

Research on the Application of Intelligent Assisted Teaching System in Personalized Learning



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ABSTRACT: This study explores the application of intelligent assisted teaching systems in personalized learning. By analyzing the problems existing in the current education model and combining advanced information technology, an intelligent assisted teaching system is proposed. This system can provide customized learning plans and resources for students based on their personalized needs and learning situations. The research results indicate that the system has significant effects in improving learning efficiency and personalized education. The system also integrates interactive learning and real-time feedback functions, providing students with a richer and more interesting learning experience. The intelligent assisted teaching system has broad application prospects in personalized learning, which helps to improve the quality of education and teaching, promote student growth and development.

KEYWORDS: Intelligent assisted teaching system, Personalized learning, Teaching effectiveness, learning motivation, Learning interests, Education reform, Learn data analysis, Customization of learning resources

I. INTRODUCTION

With the continuous development and progress of society, the field of education is also facing increasing challenges and problems. The traditional education model often adopts a "one size fits all" teaching approach, ignoring the individual characteristics and learning styles of each student. This has led to severe differentiation among students, with some students feeling bored due to the teaching content being too simple, while others may feel frustrated due to the content being too difficult to understand. This teaching model cannot meet the personalized learning needs of students, leading to a decline in learning effectiveness and a decrease in student learning motivation.

Therefore, there is an urgent need to research and apply intelligent assisted teaching systems to solve this problem. Intelligent assisted teaching systems can provide personalized learning content and teaching methods to learners based on their personality and interests, thereby better meeting their learning needs. This system can dynamically adjust teaching content and methods based on students' learning situation and feedback information, making teaching more targeted and effective. At the same time, intelligent assisted teaching systems can also provide valuable data and information for teachers, helping them better understand the learning situation and needs of students, and thus better guide teaching practices.

Studying the application of intelligent assisted teaching systems in personalized learning can not only improve the shortcomings of traditional education models, but also enhance teaching effectiveness and student learning motivation. Through personalized learning content and methods, students can better develop their potential, enhance their confidence and interest in learning. At the same time, teachers can better leverage their professional advantages and stimulate students' enthusiasm and motivation for learning. In this way, the education system will be healthier and more proactive, promoting the comprehensive development of students and social progress.

Therefore, it is necessary and important to study the application of intelligent assisted teaching systems in personalized learning. This will help break the rigidity of traditional education models, promote the development of personalized learning for students, and provide strong support for the progress and development of education. I hope that through this research, new ideas and methods can be brought to the field of education, promoting education reform and innovation, and making education truly an important force in promoting social development and personal growth.

This study aims to explore the application of intelligent assisted teaching systems in personalized learning, in order to provide useful references and insights for improving teaching effectiveness and promoting student learning interest.

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Traditional teaching methods have many shortcomings, such as a one size fits all teaching model and teaching plans that cannot meet the personalized needs of students. With the continuous development of information technology, intelligent assisted teaching systems have brought new possibilities to the field of education. By analyzing and identifying personalized learning needs of students, intelligent assisted teaching systems can tailor learning plans and resources for each student, thereby improving teaching effectiveness and meeting their learning needs.

Personalized learning is a hot topic in the current field of education, as each student has a unique learning style, interest, and ability. Traditional teaching models often struggle to meet these diverse learning needs, while intelligent assisted teaching systems can collect and analyze student learning data through technological means, and provide personalized learning services for students based on this data. Through interaction and feedback with students, intelligent assisted teaching systems can continuously optimize learning resources and course design to adapt to the constantly changing learning needs of students.

The intelligent assisted teaching system can also help teachers better understand the learning situation and progress of students, and provide timely feedback and adjustment for the teaching process. By analyzing students' learning data and performance, teachers can better grasp their learning status and needs, adjust teaching content and methods in a timely manner, and improve teaching effectiveness and student learning interest.

Overall, this study aims to explore the application of intelligent assisted teaching systems in personalized learning, in order to provide new ideas and methods for the field of education and teaching. Through the research and exploration of intelligent assisted teaching systems, we hope to promote educational reform, improve teaching effectiveness, and promote student interest in learning, contributing to the development of the education industry.

