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Virtual Reality Technology in the Teaching of Sports Dance in Colleges and Universities

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Abstract: *Virtual reality technology is the product of the development of modern science and technology, which provides an immersive teaching mode for education. The application of virtual reality (VR) technology to sports dance teaching can better mobilize the enthusiasm and participation of students in class, make students better integrate into teachers' teaching, and students will not feel boring sports dance learning, because virtual reality technology is a students have created a real teaching environment, and students can experience the fun of sports dance by wearing VR glasses. This paper establishes a physical dance teaching system based on VR technology, and compares the impact of the system teaching method and traditional teaching method on students' physical dance performance. The results show that compared with the traditional teaching mode(TM), the teaching mode of the virtual reality teaching system is adopted It can improve the performance of students in sports dance and significantly improve the quality of teaching.*

Keywords: *Virtual Reality Technology, Sports Dance Teaching, Teaching Mode, Teaching Quality*

1. Introduction

Sports dance is a course for cultivating students' physical quality, but at present, many colleges and universities(CAU) do not pay attention to sports dance courses, and students have no interest in this course. In order to make CAU attach importance to the teaching of sports dance, this paper proposes to apply VR technology to sports dance teaching, allowing students to watch teaching videos and experience immersive dance learning.

Many scholars have conducted in-depth research on the application of VR technology in college teaching, and have achieved good results to a certain extent. For example, the application of foreign virtual simulation technology in education is relatively early. In universities and middle schools in some developed countries, VR technology has been used as an auxiliary method in daily teaching and experiments, especially in mechanics, medicine, sports It has achieved good results in the field of professional training [1]. A professor of a university applied virtual simulation technology to the teaching of assembly, and used a virtual network communication platform for electronic engineering and other related topics, and compared the results before and after the application of the method, and found that after using the platform, students' participation, learning enthusiasm, the academic performance has been greatly improved [2]. Although the application of VR technology in education in my country started relatively late, after a lot of exploration and research, some colleges and universities have organically combined virtual reality technology with teaching activities, and achieved good results [3]. In the teaching of architecture, a university introduced a set of virtual reality imaging system, using the system's immersion, stereoscopic display and other characteristics, through the projector and depolarized cylindrical screen to virtually observe the internal structure of the building, so as to to find and avoid the design drawbacks that appear in the design stage [4]. Although VR technology has a wide range of applications in college teaching, there are few related researches on virtual reality technology in sports dance.

This paper expounds the characteristics of VR technology and the composition of the reality system of finding you, and then establishes a virtual reality sports dance teaching system. The performance in all aspects has been improved, and the mastery of dance technology has become more proficient, indicating that virtual reality technology can bring students into an interactive and immersive learning environment, thereby improving the quality of physical dance teaching.

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2. VR Technology and T-Test

2.1 VR Technology

(1) The composition of the VR system

The VR system is mainly composed of input devices, output devices, virtual environment devices and various virtual reality technologies [5]. Input devices have two main functions. Input devices have two main functions, one is to enter information about user activities in the virtual environment to create information interaction, and the other is to decide to regain the user's location in the virtual environment [6]. The main function of the output device is to convert the various signals that students perceive or interact with in the virtual environment into information that humans can recognize and receive. It is mainly differentiated from acoustic sensors, optical sensing and tactile sensing output devices [7]. The main function of the virtual environment generation device is to create a virtual environment, receive input information from the input device, and output signals to the detection device. It is mainly composed of computers, servers, workstations, computer network systems and software [8].

(2) Characteristics of VR technology

VR technology relies on input and output devices and corresponding software technology, and can mainly show the following technical characteristics:

Interactivity: The user performs various operations in the virtual environment through the input device, and obtains the feedback of the operator in real time through the output device [9]. It can be divided into four levels: viewing, browsing, use and control.

Immersion: The user fully integrates himself into the virtual environment through input and output devices, combined with the perception system, and then becomes a participant [10]. Immersion mainly comes from the characteristics of multi-perception and autonomy. Multisensibility means that users can perceive various information such as sight, hearing, and touch through the virtual system. Autonomy means that the operator in the virtual system can be like the real environment. When the interaction occurs, the operator can have "autonomous" dynamic performance [11-12].

