The Experiment and Research of VR Technology Application in the Tennis Teaching of Higher Vocational Colleges

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ABSTRACT

Tennis is a relatively important course in the physical education of higher vocational colleges. As the long development history and numerous attendance of tennis sports in our country, tennis teaching in the college can better express the value and significance of tennis sports to the physical education of higher vocational colleges. But the due level and professionalism of tennis teaching in the physical courses of higher vocational colleges cannot be manifested, because most of them lack of the specific control with the process and methods of physical education currently, especially the skillful teaching of tennis, causing the rather little effect of tennis course. This paper made the investigation and research with the current status of tennis teaching development of higher vocational colleges coupled with the application of VR, one modern technology, and provided the referable materials for the comprehensive development of tennis teaching in higher vocational colleges.

KEYWORDS

Higher vocational colleges, physical education, tennis teaching

PREFACE

As one of the derivative projects of volleyball sports, tennis has become one kind of mass and entertaining sports items. Along with the development of tennis, the research related with tennis has gradually increased, while the fundamental course teaching in higher vocational colleges has less access to tennis due to its request with ground and member. Tennis is of great fitness and entertainment, which plays a significant role in college students’ outdoor sports development, physical ability enhancement and sports interest training. The entering of tennis into the university campus is not only to offer a more convenient and entertaining sports activities for college students, but also train one kind of sense and ability of life-long exercise. In other words, stepping into the university campus of tennis is the excellent embodiment of college sports construction accomplishments and has a distinct effect on the college sports course establishment and enriching of students’ extracurricular and in-class activities.
DEVELOPMENT OF MODERN TENNIS TEACHING

Tennis sports, gestated in France, born in Britain and widely developed in America, are prevailing in the whole world. It originated from the palm-batting ball game in the church corridor, popularized among French missionaries from the twelfth to thirteenth century, and became one kind of indoor entertainment activity for the palace. When it came to the mid-14th century, one French poet introduced the ball game to the French palace as the pastime of royal nobility. But at that time, there were no net or racket, and people just used the two hands as rackets to throw the ball over the string that was the boundary and put in the middle place. The wooden rackets took place of hands until the fifteenth century, and the string was replaced with the net, so tennis was known to this.

Modern tennis, originated from 1873, was improved from the former tennis playing by a British Major, Walter Clopton Winfield. And then it became the sports activity on the lawn in summer and was called “lawn tennis”. According to the research of history documents, Chinese tennis originated from 1885 and began to develop in big cities such as Shanghai. And this activity representing elegant and quality was brought to our country by foreign traders and missionaries. Recent years, owing to the emergence of many Chinese in the international tennis tournaments, for instance, Li Na and Peng Shuai, these famous tennis athletes provide the tremendous impetus for the modern development of tennis. Meanwhile, tennis, as a physical education course, has started to develop in the physical course of higher education, and various higher education systems, including undergraduate and junior college, have began the practice of tennis teaching. Modern tennis teaching is gradually making progress and equipped with higher level on the road of professional level and skillful development.

RESEARCH OF VR TECHNOLOGY APPLICATION IN THE TENNIS TEACHING OF HIGHER VOCATIONAL COLLEGES

Research objects and methods

Research objects

Research objects: select 4 classes (200 boys in total) from the tennis class of 2016 in one higher vocational college to divide into two groups, two classes being one group, and each group setting an experimental class (class A) and a control class (class B); research the specific implementations of VR teaching methods applied to the tennis teaching of higher vocational colleges and the contrast and change of current teaching methods, organized forms and VR teaching methods on the aspects of teaching quality, physical quality of students and specific technique, and discuss the practical achievement of VR teaching methods applied to the tennis teaching.

Research methods

Literature consultation

This method mainly means to make the research with school sports and tennis development materials and theoretical achievements through the reference of public libraries, newspaper and documents room and internet documents, acquire the theoretical support of research through the relevant sociological research, including
documents and related works and find the development prospect of current school tennis through the analysis with corresponding literature materials to further guide the development of tennis in the school of Nanqiao County.

