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Research on the Impact of Virtual Reality Technology on Basketball Teaching

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Abstract: Virtual reality technology is a technology that simulates environments, enhances reality, and enables human-computer interaction. It is a computer graphics system that creates three-dimensional environments for users and allows for interactive operations. It uses computer graphics and digital simulation technology to process three-dimensional graphics in real-time on a computer, creating a sense of immersion for users. The development of virtual reality technology has revolutionized the way people communicate with each other, providing a new platform for education. This article studies the effects of the application of virtual reality technology in basketball teaching, analyzes the impact of the application of virtual reality technology in basketball teaching and the issues that need to be noted, and provides some references for the future application of virtual reality technology in basketball teaching.

1. Introduction

With the improvement of people's living standards, there are higher requirements for the quality of education. The traditional teaching mode can no longer meet the teaching needs, and the emergence of virtual reality technology has had a huge impact on the traditional education mode. It integrates educational information into a virtual environment and simulates multiple teaching environments to carry out teaching activities. The application of virtual reality technology in basketball teaching can effectively promote basketball teaching reform and improve teaching effectiveness. Therefore, in order to better utilize virtual reality technology in basketball teaching, it is necessary to conduct relevant research.

2. Basic concepts and characteristics of virtual reality technology

2.1. Basic Concepts

Virtual reality is a new human-computer interaction technology that is based on computer-generated simulated environments and transmits various information from the simulated environment to human visual, auditory, tactile, and other sensory organs through various sensors, creating a sense of immersion. Virtual reality technology is an emerging high-tech information technology that fully utilizes computer graphics, multimedia, sensor technology, and modern communication technology.

It can enable computers to generate realistic 3D images and stereoscopic effects, bringing users into a realistic 3D spatial scene and providing interaction between users and the environment. Virtual reality technology has been widely applied in many fields such as education, medicine, military, tourism, entertainment, etc[1-2].

Virtual reality technology can use computers to generate a simulated environment, allowing users to immerse themselves in this environment and exchange information with the environment through input devices and interactive devices, obtaining a sense of presence that is basically similar to the real environment. In the field of education, virtual reality technology can be used to create teaching scenarios, such as simulated training systems, simulated sports fields, laboratories, classrooms, etc[3].

2.2. Basic Features

The basic characteristics of virtual reality technology are:

(1) Immersion: The feeling of being in a virtual environment has authenticity and a sense of presence.

(2) Interactivity: The interaction between humans and virtual environments.

(3) Imaginative: It is a subjective feeling formed in the brain based on existing knowledge and experience, which is mainly reflected through the user's senses and psychological activities.

(4) Multi sensory perception: a comprehensive sensory experience caused by interaction. In addition to sensory organs such as eyes, ears, and nose, the human body can also sense sound and touch, which are achieved through the human nervous system.

(5) Real time performance: Dynamic images in virtual environments are generated and displayed in real-time, and users can interact with the virtual environment through input devices such as mice and keyboards. Due to the real-time and interactive nature of dynamic images in virtual environments, immersion can be achieved that is different from traditional media.

3. The impact of virtual reality technology

3.1. Virtual reality technology can enhance basketball theory teaching

Basketball is a sport with strong technical and skill requirements, which requires students to have a high theoretical foundation. However, traditional teaching methods cannot effectively improve students' interest in learning basketball skills, which affects the quality of teaching. At present, traditional teaching methods are no longer able to meet the needs of modern physical education development, and teachers find it difficult to accurately grasp students' mastery of knowledge, which affects the quality of teaching. Virtual reality technology can provide a new platform for basketball theory teaching, and students can use virtual reality technology to carry out basketball theory learning and improve learning efficiency.

The use of virtual reality technology in basketball theory teaching can effectively enhance the effectiveness of theoretical teaching. In traditional basketball theory teaching, teachers often choose to describe abstract basketball techniques, movements, and theoretical knowledge through images, text, and other forms, and students can only passively accept these abstract knowledge. In virtual reality technology, teachers can simulate abstract basketball theory knowledge through three-dimensional graphics, allowing students to simulate basketball technical movements and theoretical knowledge through 3D animation, and understand these abstract knowledge through observation and thinking. In this way, students can learn independently in the virtual reality environment, which improves their understanding of theoretical knowledge. Table 1 shows the advantages of virtual reality technology in basketball theory teaching.