2.2 T-Test

The t-test can be used in the case of small sample size to infer the probability of a difference and compare whether the difference between two means is significant [13-14].

$$t = \frac{\overline{X}_1 - \overline{X}_2}{S_{\overline{X}_1 - \overline{X}_2}} \tag{1}$$

$$t = \frac{(x - \mu_0)}{S / \sqrt{n}} \tag{2}$$

Among them, n is the sample size, S is the standard deviation, $\overline{X}_1$ and $\overline{X}_2$ are the sample mean, and μ_0 is the population mean.

3. Research on the Application of VR Technology in Sports Dance Teaching

3.1 Establish a Virtual Reality Sports Dance Teaching System

When developing and designing a virtual reality sports dance teaching system, the system should include 5 basic components: participants (students, teachers, designers, etc.), resources (real environment), source knowledge (concepts, skills, materials, etc.) , model (metaphor projection), process, as shown in Figure 1.

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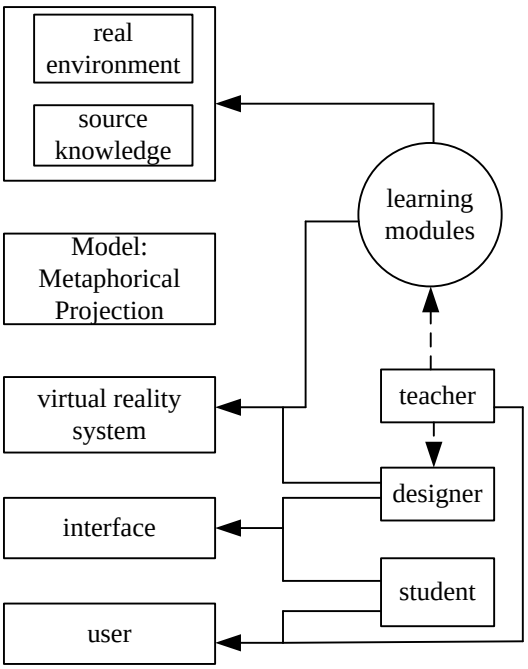

Figure 1: Virtual reality sports dance teaching system

(1) The real environment refers to the resources that can be used for learning and the real environment that exists, such as classrooms, laboratories or training rooms for teaching. Source knowledge refers to the knowledge of skills that students must acquire in relation to learning objectives. In order to determine the source of knowledge, it must be considered in conjunction with the actual learning environment.

(2) Metaphoric projection is to project the source knowledge that needs to be mastered in the real environment into the virtual environment. The learner learns the knowledge from the real environment by observing, feeling and operating in the virtual reality environment. Metaphoric projection explains learning methods in a virtual environment and guides student-teacher interactions.

(3) Designers, teachers and students are all participants in the design and development of virtual systems, and designers specialize in developing virtual systems. Teachers and students are not only involved in the system development and testing process, but are also end users of the virtual system.

3.2 Research Content and Methods

In this paper, two classes are randomly selected in a university, and the number of students in each class is 50. Class A is used as an experimental class, and class B is used as a control class(CC). Class A adopts the virtual system teaching method, and class B still adopts the traditional TM to teach sports dance. Before the start of the experiment, the T test is used to test whether there is a significant difference(SD) between the two classes. When there is no difference, it means that the basic conditions of the two classes are the same, and the next experiment can be continued. Then, different teaching modes were adopted for the two classes, and after two months, the results of the two classes were compared.

4. Analysis of Application Results of Virtual Reality Sports Dance Teaching System

4.1 Pre-Experimental Test Results

Before the start of the experiment, the students in the two classes were investigated for their understanding, learning and liking of sports dance. The results showed that the P values were all greater than 0.05, indicating that the students in the two classes did not have a high degree of cognition of sports dance. There were no significant differences in cognition. From the survey results in Table 1, it can be seen that the students in Class A and Class B mainly focus on "understanding a little" and "do not understand" about sports dance, and very few students have a very in-depth understanding of sports

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dance; Most of the students in class B have not studied or learned a little sports dance, and only a small number of students have learned it. Students in Class A and Class B who chose "dislike" sports dance accounted for 48% and 42% respectively. Interviews were conducted with the students who chose "dislike", and it was learned that these students thought sports dance was boring, and the students who chose not to like it were too big. Some are boys.

