International Journal of Sociologies and Anthropologies Science Reviews
Volume 4 Issue 5: September-October 2024: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

A Construction of Virtual Reality Technology Teaching Model to Improve Table Tennis Skills for University Students

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Received 24/03/2024 Revised 15/04/2024 Accepted 16/04/2024

Abstract

Background and Aims: To explore and build virtual reality physical education courses, and create a new teaching model of "VR+ teaching" to improve the quality of talent training and teaching effect. This study will build a teaching model of virtual reality technology to improve college students' table tennis skills, trying to enable learners to complete real-time interaction of multiple senses with the help of sensing devices in virtual sports situations, and then combine the goal incentive and feedback mechanism to improve students' self-efficacy and learning interest, which can not only promote the diversified development of sports skill learning but also promote the development of sports skill learning. It also provides a reference for the application of virtual reality technology in physical education. The purpose of this study is to construct of virtual reality technology teaching model to improve table tennis skills for university students.

Methodology: The survey included faculty and students at the three universities. Current number of teachers and students: Yunnan University has 1855 students and 66 teachers; Yunnan Normal University has 1980 students and 95 teachers. Yunnan Minzu University has 1531 students and 65 teachers. In this study, the experts were interviewed by telephone interview, face-to-face interview, and summary interview, using the method of interview outline. Questionnaires were distributed to students and teachers on-site and by webmail. The Delphi Method expert questionnaire was issued to 19 experts.

Results: Most of the teachers are willing to use virtual reality technology to teach table tennis. They think virtual reality technology will improve their teaching effectiveness. Construct a virtual reality teaching model for improving college students' table tennis skills, and construct a virtual reality teaching model for improving college students' table tennis skills from five dimensions: teaching idea, teaching goal, teaching content, teaching process, and teaching evaluation. Most people agree on all issues (IQR range 0.00-1).

Conclusion: Virtual reality technology is applied to table tennis teaching in colleges and universities so that students can quickly enter the role, and effectively improve the dull feeling caused by being bored and unable to hit the ball in the learning process of table tennis. While learning table tennis knowledge and skills, learners actively explore and complete the construction of new knowledge. It provides a new teaching concept for the reform of table tennis teaching and the multiple development of physical education curricula in colleges and universities and also promotes the deep integration of education informatization and physical education teaching in the new era.

Keywords: Virtual Reality Technology; Table Tennis Skills; University Students

Introduction

Statement and meaning of the question

Virtual reality technology, abbreviated as VR, is a virtual environment that is highly close to the real world established through computer technology and sensor network technology, etc. Immersion, Interaction, and Imagination are the three basic characteristics of this technology, and they are a kind of advanced human-computer interaction interface. To put it simply, virtual reality technology is an abstract simulation of behaviors and activities in the real world and the surrounding environment. With the help of interactive devices such as sensors and eyepieces, users can interact with objects in the virtual environment in a way close to nature, thus enabling participants to interact with the virtual environment (Fan, Yan & Zhong, 2016). The early application of virtual reality technology was limited to large-scale projects such as the government and the military, but in recent years, virtual reality began to slowly enter people's lives and gradually improve people's quality of life. Technology products and application systems related to virtual reality have attracted wide attention at home and abroad, such as environmental simulation, surgery, education, rehabilitation training, and many other fields that have made remarkable achievements (Guo, Song & Zhang, 2016). The biggest feature of virtual reality technology is that it can realize participants' presence. Different from traditional multimedia teaching,

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students are no longer just passive recipients. Participants of virtual reality and virtual environment interact with each other in two aspects of the whole, making students passive and active. Encourage students to explore independently, and transform the traditional learning mode of "promoting learning by teaching" into an "interactive" learning mode in which students learn knowledge and skills through interaction between themselves and virtual environments (Tang, 2020). The development of virtual reality (VR) technology has brought new vitality to the field of education. By introducing VR technology into teaching and training, learners can realize real-time interaction of vision, hearing, and touch in the virtual environment through sensing equipment, and build their knowledge system in the transmission of situational information.

