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Application of Multimedia Teaching Technology in Elementary School Mathematics Instruction

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Abstract: Multimedia teaching technology demonstrates significant advantages in primary school mathematics instruction. This technology effectively stimulates students' learning interest and enhances classroom participation through abundant teaching resources, vivid audiovisual effects, and interactive functions. Meanwhile, multimedia teaching technology enables the scientific design of instructional materials, ensuring precise content with clear hierarchical structure, while emphasizing classroom interaction and immediate feedback to optimize the teaching process and improve instructional effectiveness. These application strategies not only help students better understand and master mathematical knowledge but also promote the comprehensive development of their overall competencies.

Keywords: Multimedia teaching technology; Primary school mathematics teaching; Application

1. Introduction

With the rapid advancement of information technology, multimedia teaching technology has become a crucial component of modern education. In elementary school mathematics instruction, multimedia teaching technology, with its unique advantages, has infused new vitality into traditional teaching models. It not only enriches teaching methods and stimulates students' interest in learning but also enhances teaching effectiveness through intuitive demonstrations and immediate feedback, thereby promoting the holistic development of students. Therefore, exploring the application strategies of multimedia teaching technology in elementary school mathematics instruction is of great significance for improving teaching quality.

2. Overview of Multimedia Teaching Technology

Multimedia teaching technology, as a significant innovation in modern education, refers to the instructional method that utilizes various modern information technologies such as computer technology, network technology, and digital audiovisual technology to organically integrate text, images, sound, animation, and other media information, presenting them to students through computers or other electronic devices. This technology not only greatly enriches the forms of content presentation but also fundamentally transforms traditional teaching models, making educational activities more vivid, intuitive, and efficient. The core of multimedia teaching technology lies in its integration and interactivity. Integration is manifested in its ability to seamlessly combine multiple types of media information into a cohesive whole, providing



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students with a comprehensive and multi-faceted learning experience^[1]. Interactivity, on the other hand, refers to the real-time interaction between students and teachers, peers, and the learning content through computers or other electronic devices during the teaching process. This interaction not only enhances students' interest and engagement but also facilitates deeper understanding and application of knowledge. With the continuous advancement of technology, multimedia teaching technology is also evolving and improving. From initial slide presentations and audio playback to the current application of high-tech means such as virtual reality and augmented reality, multimedia teaching technology is gradually building a more three-dimensional, rich, and interactive teaching environment. In this environment, students can more freely explore the mysteries of knowledge, enjoy the pleasures of learning, and thereby achieve self-development and growth.

3. The Role of Multimedia Teaching Technology in Elementary School Mathematics Instruction

3.1. Enrich Teaching Content to Enhance Student Learning Interest

In primary school mathematics teaching, multimedia teaching technology, with its powerful information integration capability, greatly enriches the teaching content, presenting students with a vibrant and engaging world of mathematics. This richness is reflected not only in form but also in the depth and breadth of the content. First, multimedia teaching technology makes abstract mathematical concepts concrete and intuitive through various media forms such as images, animations, and videos. For example, when teaching geometric shapes, teachers can use multimedia to display various figures and demonstrate transformations like rotation, translation, and reflection through animations, allowing students to visually grasp the properties and patterns of these shapes. This intuitive teaching approach not only reduces the difficulty of comprehension but also sparks students' curiosity and desire to explore. Second, multimedia teaching technology can introduce a wealth of real-life examples and scenarios, closely connecting mathematical knowledge with everyday life. Teachers can use multimedia to showcase mathematical

problems in daily contexts such as shopping, traveling, and construction, helping students recognize the widespread application and importance of mathematics in real life. This life-oriented teaching method not only enhances students' interest in learning but also cultivates their awareness of mathematical application and problem-solving skills. Third, multimedia teaching technology provides abundant learning resources and supplementary materials. Teachers can access high-quality educational resources online as needed, such as mathematical stories, games, and experiments, offering students a more diverse learning experience. These resources and materials not only broaden students' horizons but also foster their independent learning abilities and innovative thinking.

3.2. Facilitating Knowledge Comprehension and Mastery

In elementary school mathematics education, multimedia teaching technology significantly enhances students' understanding and mastery of mathematical knowledge through its unique advantages. This role is manifested not only in the efficiency of knowledge delivery but also in how it helps students overcome cognitive barriers and deepen their comprehension of mathematical concepts, principles, and methods. (1) Multimedia teaching technology makes abstract mathematical concepts intuitive and tangible through dynamic demonstrations and simulations. For example, when teaching fraction addition and subtraction, teachers can use animations to display the process of splitting and combining different fractions, allowing students to clearly observe the essence of fraction operations—the patterns of change in numerators and denominators. Such dynamic presentations are more effective in capturing students' attention and stimulating their cognitive engagement compared to static text or images, thereby facilitating better understanding and mastery of these concepts. (2) Multimedia teaching technology also offers rich interactivity, enabling students to actively participate in the learning process. Through operations such as clicking, dragging, and selecting, students can personally explore mathematical patterns and verify theorems, thereby deepening their understanding of mathematical knowledge. This active learning approach not only boosts students' interest but also cultivates their spirit of inquiry and problem-solving skills. (3) Additionally, multimedia teaching

