

# Application of Virtual Simulation Technology in Track and Field Teaching

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**Abstract.** With the continuous deepening of quality-oriented education, more and more schools have begun to pay attention to the all-round development of students. In addition to teaching students the knowledge of basic subjects, schools also need to arrange physical education classes to allow students to exercise in physical education classes. Track and field sports are the basic content in the teaching of physical education. Teachers need to take scientific methods to carry out track and field teaching in physical education classes to ensure the effect of track and field teaching. Track and field sports can well reflect the qualities of human endurance, speed and strength, and appropriate track and field sports can enhance students' physical fitness. Physical education teachers adopt scientific teaching methods to guide students in physical education. Virtual simulation technology is a newly developed computer technology. It mainly combines simulation technology and virtual reality, and applies virtual simulation technology in sports track and field teaching, which can guarantee the quality of track and field teaching.

## 1. The Significance of Applying Virtual Simulation Technology in Track and Field Teaching

### 1.1 To avoid Accidents in Teaching

Track and field sports include items such as hammers, shots and javelins. These projects are usually carried out in the same sports ground. Due to the large number of people in the venue, other students or personnel may have personal injury. In order to avoid the accidents of physical education to the greatest extent, most schools will abandon certain sports, or reduce the hours of certain sports, which is obviously not conducive to students' active participation in sports. Physical education teachers can effectively use the virtual simulation technology in the process of track and field teaching, which can effectively simulate the training scene and can avoid the unexpected situation that may occur in the track and field teaching to the greatest extent, so that students can smoothly carry out track and field sports.

### 1.2 To Break through the Limitations of Venues and Facilities

At present, many schools in our country have poor conditions of sports venues and facilities, and there are many small events in track and field sports. Physical education teachers are vulnerable to the influence of venues and facilities in track and field teaching. The venues and facilities are prone to be too small to fully stretch their sports. The facilities are inadequate and it is not possible to demonstrate to the students the correct operation of the facility. Physical education teachers effectively apply virtual simulation technology in the teaching process to minimize the restrictions on sports and sports conditions. Virtual simulation technology can create simulated scenes for students, and teachers can explain the main points of track and field projects in simulated scenes, so that students can master more sports knowledge through the demonstration of virtual scenes.

### 1.3 To avoid Harming Students by Difficult Movements

There are some difficult movements in events in track and field, such as hammer, shot put. These difficult movements are easy to cause students to be injured in the course of sports, and even some of them will cause students to fall into lifelong disability. Therefore, physical education teachers should try to avoid the difficult movements of athletics in the process of track and field teaching. Physical education teachers can use virtual simulation technology to scientifically transform some training facilities, so that students can use virtual equipment and facilities to practice and to avoid the injury of difficult movements to students to a certain extent. At the same time, the application of virtual simulation technology in sports track and field teaching can make students no longer afraid of training and bravely repeat the exercise of sports action to achieve the excellence of sports

action.

## **2. Principles to be Followed in the Application of Simulation Technology in Track and Field Teaching**

### **2.1 Applying Multiple Teaching Resources as Far as Possible**

In the past, physical education teachers used the methods of explaining theoretical knowledge in the classroom to teach the track and field. The students only passively accepted the knowledge points taught by the teachers. In this case, the only way for students to acquire learning resources is physical teachers. The theoretical knowledge, sports techniques and tactics that students can master depend on the level of teachers, which leads to the limited space for students to grow. Therefore, physical education teachers need innovative teaching methods to enable students to acquire more learning resources through effective methods. Teachers applying virtual simulation technology in track and field teaching should follow the principle of learning multiple teaching resources. The use of virtual simulation technology can change the single and boring teaching form in the past, which can make the teaching content simple and can make the teaching content more attractive to students. At the same time, physical education teachers can also use virtual simulation technology to produce courseware. For example, physical education teachers can make MOOCs and online courses that meet the trend of the times, so that the channels for students to learn resources can be further expanded, so that students can interact with teachers in real-time learning, and promote the quality of track and field teaching.

### **2.2 Following the Principle of Presenting Exercise Skills and Movements Correctly**

The main content of track and field teaching is to explain the theoretical knowledge, technology and tactics of sports such as hammer, shot and javelin. The technology is the core of the whole track and field teaching. Students hope to master correct and standardized actions in classroom teaching. However, China still cannot fully regulate the movements of track and field athletes. The movements of different physical education teachers will be different. Therefore, it is necessary to use scientific methods to expose students to normative actions. The use of virtual simulation technology in track and field teaching needs to follow the principle of presenting motion movements correctly. For example, physical education teachers can place electronic muscle patches on students' bodies, and use technology to scientifically simulate student movements, and then make full use of high-level athletes' movements and electronic computers to carry out comparisons to effectively help students to correct their movements and help students master the normative movements.