Table tennis is a traditional major sport in China and is favored by all social classes in China. Many studies have investigated the teaching situation of table tennis in colleges and universities and found that table tennis teaching in colleges and universities is often plagued by external factors such as lack of teachers, insufficient venues, and less practice time, which often lead to unsatisfactory practice results (Su, 2021). At present, the combination of virtual reality technology and the education industry has been very extensive, but relatively few studies have been used in physical education teaching, and the combination with table tennis teaching is even less research, and the model that can truly apply virtual reality technology in table tennis teaching has not yet appeared. Therefore, in the era of industrial informatization, it is very necessary to build a table tennis teaching model by using virtual reality technology, a new technological means, to improve students' table tennis skills and enhance their autonomy and awareness.

Objectives

The objectives of this research are as follows:

Main objective

To construct of virtual reality technology teaching model to improve table tennis skills for university students.

Subsidiary objectives

To investigate the status quo of virtual reality technology and table tennis teaching mode of university students.

To develop the indicators of virtual reality technology teaching mode to improve university students' table tennis skills.

To determine the virtual reality technology teaching mode to improve university students' table tennis skills.

Literature Review

By searching the Web of Science database, China Social Science Index, China Journal Full-Text Database (CNKI), Wan Fang Database, and other Chinese and English databases, I have obtained a large number of important literature. Through the collation and analysis of the literature obtained, the hot issues and representative views of the predecessors are summarized, which provides an important theoretical basis for the study of this paper and provides a reference for the writing of the paper.

Guo (2015) proposed a scheme to realize a virtual reality system based on simple VR glasses and ordinary smartphones, which mainly includes the realization of stereovision, the realization of head tracking based on mobile phone gyroscope, and the realization of virtual-real interaction based on mobile phone accelerators and network interconnection.

Song (2005) mentioned that virtual reality technology has a very important application in the field of education. As a new information carrier, it can make learners feel immersive.

Song (2007) concluded that the application of virtual reality technology in the sports industry is mainly the simulation of sports processes and competitive simulation, and VR technology can be seen in the training of swimming, football, trampoline, bicycle, and other sports.

Sun (2013) mentioned that the development and application of information technology make it possible for computer simulation of sports actions, and many sports powers have also established their own sports simulation systems.

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Liao (2014) proposed a simple virtual-reality-assisted swimming training method to alleviate the contradiction between the large number of swimmers and the shortage of resources in swimming venues. The scheme used 3DSMAX software to build virtual scenes.

Kong et al (2020) found that VR training can effectively improve the tactical training effect of primary school football players aged 10 to 12 in their applied research on football tactical training with VR technology.

Wang et al (2020) used 3D virtual reality technology to effectively solve the problem of partial occlusion of 3D high-speed video by referees in the competition in his research on the techniques and tactics of short-track speed skating Olympic champion Wu Dajing's curve. The application of virtual simulation technology in many industries in our country is increasing day by day.

Through the research, it is found that scholars' research content on table tennis teaching mainly focuses on the current situation, existing problems, and future development trends of table tennis teaching, and the application of virtual reality technology combined with table tennis project system design is less. Therefore, this study adopts the experimental method, and according to the difficulties encountered in the teaching process of table tennis, to design a targeted virtual reality table tennis teaching program, and further explores the feasibility of the application of virtual reality technology in table tennis teaching, increase the teaching means of table tennis in colleges and universities, improve the teaching effect and improve the teaching quality of the application value.

