

# Research on Mathematics Experimental Teaching Based on the Ability Cultivation of Normal Students in the New Media Era

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**Abstract:** With the rapid development of information technology, the application of new media and technologies in the field of education is becoming increasingly widespread. Especially in terms of cultivating the abilities of teacher trainees, new media technology has brought unprecedented opportunities and challenges to mathematics experimental teaching. This article aims to explore the impact of mathematical experimental teaching in the era of new media on the ability cultivation of normal students, and propose corresponding teaching strategies to improve their professional competence and teaching skills.

**Key Word:** New media; Mathematics education; Teacher preparation.

## I. Introduction

In the context of the new media era, the continuous innovation and widespread application of information technology are reshaping the field of education with unprecedented strength, leading to profound changes in teaching methods and tools. Faced with this trend, normal students majoring in education, as the driving force of future education, are not only required to have a solid foundation of professional knowledge, but also expected to possess excellent information literacy and superb teaching skills. Mathematical experimental teaching, as a proven and effective teaching model, has significant value in cultivating students' logical thinking and practical operation abilities. In view of this, this article aims to analyze and explore how new media technology can be effectively applied in mathematics experimental teaching from the core perspective of cultivating the abilities of normal students, in order to provide new ideas and practical paths for improving the comprehensive abilities of normal students.

## II. The current application status of new media technology in mathematics experimental teaching

New media technologies such as animation, video, audio and other multimedia resources can enrich teaching content and enhance classroom fun. For example, demonstrating the derivation process of mathematical formulas through animation can visualize abstract knowledge and help students understand and master it. Based on over 10 years of research, Kurt Squire tells the story of the emerging field of immersive digital media learning environments (or games) and outlines the future of education<sup>[1]</sup>. The author features the experiences of game researchers and tells a fascinating story: (1) explores the intersection between entertainment business game design and design-based research conducted in schools; (2) Emphasize the importance of social interaction around games at home, school, and online communities. In fact, as early as the 1980s, Papert<sup>[2]</sup> and Abelson A et al.<sup>[3]</sup> provided an early and inspiring vision for how to apply digital technology to young learners.

Sinclair et al.<sup>[4]</sup> focus on literature that contributes to understanding of how the use of digital technologies affects and changes the teaching and learning of mathematics—that is, how different affordances and design choices impact on the way teachers and learners interact and express themselves mathematically. The digital technologies refer to a range of tools including multi-purpose computer-based software programs, web-based applets, virtual manipulatives, programming languages, CD-ROMs, games, calculators, touchscreen applications and interactive whiteboards.

New media technology has provided unprecedented convenience for students' observation, thinking, and hands-on operation, greatly enriching the connotation and extension of mathematics experimental teaching. This trend is particularly evident in educational practices both domestically and internationally. For example, with the outstanding representative of virtual laboratory technology, students can overcome the limitations of physical space and enter a highly interactive and realistic mathematical experimental environment anytime, anywhere. Here, they are not only able to conduct various mathematical experiments ranging from basic to complex, such as transformations of geometric shapes, simulations of probability and statistics, and intuitive demonstrations of calculus concepts, but also can deepen their understanding of logarithmic principles and promote the flexible application of knowledge by adjusting experimental parameters and observing mathematical phenomena under different conditions.

Furthermore, virtual laboratories are typically equipped with real-time feedback mechanisms that can display experimental results in real-time, helping students verify hypotheses, identify errors, and adjust their thinking.

This "trial and error correction trial and error" process is crucial for cultivating students' critical thinking, problem-solving, and self-directed learning abilities. In addition, new media technology allows students to record and share experimental processes and results in various forms, such as through videos, animations, or interactive reports. This not only enhances the fun and participation of learning, but also promotes communication and cooperation among students, jointly building a mathematical knowledge system.

In summary, new media technology not only provides students with more convenient and diverse mathematical experimental platforms, but also effectively promotes the development of mathematical experimental teaching to a higher level by simulating real situations, promoting deep learning, and enhancing learning interactivity. New media technology can help teachers achieve personalized teaching and provide personalized learning resources and evaluations for students. For example, through online learning platforms, teachers can push different learning tasks and exercises based on students' learning progress and abilities to improve teaching effectiveness.

## II. The Influence of Mathematics experimental teaching on the ability cultivation of normal students in the new media era

**Enhance information literacy.** Mathematical experimental teaching has been given unprecedented attention in the current education field, with its core being the cultivation of practical operation and hands-on abilities. With the continuous deepening of research both domestically and internationally, the value of this teaching model is becoming increasingly prominent. The vigorous development of new media technology has opened up a broad Xintiandi for normal students to explore mathematical mysteries and hone teaching skills. Through innovative tools such as virtual laboratories and online simulation platforms, teacher trainees can immerse themselves in highly interactive and simulated learning environments, not only deeply understanding and mastering mathematical core concepts and skills in practice, but also significantly enhancing their ability to transform theoretical knowledge into teaching practice. These technologies not only transcend the limitations of physical space, but also greatly enrich the forms and contents of practical activities, enabling the comprehensive enhancement of mathematics teaching practical abilities of normal students through flexible and diverse exercises, laying a solid foundation for becoming efficient mathematics teachers in the future.

