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Research on the Deep Integration of Virtual Reality Technology (VR) and Practical Teaching in Vocational Colleges in the New Era

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Abstract

Based on the importance of practical training teaching and the characteristics of virtual reality technology, this paper expounds the advantages of virtual practical training teaching, and puts forward the implementation path of deep integration of virtual reality technology and practical training teaching in vocational colleges. New problems are found in the virtual practical teaching practice, and the improvement methods and solutions are explored to ensure the teaching effect, so as to provide reference for promoting the reform of vocational education informatization.

Keywords

Virtual Reality Technology; VR; Practical Training Teaching; Theoretical Teaching; School-enterprise Cooperation.

1. Introduction

In the new era, vocational colleges aim to cultivate high-quality technical and technical talents, and practical teaching is the key link of teaching activities. The effect of practical teaching largely determines the achievement of talent training objectives and the quality of education and teaching. Compared with theoretical teaching, practical teaching emphasizes students' main body more in terms of teaching concept, content selection, teaching method and organizational form, and encourages them to actively construct knowledge system. More emphasis on ability based, starting from the needs of enterprise vocational positions, training industry vocational skills; More prominent knowledge, emotion, meaning, technology advanced compound effect, enhance the learning interest and drive, strengthen the operational response ability and proficiency; More emphasis on comprehensive design and interdisciplinary, improve students vocational skills comprehensive application ability and professional quality. Therefore, the reform of practical training is an important part of the teaching reform of vocational colleges and plays an important role in improving the quality of talent training in vocational colleges in the new era.

Virtual reality (VR) is a comprehensive information technology that integrates computer graphics, multimedia technology, sensor technology and human-computer interaction. It allows users to create, observe and experience a virtual world with the characteristics of multi-perception, immersion, interactivity and conception. The integration of virtual reality technology and practical teaching in vocational colleges can promote the innovation of practical teaching model and the upgrade of effect. In recent years, some vocational colleges have introduced virtual reality technology into the practical teaching of medical nursing, aerospace, automobile maintenance, agriculture and forestry, architecture and other majors, which not only breaks the limitation of the traditional practical teaching in time and space, but also plays a great role in stimulating students' learning interest, enhancing their learning autonomy and improving the learning effect. For example, the virtual reality laboratory of automobile maintenance in Guangzhou University of Technology, the virtual simulation training base of building construction in Hunan Technical College of Engineering, and the virtual simulation

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training platform of modern agricultural equipment and facilities in Xinjiang Agricultural University.

Virtual reality technology leads the new direction of practical teaching reform in vocational colleges, but how to effectively realize the deep integration of virtual reality technology and practical teaching, give full play to the advantages of virtual practical teaching, effectively transfer real skills, effectively improve the effect of practical teaching, maintain its sustainable development and other issues need to be deeply thought, studied and solved by vocational educators.

2. Advantages of Integrating Virtual Reality Technology into Practical Teaching in Vocational Colleges

(1) Reduce the cost of practical training and teaching

Some practical training equipment in vocational colleges is expensive, the cost of updating is fast and the cost of upgrading is high, and the consumption of practical training supplies is large, which leads to high cost. With the help of VR technology, virtual simulation practical training scenes are constructed on the computer, virtual instruments and equipment are created, and the training environment is optimized, which can perfectly solve the above problems, complete the practical training teaching with complex operation, high cost and long cycle, increase the opportunities of practical training and improve the effect of practical training.

(2) Stimulate students' interest in learning

The traditional practical teaching in vocational colleges mostly adopts multimedia teaching methods, while VR technology brings a stronger sense of immersion. With the help of multiple sensory stimulation, the experience is more real, which helps to stimulate students' interest in learning, deepen cognition and effectively promote knowledge and skills. The VR practical training teaching platform usually has a good human-computer interaction interface, friendly and real interaction design, and the practical training scene is highly connected with the actual career situation, which is conducive to promoting the enthusiasm for learning and achieving better practical training teaching effect.