Conceptual Framework

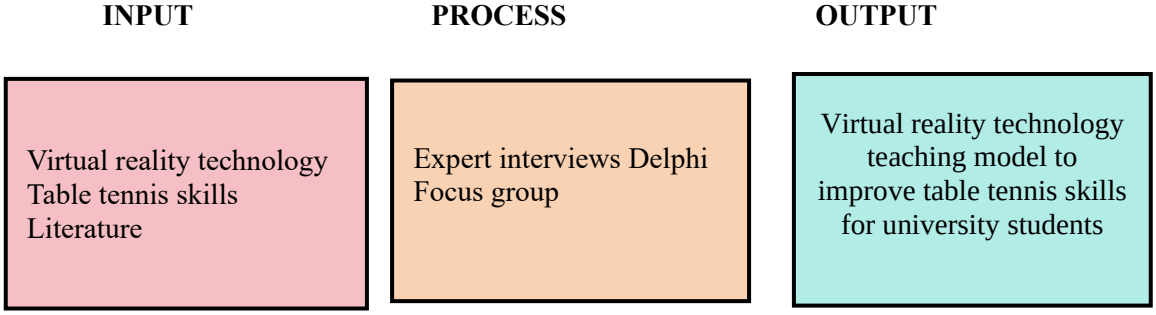

Figure 1 Conceptual Framework

Methodology

Population: The research scope of this study is for the universities offering table tennis courses in Kunming City, Yunnan Province, and the survey objects are the table tennis authorities, university leaders, table tennis experts, PE teachers, and students in Kunming City, Yunnan Province. To facilitate the research and investigation, three universities, Yunnan University, Yunnan Normal University, and Yunnan Minzu University, offered table tennis courses. The number of teachers and students in the three universities offering table tennis courses is: Yunnan University has 1855 students and 66 teachers; Yunnan Normal University has 1980 students and 95 teachers. Yunnan Minzu University now has 1,531 students and 65 teachers. The three schools now have 5,366 students and 226 teachers, with a total number of 5,592 students.

Sample:

1. Stratified sampling: the whole unit is divided into several subpopulations (layers) according to certain characteristics, and then simple random sampling from each layer to form a statistical calculation method for one sample. The stratified sampling formula is $n=N / [1 + N (e)^2]$, proposed by Japanese economist and statistician Taro Yamagan(n is the required sample size, N is the overall size, e is the allowed error rate, generally set e=0.05). n is the required sample size, N is the overall size, and e is the allowable error rate, generally set as e=0.05. The sample size of this study was 373 students, including 124 students from Yunnan University, 4 teachers, 133 students, and 6 teachers. Yunnan University for Nationalities now has 102 students and 4 teachers.

2. The Expert interview with IOC 8 people, associate senior title or above title.

3. The Expert Investigation method (Delphi method) requires 19 experts with associate senior titles, including 5 virtual reality technical experts (all with experience in table tennis) and 14 table tennis teaching experts.

4. Focus group experts, associate senior title or above.

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Research tools: Student questionnaire, Teacher survey questionnaire, Expert interview form, and the Delphi questionnaire.

Data collection: Interview outline, Student and Teacher Questionnaire, Expert questionnaire, and Focus group discussion.

Data analysis: Median and Interquartile Range

Results

Data analysis Results Data analysis is divided into the following four parts:

1. Interview experts round 1 Delphi data analysis results

1.1 Primary selection of teaching thought indicators: By combining the results of literature analysis and expert consultation, the teaching thought index of virtual reality technology table tennis teaching mode is the first guiding ideology of health. This physical education teaching thought is the evolution track of Chinese historical sports thought and the characteristics of table tennis teaching mode. It has been the teaching guiding ideology for a relatively long time in China, and also the latest teaching guiding ideology.

1.2 Primary selection of teaching objectives and indicators: By combining the results of literature analysis and expert consultation, three teaching objectives of virtual reality technology table tennis teaching mode are preliminarily selected, namely, knowledge and skill objectives, process and method objectives, and emotion and attitude objectives. These teaching objectives also refer to the teaching mode of other sports projects, and these indicators have a certain comprehensiveness.

