Research on the Innovative Teaching Model of Information Technology in Middle School based on Artificial Intelligence Technology

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Abstract: With the rapid development of science and technology, artificial intelligence has gradually been integrated into all aspects of people's lives. Especially in the field of education, artificial intelligence has brought unprecedented innovative opportunities for middle school information technology teaching. An in-depth discussion on how this innovative model can help students cultivate information literacy is an important measure to promote the professional development of teachers and meet the development needs of middle school students in the new era. Based on this, this paper first analyzes the relationship between artificial intelligence technology and information technology teaching in middle school, as well as the practical significance of innovative information technology teaching in middle school based on artificial intelligence technology, and then puts forward feasible new teaching mode to provide a reference for peers.

Keywords: Artificial intelligence technology; Middle school; Information technology teaching; Innovation; Pattern

1. Introduction

The introduction of artificial intelligence technology has brought about subversive changes to the traditional teaching method of information technology that often focuses on the teaching of theoretical knowledge. Through the integration of artificial intelligence elements, teachers can adjust the teaching content in real-time according to the learning situation of students and realize personalized teaching. This not only stimulates the student's interest in learning but also effectively improves the teaching effect, which is one of the mainstream directions of information technology teaching innovation in contemporary middle schools.

2. The relationship between artificial intelligence technology and information technology teaching in middle school

Artificial intelligence technology provides a new perspective and teaching method for middle school information technology teaching. Traditional information technology courses mostly focus on basic

programming and computer principles, while the introduction of artificial intelligence gives students more opportunities to explore more advanced and practical technology fields. The application of artificial intelligence technology can not only stimulate students' interest in learning but also cultivate their innovation ability and problem-solving ability. More importantly, artificial intelligence technology can help teachers better evaluate the progress and effect of students' learning. Through machine learning and big data analysis, teachers can more accurately grasp students' learning status to provide them with more targeted teaching guidance. At the same time, AI technology has also brought challenges to information technology teaching in middle schools. Among them, how to present professional knowledge such as complex algorithms and big data in a way suitable for middle school students to understand is a huge task. Teachers need to constantly improve their professionalism and update their teaching content and methods to adapt to this change. In the teaching of information technology in middle school, the advantages of artificial intelligence technology should be fully utilized to cultivate students' information literacy and scientific and technological innovation ability, and attention should be paid to avoiding over-complication of technology to ensure that students can truly understand and master the core principles and application methods of artificial intelligence technology in the learning process [1].

3. The practical significance of innovating information technology teaching model in middle school based on artificial intelligence technology

With the rapid development of science and technology, artificial intelligence technology has been integrated into all aspects of people's lives. Middle school information technology teaching model is also experiencing this unprecedented change. The innovation based on artificial intelligence technology has not only improved the quality and efficiency of information technology teaching but also promoted the development of educational equity and personalized education on a deep level. First of all, artificial intelligence technology provides more abundant teaching resources for information technology teaching in middle schools. Traditional information technology courses are limited to a certain extent by textbooks and teachers' knowledge reserves, but artificial intelligence technology can provide customized learning resources for students according to their learning conditions, making learning more accurate and efficient [2]. Secondly, artificial intelligence technology provides more intelligent teaching assistance for information technology teaching in middle schools. Through artificial intelligence technology, teachers can grasp students' learning situations more accurately, adjust teaching strategies in time, and improve teaching effect. At the same time, artificial intelligence technology can also assist teachers in completing some repetitive tasks, so that teachers have more time and energy to pay attention to the personalized needs of students. Finally, the application of artificial intelligence technology helps to cultivate students' innovative abilities and critical thinking. In the environment of artificial intelligence, students can have access to the latest technology and cultivate their ability to solve practical problems through practical operation [3]. As the challenges and problems brought by artificial intelligence technology increase, the use of critical thinking to think and judge will be a necessary quality in the future society. It is an important task for contemporary teachers to innovate the information technology teaching mode in middle schools based on artificial intelligence technology [4].

4. The new teaching model of information technology in middle school based on artificial intelligence technology

4.1. Strengthen the teaching of artificial intelligence by combining network resources

In the traditional teaching model, teachers usually use lectures and demonstrations to teach. Although this

