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Effective Strategies for Blended Teaching of Elementary School Mathematics Based on the Smart Education Platform

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Abstracts: The continuous development of educational technology has made the smart education platform an important part of modern teaching and learning, especially in elementary school mathematics teaching, which continues to show great potential. Smart education platforms have been described as revolutionary tools that have dramatically changed traditional teaching and learning methods through integrated technologies such as artificial intelligence, big data analytics, and cloud computing, and these platforms not only provide rich and diverse teaching resources but also support personalized learning paths and interactive learning experiences, thus effectively improving teaching efficiency and learning quality. The integration of smart education platforms with traditional offline teaching not only meets the requirements of the reform of the teaching mode but also optimizes the learning process of students and improves the learning effect. Based on this, this paper elaborates on the effective strategies of blended teaching of elementary school mathematics based on the wisdom education platform from different perspectives.

Keywords: wisdom education platform; elementary school mathematics; blended teaching; effective strategies

Introduction

The wisdom education platform is a product of the era of the mutual integration of science and technology and the education industry, and the use of the wisdom education platform to carry out blended teaching can not only provide students with diversified learning materials and activities to meet the learning needs of different students, but also help to stimulate the interest of students in mathematics learning, reduce the burden of teachers' teaching, and reduce the burden of students' learning. Of course, in the specific practice process, by the resource support, teacher quality, student cooperation, and other factors, the integration of intelligent education platform and blended teaching still creates several problems, the relevant educators should actively take effective measures against these problems, to promote the smooth reform of elementary school mathematics teaching.

1. The significance of blended teaching of elementary school mathematics based on the intelligent education platform

1.1 Meet the learning needs of different students

The smart education platform can identify each student's learning ability, style, and interest points through data analysis, to provide them with a more personalized learning path, and the smart platform usually has a wealth of learning resources, such as video tutorials, interactive games, simulated test questions, etc., which can provide appropriate learning materials according to the different needs of the students (Xie, 2023). Personalized learning not only has the adaptation of content but also includes the self-adaptation of the learning path, such as the smart education platform can adjust the teaching plan

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and difficulty according to the student's learning progress and comprehension, ensuring that students learn at a pace that suits them. In addition, the instant feedback mechanism provided by the platform can also help students understand their learning situation promptly, and teachers can adjust their teaching strategies and provide targeted counseling based on this feedback.

1.2 Improve the teaching effect of the math classroom

Using the smart education platform, teachers can access a large number of high-quality teaching resources, such as interactive courseware and video tutorials, to more effectively help students understand complex mathematical concepts while reducing the time teachers spend on lesson preparation. The platform allows teachers to adjust teaching methods and content based on student learning and feedback, a flexibility that not only improves teaching effectiveness but also makes it more efficient. Smart education platforms are often equipped with interactive tools, such as online quizzes, real-time polling, and gamified learning, which increase student engagement and interaction in the classroom, thus improving learning efficiency. Through smart education platforms, parents can also more easily understand their children's learning status and progress, facilitating communication between home and school and thus better supporting their children's learning. For teachers themselves, the platform can help them manage courses, record grades and attendance, etc., reducing the administrative workload so that teachers can devote more energy to teaching (Zhu, 2023).

1.3 Help students actively participate in learning

Smart education platforms usually contain rich interactive elements, such as interactive exercises and gamified learning tasks, which can stimulate students' interest and encourage them to participate more actively in the learning process. Smart education platforms provide students with a variety of resources and tools to support inquiry-based learning, for example, students can actively explore knowledge through searching, experimenting, etc. to enhance their understanding and application skills. The discussion forums, group collaboration projects, and other functions on the platform can also promote communication and cooperation among students and help them deepen their understanding of mathematical concepts through discussion and collaboration. Students can learn at their own pace and independently choose what and when to study, and the cultivation of such self-management skills is crucial to long-term learning development.

1.4 Facilitate teachers' teaching assessment and feedback

Teachers can collect students' learning data in real-time with the help of the smart education platform, such as learning progress, question-answering, interaction records, etc., which helps teachers understand the learning status of each student promptly (Hou, 2023). Through in-depth analysis of the collected data, teachers can accurately identify students' strengths and weaknesses in the learning process, which helps customize more effective teaching plans and interventions. Teachers can also give students timely feedback based on the results of data analysis to help them understand mistakes and guide them on how to improve. At the same time, teachers can adjust their teaching content and methods based on this feedback. Most importantly, the long-term data tracking function provided by the platform enables teachers to monitor students' learning progress and identify learning trends, thus guiding students' long-term learning planning more effectively.

2. The Current Situation of Blended Teaching of Elementary School Mathematics based on the Smart Education Platform

2.1 Teachers' and students' varying degrees of familiarity with technology

Not all teachers possess sufficient technological knowledge and skills to support the use of smart education platforms. While contemporary students are usually more familiar with IT, there are still varying degrees of adaptability. For example, younger students need more guidance to effectively use the smart platform (Zheng, 2023). Schools that do not provide adequate training and support will not be able to help teachers and students overcome barriers to technology use. In addition, over-reliance

on technology can lead to neglecting the importance of basic teaching methods and human interaction. At the same time, if the technology fails, it can interfere with the normal teaching and learning process.