II. LITERATURE REVIEW

A. *The definition of intelligent assisted teaching systems*

Intelligent assisted teaching system is an educational tool based on artificial intelligence technology, aimed at improving teaching efficiency and quality, and achieving personalized learning. It provides personalized learning content and paths based on the learning situation and needs of students by collecting and analyzing their learning data. The intelligent assisted teaching system can automatically generate teaching resources and plans suitable for students based on their learning style and level. At the same time, it can also monitor students' learning progress and performance, timely identify learning problems, and provide targeted assistance and guidance.

Intelligent assisted teaching systems play an important role in the teaching process. It can provide personalized learning content and goals based on the learning situation and needs of students, helping them better understand and master knowledge. Intelligent assisted teaching systems can adjust teaching methods and content in a timely manner based on students' learning performance, provide targeted teaching feedback, help students overcome learning difficulties, and improve learning outcomes. The intelligent assisted teaching system can also provide data support for teachers, help them understand the learning situation of students, optimize the teaching process, and improve teaching efficiency.

In terms of personalized learning, intelligent assisted teaching systems play an important role. By collecting and analyzing student learning data, intelligent assisted teaching systems can gain a deeper understanding of their learning characteristics and needs, tailor learning plans for each student, and achieve personalized learning. The intelligent assisted teaching system can provide different learning resources and paths for different students, meeting the learning needs and styles of each student. In this way, it can better stimulate students' interest in learning, promote their learning motivation, and improve learning outcomes.

Intelligent assisted teaching systems play an important role in the teaching process, improving teaching efficiency and quality, and achieving personalized learning. With the continuous development and popularization of artificial intelligence technology, intelligent assisted teaching systems will play an increasingly important role in the future education field, bringing better learning experiences and teaching effects to teachers and students.

B. *Classification of intelligent assisted teaching systems*

The intelligent assisted teaching system aims to use advanced technological means to provide students with personalized and efficient learning experiences. According to different technologies and teaching theories, intelligent assisted teaching systems can be classified into various types.

A common classification method is based on technology, which mainly includes systems based on artificial intelligence, systems based on big data, and systems based on virtual reality technology. Artificial intelligence based systems provide personalized learning content and suggestions for students by analyzing their learning behavior and performance. For example, intelligent navigation systems can automatically adjust learning paths and difficulties based on students' learning progress and abilities. A big data based system collects and analyzes a large amount of learning data, mining students' learning preferences and habits, and pushing learning resources that meet their interests and needs. And systems based on virtual reality technology can simulate real learning scenarios, providing an immersive learning experience, allowing students to learn in an immersive way.

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Another classification method is based on teaching theory, which mainly includes systems based on cognitive psychology, systems based on constructivism, and systems based on behaviorism. A system based on cognitive psychology focuses on the thinking process and cognitive structure of students, providing corresponding learning support by analyzing their learning methods and problem-solving abilities. Constructivist systems emphasize the process of constructing knowledge for students, encouraging them to jointly construct knowledge structures through practice and cooperation. Behavioral systems focus on motivating students to engage in goal-oriented learning, guiding their behavior and learning motivation through reward and punishment mechanisms.

Overall, different types of intelligent assisted teaching systems have their own characteristics and advantages, and suitable systems can be selected for application based on the learning needs and characteristics of students. With the continuous development of technology and the continuous improvement of educational theory in the future, the application prospects of intelligent assisted teaching systems will be broader, providing more effective support and assistance for personalized learning.

C. The characteristics of intelligent assisted teaching systems

The intelligent assisted teaching system is a teaching tool based on artificial intelligence technology, which has many unique characteristics [6]. The intelligent assisted teaching system has personalized learning ability. The system can customize learning content for each student based on their learning habits, interests, learning abilities, and other personal characteristics, helping them learn more effectively. The intelligent assisted teaching system has real-time monitoring and feedback functions. The system can monitor students' performance in real-time during the learning process, provide timely feedback and suggestions, help students adjust learning strategies in a timely manner, and improve learning effectiveness. The intelligent assisted teaching system also has the characteristic of strong interactivity. The system not only provides rich and diverse learning resources, but also promotes interaction between students and knowledge through interactive learning methods, thereby better understanding and mastering knowledge.

