Application of Virtual Reality Technology in College Physical Education Teaching and Training

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Abstract: With the continuous development of social science and technology, the application range of computers is wider and wider. The computer "virtual reality" technology is used in college sports training, which can enrich the content of physical education classrooms, update classroom teaching methods, and improve the quality and efficiency of physical education training. However, in the process of actual application, there are still some problems to be solved.

1. Introduction
Virtual reality technology itself is a new technology for real-life simulation through computer systems. Compared with previous human-computer interaction, it not only provides strong audio-visual experience, but also provides human-computer interaction such as smell and taste. Through the terminal equipment and interface in the computer, a variety of software and hardware are combined to simulate the human sense, so that the user can feel immersive from all directions and achieve a more realistic situational experience. The integration of virtual reality technology into college physical education and training can make students feel immersive and learning and training in specific situations can greatly improve the teaching effect.

2. Characteristics of computer "virtual reality" technology
The continuous development of computer technology has created a good working environment for the use of computer "virtual reality." According to relevant research, computer "virtual reality" technology is divided into four types: interactive features, multi-perceive features, conceptual features, and immersive features.

2.1. interactive features
"Virtual reality" mainly simulates various scenes of reality through computers. Therefore, most of the virtual reality technologies are in the form of Table 1 below. Under the artificial operation, the simulated scenes can be modified accordingly to perfect the reality and imagination.

| User response action | Detection equipment                                |
|----------------------|---------------------------------------------------|
| Head movement        | Head tracking device                               |
| Limb or body movement| Tracker, force feedback device, space ball         |
| Finger movement      | Data gloves, button device, sense of manipulation  |
| Eye movement         | Eye tracker                                        |
| Language             | Speech recognition device                          |
| Force                | Force feedback device with force sensor            |
As shown in Table 1 above, this capability has a two-way interaction that makes the computer "virtual reality" technology interactive. Because of this, technicians can selectively simulate various non-existent scenes in real life, whether it is in scene simulation such as film and television shooting or physical research.

2.2. multi-perceived features
Because the "virtual reality" technology is mainly composed of various types of sensors, computer hardware and software, the multi-perception feature makes the sensor more flexible, so that the physical education and training of colleges and universities is more scientific and reasonable. As shown in Figure 1 below, it is a non-perceptual concrete presentation and three-point application. This technology can perform motion and image acquisition and analysis:

- Enhance spatial information, especially when space is outside the scope of view.
- Data-driven sound can convey attribute information of an object.
- Sound is another way to interact with users and virtual environments.

In addition to the one shown in Figure 2 above, "virtual reality" can also judge and process non-specific information such as force field, magnetic field, and touch, and can present the results of analysis and processing through the form of a map or a signal. Based on these characteristics, the computer "virtual reality" technology has multiple sensing characteristics.

2.3. Conceptual Features
The conception and interactivity are common, and both are simulated by computer for various non-existent scenarios. However, the conceived features can expand people's imagination, and construct a scene that does not exist in reality through human imagination.

2.4. immersio characteristics
Immersio is one of the more important features of "virtual reality" technology. Virtual reality can almost simulate a certain scene according to people's fantasy, thus satisfying people's desire to communicate in the virtual world. The realistic environment simulated can make people immersed in it.

3. The status quo of college sports training in China

3.1. There are many training subjects, less training time and poor training results.
At present, the most prominent problem in college sports training is that there are many training subjects and less class hours. It is difficult to meet the requirements of the new curriculum standard by using traditional sports training methods.
Figure 2: The current status of the overall process of college sports training in China

At the same time, the traditional sports training teaching process is mainly as shown in Figure 2. Most of the focus is on improving students' sports level, ignoring the improvement of students' comprehensive ability. The training method is very monotonous and boring, and the sports training effect is not.

3.2. Students lack enthusiasm for learning and the criteria for judging are not clear.
College teachers do not pay much attention to physical education, and there is no clear regulation on students' sports performance. Students lack enthusiasm for learning. Many students only take physical education classes to cope with forms, and teachers' neglect management makes physical education training affect.

4. Classification of computer "virtual reality" technology in college sports training
From the current situation, computer "virtual reality" technology can be divided into "immersive" and "non-immersive" in sports training. Immersive means that the trainer should use a three-dimensional helmet or stereo glasses to make the trainer feel a very realistic three-dimensional environment. This type of training allows the trainer to devote himself to the virtual training environment and is able to perform a series of simulations.

