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Research on the Application Practice of Smart Teaching Cloud Platform in High School Mathematics Teaching

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Abstract: In the context of the digital information age, the integration of information technology and education has given birth to various novel and efficient teaching models, which can accelerate the process of curriculum reform and innovation. High school mathematics teachers follow the trend of the times, organize teaching innovation with the help of smart teaching cloud platforms, and leverage the advantages and value of smart teaching cloud platforms before, during, and after class. They integrate various educational resources to reduce the difficulty of understanding mathematical knowledge, reignite students' learning enthusiasm, and break students' stereotypes of mathematics as dull and boring. This article aims to explore the application path of smart teaching cloud platform in high school mathematics teaching, and improve the effectiveness of high school mathematics classroom teaching.

Keywords: High school mathematics; Smart teaching cloud platform; Classroom teaching; Application Practice

Introduction

In the new era, high school mathematics teachers aim to promote students' comprehensive development. Based on reflecting on outdated education models, they optimize classroom design with the help of smart teaching cloud platforms, strengthen the connection between in-class and out-of-class activities, and help students develop good study habits. The integration of smart teaching cloud platform and high school mathematics classroom teaching can break through the constraints of outdated education models, create a better learning environment for students, and use the smart teaching cloud platform to integrate high-quality educational resources to drive students' self-learning in and out of class, improve students' self-learning ability, and enhance the effectiveness of high school mathematics classroom teaching.

1. Pre class: Efficiently preview with the help of intelligent teaching cloud platform

High school students face a lot of academic pressure, and the abstract nature of mathematical concepts leads to frequent problems in their knowledge learning, and some students may even develop a fear of difficulty. In response to this issue, high school mathematics teachers leverage the educational value of the intelligent teaching cloud platform by providing learning materials, uploading micro lesson videos, and assigning preview tasks before class, driving students to use fragmented time for independent preview. During this period, students carried out interactive exchanges on the online platform to share and express the problems encountered in the preview. Teachers adjusted the direction of classroom teaching after summarizing, which can improve the pertinence and effectiveness of classroom teaching. For example, in the high school mathematics textbook published by the Hunan Education Press, Chapter 4, Section 3, "Combination," of the first volume of the elective compulsory course, students are assigned preview tasks before class to stimulate their self-learning awareness and drive them to watch preview videos on the intelligent teaching cloud platform. Through the analysis of video examples, students can understand the concept of combination and the difference between combination and arrangement. Continuing to browse the preview PPT provided by the teacher, fill in the blanks of the basic concepts in the PPT, and organize the derivation of the calculation formula for combination numbers under their guidance. Deepen the understanding of combination concepts with charts, examples, and assistance. On this basis, combined with the preview content, complete and combine related preview exercises, such as multiple-choice questions, fill-in-the-blank questions, and calculation questions, to test students' preview situation and lay a solid foundation for teachers to organize teaching practice[1].

2. In class: Utilize the Smart Teaching Cloud Platform for interactive communication

Under the previous education model, high school mathematics teachers often used the method of lecturing, using rigid explanations to help students understand abstract mathematical concepts, resulting in students' understanding and mastery of mathematical knowledge floating on the surface, weak mathematical foundations, and low classroom teaching efficiency. Based on this, high school mathematics teachers actively innovate their educational concepts, using smart teaching cloud platforms to bring teachers and students closer together in knowledge sharing, organically combining online learning with offline teaching, introducing high-quality educational resources from the smart teaching cloud platform, enriching course content, broadening students' knowledge, increasing the frequency of teacher-student interaction and communication, and improving the effectiveness of classroom teaching. For example, in the high school mathematics textbook published by the Hunan Education Press, Chapter 4 "Preliminary Stereoscopic Geometry" and Section 4 "Position Relationship between Planes" are mandatory (Volume 2). In classroom learning, they are introduced through micro lesson videos on the Smart Teaching Cloud platform, focusing on the stereoscopic geometry images in the videos, guiding students to observe and think about the position relationship between planes, and encouraging them to speak freely. Continuing with the organization of learning activities around "parallel to plane" and "perpendicular to plane", assign learning tasks to drive students' independent thinking and collaborative exploration. Log in to the smart teaching cloud platform and watch the uploaded teaching videos of "parallel to plane" and "perpendicular to plane", and interact with group members to discuss and raise their own questions, carry out teacher-student interaction and communication, and bring teachers and students closer together.

