

Research on the Application of Multimedia Virtual Technology in Middle School Basketball Teaching

Haicheng Feng

College of Physical Education and Health, Zhaoqing University, Zhaoqing, Guangdong 526061, China

Abstract: The application of multimedia virtual technology in physical education teaching is becoming increasingly widespread. The use of multimedia technology in middle school basketball teaching can provide virtual simulation training, technical and tactical demonstrations, and personalized teaching, which is conducive to solving key and difficult problems in teaching, correcting incorrect movements, improving teaching efficiency, enhancing teaching interest, promoting students' self-directed learning, and enhancing learning efficiency.

Keywords: Multimedia Virtual Technology; Middle School; Basketball Teaching

1. Introduction

Basketball is a complex and ever-changing sport that requires coordinated and consistent movements throughout the body, and has its own sports characteristics. With the rapid development of technology, multimedia virtual technology has gradually penetrated various fields, including education. In high school basketball teaching, the application of multimedia virtual technology provides teachers and students with a richer and more authentic learning and teaching experience. However, in most regions of China, the application of virtual technology in basketball teaching is still relatively rare. The acquisition and mastery of student sports skills mostly come from school physical education teaching and extracurricular training. Therefore, the application of multimedia virtual technology in basketball teaching has broad prospects. This article will explore the application and advantages of multimedia virtual technology in middle school basketball teaching.

2. Objects and Methods

2.1. Objects

The research focuses on students from six middle schools in Duanzhou District, Zhaoqing City.

2.2. Methods

2.2.1. Interview Method

Collect information about the personal experiences, perspectives, attitudes, behaviors, and other aspects of the interviewees through face-to-face or telephone communication. After allowing students and teachers to experience multimedia virtual reality technology teaching firsthand, collect their opinions on the teaching method and form written texts.

2.2.2. Experimental Method

Experimental objective: To verify the effectiveness of multimedia technology in basketball shooting teaching and explore its impact on students' basketball skills and theoretical knowledge mastery.

Experimental steps: Randomly select two first grade classes from each high school as the experimental group and control group, ensuring that the basketball foundation and learning abilities of the two groups of students are similar.

Prepare multimedia devices for teaching, such as computers, projectors, virtual reality devices, etc. The experimental group was taught basketball using multimedia technology, such as using virtual reality technology for technical and tactical demonstrations, and using multimedia to showcase basketball theory knowledge. The control group, on the other hand, adopted traditional teaching methods such as explanation and demonstration, and student practical exercises. During the 6-week teaching process, students will be tested twice a week on their basketball skills and theoretical knowledge, and their grades and progress will be recorded. At the same time, collect feedback from students on teaching through questionnaires, interviews, and other methods. Analyze the collected data and compare the differences in basketball skills and theoretical knowledge mastery between the experimental group and the control group. At the same time, the feedback from students is also summarized and summarized. Based on the data analysis results, the effectiveness of multimedia technology in basketball teaching is obtained, and its role in improving the basketball skills and theoretical knowledge mastery of middle school students is summarized. At the same time, based on student feedback, reflect on and improve the application of multimedia technology in teaching.

2.2.3. Mathematical Statistics

Summarize and organize the data materials of the survey and research, and use relevant statistical software for comprehensive analysis.

3. Results and Analysis

3.1. Concept and Characteristics of Multimedia Virtual Technology

Multimedia virtual technology refers to the combination of multimedia technology and virtual reality technology to create a simulated, interactive, and three-dimensional virtual environment. In this environment, users can interact with virtual objects in an immersive manner and experience feelings in the real world. The characteristics of multimedia virtual technology: (1) interactivity. Users can interact with the virtual environment, operate and control it, and achieve a similar experience to the real world. (2) Immersion. Multimedia virtual technology can provide users with an immersive feeling, allowing them to fully immerse

themselves in the virtual environment. (3) Multi-sensory. In addition to visual perception, multimedia virtual technology can also provide various senses such as hearing and touch, allowing users to experience the virtual world more comprehensively. (4) Autonomy. Users can freely move, explore, and learn in the virtual environment according to their own wishes. Multimedia virtual technology, with its unique interactivity, immersion, multi perception, and autonomy, provides users with a new and rich experience, and has broad application prospects in many fields. Applying multimedia virtual reality technology to basketball teaching, difficult to understand theoretical knowledge and technical movements are presented to students from different angles, comprehensively, multi perspectives, and dynamically in multimedia, vividly inspiring and guiding students to learn.

3.2. Application of Multimedia Virtual Technology in Middle School Basketball Teaching

3.2.1. Virtual Simulation Training

Through multimedia virtual technology, real basketball game scenes can be simulated, allowing students to engage in virtual simulation training. Students can choose different roles in the virtual environment to train their basketball skills such as shooting, passing, and defense, in order to improve their basketball skills. This training method not only saves space and equipment costs, but also allows students to train anytime and anywhere, improving training efficiency.

3.2.2. Technical and Tactical Demonstration and Analysis

Multimedia virtual technology can visually demonstrate and analyze the techniques and tactics of basketball games. Teachers can use virtual reality technology to combine technical and tactical demonstrations with practical cases, allowing students to have a more intuitive understanding of the application of tactics. At the same time, students can also conduct technical and tactical exercises in virtual environments, deepening their understanding and mastery of technology and tactics.

3.2.3. Personalized Teaching

Each student's basketball foundation and skill level are different, and the traditional teaching method is difficult to meet the personalized teaching needs. Multimedia virtual technology can develop personalized teaching plans based on the actual situation of each student. Students can choose suitable learning content and methods based on their interests and needs, and improve their learning interest and enthusiasm.