(3) Break through the time and space limit of students' practical training

In traditional practical teaching, some are difficult to implement due to site and safety restrictions, and some are difficult to reproduce due to special conditions. Practical teaching is also limited by conventional teaching time and space. VR practical training teaching can break through the limitations of practical training teaching site, hardware, teachers, time and space. Students can use various portable hardware devices, such as VR glasses, mobile phones, PAD, etc. to access the practical training platform at any time and anywhere, independently arrange the learning and training progress, and repeatedly carry out risk-free and personalized practice training to strengthen the mastery of the knowledge and skills. And improve learning initiative, autonomy and creativity.

3. Deep Integration of Virtual Reality Technology and Practical Teaching in Vocational Colleges

(1) Selection of practical training projects

Curriculum is the core of school education, and the quality of curriculum reflects the concept of talent training and determines the quality of talent training. However, not all practical training projects in the curriculum are suitable for practical training projects integrated with virtual reality technology. Select relatively independent and self-contained training projects in the course that can adopt the traditional training mode. Upload the project content and video and animation resources to the virtual training platform as training resources to assist the

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explanation of knowledge before and during class. Aiming at the practical training teaching links of "high investment, high loss, high risk", "difficult to implement, difficult to observe and difficult to reproduce", by virtue of the advantages of virtual reality technology, the corresponding practical training projects are developed to support students' practical training practice, cultivate students' skill level and improve their practical working ability. For example, in the course "Nursing Practice Clinical Disposal", the practical training of nursing clinical disposal of acute myocardial infarction patients in the traditional practical teaching, there are simulated people, practical training scenes are limited, time is urgent, the number of students is too large to participate in the whole process. This practical training project involves a lot of knowledge and skills, and due to the limitations of technology, teachers, facilities and equipment, it is difficult to fully simulate in the traditional mode of practical training teaching, so that students can obtain a full range of clinical thinking and skills training, it is very necessary to develop a virtual simulation practical training project.