**Enhance practical ability.** Mathematical experimental teaching, as an important way to cultivate future teachers' practical and hands-on abilities, has received widespread attention and importance in educational research both domestically and internationally. The rise of new media technology has created a practical stage full of infinite possibilities for teacher trainees, among which innovative forms such as virtual experiments and online simulations are particularly prominent. These technologies not only provide rich and diverse, highly interactive practical opportunities for teacher trainees to explore mathematical principles in simulated real situations, master solid mathematical knowledge and skills, but also greatly promote their ability to flexibly apply this knowledge in teaching practice, thereby effectively enhancing their mathematical teaching practice ability, laying a solid foundation for becoming excellent mathematics teachers with innovative spirit and practical ability.

**Cultivate innovative thinking.** The widespread application of new media technology has become a hot topic in the field of education research at home and abroad, deeply influencing the training methods of teacher trainees, especially in encouraging innovation and exploration, demonstrating enormous potential. In the vast field of mathematical experimental teaching, normal students are able to utilize the powerful power of new media technology to carry out creative teaching design practices. They are not only able to independently develop interactive courseware to stimulate students' interest in learning in a novel way, but also cleverly create animated demonstrations to visually demonstrate complex mathematical concepts and processes. These practical activities not only greatly enrich teaching methods, but also provide a stage for teacher trainees to showcase themselves and challenge conventions, effectively promoting the development of their innovative thinking and abilities, and paving the way for them to become innovative mathematics teachers who can lead the trend of educational reform in the future.

## III. Strategies for Mathematical experiment teaching in the new media era

1. Integrating new media resources and expanding the depth and breadth of mathematics experimental teaching.

In the current context of education research both domestically and internationally, teachers are actively exploring and practicing the effective integration of new media resources, in order to achieve dual innovation in content and form in mathematics experimental teaching. Specifically, various new media elements such as animation, video, and audio should be carefully selected and cleverly integrated as an organic component of teaching content, greatly enriching the presentation and connotation of mathematics experimental classrooms. The comprehensive use of multimedia resources can not only vividly demonstrate the essence and charm of mathematical concepts, but also effectively activate students' multiple sensory experiences such as visual and auditory senses, greatly stimulating their learning interest and exploration desire, promoting the occurrence of deep learning, and significantly improving the overall effectiveness and quality of mathematical experimental teaching.

2. Promoting virtual experimental teaching and strengthening the cultivation of practical abilities of teacher trainees.

In the current trend of education research both domestically and internationally, virtual laboratories, as a cutting-edge teaching tool, are widely used in mathematics experimental teaching, providing an unprecedented practical platform for teacher trainees. Through this platform, teacher trainees can immerse themselves in highly simulated virtual environments and freely conduct various mathematical experiments, thereby honing and improving their operational abilities in practice. The virtual laboratory not only simulates real experimental scenes, but also provides rich and diverse simulation data, which not only helps normal students master the experimental steps and skills proficiently, but also provides them with sufficient opportunities to exercise in advanced abilities such as data analysis and problem solving. The innovation of this teaching model not only meets the needs of the digital age, but also lays a solid foundation for cultivating future mathematics teachers with solid practical abilities and innovative spirit.

3. Leading the trend of teaching innovation, cultivating innovative thinking and practical ability of teacher trainees.

Under the wave of global education reform, domestic and foreign research generally emphasizes the importance of innovative teaching methods for the cultivation of teacher trainees. In this context, teachers should actively advocate and encourage normal students to have the courage to try and develop new teaching resources and methods such as interactive courseware and carefully crafted animated demonstrations. These innovative teaching design practices can not only stimulate students' interest in learning and enhance classroom interaction, but more importantly, they can become an important carrier for cultivating innovative thinking and abilities of teacher trainees. Through continuous exploration and practice, teacher trainees can learn how to integrate new concepts and technologies into their teaching, laying a solid foundation for innovation in their future educational careers and becoming excellent teachers who can lead the trend of educational innovation and promote students' comprehensive development.

4. Deepening teacher-student interaction, driving teaching reflection and improving teaching quality.

In the context of global education, the vigorous development of new media technology has opened up broader and more convenient channels for teacher-student interaction. Teachers should actively embrace this change and make full use of diverse tools such as online learning platforms and social media to build an instant and efficient communication bridge with students. Through this approach, teachers can not only gain a deeper understanding of students' learning progress, difficulties, and interests, but also obtain timely teaching feedback, providing valuable first-hand materials for teaching reflection. This new media technology-based teacher-student interaction model not only promotes the harmonious construction of teacher-student relationships, but also becomes a powerful driving force for teachers to self-examine, adjust teaching strategies, and continuously improve teaching quality, laying a solid foundation for cultivating a student group with critical thinking and self-learning abilities.

#### IV. conclusion

Entering the era of new media, mathematical experimental teaching has demonstrated extraordinary significance in the field of cultivating the abilities of normal students. By cleverly integrating new media resources, actively conducting virtual experiments, constantly exploring innovative teaching methods, and focusing on strengthening teacher-student interaction, we can significantly enhance the information literacy, practical operation skills, and innovative thinking level of teacher trainees. Looking ahead to the future, with the rapid development of new media technology, the core role of mathematical experimental teaching in the ability cultivation system of normal students will undoubtedly become more significant, providing strong support for cultivating outstanding teacher talents that meet the needs of education in the new era.

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