2.2 Differences in smart education resources in different schools

There are significant differences in the distribution of educational resources between different regions (e.g., urban and rural, developed and underdeveloped regions). For example, some regions lack sufficient financial and technical support to realize the full application of smart education. Even within the same region, there may be significant differences in resources between different schools. For example, some schools have advanced technological equipment and rich teaching resources, while others are relatively lacking in these aspects. Schools with high-level educational resources tend to attract more outstanding teachers and provide better teacher training, and these factors may also affect the effective use of the smart education platform. High-quality smart education platforms also require continuous technical support and maintenance, but schools with fewer resources cannot afford long-term technical support costs.

2.3 Some students may lack the ability to learn independently

Although smart education platforms provide flexible learning options, some students still have not fully developed the ability to learn independently, which makes it difficult for students to maintain the continuity and efficiency of their learning without direct supervision, e.g., younger students need to learn how to effectively manage their time and organize their learning tasks, and it is difficult for them to rationally arrange their study time or find a balance between their homework and online learning to find a balance between homework and online learning (Liu, 2022). Various distractions in the online environment (e.g., social media, games, etc.) can also cause students to be distracted and affect learning outcomes. Online learning lacks the immediate feedback and face-to-face communication of a physical classroom, which can also pose a challenge to the learning of some students who need more interpersonal interaction and direct instruction.

2.4 Different levels of parental support for smart education

Parents have different levels of understanding of smart education and blended learning, with some parents being well versed in the concepts and methods, while others are less familiar and unsure of how to effectively support their children's learning. Parental involvement also fluctuates depending on individual time, interest, or level of awareness; for example, parents who are busy at work or less confident in using technology are less likely to be involved in their child's learning process. In addition, not all parents have the technical skills required to use smart education platforms, and the technological divide can prevent parents from effectively monitoring and supporting their children's online learning. From the school perspective, some schools and teachers have not established effective communication and collaboration mechanisms to promote parental participation and support, and parents also have difficulty mastering scientific methods.

3. Measures for Blended Teaching of Elementary School Mathematics based on the Smart Education Platform

3.1 Guiding pre-study with the help of the platform, cultivating students' self-learning ability

In the traditional teaching mode, students often learn new knowledge under the direct guidance of teachers. In contrast, under the smart education platform, the blended teaching mode provides new opportunities, namely, the use of technological means to guide students to pre-study, to cultivate students' self-learning ability (Minya, 2022). Through previewing, students can understand and explore problems more deeply in class. Of course, independent learning encourages students to think independently instead of relying solely on the teacher, who should provide sufficient guidance and support while giving students the space to explore on their own, and also make sure that all students can easily access and use the smart education platform, and continuously optimize the content and methods of previewing promptly based on students' feedback and learning effects.

Taking Mixed Operations in Four as an example, teachers can make a teaching video about mixed operations in four in advance, briefly introduce the relevant concepts and calculation methods, and utilize the interactive tools of the platform to create basic mixed operations in four practice problems for students to try to answer. Then provide some simple and easy-to-understand reading materials to help students better understand the rules of the four operations, and finally upload these resources and tasks to the platform and make clear to students the requirements of the tasks and the deadline for completion. Students first watch the video on mixed four operations provided by the teacher to understand the basic concepts and calculation methods, and then apply what they have learned through the interactive exercises on the platform to deepen their understanding of mixed four operations. Then they read the materials provided by the teacher to have a more comprehensive understanding of the rules and skills of the four mixed operations. Finally, based on the preview, students fill out an introductory sheet, which includes a summary of key concepts, steps for solving problems, and self-assessment. Through pre-learning, students have a basic understanding of the four rules of mixed arithmetic before formal classroom learning, which helps to improve learning efficiency in the classroom. Through the feedback mechanism of the platform, teachers can also understand students' learning status in time and adjust the classroom teaching plan as needed.

3.2 Visualizing teaching difficulties and strengthening students' knowledge and understanding

In elementary school mathematics teaching, a visual display of the key points and difficulties in teaching is crucial for students to understand abstract mathematical concepts. The smart education platform provides rich tools and resources to make this process more efficient and vivid. Modern technologies, such as interactive whiteboards and simulation software, make it possible to display complex concepts visually, and visualized information is easier for students to remember and recall (Yang, 2021). Teachers need to ensure that presentations are clear and organized to avoid confusion caused by too much information, and also to engage students in the process of visualization, such as solving problems and asking questions. Considering the speed and level of understanding of different students, teachers should adjust the content and pace of teaching in time, and understand the students' understanding and mastery of the visual display through quizzes and feedback.