Table 1: Pre-test results

		Class A	Class B	P
Degree of learn degree	know it well	4%	2%	0.154
	understand a little	74%	66%	
	don't understand	22%	32%	
Degree of study	learned	4%	8%	0.068
	learned a little	26%	24%	
	never studied	70%	68%	
Degree of preference	like	20%	28%	0.237
	Quite like it	32%	30%	
	dislike	48%	42%	

4.2 Post-Test Results

Under the circumstance of controlling other influencing variables as much as possible, the virtual sports dance teaching system is adopted for the teaching of class A, and the traditional teacher teaching mode is adopted for class B. After the teaching experiment is completed for two months, the sports dance skills test is carried out. The test results are shown in Figure 2.

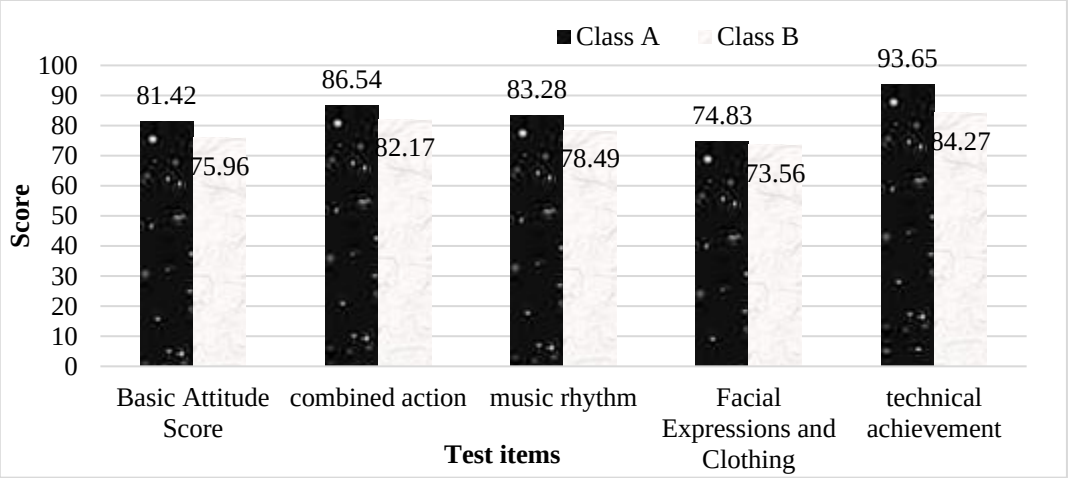

Figure 2: Comparison of sports dance performance between two classes

As shown in Figure 2, in terms of basic posture scores, the average score(AS) of class A is 81.42 points, and the AS of class B is 75.96 points; in terms of combined movement scores, the AS of class A is 86.54 points, and the AS of class B is 82.17 points; In the score of music rhythm, the AS of class A is 83.28 points, and the AS of class B is 78.49 points; in terms of facial expressions and clothing, the AS of class A is 74.83 points, and the AS of class B is 73.56 points; in terms of technical scores , the AS of class A was 93.65 points, and the AS of class B was 84.27 points; after the T test, the P values were all less than 0.05, and there was a statistically significant difference. Therefore, it can be shown that the use of VR teaching method in sports dance teaching has a significant role in promoting students' physical dance performance and skills.

In the virtual reality environment, when learners enter the autonomous learning mode, they are easily immersed in it and form an autonomous learning mechanism. Students may have deviated from their learning goals, may not achieve the expected learning effect, and the learning is very difficult. The learning status of students in the virtual learning environment should be discovered in time. Furthermore, if students are mainly engaged in autonomous learning, they may feel isolated, helpless, and affected by learning motivation when they encounter difficult problems, and they will subjectively think that teachers lack teaching functions. Therefore, even when learning in a virtual reality environment, teachers need to strengthen communication with students and answer students' questions

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in a timely manner, so as to ensure the efficiency of students' autonomous learning.

The virtual reality sports dance teaching system is adopted. First, students can learn the teaching content in advance. In the classroom, teachers only need to spend a small amount of time to guide and correct students' problems, leaving more time for students to practice. If you master it well, you will invite dance partners to practice independently after class, which increases the tacit understanding between dance partners and improves the technical level of dance movements. The second is that teachers can upload dance teaching videos in the system. The teaching videos distributed to students include basic posture exercises (such as head, standing posture, grip posture, and back exercises). Students are required to learn the teaching content before class. Practice basic postures, and teachers will also spend some time in class to practice basic postures. Teachers will always remind students to maintain postures and deepen their impressions. The third is that students can play music during the video learning process, which has an immersive experience. Students can practice dance moves with the rhythm of the music at any time. The teacher also turns on the sound in the classroom, so that students can practice with the rhythm of the music while practicing. At the same time, if any classmates are found wrong in the rhythm of music, they will be reminded in time. Therefore, the students of class A are better than the students of the control class in terms of basic posture and music rhythm, so the overall score is higher than that of the CC.