In addition, the intelligent assisted teaching system also has the characteristic of intelligent learning path planning. The system can automatically adjust the learning path based on the learning progress and level of students, providing them with the most suitable learning content and teaching methods, and helping them achieve learning goals more efficiently. The intelligent assisted teaching system also has the characteristics of automated evaluation and analysis of learning data. The system can automatically generate student learning data reports, helping teachers and students to have a more comprehensive understanding of the learning situation, adjust teaching plans in a timely manner, and improve learning effectiveness.

The characteristics of intelligent assisted teaching systems include personalized learning ability, real-time monitoring and feedback function, strong interactivity, intelligent learning path planning, automated evaluation and analysis of learning data, etc. These characteristics make intelligent assisted teaching systems a powerful educational tool, providing students with a more efficient and personalized learning experience.

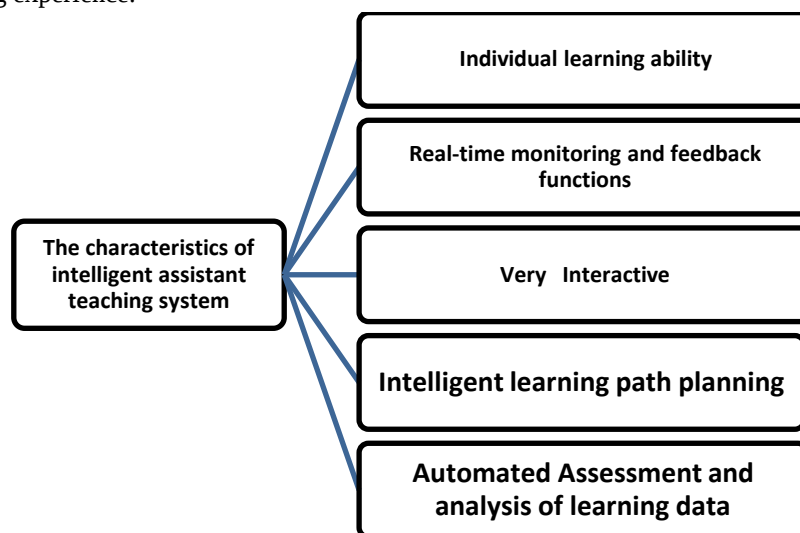


Figure 1: Characteristics of Intelligent Assisted Teaching System

III. PERSONALIZED LEARNING CONCEPT

In the current era of information explosion, learners are increasingly diversified in their channels of obtaining information and knowledge. Therefore, traditional teaching methods are no longer able to meet the needs of personalized learning. Personalized learning is an intelligent and customized learning method based on the individual characteristics, learning style, interests, and learning motivation of learners. Through personalized learning, learners can be more autonomous in choosing learning content and paths, improving learning motivation and effectiveness.

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The importance of personalized learning is mainly reflected in the following aspects: personalized learning can better meet the needs of learners. Different learners have different learning characteristics and goals, and traditional one size fits all teaching cannot meet the needs of all learners. Through personalized learning, personalized customization can be made based on the actual situation of learners, enabling them to be more focused and actively involved in the learning process.

Personalized learning can enhance the learning interest and effectiveness of learners. The traditional teaching method often involves imparting knowledge in a single area, and learners lack a sense of participation and interest, making it easy for them to give up learning. Through personalized learning, intelligent matching can be made based on the interests and learning styles of learners, improving their learning enthusiasm and effectiveness.

Personalized learning can promote learners' independent development and innovation ability. Personalized learning emphasizes the subjectivity of learners, advocates for active exploration and practice in the learning process, cultivates learners' independent thinking and problem-solving abilities, and promotes their comprehensive development and innovation abilities.

