing Exercises" shown in Figure 3 can give teachers flexible feedback and help them better grasp the learning situation. Students can self-correct through their own feedback and the teacher's explanation, so as to achieve an individualized learning effect. Using the "intelligent assistant", the teacher shares the

good articles with the students, and the students communicate together. It fully stimulated the enthusiasm of the students and increased their interest in good articles. According to the later data, due to the help of the new curriculum, the average English writing score of this class in early July 2020 was 15% higher than that in early February of the same year.

Order	Criteria Analysis	Level of error	
		amount	%
1	Inability to perform the assigned task because of not understanding the question.	5	3.73
2	No introduction.	111	82.84
3	Lack of main ideas	25	18.66
4	No topic sentence stating the main points	99	73.88
5	Lack of development of the main ideas (adding details and facts about the main point)	93	69.40
6	Lack of organization	114	85.07
7	An accumulation of errors in sentence structure and/or usage	93	69.40
8	No transitional words	121	90.30
9	Incoherence	103	76.87
10	No conclusion	111	82.84

Figure 3: Analysis of error types in composition exercises

7. Conclusion

The article explores the impact mechanism of artificial intelligence in university teaching, and explores its application in university teaching from three perspectives: creative teaching, personalized learning, and intelligent evaluation, in order to further improve the quality of university teaching. The integration of university technology and artificial intelligence technology is an inevitable requirement for the development of university technology. In this context, the development and improvement of artificial intelligence technology have more profound significance for promoting teaching reform and innovation.

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