technology can provide personalized instructional support based on students' learning progress. Teachers can use data analysis to identify each student's learning pace and difficulties, then offer targeted teaching resources and guidance accordingly. This personalized approach helps students address knowledge gaps promptly, consolidate learning outcomes, and ultimately improve their overall academic performance.

3.3. Enhancing Classroom Interactivity and Participation

In primary school mathematics education, multimedia teaching technology, with its unique interactivity and fun, significantly enhances classroom interaction and student engagement. This improvement is reflected not only in the liveliness of the classroom atmosphere but also in how it fosters deep communication and cooperation between teachers and students, as well as among students themselves. (1) Through rich media forms such as animations, videos, and games, multimedia teaching technology creates a fun and challenging learning environment for students. These media elements quickly capture students' attention, stimulate their interest in learning, and encourage them to participate more actively in classroom activities. At the same time, these elements provide students with diverse interactive methods, such as dragging, clicking, or selecting to answer questions or complete tasks, thereby enhancing their interaction with the teaching content. (2) Multimedia teaching technology offers teachers more teaching methods and tools, enabling them to design more flexible and diverse teaching activities. For example, teachers can use multimedia teaching software to design math games or competitions, allowing students to learn mathematical knowledge through play, thereby increasing their interest and engagement. Additionally, teachers can utilize real-time feedback systems to promptly understand students' learning progress and adjust teaching strategies based on the feedback, ensuring that every student keeps up with the pace of instruction. (3) Multimedia teaching technology also promotes interaction and cooperation among students. Through group discussions, collaborative task completion, and other forms, students can exchange ideas, share experiences, and solve problems together. This cooperative learning approach not only enhances

students' teamwork and communication skills but also cultivates their critical thinking and innovation abilities.

3.4. Enhance Exercise Effectiveness and Improve Knowledge Consolidation Efficiency

In elementary school mathematics instruction, multimedia teaching technology significantly enhances exercise effectiveness and improves knowledge consolidation efficiency with its unique advantages.

3.4.1. Personalized Exercise Design

Multimedia teaching technology can intelligently generate personalized exercises based on students' learning progress. These exercises are not only appropriately challenging but also precisely target students' knowledge gaps for reinforcement. Through personalized exercise design, students can practice at a difficulty level suited to their abilities, thereby enhancing practice effectiveness and accelerating knowledge consolidation. For instance, teachers can use multimedia teaching software to assign exercises of varying difficulty to students at different levels, ensuring each student progresses within their optimal learning range.

3.4.2. Real-Time Feedback and Adjustment

Multimedia teaching technology also features immediate feedback functionality. After completing exercises, students receive prompt answers and analysis from the system, enabling them to quickly assess their understanding. For incorrect answers, the system provides detailed explanations and correct problem-solving approaches, helping students rectify mistakes and deepen comprehension. This real-time feedback mechanism allows students to identify and address issues immediately, preventing the accumulation of knowledge gaps and enhancing knowledge retention efficiency.

3.4.3. Diversified Exercise Formats

Multimedia teaching technology also offers diverse exercise formats, such as multiple-choice questions, fill-in-the-blanks, application problems, and game-based challenges. These varied exercise types not only cater to students' diverse learning needs but also stimulate their interest and motivation. Through these diverse exercises, students can better understand and master key concepts while enhancing their ability to

apply knowledge. Additionally, the variety of exercise formats encourages students to approach problems from different perspectives, fostering their critical thinking and innovation skills.

3.4.4. Scenario Simulation and Practical Application

Multimedia teaching technology can also enhance students' understanding and application of mathematical knowledge through scenario simulations and practical applications. For instance, when teaching addition and subtraction of fractions, teachers can use multimedia technology to simulate a shopping scenario, allowing students to practice fraction operations during the simulated shopping process. This approach not only helps students better grasp the practical significance and real-world applications of fractions but also increases their learning interest and engagement, thereby improving the efficiency of knowledge retention.