way can let students understand some basic knowledge and skills, it is difficult to stimulate students' learning enthusiasm and initiative. Building a new middle school information technology teaching model based on artificial intelligence can make full use of network resources, through a variety of ways to teach, to better stimulate students' learning interest and initiative. For example, in the lesson on data analysis and visualization, teachers can make use of network resources to collect some actual data analysis cases, so that students can master relevant skills through practical operations [5]. First, teachers need to search for some practical data analysis cases, which can come from various fields, such as finance, medical treatment, education, and so on. Using these actual data as learning materials, students can explore how to collect, organize, clean, and analyze data to understand the basic process of data analysis. Secondly, teachers should use some visualization tools, such as Excel, Tableau, and so on, to guide students to visually present the results of data analysis. Visualization is an important part of data analysis, as it can present the data in an intuitive way to help students better understand the data. Thirdly, teachers guide students to make use of artificial intelligence technology for data analysis. Specifically, teachers can guide students on how to use machine learning algorithms to classify and cluster data, so that students can understand the application of artificial intelligence technology in data analysis [6]. Finally, according to the learning progress of students, students can be organized to have group discussions and sharing, so that students can exchange learning experiences. Guiding students to learn the knowledge of data analysis and visualization through the above four steps can not only help students master the relevant skills of data analysis, but also cultivate students' innovative thinking and practical operation ability, laying a solid foundation for their future development [7].

4.2. Activate learning interest with the help of application scenarios

In today's society, artificial intelligence technology is changing rapidly, so the teaching of information technology in middle schools needs to keep pace with time. Methods to use the application scenario to activate students' interest in learning to improve the teaching effect should be considered. Taking the lesson "Feel the Charm of Artificial Intelligence" as an example, teachers can optimize the teaching model as follows. First, teachers need to make their teaching goals clear [8]. This course aims to let students understand the basic concepts, development, and application fields of artificial intelligence, and stimulate students' interest and enthusiasm for artificial intelligence technology. To achieve this goal, the way of introducing application scenarios can be adopted to enhance the life and vividness of the teaching process. A variety of application scenarios specific to the teaching process can be designed to combine theoretical knowledge with practical operation so that students can personally experience the charm of artificial intelligence technology. For example, the author guides students to use voice assistants to complete classroom question-and-answer interactions, or to use machine learning platforms for simple data classification. Through practical operations, students can more intuitively understand the working principle and application value of artificial intelligence technology. Based on students' understanding of artificial intelligence, the author encourages them to design unique application scenarios of artificial intelligence technology according to their interests and imagination [9]. Some students designed a smart home control system to realize remote control of home appliances through voice recognition and automation technology. Some students designed an intelligent navigation robot for the campus, which has automatic positioning, campus map navigation, information query, and other functions. Another student designed a machine learning-based scoring system for works of art, which gives objective evaluations by analyzing the style and technique of the work. In this process, students need to make full use of their knowledge of programming and data processing to realize functions and solve problems. When their work can provide services as envisaged, the sense of achievement makes them interested in artificial intelligence [10].

4.3. Optimize the evaluation model and promote the intelligent development of teaching

The traditional teaching evaluation model is often based on examination results, which makes it difficult to fully reflect students' learning situations and development potential. To better adapt to the development situation and students' development needs in the era of artificial intelligence, middle school information technology course teachers should optimize the evaluation model to further realize the intelligent development of teaching mode [11]. First of all, teachers need to make clear the goal of evaluation. In other words, in the process of teaching evaluation, they should pay attention to the development of students' practical operation ability, problem-solving ability, innovative thinking, and other qualities besides students' knowledge mastery. Secondly, while making the evaluation model include multiple dimensions, it is also necessary to promote the diversification of evaluation methods. In addition to the traditional test scores, they can also use a variety of ways to evaluate students' learning, such as work evaluation, oral expression, group discussion, and self-evaluation. These evaluation methods can reflect students' abilities more objectively and comprehensively, help teachers accurately grasp the needs of intelligent teaching implementation, and at the same time stimulate students' enthusiasm and improve their interest in learning [12]. Thirdly, teachers need to use intelligent technology to assist evaluation. Traditional evaluation methods are often limited by human resources, time, and other factors, so it is difficult to achieve comprehensive and accurate results. Fortunately, with the rapid development of artificial intelligence technology, the emergence of intelligent evaluation tools has brought new possibilities to the field of information technology teaching. Intelligent evaluation tools can track, record, and analyze students' learning performance in real-time. These data can not only provide teachers with an accurate and scientific evaluation basis but also help students understand their learning status more clearly. For example, some intelligent learning platforms analyze students' learning behavior on the platform based on learning time, learning efficiency, answer rate, and other aspects, evaluate students' learning status, and provide targeted feedback for teachers. Finally, teachers need to guide students to view the evaluation results correctly. Evaluation is not an end, but a means. Through reasonable evaluation, students can better understand their learning status and find their shortcomings, to better improve their learning results [13].