Survey research method

This method is one of common research and analysis methods. Based on the related need of this project, the writer made a survey with the practical situation of VR teaching with students who selected the tennis course in the higher vocational college of this research area. The survey and research with 200 tennis students mainly took the method of questionnaire, and its content included the improving effect of VR technology on tennis teaching and its development in higher vocational colleges, the satisfaction degree survey with the practical launch condition of VR teaching, the significant influence of sports literature construction and the enriching level of tennis to the sports life of students.

In terms of questionnaire distribution, this research actually handed out 230 questionnaires, of which 10 pieces were distributed to the person in charge and relevant leaders of tennis and sports activity in higher vocational colleges, 30 pieces to those teachers who execute tennis teaching and 200 pieces to students learning tennis. The valid recovery rate was up to 100%, and the content was relatively real as there was no artificial phenomenon.

Method of comparative analysis

Make the analysis with the practical tennis training level and corresponding problems of these two groups of students in the tennis class of 2016 to clarify the tennis learning condition of students before the application of VR teaching methods as well as the effect of VR teaching methods on tennis teaching.

Data arrangement and analysis

The data of this research mainly are the related survey of tennis among 230 questionnaires and comprehensively apply the handling softwares such as Excel, to make the compilation and arrangement of data.

RESEARCH RESULT AND ANALYSIS

Current situation analysis of tennis sports development of higher vocational colleges

Make the survey analysis with questionnaire results of the research and find the tennis launch of current higher vocational colleges mainly express the following situation:

Firstly, the construction of tennis field and relevant tennis infrastructure is not perfect yet, and the relevant essential items are not complete. At the same time, the hardening degree of tennis field is higher, and those athletes lacking effective protective measures are more likely to fall down and be injured. The durable years of tennis stands are rather longer, and the maintenance is rather weaker.
Secondly, the weekly practical tennis time of students selecting tennis course shows the polarized tendency. Some students have a higher frequency of tennis, while some students spend less time on practical tennis. Their exercise lack of the rational plan and didn’t achieve good practice result.

Finally, the practical work of related persons with sports in the school is not properly handled with, and they make little help to the development of tennis in the school. Lacking the effective tennis tournament organization and promotion with tennis results in the confusion of students with tennis at present coupled with the imperfect development on the concept of full participation.

In summary, it can be seen that the actual development of tennis in the higher vocational college is still rather sluggish, and there also exist problems of imperfect system and lacking systematic propaganda. Insufficient favor of physical exercise and tennis by the masses and incomplete tennis culture in the school cause certain handicap to the practical development of tennis. In addition, it should also be seen that tennis enthusiasts are gradually expanding in the high vocational college with the continue popularization of tennis, which expresses the charm of tennis.

The statistical analysis of VR technology application in the tennis teaching of higher vocational colleges

Make the statistical analysis of the questionnaire survey with 200 tennis enthusiasts, teachers and persons in charge and acquire the data as the following:

In the opinion survey of higher vocational colleges taking advantage of VR to make the tennis teaching, there were 51 percent of students thinking that the atmosphere of VR technique applied to tennis teaching in this school is rather strong, also believing that certain advanced teaching methods can better enhance the popularized degree of tennis and have significant meanings to the development of tennis culture. It can be found from the summary of the current development of VR tennis teaching in higher vocational colleges that the method of using VR to simulate the hitting and tactics of tennis athletes has a stronger sense of volume and intuition than that one of traditionally using videos and demonstration teaching by the teacher, and students can make the battle with virtual characters through VR system, truly feel the change of serving and hitting point and then make the corresponding response. As a result, it can form a innovative learning model. Taking advantage of VR technique can relieve the situation that lacking of tennis field in current colleges causes the insufficient participation of students in the tennis.

