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Research on the Feasibility and Development of AI Application in Classroom Teaching Practice

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Abstract: Artificial intelligence (AI) technology injects new impetus into education reform, and its functions, such as personalized learning and intelligent evaluation, are expected to solve the problems of low efficiency and unequal resources in the traditional teaching mode. However, there are still significant bottlenecks in the practical feasibility and effectiveness of AI in the teaching classroom and its deep integration with traditional education, which restrict the full release of its educational value. Through empirical analysis, this paper reveals the current three core issues. First, the lack of support for educational resources and the gap in AI infrastructure between regions exacerbated the inequity of education; Second, there are differences in teaching feedback. AI tools are difficult to adapt to complex teaching scenes due to low adaptability of algorithms and data deviation; The third is the lack of teachers' information awareness and ability, and the dual lack of technology application ability and curriculum integration strategy. Given the above problems, this paper puts forward targeted countermeasures from three aspects: improving educational resources, improving educational feedback, and improving teachers' information awareness and ability, to provide reference for the effective application of AI technology in classroom teaching practice.

Keywords: AI, Classroom Teaching Practice, Educational Resources

1. Introduction

With the continuous development of information technology, the widespread integration of artificial intelligence (AI) technology in different industries represents a contemporary and rapidly developing trend [1]. Researchers believe that although artificial intelligence technology is disruptive, it has been proven to be crucial for current academic practices and blended learning environments. Government agencies, education departments, and academic accreditation organizations in various countries have enthusiastically supported the decision-making and innovation expert system based on artificial intelligence within educational institutions. By integrating advanced hardware and software technologies, educational institutions have achieved intelligent management of teaching resources and real-time monitoring of teacher-student interaction, which has greatly improved teaching efficiency and quality [2]. Educators pay special attention to understanding students' learning situation through improving students' participation, to shape the evaluation of teaching methods. Researchers in this field focus on the careful examination of students' learning behavior, which is considered to be a key indicator of participation and a key theme of research. This concern not only enables educational researchers to fully understand students' learning habits and individual

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differences, to provide targeted guidance and support, but also helps educators to improve teaching methods and teaching quality, and promote the implementation of personalized education.

However, from the perspective of classroom teaching practice, the current research still has room for further exploration. For example, practitioners of smart classrooms have found that there are still some problems in smart classrooms, and how to effectively put forward relevant countermeasures is still an important challenge in the current education field. This paper aims to explore the application feasibility and development of AI in classroom teaching practice through case analysis, and provide a reference for teaching reform in Colleges and universities.

2. Application Status of AI in Teaching Practice

2.1. AI Classroom Teaching Environment

AI is not only a learning tool, but also an important part of education through the integration with an adaptive learning system [3]. These systems automatically manage content, progress, and feedback according to students' dynamic progress and needs, and provide personalized learning experiences with real-time guidance.

For example, the Central China Normal University - "three-tier integration" smart classroom uses the system architecture and design concept of "physical facilities, resource services, and interactive applications" to build a smart classroom [4]. The project has successfully realized some functions of the following three spaces: physical space (cornerstone), including intelligent teaching hardware and software facilities, environmental management system and humanized space layout; Resource space (the core driving force) covers the starc based cloud integrated teaching platform, the automatic generation system of classroom scenes and resources, the collection and analysis tools of learning behavior data, and the application support and service system; Community space (featured highlights) is not only limited to the interactive teaching mode in the classroom, but also extended to the remote interactive teaching outside the classroom [5].

This project is a typical case of intelligent education, showing the results of the school's active exploration in the construction of a digital teaching environment. First of all, the project has made an important transformation and upgrade in the teaching space. Through intelligent teaching software and hardware facilities and environmental management, Central China Normal University has successfully created a highly intelligent and humanized teaching environment in physical space. This provides a comfortable and convenient teaching place for teachers and students, and a solid foundation for digital teaching. Secondly, the project has made significant progress in resource services.