1.3 Primary selection of teaching content indicators: By combining the results of literature analysis with expert consultation, the Initially selected virtual reality technology table tennis teaching mode teaching content index is 14, respectively, are the Overview of table tennis theory, Grip racket, and footwork, Serve flat ball, Serve backspin ball, Serve side-spin ball, Serve Inverse rotation, Forehand attack, Backhand push, Backhand push left and forehand attack right, Forehand pull, Backhand slice, Backhand slice left and Forehand pull right, Smash tall ball, Loop-drive. For college students, table tennis skills mainly include service skills, forehand and backhand attack ability, control ability, and counterattack ability. In terms of combining technology, according to the opinions of experts and the physical and mental characteristics of college students, the technology of the course teaching content should not be too much and too difficult. The indicators listed in the table comprehensively reflect the routine teaching content in daily teaching.

1.4 Primary selection of teaching process indicators: By combining the results of literature analysis and expert consultation, the teaching process indicators of virtual reality table tennis teaching mode are initially selected as 3, and the three links are pre-class links. In class: beginning part, basic part, end part; After class.

1.5 Primary selection of teaching evaluation index: By combining the literature analysis and expert consulting results, preliminary selected the virtual reality technology table tennis teaching mode teaching process index is three, respectively technical qualitative evaluation 20 points, 40 points, process evaluation 40 points: according to the student's classroom attendance 10 points, learning attitude 10 points, classroom performance 10 points, learning effect 10 points in four aspects. The teaching evaluation of physical education courses is generally divided into final evaluation and process evaluation. The above proportion is designed based on references.

2. Round 2 of Delphi data analysis results

2.1 Analysis of the screening results of teaching thought indicators: The results of the second round of the teaching thought index show that: health first guiding ideology Median=5.00, IQR=0.00, is an excellent indicator, and keep it.

2.2 Analysis of the screening results of teaching objectives: The results of the second round of expert survey on teaching objective indicators showed that: knowledge and skill objectives Median=4.00, IQR=1.00; Process and method objectives Median=5.00, IQR=0.00; Emotional and attitude goals Median=5.00, IQR=0.00, all three metrics are excellent and keep them.

2.3 Analysis of Teaching Content Index Screening Results: The results of the second round of expert survey of teaching content indicators showed that: Overview of table tennis theory Median=5.00, IQR =0.00; Grip racket and footwork Median=4.00, IQR=0.00; Serve flat ball Median =5.00, IQR=0.00; Serve backspin ball Median=5.00, IQR=0.00; Serve side-spin ball Median =5.00, IQR =0.00; Serve Inverse rotation Median=1.00, IQR=1.00; Forehand attack Median =4.00, IQR =1.00; Backhand push Median =5.00, IQR=0.00; Backhand push left and forehand attack right Median=4.00, IQR=1.00; Forehand pull Median=4.00, IQR =1.00; Backhand slice Median=5.00, IQR=0.00;

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Backhand slice left and Forehand pull right Median=5.00, IQR=0.00; Smash tall ball Median=4.00, IQR=0.50; Loop-drive Median=5.00, IQR=0.00, Delete the Serve Inverse rotation, Everything else is excellent indicators, And keep them.

2.4 Analysis of Teaching Process Index Screening Results: The results of the second round of expert survey on the teaching process indicators show Median=5.00, IQR=0.00; the beginning part of the class link Median =5.00, IQR=1.00; the basic part of the class link Median=4.00, IQR=1.00; the end part of the class link Median=5.00, IQR=0.00; after class link Median=5.00, IQR= 0.00, which are all excellent indicators and keep them. According to the experts' advice, the preparation part was added to the class session.

2.5 Selection result analysis of teaching evaluation indicators: The results of the second round of expert survey of teaching evaluation indicators show that: technical qualitative evaluation 20 points: A16-20 B11-15 C6-10 D1-5 Median=4.00, IQR=0.50; Technical quantitative evaluation of 40 points: Serve backspin ball 10 + Backhand push left and forehand attack right 60 Median=4.00, IQR=1.00;40 points for process evaluation:10 points for class attendance Median =5.00, IQR=0.00; Learning attitude of 10 points Median=5.00, IQR=0.00; Class performance:10 points, Median=5.00, IQR=0.00; Learning effect of 10 points Median =5.00, IQR=0.00, Are all very good indicators, And keep them.

