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# Application of virtual reality technology assisted training in college taekwondo training

**Ma Dongcheng**

*Baoshan University, Baoshan City, Yunnan, 678000, China*
*Jungwon University, Goesan-gun, North Chungcheong, 28024, Republic of Korea*

***Abstract:*** *Taekwondo is a high-intensity sport that requires athletes to have a high level of skill and physical fitness. In traditional taekwondo training, there are certain problems with both training effect and training cost. In order to better improve the training effect, reduce the training cost, and enhance the training experience, more and more coaches and athletes have begun to try to use virtual reality technology for taekwondo training. The application of virtual reality technology can not only improve students' skill level, but also provide students with a richer and more diverse training experience. Therefore, the application of virtual reality technology will become an important development direction for college taekwondo training in the future. Therefore, this paper analyzes the advantages and challenges of virtual reality technology in taekwondo training, and on this basis, the application countermeasures of virtual reality technology in taekwondo training are proposed in order to provide some reference for relevant personnel.*

***Keywords:*** *college taekwondo training; virtual reality technology; auxiliary training; apply*

## 1. Introduction

In today's modern scientific and technological development, virtual reality technology has become a hot topic in many fields, among which sports training is no exception. In college taekwondo training, the application of virtual reality technology can provide students with a more realistic and effective training experience, and can also improve the safety and controllability of training. This article will discuss the application of virtual reality technology in college taekwondo training, in order to provide coaches and students with more scientific and efficient training methods.

## 2. The overview of virtual reality technology

Virtual reality technology is a kind of computer technology-based, using human-computer interaction technology, sensing technology, graphic image processing technology, simulation technology and other technical means to create a virtual environment, so that users can feel the various feelings and experiences in the virtual environment. The core of virtual reality technology is to use computers as tools to create a virtual environment by simulating various elements of the real environment and situation, allowing users to experience the same or similar feelings and experiences as the real world in the virtual environment. The application range of virtual reality technology is very wide, including games, entertainment, education, medical, construction, industrial, military and other fields. In the field of games and entertainment, virtual reality technology has been widely used, such as virtual reality games, virtual reality movies, etc. In the field of education, virtual reality technology can be used to simulate experiments, create virtual teaching environments, etc. In the medical field, virtual reality technology can be used for surgical simulation, rehabilitation training, etc. In architecture and industry, virtual reality can be used for design, simulation, and more. In the military field, virtual reality technology can be used for training, simulation, etc. [1].

## 3. The main content of taekwondo training in colleges and universities

College taekwondo training is a comprehensive sports training, mainly including basic skills training, tactical training, physical training, psychological training and other aspects.

First, basic skills training. Basic skills training is the foundation of college taekwondo training,

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including the basic postures, basic movements, basic skills, etc. of taekwondo. In basic skills training, students need to master the basic postures of taekwondo, including standing, footwork, techniques, etc., as well as the basic movements of taekwondo, including kicking, hitting, dodging, blocking, etc. In addition, students need to master the basic skills of taekwondo, including kicks, fights, and wrestling.

Second, tactical training. Tactical training is an important part of college taekwondo training, including offensive and defensive conversion, offensive skills, defensive skills, etc. In tactical training, students need to master the skills of offensive and defensive conversion, including quick reaction, flexible conversion, etc. In addition, students need to master offensive and defensive skills, including how to launch effective attacks, how to defend effectively, etc.

Third, physical training Physical training is an important part of college taekwondo training, including strength training, speed training, endurance training, etc. In physical training, students need to perform a variety of different trainings, including weight lifting, running, mountain climbing, etc., to improve their physical fitness and fitness level.

Fourth, psychological training. Psychological training is an important part of college taekwondo training, including psychological quality training, psychological adjustment training, etc. In psychological training, students need to master skills such as how to stay calm and how to regulate emotions to improve their psychological quality and psychological ability.

## 4. The advantages and challenges of virtual reality technology in college taekwondo auxiliary training

### *4.1 Advantages*

Virtual reality technology is a kind of computer technology-based, using human-computer interaction technology, sensing technology, graphic image processing technology, simulation technology and other technical means to create a virtual environment, so that users can feel the various feelings and experiences in the virtual environment. The application potential of virtual reality technology in sports training is very large, which can improve training effects, reduce training costs, and enhance training experience.

First of all, virtual reality technology can improve the training effect. The traditional sports training mode often requires a lot of time and manpower and material resources, and the training effect is difficult to guarantee. Virtual reality technology can use computer technology and sensing technology to simulate various training scenarios and environments, so that athletes can conduct various training in a virtual environment, thereby improving the training effect. For example, in taekwondo training, virtual reality technology can simulate various competition scenarios and opponents, allowing athletes to conduct actual combat training in a virtual environment, thereby improving actual combat ability.