4.3 Perfect Application of Virtual Reality Technology in Sports Dance Teaching

In the application process of physical dance teaching, some existing problems have also been found, such as insufficient virtual equipment, incomplete virtual scenes, lack of cooperation and communication between students, etc. Some problems can be improved by improving teaching design, and some problems need to increase investment Therefore, the application of VR technology in sports dance teaching needs to be continuously improved to make it more suitable for the needs of sports dance teaching.

5. Conclusion

This paper studies the application of VR technology in the teaching of sports dance in colleges and universities. For this purpose, a virtual reality sports dance teaching system is specially designed, and two classes are selected as the experimental research objects. The two classes adopt systematic teaching and traditional TM respectively. The SD between the two classes was detected and found that there was no SD between the two classes. After the experiment, the sports dance scores of the two classes were tested, and it was found that the AS of the class that used the VR system for teaching was higher, and the T test also It is verified that there is a SD in the scores of the two classes, indicating that the use of VR teaching system for sports dance teaching can effectively improve the quality of teaching.

References

[1] Vakaliuk T A , Shevchuk L D , Shevchuk B V , et al. Possibilities of Using AR and VR Technologies in Teaching Mathematics to High School Students. Universal Journal of Educational Research, 2020, 8(11B):6280-6288.

[2] Dooley K, Bender S, Ferris G, et al. Immersive media practices in the classroom: models of the teaching research nexus in an Australian context. Media Practice and Education, 2020, 21(4):241-260.

[3] Goehle G. Teaching with Virtual Reality: Crafting a Lesson and Student Response. The international journal for technology in mathematics education, 2018, 25(1):35-45.

[4] Fransson G, Holmberg J, Westelius C. The challenges of using head mounted virtual reality in K-12 schools from a teacher perspective. Education and Information Technologies, 2020, 25(6):1-22.

[5] Vieiramonteiro A M, Ribeiro P. Virtual reality in English vocabulary teaching: an exploratory study on affect in the use of technology. Trabalhos em Lingu ́stica Aplicada, 2020, 59(2):1310-1338.

[6] Kowalski S, P Sam ́l, R Hirsch. Virtual reality tools in teaching the conservation and history of Polish architecture. World Transactions on Engineering and Technology Education, 2020, 18(4):399-404.

[7] Aliyu F, Talib C A. Virtual Reality Technology. Asia Proceedings of Social Sciences, 2019, 4(3):66-68.

[8] Akb A, Hha B, Mza C . The application of virtual reality technology in architectural pedagogy for building constructions. Alexandria Engineering Journal, 2019, 58(2):713-723.

ISSN 2706-6827 Vol. 4, Issue 4: 117-122, DOI: 10.25236/IJFS.2022.040419

[9] Bacca-Acosta J , Tejada J , Fabregat R , et al. Scaffolding in immersive virtual reality environments for learning English: an eye tracking study. Educational technology research and development, 2021, 70(1):339-362.
[10] Zakaria M , Abuhassna H M . Virtual Reality Acceptance in Classrooms: A Case Study in Teaching Science. International Journal of Advanced Trends in Computer Science and Engineering, 2020, 9(2):1280-1294.
[11] Alfalah S . The Value of Virtual Reality Technology in Embryology Education; Objective and Subjective Outcomes. International Journal of Psychosocial Rehabilitation, 2020, 24(9):4672-4684.
[12] Hopp M , Pfiel S , Schuster M , et al. A debate about implementing immersive technology for higher education: Pre-study examining the usability of virtual reality for lectures. Human Systems Management, 2020, 39(4):565-571.
[13] Setiawan A , Agiwahyuanto F , Arsiwi P . A Virtual Reality Teaching Simulation for Exercise During Pregnancy. International Journal of Emerging Technologies in Learning (iJET), 2019, 14(1):34-48.
[14] Park S W , Lee S K . The Effect of Liberal Dance Class with Reciprocal Teaching Method on Physical Self-efficacy, University Life Satisfaction of Female College Students. Journal of the Korean society for Wellness, 2019, 14(4):293-307.