3. Round 3 Delphi data analysis results

3.1 Analysis of the screening results of teaching thought indicators: The results of the third round of teaching thought index show that: health first guiding ideology Median=5.00, IQR=0.00, is an excellent indicator, and keep it.

3.2 Analysis of the screening results of teaching objectives: The results of the third round of expert survey on teaching objective indicators showed that: knowledge and skill objectives Median=4.00, IQR=0.00; Process and method objectives Median=5.00, IQR=0.00; Emotional and attitude goals Median=5.00, IQR=0.00, all three metrics are excellent and keep them.

3.3 Analysis of Teaching Content Index Screening Results: The results of the third round of expert survey of teaching content indicators showed that: Overview of table tennis theory Median=5.00, IQR =0.00; Grip racket and footwork Median=4.00, IQR=0.00; Serve flat ball Median=5.00, IQR=0.00; Serve backspin ball Median=5.00, IQR =0.00; Serve side-spin ball Median=4.00, IQR=1.00; Forehand attack Median=5.00, IQR =0.00; Backhand push Median=5.00, IQR=0.00; Backhand push left and forehand attack right Median=4.00, IQR=0.50; Forehand pull Median=5.00, IQR=0.00; Backhand slice Median =5.00, IQR=0.00; Backhand slice left and Forehand pull right Median=4.00, IQR=0.00; Smash tall ball Median=5.00, IQR=0.00; Loop-drive Median=5.00, IQR=0.00, Are all excellent indicators, And keep them.

3.4 Analysis of Teaching Process Index Screening Results: The results of the third round of expert survey of the teaching process indicators show Median=4.00, IQR=0.00; the beginning part of the class Median=5.00, IQR=0.00; the preparation part of the class Median=4.00, IQR=0.00; the basic part of the class link Median=5.00, IQR=0.00; the end part of the class Median =5.00, IQR=0.00; After class link Median=5.00, IQR=0.00, which are all excellent indicators and keep them.

3.5 Selection result analysis of teaching evaluation indicators: The results of the third round of the teaching evaluation index show: technical qualitative evaluation 20 points: A16-20 B11-15 C6-10 D1-5 Median=5.00, IQR =0.00; Technical quantitative evaluation of 40 points: Serve backspin ball 10 + Backhand push left and forehand attack right 60 Median=5.00, IQR=0.00; 40 points for process evaluation: 10 points for class attendance Median=5.00, IQR=0.00; Learning attitude of 10 points Median=5.00, IQR=0.00; Class performance: 10 points, Median=5.00, IQR =0.00; Learning effect of 10 points Median=5.00, IQR=0.00, Are all very good indicators, And keep them.

4. Data analysis results from the focus groups of 9 expert meetings

4.1 Confirmation of teaching thought indicators: The teaching idea finally determined by the focus group is the first guiding ideology of health. "Health first" is the core of China's new curriculum standard guiding ideology, this thought requires an accurate grasp of the health complete meaning, also requires the idea of the teaching material, teaching organization, teaching assessment of all aspects of teaching, always paying attention to students' health, everything to students' health as the goal, everywhere reflect health first.

4.2 Determination of teaching objectives and indicators: The final teaching objectives of the focus group were knowledge and skills goals, process and method goals, and emotion and attitude goals

4.3 Determination of teaching content indicators: The final instructions identified in the

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focus groups were an Overview of table tennis theory, Grip racket, and footwork, Serve flat ball, Serve backspin ball, Serve side-spin ball, Forehand attack, Backhand push, and Backhand push left and forehand attack right, Forehand pull, Backhand slice, Backhand slice left and Forehand pull right, Smash tall ball, Loop-drive

4.4 Determination of teaching process indicators: The final teaching process of the focus group is the pre-class link; the in-class link: beginning part, preparation part, basic part, and end part; and the after-class link.