4. Application Strategies of Multimedia Teaching Technology in Elementary School Mathematics Teaching

4.1. Integrating Multimedia with Real Life

In elementary school mathematics teaching, closely integrating multimedia teaching technology with real-life situations is an effective instructional strategy. This approach not only makes abstract mathematical knowledge vivid and concrete, facilitating student comprehension, but also stimulates students' interest in learning and cultivates their awareness of mathematical application. First, teachers should thoroughly explore the connections between mathematical knowledge and real life, identifying suitable real-world examples that can be presented through multimedia. For instance, when teaching addition and subtraction, multimedia can be used to display supermarket shopping scenarios, allowing students to simulate the shopping process and understand the meaning and application of addition and subtraction through hands-on practice. This teaching method is not only closely related to students' daily lives but also enables them to experience the fun and practicality of mathematics through practical application. Additionally, teachers should pay attention to the selection and creation of multimedia materials. When selecting materials, it is essential to ensure they are relevant to students' real-life experiences, representative, and engaging. At the

same time, when creating multimedia courseware, emphasis should be placed on the visual appeal of the content and the smoothness of animations to capture students' attention and enhance their learning interest^[2]. After teaching a particular concept, teachers can design exercises or practical activities related to real-life situations, allowing students to apply their knowledge to solve practical problems. For example, after learning about units of time, students can create their own daily schedules; after learning about currency units, students can simulate shopping scenarios to practice currency conversion. Such practical activities not only help students consolidate their knowledge but also foster their awareness of mathematical application and problem-solving abilities. Finally, teachers should focus on cultivating students' observation and imagination skills. By using multimedia to present real-life examples, students can be guided to observe, think, and imagine, thereby enhancing their observational and imaginative abilities. For instance, when teaching geometric shapes, multimedia can be used to display various objects and buildings of different shapes, allowing students to observe their characteristics and imagine how they are composed of basic geometric figures. This teaching approach not only helps students better understand and master geometric knowledge but also develops their spatial imagination and innovative thinking.

4.2. Scientific Design of Multimedia Teaching Materials

In elementary school mathematics teaching, scientifically designing multimedia teaching materials is crucial to ensuring effective instruction. This strategy requires teachers to focus not only on the accuracy and richness of content during the design process but also on accommodating students' cognitive characteristics and learning needs. (1) Content design must precisely align with teaching objectives. Teachers should thoroughly analyze the textbook, clarify the core knowledge points and teaching goals of each lesson, and ensure that the selected multimedia materials closely revolve around these objectives, avoiding information redundancy or deviation from the topic. (2) Materials should possess hierarchy and progression. Since elementary students' cognitive development occurs in stages, multimedia teaching materials must follow the principle of progressing from simple to complex and from easy

to difficult, gradually guiding students to explore the world of mathematics in depth. Simultaneously, there should be clear logical connections between knowledge points to help students construct a complete knowledge system. (3) Integrate elements of fun to stimulate student interest. Leveraging the advantages of multimedia technology, such as animations and sound effects, can add enjoyment to teaching materials, enabling students to learn mathematical knowledge in a relaxed and pleasant atmosphere. Additionally, by incorporating real-life scenarios that are familiar to students, mathematics becomes more relatable and tangible. (4) Emphasize interactivity and participation. When designing multimedia teaching materials, teachers should prioritize students' active role by incorporating interactive segments, Q&A sessions, and other methods to encourage active participation in the teaching process, thereby enhancing their initiative and creativity in learning.

4.3. Emphasizing Classroom Interaction and Feedback

In primary school mathematics teaching, the application of multimedia teaching technology should place high importance on classroom interaction and immediate feedback to promote students' deep engagement and effective learning. Classroom interaction is key to activating students' thinking and enhancing their motivation to learn. Teachers should fully utilize the interactive features of multimedia teaching technology to design diverse interactive activities, such as group discussions, role-playing, online polls, etc., encouraging students to actively participate in classroom activities, express their personal opinions, and engage in intellectual exchanges with peers and teachers. This interaction not only helps students better understand mathematical knowledge but also cultivates their spirit of cooperation and communication skills. Additionally, immediate feedback is an important means to optimize the teaching process and improve learning efficiency. Multimedia teaching technology

can quickly collect students' learning data, providing teachers with immediate feedback^[3]. Teachers should closely monitor students' learning status, promptly identify issues, and offer guidance. At the same time, through system-generated feedback reports, teachers can understand the learning situation of the entire class, thereby adjusting teaching strategies to ensure that every student keeps up with the teaching progress. By enhancing classroom interactivity and immediate feedback mechanisms, teachers can better guide students to participate in learning, improve teaching effectiveness, and promote students' holistic development.

5. Conclusion

In summary, by scientifically designing teaching materials, emphasizing classroom interaction and immediate feedback, this technology can be effectively utilized to help students gain a deeper understanding of mathematical knowledge and cultivate mathematical thinking and innovation skills. In the future, with continuous technological advancements, multimedia teaching technology will play an increasingly important role in elementary school mathematics education, driving the sustained development of the education sector.

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