Second, virtual reality technology can reduce training costs. The traditional sports training model often requires a lot of resources, such as venues, equipment, manpower and material resources, and the cost is high. Virtual reality technology can use computer technology and sensing technology to simulate various training scenarios and environments, without the need for a large number of resources such as venues and equipment, thereby reducing training costs. In taekwondo training, virtual reality technology can simulate various venues and equipment and other environments, without the need for actual equipment resources, thereby reducing training costs [2].

Finally, virtual reality technology can enhance the training experience. Traditional sports training models are often monotonous and boring, and it is difficult to stimulate the interest and enthusiasm of athletes. Virtual reality technology can use computer technology and graphic image processing technology to create a variety of virtual environments and scenes, so that athletes can feel a variety of training scenes and environments in an immersive way, thereby enhancing the training experience. In taekwondo training, virtual reality technology can simulate various competition scenarios and opponents, allowing athletes to conduct actual combat training in a virtual environment, thereby enhancing the training experience[3].

The application potential of virtual reality technology in sports training is very large, which can improve training effects, reduce training costs, and enhance training experience. The application of virtual reality technology needs to combine the actual training scene and environment, combine with the traditional training mode, and carry out personalized application according to the characteristics of different sports and athletes, so as to achieve better training effects and experiences [4].

ISSN 2618-1576 Vol. 5, Issue 7: 12-18, DOI: 10.25236/FSR.2023.050703

### *4.2 Challenges*

#### *4.2.1 The cost of equipment and software is high*

The application of virtual reality technology in taekwondo training requires the use of specialized equipment and software, which are relatively expensive. In particular, high-end virtual reality equipment and software are even more expensive. For some small and medium-sized taekwondo training institutions, purchasing these equipment and software may cause some financial pressure. At the same time, these devices and software need to be constantly updated and maintained, which also increases the operating costs of training institutions.

#### *4.2.2 Technical instability*

The technical level of virtual reality technology is still relatively unstable, especially in human-computer interaction, motion capture, virtual scene production, etc., there are certain technical difficulties. This may affect how well virtual reality technology is used in taekwondo training. For example, in virtual reality training, the instability of motion capture technology can lead to inaccurate training data, which can affect the training effect. Therefore, the application of virtual reality technology in taekwondo training requires continuous technical improvement and optimization [5].

#### *4.2.3 Need to adapt to the habits and psychology of the population*

The application of virtual reality technology in college taekwondo auxiliary training needs to take into account the habits and psychology of the crowd, which is a very important issue. Virtual reality technology requires the use of devices such as head-mounted displays, joysticks, etc., which may be new to many students and require a certain amount of time and adaptation process. For some students, virtual reality technology can bring feelings of discomfort or dislike. For example, a head-mounted display may make some students feel dizzy, dazzling, or uncomfortable, and devices such as a handle may be inconvenient or uncomfortable for some students. In this case, it is necessary to provide personalized coaching and guidance to students, understand their feelings and needs, provide them with more comfortable and suitable virtual reality equipment, and improve the training effect.

## 5. The application of virtual reality technology in college taekwondo auxiliary training

Virtual reality technology is a comprehensive application based on computer graphics, human-computer interaction, perception technology and other technologies, by simulating real scenes and environments, allowing users to feel the existence of the virtual world immersively. In taekwondo training, virtual reality technology can be applied to technical training, tactical training and competition simulation, which can improve training effects, reduce training costs, and enhance training experience.

### *5.1 Application of virtual reality technology in taekwondo technique training*

Taekwondo is a highly technical sport that requires athletes to master various technical movements such as kicking, hitting, and defense. Virtual reality technology can provide taekwondo athletes with a more realistic and intuitive technical training environment, helping them better master various technical movements. Specific applications include the following:

First, the demonstration and simulation of technical actions. Virtual reality technology can allow athletes to feel the actual effects of various technical actions by simulating real scenes and environments. For example, with virtual reality head-mounted displays and joysticks, athletes can simulate various technical movements such as kicking, hitting, defense, etc., and demonstrate and simulate in real time in a virtual environment. This can help athletes better master the essentials and techniques of various technical movements and improve the effect of technical training [6].

Second, the adjustment and optimization of technical actions. Virtual reality technology can provide coaches and athletes with more intuitive and accurate technical training data, helping them adjust and optimize technical movements. For example, through virtual reality head-mounted displays and motion capture devices, various technical movement data of athletes can be recorded in real time, including speed, strength, angle, etc. of movements. This data can be used to analyze the athlete's technical movements, identify existing problems, and make targeted adjustments and optimizations to improve the effect of technical training.