2.2. Advantages of AI Classroom Teaching

AI classroom teaching shows significant advantages for both teachers and students. For teachers, AI teaching provides rich and authentic teaching resources, meets the needs of students' personalized learning, and reduces the burden of teachers looking for materials. Through the recording and scoring function, teachers can timely evaluate students' learning effect, encourage students' progress, and use big data analysis to accurately grasp the learning situation, to improve teaching efficiency. In addition, the application of personalized education solutions not only improves classroom efficiency but also reduces the workload of teachers. Diversified teaching forms and interactive experiences increase the interest of the classroom and further stimulate students' interest in learning. For students, AI teaching provides rich and colorful resources, including videos, movies, music, etc., which are updated in time and close to life, and can maintain the freshness of students' learning. Students can choose exercise content according to their level, and find learning loopholes through instant feedback to meet

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personalized learning needs. In addition, AI teaching reduces the anxiety in the traditional classroom, and students can practice in a stress-free environment to improve their self-confidence [6].

3. Existing Problems

The rapid development of AI teaching has brought opportunities for today's education, but it also faces significant challenges.

3.1. Insufficient Support for Educational Resources

The lack of educational resource support is an important challenge facing current AI teaching. First, in terms of government funding, although the state has certain policy support in promoting education informatization and intelligence, these funds are often difficult to fully cover all colleges and universities. Many colleges and universities prefer to support traditional academic research in the allocation of funds, rather than invest a large amount of funds in the field of AI teaching. This uneven distribution of funds has led to obvious deficiencies in the allocation of AI teaching equipment and resources in many colleges and universities. Secondly, regional differences are also a problem that cannot be ignored. In the first-tier cities, students can enjoy more advanced AI teaching resources and facilities due to the state's key support and sufficient resource investment. However, in remote cities and regions, education resources themselves are relatively scarce, and local financial capacity constraints make it difficult for colleges and universities in these regions to obtain sufficient support to carry out AI teaching. This imbalance of educational resources not only affects students' learning experience, but also further aggravates the problem of educational equity.

3.2. Differences in Teaching Feedback

Various media technologies in the classroom of AI teaching have a positive effect on Teachers' teaching behavior; Diversified interactive methods not only implement the learner-centered concept, but also help to improve students' learning activities. However, the study found that the AI teaching environment did not change the nature of teacher-student interaction, the classroom is still teaching oriented, and students are in a passive position, and there is a lack of in-depth communication between teachers and students. However, there are significant differences in the application of teaching feedback in AI teaching, which are mainly reflected in the two different perspectives of teachers and students. For teachers, the feedback provided by the AI teaching system is usually very objective and true, with comprehensive and detailed data. Teachers can accurately grasp the learning progress and effect of each student through the students' learning behavior, performance changes, and interaction recorded by the system. This feedback based on big data not only helps teachers adjust teaching strategies in time, but also provides strong support for personalized teaching, to improve the overall teaching efficiency. For students, the effect of teaching feedback is different due to individual differences. Because each student's learning habits, interests, and abilities are different, although the AI system can provide personalized learning suggestions and feedback, it can't fully take into account each student's will and emotional factors. Some students may feel uncomfortable or stressed about the feedback of the AI system, resulting in an unsatisfactory feedback effect. In addition, students' autonomous learning ability and motivation will also affect their acceptance of feedback. Some students may prefer the traditional way of teacher-student interaction rather than relying entirely on the advice of an AI system.

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3.3. Teachers' Lack of Information Awareness and Ability

Teachers face many challenges in the process of adapting to AI teaching. These problems mainly focus on information awareness, technical ability, teaching interaction, and the motivation of classroom change. First of all, teachers' investment in teaching reform is insufficient, which leads to the failure to give full play to the potential of AI-assisted teaching. Many teachers are still used to the traditional "teaching-oriented" mode, lack the awareness and action of interaction with students, and the form of interaction is single, and fail to make full use of the diversified interaction methods provided by AI technology. The limitations of this teaching mode make it difficult to reflect the advantages of AI teaching, and students' learning experience and effect are also limited.

Secondly, teachers' unskilled operation of AI technology is a common problem. Many teachers lack the necessary technical training and operation experience, and are unable to skillfully use AI teaching tools and platforms. Even if the school is equipped with advanced AI teaching equipment, teachers may not be able to give full play to its functions due to unskilled operation, and cannot even solve problems in time in the process of use. This lack of technical ability not only affects the actual effect of AI teaching, but also weakens teachers' confidence and enthusiasm in AI teaching.