Personalized learning is the trend and direction of future education, with important significance and role. The application research of intelligent assisted teaching systems in personalized learning helps to improve teaching quality and learning effectiveness, promote the transformation and innovative development of educational models.

Table 1: The importance of personalized learning

Aspects	Importance
Meet the high needs of learners	high
Improving the learning interest and effectiveness of learners	very high
Promoting learners' autonomous development and innovative abilities	extremely high

IV. THE APPLICATION OF INTELLIGENT ASSISTED TEACHING SYSTEM IN PERSONALIZED LEARNING.

A. Design principles of personalized learning systems

The design principles of personalized learning systems should follow the following key principles. The system needs to establish a comprehensive student profile, including information on students' learning history, interests, learning styles, and other aspects, so that the system can accurately understand each student. The system should be able to automatically adjust teaching content and progress according to the learning characteristics and needs of students, and tailor learning plans for each student.

Personalized learning systems also need to have flexibility and adaptability, which can continuously adjust teaching strategies based on student learning performance and feedback information, making the learning process more efficient and effective. Personalized learning systems should be able to provide diverse teaching resources and learning activities to meet the learning needs of different students, stimulate their interest and initiative in learning.

In personalized teaching design, teachers also play a crucial role. The intelligent assisted teaching system should be able to fully utilize the professional knowledge and experience of teachers, and work together with them to develop personalized learning plans to promote student learning outcomes. At the same time, the system should also provide real-time teaching support and feedback information for teachers, helping them better grasp the learning situation of students and adjust teaching strategies in a timely manner.

In general, the design principles of personalized learning systems should be based on the individual differences and needs of students, with the goal of providing targeted teaching services, fully leveraging the advantages of intelligent assisted teaching systems in personalized teaching, and providing students with more effective and personalized learning experiences. With the continuous development and application of intelligent technology, it is believed that personalized learning systems will bring greater changes and breakthroughs to education and teaching in the future, providing more and better support and guidance for students' learning.

B. Practical application cases of personalized learning systems

When studying the application of intelligent assisted teaching systems in personalized learning, it is necessary to deeply explore the specific performance and effects of personalized learning systems in practical application cases. An important aspect is how to provide personalized learning content and auxiliary teaching services for students based on their learning characteristics and needs. By analyzing and modeling student learning data, a more effective personalized learning system can be designed to enhance learning effectiveness and experience.

A key issue in personalized learning systems is how to assess students' learning status and progress, in order to provide them with appropriate learning resources. This involves modeling and predicting learning states, which can be achieved through mathematical models and algorithms. One common method is to use Bayesian networks to model the learning state of students, and update the probability distribution of student states by observing data. Specifically, the following Bayesian formula can be used to calculate the learning state of students at time t :

$$P(S_t|O_1, O_2, \dots, O_t) = \frac{P(O_t|S_t)P(S_t|O_1, O_2, \dots, O_{t-1})}{P(O_t|O_1, O_2, \dots, O_{t-1})}$$

Through such learning status assessment, personalized learning systems can more accurately understand students' learning needs and provide them with more effective learning support.

V. CONCLUSION

Intelligent assisted teaching systems play an important role in personalized learning, meeting the learning needs of students through personalized learning content and teaching methods, and improving learning effectiveness and student interest. The design of personalized learning systems should focus on the individual differences and needs of students, provide targeted teaching services, and fully utilize the professional knowledge and experience of teachers to jointly develop personalized learning plans, improve teaching quality and learning effectiveness. With the continuous development of technology and the continuous improvement of educational theory, the application prospects of intelligent assisted teaching systems will be broader, providing more effective support and assistance for personalized learning. By studying the application of intelligent assisted teaching systems in personalized learning, we can promote the transformation and innovative development of educational models, and provide more and better support and guidance for students' learning. This study aims to explore the application of intelligent assisted teaching systems in personalized learning, in order to provide useful references and insights for improving teaching effectiveness and promoting student learning interest. I hope that through this research, new ideas and methods can be brought to the field of education, promoting education reform and innovation, and making education truly an important force in promoting social development and personal growth.

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