<table>
<thead>
<tr>
<th>Teaching atmosphere of VR</th>
<th>Number (people)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong atmosphere</td>
<td>102</td>
<td>51.0</td>
</tr>
<tr>
<td>Better atmosphere</td>
<td>55</td>
<td>27.5</td>
</tr>
<tr>
<td>General atmosphere</td>
<td>30</td>
<td>15.0</td>
</tr>
<tr>
<td>Bad atmosphere</td>
<td>13</td>
<td>6.5</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>
Meanwhile, there are 6.5% of the interviewees thinking that VR teaching in the school lacks of enough atmosphere and has space to be improved. They are not positive with the effect of VR on learning tennis technique and improve abilities. Even lots of people view the current development of tennis in higher vocational colleges with the posture of traditional competitive sports. Among the 27.5% who think that the VR tennis teaching has a better atmosphere, the main reasons are their satisfaction degree with the number of tennis players or the facility. However, there are still some students argue that the tennis development in higher vocational colleges under the VR teaching lacks of the advanced level and cannot express the true value and charm of tennis. It can be seen from the above situation that most people hold the optimistic attitude on higher vocational colleges carrying out tennis sports and think that VR teaching can promote the interactivity and interestingness of tennis course teaching, coupled with a good atmosphere and perfect accessibility, which is suitable to the long pretty development and proceed certain propaganda and expansion.

The satisfaction degree survey of higher vocational colleges taking advantage of VR to make the tennis teaching shows that there are over half (78.0%) interviewees holding the better evaluation with the tennis teaching of higher vocational colleges carrying out VR teaching. While most people don’t hold the opposite opinions on the measures of higher vocational colleges introducing VR teaching to the tennis teaching, showing the satisfaction with the facility or the practical improvement of technique. Of the two parts of people, there are many people playing tennis or occasionally playing, and they have not much demand but the tennis field that can be offered by higher vocational colleges. And another 7% interviewees show their dissatisfaction with the school carrying out VR teaching in the tennis course, and this part of people mainly have the keen interest in tennis, who often watch the domestic and foreign tennis tournaments. Their adore those tennis stars, for example, Spain's Rafael Nadal and China’s Li Na, and they have a deep understanding with tennis knowledge, especially some senior tennis fans. The tennis they desire is more of profession and emphasizing ability, so they attach less importance to the teaching part as they already have a pretty understanding and mastering with basic tennis technique.

SUGGESTIONS OF VR TECHNIQUE DEVELOPMENT IN THE TENNIS TEACHING IN HIGHER VOCATIONAL COLLEGES

Virtual reality technique is one kind of computer simulated system that can create and experience the virtual world, and it uses the computer to create a simulation environment. It belongs to an interactive system simulation of three dimension dynamic visual scene and entity behavior, integrating the information of various sources, and it can make the user immerse into the environment. The development of VR teaching in higher vocational colleges not only needs the support of students and teachers, but some
development concepts. In the future, the practical development of tennis teaching in higher vocational colleges needs to be strengthened from the two aspects:

**Strengthen the connection degree of VR technique and practical teaching**

It can be seen from the above research that students have various opinions on the introduction of VR technique to the tennis teaching. Some students hold the belief that VR technique is able to greatly improve the teaching efficiency and realize the interesting and technological teaching, so they have the higher satisfaction degree with VR tennis teaching; while some students have not enough approval with VR teaching, mainly due to the VR teaching lacking of the sense of reality and participation in the process of practical tennis teaching, and virtual experience is one kind of ignorance with the characteristics of tennis, thus representing the less acceptance degree. Concluding from the above opinions, it will be necessary to strengthen the connection of these two aspects in the future tennis teaching in higher vocational colleges, which means that VR technique can be used to teach the technical essentials of tennis, enhance the cognitive degree of students, alleviate the practical demonstration intensity of teachers to help teachers better get rid of the heavy teaching activities and make the great help to the personal development of students. On the other hand, students can feel the contribution of high-technology to the sports activity and understand the tennis with a faster pace. After the VR teaching experience, students are supposed to walk onto the field and make the real exercise with grasping the rackets, which can enhance the comprehensive progress with tennis theory and practice as well as deepen the understanding with tennis course teaching.

**Focus on the difference of VR and reality and promote the exercise and fitness**

Although the application of VR technique has greatly improved the tennis teaching system of higher vocational colleges, the usage of this new technique should not be the beginning of one kind of addiction, so the school should increase the control with this teaching measure, and still makes students focus on participating in the practice of tennis as well as dialectically dealing with the technology and reality.

**CONCLUSION**

In conclusion, tennis teaching is a relatively enormous system, and college students still have a greater space for improving their skills as they are the non-professional learners that touch the tennis for the first time. And the research of this paper can provide some suggestions and references for those colleges carrying out the VR tennis teaching.

**ACKNOWLEDGEMENTS**

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