4.5 Determination of teaching evaluation indicators: The final teaching content determined by the focus group is technical qualitative evaluation 20 points: A16-20 points B11-15 points C6-10 points D1-5 points, technical quantitative evaluation 40 points: Serve backspin ball 10 + Backhand push left and forehand attack right 60, process evaluation 40 points: Class attendance 10 points: leave a deduction 0.5 points, One point for late arrival, 2 points for early leave, 3 points for absence, The qualification for the final examination and the learning attitude will be canceled. To evaluate the students' exercises after class, Divided into four grades in four grades with 10-9 points, Better to give 8-7 points, Generally given 6-4 points, Not good to give 3-1 points, classroom performance: teachers according to the student's classroom discipline and the completion of the learning content assigned by the teacher, There are four grades of 10-9 points, Better to give the 8-7 points, Generally given 6-4 points, Not good to give 3-1 points, learning effect: according to the results of the skill test at the end of the semester, There are four grades of 10-9 points, Better to give the 8-7 points, Generally given 6-4 points, Not good for 3-1 points.

4.6 Virtual Reality Technology Teaching Model for improving university students' Table tennis skills

4.6.1 Course basic information

Course name: table tennis
Course Number: ×××××××
Course nature: Public compulsory course
Applicable majors: all majors (non-sports majors)
Class hours: 32 class hours
Course credits: 2 credits
Choose teaching materials:
Wang Feng. In Sports and Health [M]. Shanghai: Shanghai Jiao Tong University Press, 2020.
Main bibliography:
I. Table Tennis, edited by Xiao Shuxin, Beijing Normal University Press, 1st edition, 2012.
II. Rules of Table Tennis Competition, edited by China Table Tennis Association, People's Sports Publishing House, 1st edition, 2017.
III. College Table Tennis Course, edited by Li Hang, Zhang Bo, Jilin University Press, 1st edition, 2017.

4.6.2 Teaching thought

"Health first" is the core of China's new curriculum standard guiding ideology, this thought requires an accurate grasp of the health complete meaning, also requires the idea of the teaching material, teaching organization, teaching assessment of all aspects of teaching, always paying attention to students' health, everything to students' health as the goal, everywhere reflect health first.

4.6.3 Instructional objectives

I. Knowledge and skills Objective: To use virtual reality technology to watch videos, so that students can comprehensively and systematically master the basic theory of table tennis, the basic principles and methods of table tennis technology, as well as the development trend of modern table tennis.

II. Process and method objective: to enable students to correctly and reasonably master the use of virtual reality technology and learn the basic technical movements of table tennis, comprehensively improve the application ability of table tennis technology, and develop their physical quality.

III. Emotional and attitude goals: Students can systematically master table tennis technology, and pay attention to cultivating students' spirit of hard work, courage, and cooperation in the teaching process, so that students can use virtual reality technology to practice consistently and lay a good foundation for lifelong physical exercise.

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4.6.4 Content of courses

Content of courses	Teaching method	Hours
Overview of Table Tennis Theory	Teaching method, virtual reality technology learning, group learning	4
Grip racket and footwork	Teaching method, virtual reality technology practice, group learning	2
Serve flat ball	Teaching method, virtual reality technology practice, group learning	2
Serve backspin ball	Teaching method, virtual reality technology practice, group learning	2
Serve side-spin ball	Teaching method, virtual reality technology practice, group learning	2
Forehand attack	Teaching method, virtual reality technology practice, group learning	2
Backhand push	Teaching method, virtual reality technology practice, group learning	2
Backhand push left and forehand attack right	Teaching method, virtual reality technology practice, group learning	4
Forehand pull	Teaching method, virtual reality technology practice, group learning	2
Backhand slice	Teaching method, virtual reality technology practice, group learning	2
Backhand slice left and Forehand pull-right	Teaching method, virtual reality technology practice, group learning	4
Smash tall ball	Teaching method, virtual reality technology practice, group learning	2
Loop-drive	Teaching method, virtual reality technology practice, group learning	2

4.6.5 Teaching process

I. Pre-class links: pre-evaluate students, and set teaching objectives according to students' conditions. Then download the course resource video of "Basketball" of Northeastern University from the MOOCs APP of Chinese University, upload the video to the virtual reality technology Oculus Quest 2 VR All-in-one, let the students watch the video and discuss the content in the group, the teacher will ask questions about the links in the video to trigger the students' thinking, and finally the teacher will summarize the understanding of the action.