(2) Development and design of practical training projects

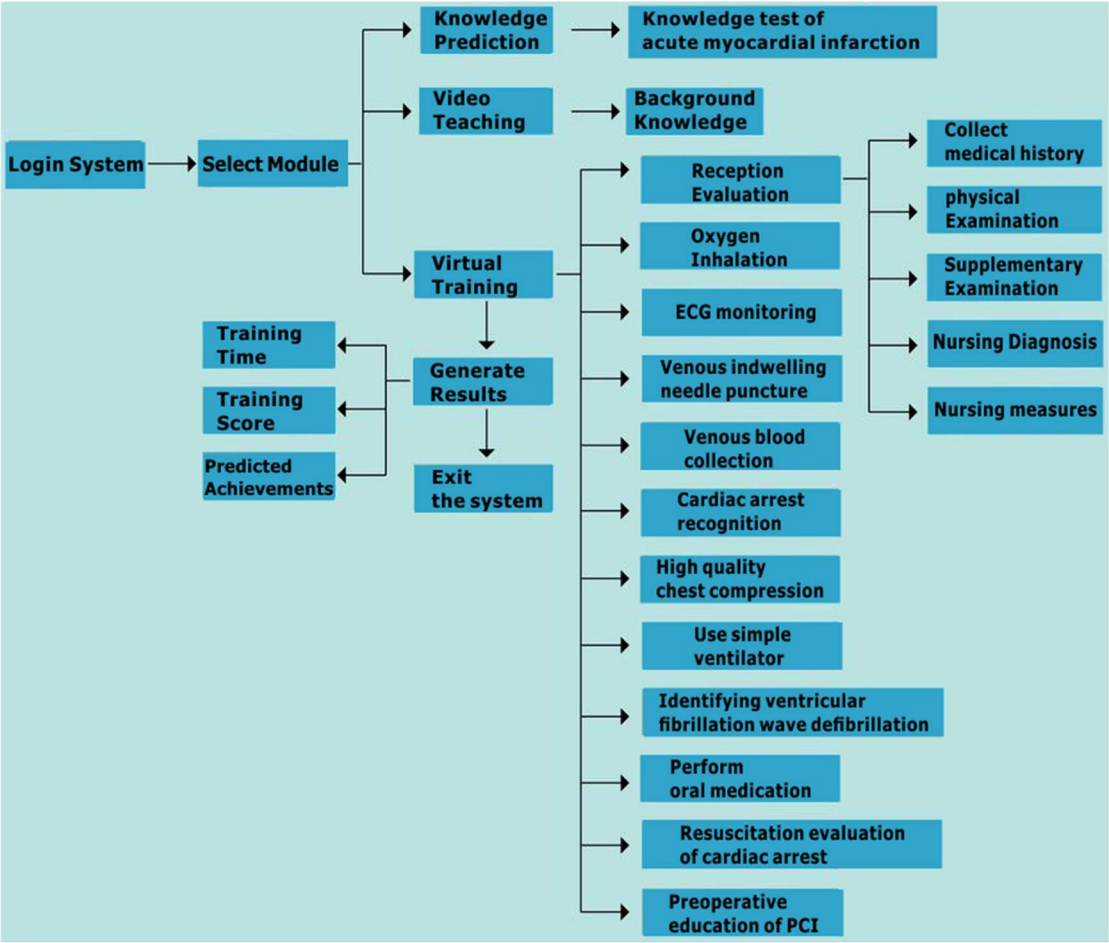

Figure 1. Design of teaching module of nursing clinical treatment virtual simulation practical training

In order to respond to the demands of high-level and high-quality construction talents training in vocational colleges in the new era, enhance the consistency between practical training teaching and the post practice of industrial enterprises, the virtual practical training environment is highly connected with the actual vocational situation, and the development of practical training projects should be based on the latest production environment and equipment of industrial enterprises, and absorb new ideas, new technologies, new processes,

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new norms and new standards. In the school-enterprise (hospital) cooperation mode, professional teachers and enterprise experts jointly sort out the typical work tasks of practical training projects, refine them, and decompose them into units. The virtual simulation practical teaching system for nursing clinical treatment of patients with acute myocardial infarction is jointly developed by professional teachers of vocational colleges, skilled operators of nursing skills in affiliated people's Hospital and chief designer of nurse skills contest. The module breakdown is shown in the following figure. For each module, the project design script was written from the aspects of practical training scenario description, practical training operation steps, and practical training interaction design. With the help of virtual reality technology, restore the production environment of regional leading enterprises, the layout and equipment use of hospital ambulance space, nursing technology training, process and management, etc. Based on artificial intelligence technology and virtual reality technology, we will create a vocational environment close to front-line production and service, promote immersive and personalized independent learning, and combine vocational skill training and professional quality cultivation for students, so as to train students' vocational skills and cultivate their professional quality.

(3) Implementation of practical training projects

A good virtual practical training project needs teachers' creative application to achieve the expected teaching objectives. Through the application of high-level education concept and task-driven, situational teaching and other methods, fully mobilize students' learning initiative and creativity; Expand the teaching environment of practical training, repeatedly explore the differences between virtual and real training, and build a new virtual and real integrated training model; Give full play to the multi-disciplinary integration of virtual practical training projects, transfer and strengthen knowledge and skills, and realize the sustainable development of virtual practical training teaching.