However, this training method has high input cost and complicated operation, and most universities cannot meet this requirement. According to a report by data analysis agency Super Data Research, by the end of 2016, the number of VR product users will reach 3.89 million, while the VR market is expected to reach $5.1 billion. The analysis predicts that Europe will become the first market for VR products in 2016, with a scale of US$1.9 billion. The market size in North America will be US$1.5 billion, followed by the Asian market, which will reach US$1.1 billion. In the rest of the world, 600 million US dollars, the total size of the VR market in 2016 can reach 5.1 billion US dollars.

Non-immersive, this training method can be used as long as there is a computer, using a computer to provide students with a flat virtual environment to meet the learning requirements of students, for example, to make sports training videos. Although this method cannot build a three-dimensional virtual environment for students like immersive, it can bring a very rich visual and auditory effects, and the operation is very convenient.

5. Application of Computer Based "Virtual Reality" Technology in College Physical Education
It is worth mentioning that the size of the VR market in education in 2016 will be 7.7 times higher than the 660 million US dollars in 2015. The analysis also pointed out that this figure will jump to 8.9 billion in 2017, and in 2018 will reach $12.3 billion. The interactive texture attribute applied by the virtual reality technology is mainly calculated according to the following formula:

\[
I_{local} = k_a I_a + k_d (N \cdot L) + k_s (N \cdot H)^n
\]

\[
I = I_{local} + sI_a + t I_i
\]
Of course, college sports teaching workers are most concerned about the price of VR products. Compared with expensive VR devices, college physical education teachers are more inclined to experience VR content on relatively inexpensive mobile devices. But the report also mentioned that relatively high-end products like PlayStation and Oculus Rift will eventually become the first to promote the development of the VR industry.

The report also pointed out that PCVR devices such as Oculus Rift and HTCVice will sell 6.6 million units in 2016, accounting for 17% of total sales; PlayStation sales are expected to reach 1.9 million units, accounting for 5%; similar to Google and The lightweight portable VR devices launched by Samsung and other manufacturers (that is, the ones that put mobile phones in them) will sell 27.1 million units, which is the highest in sales, reaching 71%.

a) Complete the sports technology movement and reality comparison through "virtual reality" technology
The key content in college sports training is to let students master a certain technical movement through corresponding training, so that their movements are more standard. At present, many countries have increased the construction of various simulation, simulation, and virtual reality technologies. This kind of simulation system can comprehensively analyze the specific content of athlete training, find out the problems existing in the technical movement, and thus strengthen the training in the actual training in the later stage and improve the effect of students' sports training.

As shown in Figure 3 above, this sports training simulation system is an application of computer "virtual reality" technology. In actual teaching, teachers should fully grasp the use of "virtual reality" technology, and understand the students' sports literacy related content, and teach students in accordance with their aptitude. At the same time, teachers can also add some standard sports actions to the system, using computer to break down the action, not only can students have a deeper understanding of their own actions, but also deepen the communication between teachers and classmates, thus enhancing the effect of sports training.

b) Building a Surreal Training Environment with "Virtual Reality" Technology
The more remarkable feature of "virtual reality" technology is the use of computer systems to construct an imaginary environment, and to create an "immersive" feeling in this virtual environment. By applying this technology to college sports training, teachers can flexibly build a surreal training environment according to different environments and allow students to quickly adapt to the environment. At the same time, the new training environment can attract students' attention and stimulate students' interest in sports training, thus improving students' sports level in a relaxed and pleasant environment. In addition, the construction of a virtual training environment has a very important role in the training of various sports events in colleges and universities. There are often some sports exchanges between major universities. The home advantage of athletes will open up the sports level of both sides. However, the use of "virtual reality" technology in exchanges can avoid this kind of home advantage phenomenon and can improve the morale of athletes before the game.
c) Using computer "realistic virtual" technology to achieve interactive training in different places
Due to the interactive nature of computer "virtual reality" technology, this is also a prerequisite for effective cross-field interaction training. Many colleges and universities regard the traditional sports competition subject training as the main training content, and rarely involve more advanced and typical sports training programs. Applying "virtual reality" technology to sports training can not only increase the number of physical training subjects, but also improve the level of college sports training. Through the comparison of the school and other schools' physical training content, and appropriate improvement, to explore the best sports training method suitable for the school.

6. Conclusions
All in all, as the society gradually tends to modernize, the public's awareness of sports health is also showing a growing trend, which greatly increases the demand for the number of sports talents. Therefore, in order to better adapt to the trend of social development, relevant educators should also start from strengthening the teaching quality and teaching efficiency of physical education training, doing a good job in the innovation of physical education training system and teaching mode, and maximizing the students.

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