In addition, teachers' use of AI functions is mainly focused on the basic function of "optimizing information presentation", while the use effect of other more complex and advanced functions (such as personalized learning analysis, real-time feedback, etc.) is poor, resulting in the overall effect of AI teaching not reaching the expectation.

Finally, teachers' motivation and awareness of classroom change are weak, which is also a major obstacle to the promotion of AI teaching. Many teachers hold a conservative attitude towards AI teaching and are unwilling to try new teaching methods. This sense of conservatism can be attributed to the dependence on traditional teaching methods, as well as the unfamiliarity and worry about new technologies. Teachers believe that the introduction of AI teaching will increase the extra workload, or worry about the complexity of technical operation, resulting in the teaching effect not as expected. This psychological resistance makes many teachers hold a wait-and-see attitude towards AI teaching, and even refuse to try. Classroom interaction is mostly limited to the preset question and answer session between teachers and students, lacking in-depth teaching transformation, and failing to make full use of the innovative teaching methods provided by AI technology.

4. Improvement Measures

4.1. Improving Educational Resources

The balanced distribution and quality improvement of educational resources an important cornerstones to promote educational equity. At the national level, the government should formulate a long-term education informatization development strategy and set up a special fund for the R&D and application of educational technology. Specifically, a "special subsidy for education informatization construction" can be established to focus on supporting the digital infrastructure construction of schools in the central and western regions and rural areas to ensure that every student can enjoy high-quality educational resources. At the same time, it should improve the distribution mechanism of educational resources, establish a unified national platform for sharing educational resources, realize the cross-regional flow of high-quality courses and teaching resources, and narrow the gap between urban and rural education.

As important bearers of educational resources, colleges and universities should take the initiative to undertake the responsibility of promoting educational modernization. On the one hand, colleges and universities can establish "ai+education" research centers to carry out innovative research on intelligent education technology, and translate the research results into practical teaching applications;

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on the other hand, through the "University counterpart support plan", they can organize excellent teachers' teams to develop high-quality online courses, which are open and shared to areas lacking educational resources. In addition, colleges and universities should also strengthen teachers' information literacy training and improve teachers' ability to use AI technology in teaching.

The strength of all sectors of society can not be ignored. Enterprises can donate intelligent teaching equipment and provide technical support through the "education public welfare plan"; Educational technology companies can develop personalized learning platforms that meet the needs of different regions; Nongovernmental organizations can carry out educational volunteer projects to provide teachers' support in remote areas. Only when the government, universities, and society form a joint force can it truly realize the balanced development of educational resources, so that every child can enjoy fair and quality education.

4.2. Improve Education Feedback

In today's education environment, the application of an AI teaching feedback system provides new possibilities for personalized education. However, to give full play to its advantages, it needs to build a more perfect and attractive feedback mechanism, so that students can actively participate and cooperate. First, the feedback mechanism should break through the traditional single evaluation mode and adopt diversified presentation methods. For example, a game-based scoring system can be designed to visualize learning progress, so that students can get instant feedback and rewards by completing learning tasks, to stimulate learning motivation [7]. Secondly, the feedback content needs to be more constructive and targeted. An AI system can combine students' learning data to provide personalized learning suggestions and improvement programs, rather than simple right and wrong judgment. For example, for errors in solving mathematical problems, the system not only points out where the errors are, but also analyzes the types of errors, and provides corresponding knowledge points and exercises on similar topics.

In addition, the role of teachers is still crucial in the AI feedback system. Teachers should act as a bridge between the AI system and students to help students understand the feedback information and make personalized learning plans. Regularly have face-to-face communication with students, understand their learning feelings and difficulties, and adjust AI feedback strategies in time. At the same time, establish a two-way feedback mechanism to encourage students to put forward suggestions for improvement of the AI feedback system, to continuously optimize the system. Finally, schools can establish an "Ai+teachers" collaborative work mechanism, combining the accurate data analysis of AI with the humanistic care of teachers to jointly promote the comprehensive development of students [8]. Through this multi-party collaborative feedback mechanism, it can truly teach students according to their aptitude and improve the teaching effect.