Third, diversified training of technical movements. Virtual reality technology can provide athletes

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with more diverse and personalized technical training programs, helping them better adapt to different technical scenarios and opponents. For example, through virtual reality technology, different competition scenarios and opponents can be simulated, allowing athletes to conduct diversified technical training in a virtual environment. This can help athletes better adapt to different competition scenarios and opponents, and improve the resilience and winning rate of the competition [7].

### *5.2 Application of virtual reality technology in taekwondo tactical training*

In taekwondo, in addition to the skill and proficiency of technical movements, the use of tactics is also very important. Virtual reality technology can provide taekwondo athletes with a more realistic and intuitive tactical training environment, helping them better master various tactical techniques. Specific applications include the following:

First, the demonstration and simulation of tactical skills. Virtual reality technology can allow athletes to feel the actual effects of various tactical techniques by simulating real game scenarios and opponents. For example, with virtual reality head-mounted displays and joysticks, athletes can simulate different competition scenarios and opponents for real-time presentations and simulations. This can help athletes better master the essentials and techniques of various tactical skills and improve the effect of tactical training.

Second, the adjustment and optimization of tactical skills. Virtual reality technology can provide coaches and athletes with more intuitive and accurate tactical training data, helping them adjust and optimize tactical skills. For example, virtual reality head-mounted displays and motion capture devices can record data on athletes' tactical skills in real time, including speed, strength, angle, and more. This data can be used to analyze athletes' tactical skills, identify existing problems, and make targeted adjustments and optimizations to improve the effectiveness of tactical training.

Third, diversified training of tactical skills. Virtual reality technology can provide athletes with more diverse and personalized tactical training solutions, helping them better adapt to different competition scenarios and opponents. For example, through virtual reality technology, different competition scenarios and opponents can be simulated, allowing athletes to conduct diversified tactical training in a virtual environment. This can help athletes better adapt to different competition scenarios and opponents, and improve the resilience and winning rate of the competition [8].

### *5.3 Application of virtual reality technology in taekwondo competition simulation*

Virtual reality technology can provide taekwondo athletes with a more realistic and intuitive competition simulation environment, helping them better adapt to the competition scene and opponent, and improve the resilience and winning rate of the competition. Specific applications include the following:

First, the simulation of the competition scene. Virtual reality technology can allow athletes to feel the tension and pressure of the competition by simulating real competition scenarios and opponents. For example, with virtual reality head-mounted displays and joysticks, athletes can simulate different competition scenarios and opponents for real-time simulation. This can help athletes better adapt to the competition situation and opponents, and improve the resilience and winning rate of the competition.

Second, the adjustment and optimization of competition strategies. Virtual reality technology can provide coaches and athletes with more intuitive and accurate competition training data, helping them adjust and optimize their game strategies. For example, through virtual reality head-mounted displays and motion capture devices, athletes' game data can be recorded in real time, including speed, strength, angle, etc. of movements. This data can be used to analyze athletes' performance, identify problems, and make targeted adjustments and optimizations to improve the winning rate of competitions.

Third, the accumulation and improvement of competition experience. Virtual reality technology can provide athletes with more diversified and personalized competition training programs, helping them accumulate competition experience and improve competition skills. For example, through virtual reality technology, different competition scenarios and opponents can be simulated, allowing athletes to conduct diversified competition training in a virtual environment. This can help athletes better accumulate competition experience and improve competition skills, and improve the winning rate of competitions.

In short, the application of virtual reality technology in taekwondo training has broad prospects and

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potential, which can improve training effects, reduce training costs, and enhance training experience. At the same time, the application of virtual reality technology also needs to combine the actual training scene and environment, combine with the traditional training mode, and carry out personalized application according to the characteristics of different sports and athletes. Only through continuous technological innovation and practical exploration can we give full play to the role of virtual reality technology in taekwondo training and provide better support and services for athletes' training.

## 6. Strengthen countermeasures for the application of virtual reality technology in taekwondo training in colleges and universities

### *6.1 Determine the goals and needs for the application of virtual reality technology*

When applying virtual reality technology for college taekwondo training, it is first necessary to clarify the goals and needs of the application. The goals include improving students' skill level, enhancing students' physical fitness, and increasing students' interest in training. Requirements include the selection of equipment and software, the design of training scenarios, and the evaluation of training effects. Only by clarifying the goals and needs can we better select suitable virtual reality technology equipment and software for personalized applications.

### *6.2 Choose the right VR technology equipment and software*

When selecting virtual reality technology equipment and software, there are a variety of factors to consider to ensure that the selected equipment and software can meet the needs and goals of the training. When it comes to equipment, brand, performance, and price are among the most important considerations. When choosing a brand, you can choose some well-known brands because these brands usually have better quality and service guarantee. When considering performance, you need to choose the appropriate equipment according to the requirements of training, such as resolution, frame rate, latency, etc. In addition, price is also an important consideration, and you need to choose the right equipment according to your budget [9].