II. During the class

Start: greet teachers and students, gather the team, publish check-in, students sign in, check clothes and Oculus Quest 2 VR All-in-one, and arrange trainees.

Preparation part: discuss the video content of the newly learned table tennis technology. Each group sends one student to summarize, while other students listen to it and ask questions to discuss. Finally, the teacher makes a summary.

Organize the students to prepare for the activities.

Review the table tennis skills of the last class.

Basic part: The teacher checks the students' pre-class learning situation and asks some basic questions to the students.

The study group sent one or more students to explain the new classroom content, and other students would evaluate it and put forward the existing problems and doubts respectively. The teacher should accurately and refine the collective problems of the students, and then the teacher should make a concise explanation and demonstration of the key and difficult technical actions.

According to the divided groups, the students use the virtual reality technology Oculus Quest 2 VR All-in-one for action learning. By forming the movements in the virtual reality

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environment, the students are asked to return to the real world for practice according to the actual situation. Students use each other with their mobile phones to help them find out and correct their mistakes, and form a good learning atmosphere of mutual assistance and mutual learning in the group. Therefore, students can find problems in this way and solve them with the help of other students.

After the practice, the teacher organizes the students to conduct the teaching competition, the main purpose is to observe the students' learning situation in this class, that is, whether the expected teaching objectives are achieved, to optimize the teaching objectives of the next class.
End part: The teacher organizes the students to carry out the physical fitness exercises

Relax and organize activities

Summarize and reflect in class

To give an assignment

III. After-class link: teachers' reflection, the students also need to independent deep thinking, processing new learning knowledge, and in their actual, leisure time can use virtual reality technology Oculus Quest 2 VR All-in-one practice, to strengthen knowledge and proficiency, and then reflect before the learning content and learning process, to improve the effectiveness of their follow-up sports course learning.

4.6.6 Curriculum evaluation

I. Total score evaluation

Total score = 40 points for process evaluation + 60 points for final evaluation
Evaluation method of total score: this course is a final examination course with a full score of 100. The total score of the course consists of 40 points for process evaluation, 20 points for technical qualitative evaluation, and 40 points for technical quantitative evaluation.

II. 40 points for process evaluation

Content of process evaluation: 10 points for class attendance, 10 points for class performance, 10 points for learning attitude, and 10 points for learning effect. The specific scoring criteria are provided as follows:

(1) 10 points for class attendance: 0.5 points deducted for one leave, 1 point deducted for one late arrival, 2 points deducted for one early leave, 3 points deducted for one absence, more than 3 times in a semester to cancel the final examination qualification.

(2) Classroom performance 10 points: the teacher gives evaluation according to the student's classroom discipline and the learning content assigned by the teacher, which is divided into four grades: 10-9 points, 8-7 points, generally 6-4 points, and 3-1 points.

(3) Learning attitude 10 points: teachers give evaluations according to the communication and communication between students and teachers, as well as students' after-class practice, which are divided into four grades and four grades: 10-9 points, 8-7 points, generally 6-4 points, not 3-1 points.

(4) Learning effect 10 points: according to the results of the end of the semester, it is divided into four grades: 10-9 points, 8-7 points, generally 6-4 points, not 3-1 points.