Table 1 Advantages of Virtual Reality Technology in Basketball Theory Teaching

Traditional teaching mode	Teaching Mode under Virtual Reality Technology
The content is not intuitive enough	Intuitive content
Static Content	Content can be static or dynamic
Single content output	Content can be combined for output

3.2. Virtual reality technology makes basketball teaching content more intuitive

In traditional teaching methods, teachers mainly explain basketball techniques through physical demonstrations, language descriptions, and other means. However, due to limitations such as the venue and equipment, it is not possible to present all the details of basketball movements to students within limited classroom time. Virtual reality technology allows students to see the entire process of basketball technique movements, and for details that cannot be fully displayed, teachers can also use virtual reality technology to make students see clearly. For example, in basketball teaching, the teacher conducted a dribbling lesson, but due to limitations such as the court and equipment, it was not possible for students to see every detail of basketball dribbling clearly. At this point, teachers can use virtual reality technology to show students video footage of basketball dribbling, allowing them to observe the key points of dribbling movements through the video and see the complete dribbling process through virtual reality technology. At the same time, virtual reality technology can also allow students to see their shooting process, helping them identify shortcomings and correct them [4-5]. At this point, teachers can use virtual reality technology to let students see the entire passing process, so that students can better grasp this action.

It can be seen that virtual reality technology can help teachers solve some of the difficulties in basketball teaching. Virtual reality technology can provide teachers with a dynamic, complete, and three-dimensional basketball teaching environment. Virtual reality technology can enable teachers to better understand teaching content, teaching objectives, teaching methods, and teaching effectiveness. Virtual reality technology can make basketball teaching content more vivid, lively, and intuitive[6].

3.3. Virtual reality technology provides virtual experience convenience for basketball teaching

Basketball is a sport that requires athletes to have a high degree of physical and mental coordination. During the game, athletes need to maintain a high level of concentration at all times, and the mastery of skills requires continuous practice and practice. If students do not have a direct feeling and experience in basketball class, it is difficult for them to master the essentials of the movements. Traditional basketball teaching is difficult to achieve ideal teaching results due to limitations such as venue, time, and teaching conditions[7]. Virtual reality technology can simulate various training environments through computers, including sports competitions and various situations involved in training. Taking the situational elements in Table 2 as an example.

Table 2 Situational Elements

Scene	Composition elements
5V5 basketball game	Team member confrontation
	Offensive or defensive tactical deployment
	Site layout

Based on Table 2, teachers can use virtual reality technology to simulate situations, allowing students to have real experiences in the context and appreciate the charm of basketball, enhancing their interest in learning. At the same time, virtual reality technology can also make up for the shortcomings in traditional basketball teaching. The use of virtual reality technology in basketball

teaching can allow students to experience realistic visual and auditory effects, help them establish correct action representations, and stimulate their brains to effectively process and feedback on the relationship between motor skills and motor knowledge, experience, and skills, achieving the acquisition, storage, and consolidation of knowledge and experience. Virtual reality technology provides teachers with a new teaching mode, changing the traditional basketball teaching situation where teachers simply explain and demonstrate, and students passively receive knowledge.

In addition, virtual reality technology provides a new teaching mode for physical education teachers, which has the characteristics of immersive experience, interactivity, and multi perception. Teachers can use virtual reality technology to allow students to truly experience and learn basketball skills in the process, enhancing students' interest and enthusiasm for learning basketball skills [8-9]. In practical teaching, teachers can combine virtual reality technology with traditional basketball teaching to create a virtual training environment for students.

3.4. Virtual reality technology provides teachers with convenient teaching aids

In traditional basketball teaching, teachers need to prepare a large number of teaching aids and equipment, which must be prepared for each class. But after applying virtual reality technology, teachers can showcase teaching content through multimedia, demonstrate and explain basketball techniques, allowing students to experience the movements in person. At the same time, they can also provide students with a practice environment related to the movements, enabling them to gain a more intuitive understanding. At the same time, teachers can use multimedia displays to create a 3D virtual representation of the basketball teaching process, and demonstrate 3D animation effects as needed, enabling students to form a complete understanding of basketball techniques and movements. In basketball teaching, certain venues, equipment, and other content that are difficult to operate in practice are displayed through virtual reality technology. At the same time, teachers can set some special situations and questions in multimedia presentations for students to think about, and teachers can provide targeted guidance to students based on these questions and situations. For example, when explaining hand changing dribbling in basketball offense, teachers can use virtual reality technology to showcase some of the problems and incorrect movements that may occur during the dribbling process. This not only helps students solve problems but also effectively improves the quality of teaching[10].

4. Conclusion

In summary, the use of virtual reality technology in basketball teaching can stimulate students' interest and motivation in learning, improve their enthusiasm and initiative in learning, and enhance teaching effectiveness. Virtual reality technology can simulate basketball techniques on a computer, helping students establish a complete concept of movements and better understand basketball skills. Therefore, the application of virtual reality technology can help teachers improve the quality of basketball teaching, enrich basketball teaching content, and enhance students' interest in basketball.

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