### **2.3 Following the Principle of Fully Presenting Motion Technology Movements**

In track and field sports, there are many projects that focus on the speed of technical action, but the fast technical action is difficult to present to students in classroom teaching. Physical education teachers can use virtual simulation technology to solve this problem. The application of virtual simulation technology in track and field teaching always follows the principle of complete presentation of technical action. For example, physical education teachers can use 3D virtual cameras to present technical actions. Virtual cameras can slow down the original high-speed technical actions, so that students can clearly view each high-speed technical action, and effectively help students better understand technical actions. Virtual simulation technology can clearly present the technical movements of track and field sports to students from multiple angles and directions. Students can also adjust the angle and orientation of observing technical movements by means of keyboard and mouse, so that students can observe and analyze technical actions pertinently.

## **3. Application of Virtual Simulation Technology in Track and Field Sports Teaching**

### **3.1 Creating Virtual Learning Situations**

Track and field teaching is different from general subject teaching. If track and field sports want to have a good teaching effect, it needs a good learning situation. Physical education teachers need to create active and interactive learning situations as far as possible in track and field teaching, so that

students can understand more theoretical knowledge, techniques and tactics of athletics, and gradually form a good learning model. Virtual simulation technology can create learning situation from two aspects. Firstly, teachers can scientifically generate virtual athletes, equipment and facilities with the help of computers, which can enable students to have visual experience, observe athletes' technical movements in virtual situation carefully, and enable students to carry out various technical movements of virtual athletes. The analysis of position enables students to have a correct perception of movement stereotypes. At the same time, the voice prompt in the virtual situation can help students grasp the essentials of track and field sports, so that students can master more techniques and tactics of track and field sports. Secondly, students can play high-level sports specialists by virtue of virtual learning situations, experience various events of track and field sports in learning situations, and practice various technical actions in virtual learning situations. Students can integrate theoretical knowledge and technical actions from virtual learning situations, which is beneficial to students' grasp the essentials of technology.

### **3.2 Building an Effective Teaching Model**

The development of virtual simulation technology has impacted the traditional physical education teaching mode. The traditional physical education teaching mode is single, which is not conducive to students' comprehensive grasp of sports knowledge. The use of virtual simulation technology in track and field teaching can effectively integrate project cognitive rules, teaching rules and learning emotional experience, which can provide convenience for students to learn independently. The teaching of virtual simulation technology mainly pays attention to the cultivation of the overall thinking and concept of student sports, that is, it pays attention to the students' understanding of the theoretical basis, tactics and technology of track and field events. The application of simulation technology can visualize the abstract teaching content of track and field sports. The use of multimedia technology increases the interest of teaching content, so that students' touch, vision and hearing can be invested in track and field teaching, effectively helping students understand the content of obscure sports teaching.

### **3.3 Completing Multiple Teaching Goals**

In the past, track and field teaching only required students to master the basic actions of a project, and skilled use of technical movements in track and field activities. After the physical education teacher applies the virtual simulation technology to the track and field teaching, the teaching objectives can be divided into two parts, that is, the skill goal and the emotional goal. The use of virtual simulation technology can make students have a rich emotional experience, and emotions can change with the movement to achieve emotional goals. Skill objectives can be divided into three aspects, namely, auditory stimulation, mirror stimulation and morphological stimulation. Auditory stimulation refers to students taking different music, vocals or warning sounds when practicing exercises in virtual situations to point out and correct correct students' wrong technical actions. Mirror surface stimulation refers to the combination of photographic imaging and simulation technology in the teaching process. Students can observe their own motion images through image and simulation technology while learning, and can find their own wrong actions in the first time. Morphological stimuli refer to the technical movements of students to observe virtual high-level special athletes and learn the normative movements of athletes. Through simulation technology, multiple goals of track and field teaching can be completed.

## **4. Conclusion**

Standardized track and field sports can effectively enhance the physical fitness of students and help students maintain a healthy body. With the popularity of track and field sports, more and more people pay attention to the normative nature of track and field sports. Physical education teachers can use simulation technology to improve the standardization of students' technical movements in track and field teaching. The use of virtual simulation technology can also improve the efficiency of track and field teaching to achieve the goal of track and field teaching.

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