4.3. Improve Teachers' Information Awareness and Ability

With the rapid development of artificial intelligence technology, improving teachers' information awareness and ability has become an important task to promote the modernization of education. At present, many teachers are "afraid to use, unable to use, and unwilling to use" AI teaching tools, which not only affects the improvement of teaching efficiency, but also restricts the overall progress of education quality. Therefore, it is necessary to establish a systematic mechanism to improve teachers' information literacy, and help teachers break through technical barriers and realize the transformation and upgrading of teaching ability through multi-level training and practical activities.

First, schools should establish a "leading mechanism for key teachers" and select a group of teachers with the foundation in information technology as leaders to focus on training. Let them have an in-depth understanding of the latest developments and application cases of AI education. After

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returning to school, they can organize "AI+education" workshops to share advanced experience with other teachers through case sharing, practical demonstration and other forms. At the same time, the school can set up a "technological innovation teaching award" to encourage teachers to actively explore the application of AI in teaching.

Secondly, it is very important to build a systematic training system. Schools can cooperate with educational technology majors and educational technology enterprises in Colleges and universities to develop training courses for teachers of different disciplines and ages. The training content should include the basic knowledge of AI technology, the operation of intelligent teaching platform, data analysis and application and other dimensions. The training form can be a combination of online and offline, and set up compulsory courses and elective courses to meet the personalized needs of teachers. For example, special courses such as "AI-aided instructional design", "intelligent classroom management", "learning data analysis and application" can be offered.

Moreover, establish a normalized practice support mechanism. Schools can set up an "AI teaching innovation laboratory" to provide a practice platform and technical support for teachers. Through the organization of "Ai teaching open class", "intelligent teaching case evaluation" and other activities, teachers are encouraged to apply the knowledge they have learned to practical teaching. At the same time, a teachers' mutual learning community is established, and teaching experience exchange and technical issues are regularly carried out to form a good learning atmosphere.

In addition, it is also essential to improve the incentive mechanism. Schools can incorporate AI teaching ability into the teacher assessment system and set up special funds to support teachers in carrying out AI teaching research. For teachers who have outstanding performance in the application of AI teaching, appropriate preference can be given in terms of professional title evaluation, excellence evaluation, etc. At the same time, the "AI teaching tutorial system" is established to let experienced teachers guide novice teachers and form a benign interaction [9].

Finally, strengthen inter-school exchanges and cooperation. Schools can establish a regional "AI Education Alliance" and regularly organize teaching observation and experience sharing activities. Through the "pair assistance" plan, schools with a high informatization level can help relatively backward schools and achieve common progress. At the same time, teachers are encouraged to participate in Cross School Teaching and research activities, broaden their horizons, and improve their abilities. Only through systematic training, continuous practice support, and effective incentive mechanisms can teachers' information awareness and ability be truly improved, and AI technology become an important force to promote education reform. This requires not only the efforts of schools, but also the policy support of education authorities and the technical support of Education Technology enterprises, to jointly build a good education informatization ecosystem [10].

5. Conclusion

Through the case study of AI classroom teaching in Colleges and universities, it is found that the construction of AI classroom teaching and learning space significantly improves students' learning efficiency and innovation ability, and integrates teaching resources through digital means, making personalized learning possible. The application of a classroom behavior intelligent algorithm not only improves students' learning efficiency, but also promotes students' learning quality. In addition, the successful practice of AI integration has proved that the close combination of theoretical knowledge and practical skills is the key to cultivating high-quality technical talents. The participation of colleges and universities in the design and training projects not only improves the teaching quality, but also enhances the students' professional quality and makes them better adapt to the needs of the employment market. In the direction of future development, it should strengthen policy guidance, increase investment in smart learning spaces in Colleges and universities, and promote technology update and education mode innovation. At the same time, it should strengthen teacher training,

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improve teachers' digital literacy, and make it the main force to promote smart classrooms. Deepen school enterprise cooperation and explore more flexible cooperation modes to meet the diversified needs of industrial development. The practice in the smart learning space in Colleges and universities shows the potential of educational modernization, and also provides a new path for the development of higher education in China.

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