3.3. Advantages of Multimedia Virtual Technology in Middle School Basketball Teaching

3.3.1. Improving Teaching Efficiency

In modern basketball teaching and training, basketball teaching generally focuses on teachers personally demonstrating, explaining, and illustrating. The outdoor teaching environment is poor, often due to factors such as weather, venue, equipment, and funding, which makes it impossible to carry out some teaching and training courses. The teacher's teaching is restricted, the audio-visual effect of the teaching is not ideal, and the problems that arise during teaching cannot be timely fed back to students, resulting in students not being able to obtain the correct concept of actions. Multimedia virtual technology allows students to train basketball skills and practice tactics anytime and anywhere,

without being limited by the venue and time. Meanwhile, virtual environments can provide richer and more authentic teaching resources, allowing students to have a deeper understanding of the connotation and charm of basketball. All of these are beneficial for improving teaching efficiency, allowing students to acquire more knowledge and skills within a limited time.

3.3.2. Enhancing Teaching Interest

Multimedia virtual technology can provide vivid and vivid teaching content, allowing students to learn basketball knowledge in a relaxed and enjoyable atmosphere. The interactivity and immersion in virtual environments can enable students to be more engaged in learning, enhance their learning experience and fun. Multimedia virtual reality systems can create a personalized learning environment by virtualizing various characters such as famous athletes and coaches in the world. For example, the NBA2020 game is an example of this. In virtual games, we can choose our favorite teams and athletes, and we can also compete with world-renowned athletes such as Jordan, Kobe, and Yao Ming. In the virtual classroom learning atmosphere, we can also communicate and discuss with virtual coaches, teachers, athletes, and explore various technical and tactical issues in learning and training. Engage in collaborative learning.

3.3.3. Promoting Self-directed Learning among Students

Multimedia virtual technology can enable students to learn and train according to their interests and needs, promoting self-directed learning. Students can freely explore and practice in a virtual environment, discover their own problems and shortcomings, and make timely adjustments and improvements. This self-directed learning approach is beneficial for cultivating students' self-learning ability and lifelong learning habits.

3.4. The Characteristics of Multimedia Technology in the Application of Basketball Teaching in Middle Schools

3.4.1. Optimize Basketball Teaching Structure and Improve Teaching Quality

The teaching method of explanation and demonstration is currently the traditional teaching method in middle school basketball teaching. The limited ability of teachers to demonstrate and complete movements has resulted in basketball teaching lagging behind the development of modern basketball. The use of multimedia technology can help teachers solve the limitations of demonstration actions. It can vividly and vividly present basketball theoretical knowledge that is difficult for teachers to explain and students to understand in daily life. It can also break down difficult technical movements into several movements, allowing students to intuitively learn the principles and difficulty of high difficulty movements.

3.4.2. Stimulating Students' Interest in Learning

The learning motivation and strong desire for knowledge and novelty of students directly determine the quality of their listening. Multimedia basketball teaching helps to stimulate students' interest in learning. In multimedia teaching, it overcomes the traditional teaching mode of teachers explaining and demonstrating at the same time, and leverages its novel, vivid, and intuitive characteristics. Create a good context to attract students' attention and mobilize their emotions, thereby mobilizing their multi-sensory participation in teaching activities, stimulating their

enthusiasm for actively participating in teaching activities, and achieving the goal of improving classroom teaching efficiency.

3.4.3. Correcting Student Incorrect Actions

In traditional teaching, teachers usually explain and demonstrate, and point out common mistakes, but some actions are completed instantly. For example, the contact point between the hand and the ball is difficult to see clearly at the moment of release, and some teachers have limited technical skills and inaccurate demonstration movements. By using multimedia technology, it is possible to demonstrate correct actions, play incorrect actions, play fast, slow, freeze, and repeat them in a courseware, allowing students to subjectively observe and think, compare themselves, and establish correct action concepts in the cerebral cortex, effectively avoiding common erroneous actions.

Before students learn new technical movements, they first watch technical videos, technical essentials charts, and help them establish the correct representation of the movements. Then, under the guidance of the teacher, they practice in groups, taking pictures of the movements of each stage of the students using a camera and saving them. They organize students to observe their own training videos, identify errors, discuss and compare the correct movements with those of excellent athletes, and explain and compare them with the correct movements of excellent athletes. And propose improvement suggestions and measures before conducting reinforcement exercises. The teaching effect of using multimedia combined with "observation, listening, thinking, imitation, and practice" teaching method is significantly better than traditional teaching method, with a hit rate increase of about 15%. If improvements are made in the long term, the hit rate can be better improved, and students' learning enthusiasm will also be better. The demonstration effect of multimedia is much better than that of teachers. Multimedia teaching provides timely feedback on students learning basketball skills, with high efficiency in correcting errors, and is more conducive to mastering skills.

4. Conclusion

Practice has proven that multimedia assisted teaching is far

superior to traditional physical education teaching. Due to its emphasis on various stimuli such as sound, image, text, animation, and video, it is beneficial to stimulate students' interest in learning, cultivate their sentiment, cultivate their observation and thinking abilities, deepen their understanding of actions, shorten the generalization process of actions, and strengthen their memory. Multimedia has injected new vitality and energy into classroom teaching, promoting the optimization of teaching effectiveness and more effectively cultivating students' ability to master sports knowledge and basic skills. However, multimedia teaching cannot be the main teaching method for physical education. It is only an auxiliary tool, a means and method, and it is the teaching content and methods that play a decisive role in teaching. Only by leveraging the advantages of multimedia teaching and recognizing the practical value of traditional teaching methods can it be used reasonably and correctly. The combination of multimedia virtual reality technology and high school basketball teaching can effectively accelerate the healthy and rapid development of school sports.

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