III. 60 points for final evaluation: 20 points for technical qualitative evaluation + 40 points for technical qualitative evaluation

(1) technology qualitative evaluation of 20 points

Grade	Value	Standard
A	16-20 Points	Correct action, coordination, and swing process are used to, force concentration, timely reduction
B	11-15 Points	The movement is correct, with poor rhythm, and no obvious error
C	6-10 Points	The movement is stiff and weak, with poor coordination, but there is no fundamental nature of the movement error
D	1-5 Points	The action is wrong in principle

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International Journal of Sociologies and Anthropologies Science Reviews
Volume 4 Issue 5: September-October 2024: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

(2) Serve backspin ball 10 Points

Test method: students in the left 1 / 2 table tennis serve backspin 10 balls, the success of a 1 point, full score 10 points.

Evaluation method: The examiner must remind the examinee that each side has sent a few. The pressure line or edge are good ball, wipe the net again. The height of the serve should not exceed twice the net, otherwise, the error will be subject to the examiner's penalty. The serve rotation is in medium strength or above, otherwise, the error will be subject to the examiner's decision.

(3) Backhand push left and forehand attack right 30 Points

Test method: students and table tennis serve machine backhand push left and forehand attack right 60, a successful 0.5 points, a total score of 30 points. Record the number of successes, and two chances, and take the best one.

Evaluation method: in the process of playing, there is a net, edge, not counting mistakes, progressive count, and continuing the test.

4.6.7 Other instructions

I. Course resources:

In addition to the number of textbooks and references used in this syllabus, there are other resources available for students to study independently, such as the Chinese University MOOC app, and the game Eleven: Table Tennis VR on the Steam platform used in this course. There are also various official websites for table tennis, table tennis books in the electronic library, etc. Students can also learn public table tennis in various forms such as online or personal participation.

II. Others:

(1) Make the basis

Based on the student training plan for 2022.

This outline refers to the syllabus of Yunnan University, Yunnan Normal University, and Yunnan Minzu University.

(2) Execution object: starting from the students of grade 2023.

Discussion

This study builds a virtual reality teaching model that can improve college students' table tennis skills. The application of virtual reality technology in table tennis teaching mode is an upgrade of traditional table tennis teaching. Virtual reality table tennis simulation training through virtual table tennis games, users in the virtual experience environment to set the corresponding identity, through the coordination with the external environment and the completion of specific practice tasks to complete the table tennis training process. Therefore, virtual reality technology teaching mode is a very useful way to improve table tennis skills, because it can not only allow students to form movements in the virtual reality world but also improve the efficiency of practice. Therefore, the inclusion of virtual reality technology in the traditional table tennis teaching plan of college students supports the previous research results on the application of virtual reality technology to improve students' sports skills.

There is no empirical data to back up the assertion that most teachers are open to using virtual reality (VR) technology to teach table tennis, nor is there a reference to pertinent studies. This claim may be conjectural and unsupported by research in the absence of information about the true attitudes and intentions of teachers regarding the use of VR technology in table tennis instruction (Choi & Lim, 2019).

Although the plan to create a virtual reality teaching model to help college students become better table tennis players is commendable, it is vague about the theoretical foundation and instructional design that will inform the model's creation. The effectiveness and validity of the suggested VR teaching model are still up for debate in the absence of a clear articulation of the underlying teaching theories or instructional strategies (Nikolic, Pavlovic, & Maksimovic, 2018).

Regarding the suggested VR teaching model, the claim that "most people agree on all issues" is ambiguous and is not backed up by any context or data. It's critical to specify the sample population and the methodology for assessing agreement, as well as to recognize any potential disagreements or study limitations (Hahn, 2018).

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Recommendation

Policy Recommendation

Virtual reality technology in physical education and physical training helps beyond doubt and then limited by the traditional concept, many teachers, and coaches still cannot fully accept this teaching method, should change ideas, break the shackles, and make full use of the advantages of virtual reality, let virtual reality in the field of sports can be reality.

Further Research RecommendationReferences

The following research should apply the virtual reality technology teaching mode of table tennis in practical teaching to verify this study.

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