4.4. Open up an online classroom and strengthen the efficiency of thinking

In the teaching of information technology in middle school, teachers are often faced with the problem of how to stimulate students' interest in learning and cultivate their innovative thinking. Especially in today's rapidly changing artificial intelligence technology, how to combine this frontier technology with teaching, open up an online classroom for students, and improve their thinking efficiency, is the topic that teachers need to think deeply about. Combined with the author's practical experience, this paper takes the "binary tree" lesson as an example to explore the middle school information technology teaching mode based on artificial intelligence technology [14]. First of all, teachers need to make it clear that the online class is not a simple and direct extension of the first class, but a complementary existence. In the "Binary Tree" lesson, the traditional classroom teaching tends to focus on the transfer of theoretical knowledge, while the online classroom allows students to deepen their understanding in practical practice. The teaching model of information technology in middle school based on artificial intelligence technology is exactly such an online classroom that can provide practical opportunities. By guiding students to use artificial intelligence technology for the construction of binary trees, traversal, and other operations, students can find problems in practice and solve problems, to cultivate their innovative thinking and problem-solving abilities. Secondly, artificial intelligence technology provides infinite possibilities for middle school information technology teaching. Teachers can use these technologies to build a simulated binary tree environment for students to explore and practice in it. For example, the teacher guides students to

build a binary tree with their own hands, and through observation and operation, they can deeply understand the nature and algorithm of the binary tree. Finally, the teacher uses artificial intelligence technology for data analysis and visualization to help students understand the structure and characteristics of binary trees more intuitively. Data analysis and visualization can help students understand the properties of binary trees more deeply and better master the relevant algorithms. In the process of pursuing higher teaching efficiency, teachers should be good at building the online classroom based on artificial intelligence technology in this way, so that students can understand knowledge more intuitively through practical operation and data analysis, strengthen thinking efficiency, and avoid their rote memorization of abstract concepts [15].

5. Conclusion

To sum up, it is of great practical significance to innovate a middle school information technology teaching model based on artificial intelligence technology. It can not only improve teaching quality and efficiency, promote the development of educational equity and personalized education, but also cultivate students' innovative ability and critical thinking. In the teaching of information technology in middle school, it is necessary to accurately grasp the relationship between artificial intelligence technology and teaching to improve teaching efficiency by introducing network resources, application scenarios, project-based teaching process, opening up an online classroom, optimizing evaluation model, and other measures.

Disclosure statement

The author declares no conflict of interest.

References

[1] Niu WJ, 2023, Student-oriented and Comprehensive Development: Optimization Strategy of Information Technology Teaching in High School. Contemporary Family Education, 2023(22): 21–23.

[2] Yi YQ, 2023, Thoughts on Thinking Guidance in Information Technology Teaching. Chinese Times (Principal), 2023(11): 143–144.

[3] Xu L, 2023, "Thinking" Blossoming along the Way: Exploration and Practice of Training Computational Thinking Based on Information Technology Classroom. New Wisdom, 2023(31): 30–32.

[4] Sun S, 2023, Research on Innovation of Teaching Methods of Information Technology under the Background of Network Era. Journal of Studies, 2023(34): 121–123.

[5] Ma QM, 2023, Four Steps and Five Rings: New Practice of Project-based Information Technology Teaching. Education Today, 2023(11): 58–59.

[6] Pan MC, 2023, Training Strategies of Middle School Students' Computational Thinking in Information Technology Teaching in High School. College Entrance Examination, 2023(30): 144–146.

[7] Chen YF, 2023, Artificial Intelligence Adds Charm to Information Technology Teaching. Literacy and Computing, 2023(29): 131–133.

[8] Qi QF, 2023, Research on Teaching Reform of Information Technology Curriculum under the Background of Big Data Application. Computer Knowledge and Technology, 19(29): 163–165.

[9] Zhao JP, 2023, The Practical Application of Artificial Intelligence in Junior High School Information Technology Teaching. Seminar on Educational Innovation Theory and Practice (2), Linxia, 2.

[10] Yao YH, 2023, Exploration of Cultivating Information Literacy in High School Information Technology Teaching.

China New Communications, 25(19): 132–134.

[11] Lin RH, 2023, Integrated Teaching of Information Technology and Artificial Intelligence in Senior High Schools under the Guidance of Top Innovative Talents. Asia Pacific Education, 2023(19): 40–42.

[12] Yuan CL, 2023, Analysis on High School Information Technology Teaching under STEM Concept. New Curriculum Teaching (Electronic Edition), 2023(18): 147–149.

[13] Qiu SF, 2023, Integrating Digital Learning Resources to Improve Teaching Efficiency of Information Technology. Literacy and Computing, 2023(27): 71–73.

[14] Zhongshan No. 1 Middle School, 2023, Cultivating Core Literacy and Stimulating Innovative Thinking: Research on Project Teaching Practice of Information Technology Artificial Intelligence Module in Junior High School. Information Technology for Education, 2023(09): 2.

[15] Qiu R, 2023, A Preliminary Study on the Teaching Structure of Information Technology Artificial Intelligence in Senior High School: Taking "Exploring Artificial Intelligence" as an Example. Teaching Reference for Middle Schools, 2023(26): 92–94.