Then, using a solid geometry model, demonstrate the process of determining "planes parallel to planes" and "planes perpendicular to planes", providing students with visual impact to avoid cognitive bias, and encouraging students to list cases of "planes parallel to planes" and "planes perpendicular to planes" in their daily lives, awakening students' life memories and diverging their thinking. During this period, analyzing examples can help students distinguish between the judgment process of "planes parallel to each other" and "planes perpendicular to each other", which can avoid knowledge confusion among students. On this basis, the intelligent teaching cloud platform is used to publish interactive classroom questions, such as "Determine whether the following statements are correct and explain the reasons. (1) If two planes are parallel to the third plane, then these two planes are also parallel. (2) If both planes are perpendicular to the same straight line, then these two planes also share their answers and reasons vertically." Guide students to actively participate in it, apply their learned knowledge to analyze and judge, and share their answers and reasons within the group. Inspire students through thinking collisions, modify and improve their answers based on feedback from teachers and classmates, and enhance their critical thinking. After the lecture on New Knowledge Learning, students are encouraged to use the mind map drawing tool in the Smart Teaching Cloud Platform to organize the knowledge points learned in class, namely the judgment theorems and properties of planes parallel to each other, and the judgment theorems and properties of planes perpendicular to each other, in order to solidify their mathematical foundation and improve teaching effectiveness[2].

3. After class: Review and consolidate with the help of the intelligent teaching cloud platform

In the new era, high school mathematics teachers are adapting to the trend of the times and introducing smart teaching cloud platforms to optimize teaching design, which can create a better learning environment for students. After the classroom knowledge is presented, homework learning tasks are assigned on the intelligent teaching cloud platform, and a mind map is provided for students to independently organize the knowledge they have learned, perceive the inherent connections of mathematical knowledge, and improve their mathematical knowledge system. Under the guidance of the intelligent teaching cloud platform, students can use various functions to review and consolidate their knowledge, complete relevant exercises and game challenges, and solidify their mathematical foundation to develop good study habits. For example, in the high school mathematics textbook published by the Hunan Education Press, Chapter 3 "Conical Curves and Equations", Section 2 "Hyperbolic Curves", and Lesson 2 "Simple Geometric Properties of Hyperbolic Curves" are selected as compulsory courses. During the course content learning, students are guided to review independently with the help of the Smart Teaching Cloud Platform after class, and their homework is driven to open the Smart Teaching Cloud Platform, log in to their personal account, select the "Hyperbolic Curves" section in the "Conical Curves and Equations" chapter, repeatedly watch teaching videos about the simple geometric properties of hyperbolic curves, timely identify and fill in the gaps, and draw a mind map based on the video content to sort out the content related to the simple geometric properties of hyperbolic curves, such as the standard equation, focal coordinates, vertex coordinates, asymptote equation, and eccentricity solving methods of hyperbolic curves, consolidating their mathematical foundation.

For example, in the high school mathematics textbook published by the Hunan Education Press, Chapter 4 "Counting Principles",

Section 1 "Two Counting Principles", and Lesson 1 "Classification and Addition Counting Principles" of the first volume of the elective compulsory course are reviewed independently after class. Starting from the basic knowledge, the "Classification and Addition Counting Principles" section is selected on the Smart Teaching Cloud Platform, and teaching videos uploaded by teachers and classroom teaching PPTs are reviewed to consolidate the learned content in a timely manner. Next, immerse yourself in the "Mathematical Games" module of the platform, select games related to classification and counting, and the system will provide multiple counting problems. Students will choose the correct classification method within the specified time and calculate the total number of methods to win the game. For example, if there are 20 students in a class, 10 of whom like basketball, 8 like football, and 5 like both, how many students like at least one of the ball sports? "Students carefully review the questions, quickly identify and classify the counting problems, add up students who like basketball, students who like football, and students who like both, and efficiently complete the problem solving. Due to the varying levels of mathematical proficiency among students, teachers can use the Smart Teaching Cloud platform to carry out hierarchical mathematical challenges in post class review, encouraging students to actively participate and improve their self-awareness level through competition. After playing games and challenges, reflect on oneself and identify personal weaknesses through the collection of incorrect questions on the intelligent teaching cloud platform, and promptly identify and fill in any gaps[3].

4. Conclusion

In summary, under the background of the new curriculum reform, new requirements have been put forward for high school mathematics classroom teaching. Mathematics teachers continuously innovate and practice based on policy guidance to make up for the shortcomings of previous education and teaching, and create a better learning environment for students. The practical application of smart teaching cloud platform in education and teaching can bring students a refreshing feeling, reignite their learning enthusiasm, and enhance their learning motivation. Therefore, mathematics teachers leverage the advantages of the smart teaching cloud platform to carry out pre-class, in-class, and post-class teaching design. Before class, they integrate learning materials and assign preview tasks. During class, they use the smart teaching cloud platform to strengthen teacher-student interaction and communication. After class, they assign review tasks and provide exercise exercises to drive students to review and consolidate in a timely manner under the guidance of interest, and help students develop comprehensively.

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