When it comes to software, functionality, ease of use, and usability are among the most important considerations. When selecting software, you need to select the corresponding software according to the training content and goals. For example, when choosing taekwondo simulation software, you need to choose software that can simulate real competition scenarios and technical movements; When choosing a workout software, you need to choose software that provides a comprehensive workout program and data analysis. In addition, ease of use is also an important consideration, and it is necessary to choose software that is easy to operate so that students can get started quickly and enjoy training. Applicability is also an important consideration, and it is necessary to choose software that can adapt to different training scenarios and needs.

### *6.3 Combined with the actual training scenario and environment, personalized application is carried out*

When applying virtual reality technology for college taekwondo training, it is necessary to combine the actual training scene and environment for personalized application. This can better meet the training needs and goals of different students and improve the training effect.

When training taekwondo skills, different training scenarios and environments can be designed according to different skill requirements. For example, when simulating a competition scenario, virtual reality technology can be used to simulate a real competition scenario, so that students can better adapt to the competition scenario and improve the winning rate of the competition. When simulating real combat scenarios, virtual reality technology can be used to simulate real combat scenarios, so that students can better master taekwondo skills and improve actual combat ability. In addition, different training environments can be designed according to different skill requirements, such as simulating different terrain and climate, so that students can better adapt to different environments and improve training effects.

When training physical fitness, different training scenarios and environments can be designed according to different training requirements. For example, when simulating a high-altitude environment, virtual reality technology can be used to simulate the high-altitude environment, so that students can better adapt to the high-altitude environment and improve their physical adaptability. When simulating

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a high-temperature environment, virtual reality technology can be used to simulate a high-temperature environment, so that students can better adapt to the high-temperature environment and improve their heat resistance. In addition, different training environments can be designed according to different training requirements, such as simulating different climates and terrains, so that students can better adapt to different environments and improve training effects.

Through personalized application, the training effect can be better improved, so that students can better master taekwondo skills and physical training, and improve training level and actual combat ability. At the same time, it can also increase students' interest and understanding of virtual reality technology, stimulate their enthusiasm for learning and innovation ability.

### *6.4 Strengthen training and guidance on the use of virtual reality technology*

When applying virtual reality technology for college taekwondo training, it is very necessary to strengthen the training and guidance of virtual reality technology. Students need to understand the basic principles and operation methods of virtual reality technology in order to better apply virtual reality technology for training. They need to know how to use virtual reality equipment and software, how to train skills and physical fitness in a virtual reality environment, and how to use virtual reality technology for competition simulation. Coaches need to understand the application scenarios and effect evaluation methods of virtual reality technology in order to better guide students in training. They need to understand how to choose the right virtual reality equipment and software, how to personalize the application according to the actual situation of students, and how to combine traditional training models and virtual reality technology for training [10].

At the same time, it is also necessary to strengthen safety education on virtual reality technology. First of all, the cost of virtual reality technology is high, it requires a large investment of money to purchase equipment and software, and it requires professionals to develop and maintain. Therefore, before the introduction of virtual reality technology, adequate budget and planning are required to ensure the feasibility and sustainability of the project. Secondly, the application of virtual reality technology needs to adapt to the habits and psychology of the crowd. In college taekwondo auxiliary training, students' interests[11], personality and psychological factors need to be taken into account to improve students' experience and learning effect. For example, some students may feel unfamiliar or uninterested in virtual reality technology and need to take steps to stimulate their interest and enthusiasm. At the same time, the application of virtual reality technology needs to strengthen safety education. Students and instructors need to wear virtual reality equipment into a virtual reality environment for training, so they need to pay attention to the safe use of virtual reality equipment. For example, avoid problems such as eye strain and dizziness caused by excessive use of virtual reality devices[12]. In addition, it is also necessary to pay attention to the safe use of the virtual reality environment and avoid excessive movements in the virtual reality environment to avoid accidental injury.

## 7. Conclusion

In short, the application of virtual reality technology in college taekwondo training has broad prospects and far-reaching significance. Through reasonable application countermeasures, virtual reality technology can be better applied for training, and students' skill level and training effect can be improved. When applying virtual reality technology for college taekwondo training, it is necessary to strengthen the training and guidance of virtual reality technology, including the training and guidance of students and coaches. In addition, it is also necessary to pay attention to the safe use of virtual reality technology to ensure the safety of students when using virtual reality technology. Only in this way can virtual reality technology be better applied for college taekwondo training and improve students' skill level and training effect.

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