When explaining the Surface Area of Rectangular and Square Bodies, the focus of the chapter is the formula for calculating surface area, and students have to master and apply the formula for calculating the surface area of rectangular and square bodies. The difficulty is the understanding and application of the formulas, and students have to understand the sources of the formulas for calculating surface area and how to apply these formulas to solve practical problems. Teachers first use the 3D model of the Smart Education Platform to show rectangular and square bodies and dynamically display unfolding diagrams to help students visualize and understand the concept of surface area. Using interactive tools, such as virtual reality or augmented reality, students manipulate and explore these geometries in a virtual environment. By breaking down each step, the teacher explains in detail where the surface area formula comes from and how it is applied. Students work in groups to discuss the properties of rectangles and squares, explore how to calculate surface area, and try to summarize the formula. They can also use cardboard to make models of rectangles and squares, actually measure and calculate their surface area, and finally solve problems related to daily life, such as calculating the area of wrapping paper in a gift box, to enhance their understanding of the application of the formula. The teaching methods of visualization and active exploration can improve students' spatial imagination, deepen their understanding of the formula, and enhance their ability to solve practical problems.

3.3 Combine online and offline with each other and design after-school homework scientifically

Reasonable homework design can help students' overall growth. The issuance of the "Double Reduction" policy makes the design of after-school homework pay more attention to scientific rationality

and efficiency. In this context, it is especially important to utilize the smart education platform to combine online and offline resources for homework design. The smart education platform provides diversified learning tools and resources, which help to improve the quality and effect of homework. Teachers should encourage students to complete homework through independent exploration and practice to develop self-learning abilities. The amount of homework should be reasonably arranged according to the age and learning ability of students to avoid overburdening. It is also necessary to combine different types of learning activities, such as online interaction and hands-on practice, to increase the diversity and interest in homework. Synchronize the provision of timely feedback and evaluation of homework to help students understand their learning. Teachers can also encourage parents to participate appropriately, but avoid excessive intervention so that students can complete the assignments independently.

After teachers explain the content of the math unit Statistics, they can ask students to find statistically significant topics in their lives, such as investigating the heights of family members and the hobbies of classmates, etc., to enable students to understand the practical application of statistics and to enhance the practicability and interestingness of learning. Students use the tools provided by the Smart Education Platform, such as spreadsheets or specific statistical software, to enter and simply analyze the collected data to improve their data processing and computer application skills. Based on the results of their analysis, students create charts, such as bar graphs or pie charts, to help them understand how to present statistical results in graphical form. Students upload their completed assignments (data analysis and charts) to the Smart Education Platform for teacher assessment. In this way, students not only learn the theoretical knowledge of statistics but also deepen their understanding of statistics through practical exercises. Moreover, by applying statistics to real life, the fun and relevance of learning are enhanced, thus stimulating students' interest in learning.

3.4 Improve the existing evaluation system and build an interactive classroom atmosphere

In the traditional teaching mode, evaluation usually focuses on test scores and ignores students' participation, thinking process, and creativity. The application of the smart education platform prompts the reform and improvement of the evaluation system to more comprehensively assess the learning effect of students and construct a more interactive and participatory classroom environment (Zhang, 2020). Through the improved evaluation system, not only students' knowledge mastery is evaluated, but also students' thinking process, problem-solving ability, and creativity are paid attention to. Teachers should ensure that the evaluation criteria and process are open and fair to students so that both students and parents can understand the basis of evaluation, and provide regular and timely feedback to help students understand their progress and areas for improvement. The school provides timely training for teachers so that every teacher can effectively use the tools of the Smart Education Platform for teaching and assessment.

Taking the blended teaching of "Lines and Angles" in the first book of Grade 4 of the Primary Mathematics Beishi University Edition as an example, teachers create a class group on the Smart Education Platform for students to discuss and share their learning achievements, and a parent group for communicating with parents about the teaching content and evaluation criteria. In the class group, the teacher releases teaching videos, interactive courseware, and online exercises on "Lines and Angles", and asks students to sort out their knowledge during the learning process and explain what they have learned in their own words. Students post their explanations in the class group for peer learning and teacher evaluation. Teachers send the teaching content and evaluation criteria to the parents' group so that parents can understand what their children are learning in school. Diversified evaluation methods: students can self-evaluate by posting their understanding of "lines and angles" in the class group; classmates can evaluate and learn from each other by commenting on and discussing the content of the students' postings; teachers can

make comprehensive evaluations based on the student's performance in the class group, the quality of their knowledge explanations, and feedback from parents; parents can make comprehensive evaluations through interactive activities with their children. ; Parents assess their children's learning through interactive activities with their children, such as games and situational inferences, and feedback on their observations to the teacher. In this way, a comprehensive evaluation system can be constructed by combining students' self-assessment, peer assessments, teachers' assessments, and parents' assessments, which helps to accurately assess students' learning.

Summarize

To summarize, elementary school mathematics teachers growing up in the new era should, first of all, establish a lifelong learning consciousness, actively understand a variety of advanced educational ideas, use new types of educational tools, and apply them to their daily teaching activities. To continue to expand the impact of the smart education platform in the field of education and provide students with a richer, more flexible, and efficient learning experience, educators should further develop and utilize the potential of the platform, continuously improve the quality of classroom teaching, and truly promote the development of students' core mathematical literacy.

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Conflict of Interest

The authors declare that they have no conflicts of interest to this work.

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