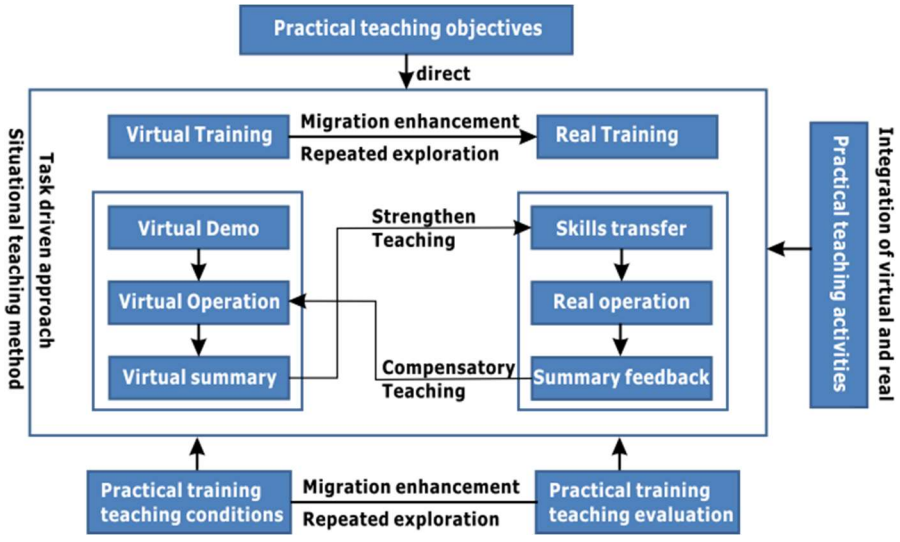

Figure 2. Implementation of virtual practical teaching in vocational colleges

4. Analysis of the Application Effect of Virtual Reality Technology into Practical Training Teaching in Vocational Colleges

A total of 70 nursing students from Aksu Vocational and Technical College were divided into two groups. The first group adopted traditional practical training and the second group adopted virtual practical training to compare and analyze the application effect of "Virtual simulation practical training teaching system for Nursing clinical treatment of patients with acute myocardial Infarction".

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The students in the two groups can complete the pre-class knowledge learning and pre-class test on the course platform or virtual practical training platform, and the time of the teacher's theoretical knowledge explanation in the class is the same. The students in the second group need to spend 10-15 minutes to get familiar with the use of the virtual practical training platform. The teaching effect test is conducted after the completion of the teaching task in three periods, and the test is conducted again a week later. It can be seen from the test results that the teaching effect of the virtual practical training group is obviously better than that of the traditional practical training group. In the traditional training group, due to the limitation of equipment, the group practice method is adopted, with seven people in a group, sharing one simulated person. In the 80 minutes of practical training teaching, each person only has 10 to 15 minutes of use time, and there is no chance to practice after class. The number of practice is not enough, and the proficiency is not high. Most of the students in the virtual practice training group could master knowledge and skills proficiently in class. Some students failed to achieve the knowledge and skills objectives of the class because they failed to master the use of the virtual practice training platform, or because they were curious about the practical training platform, they were addicted to exploring the system functions and ignored knowledge and skills learning. However, they use their extracurricular time to independently enter the virtual practical training platform and practice repeatedly. After a week, they can all reach the teaching goals of knowledge and skills.

It can be seen from the experiment that the virtual practical training breaks the restrictions of time, space and equipment, allowing students to practice repeatedly anytime and anywhere. The virtual practical training scene is realistic, interactive and real, and students are physically present. The practical training process has real-time feedback and summary, which effectively enhances students' clinical thinking, decision-making and emergency response ability, and improves the standardization and standardization of skill operation. To promote students' learning initiative and autonomy, but there are also some new problems that need further research and discussion.

5. Problems Related to Deep Integration of Virtual Reality Technology and Practical Teaching in Vocational Colleges and Countermeasures

(1) Strengthen the teachers of virtual practical training

Virtual practical teaching as a new teaching means, practical training instructor can operate software and hardware is the basic condition for its smooth development. In the virtual practical training, it is more difficult for teachers to control the depth and progress of students' learning, and students with poor self-control ability even waste their learning time and fail to complete the teaching objectives on time. Therefore, in the virtual practical training situation, the innovation of educational concept, the innovation and application of teaching methods and the reform of classroom management control are the necessary guarantees for the achievement of teaching effects. Vocational colleges can organize industry enterprise experts and teachers of virtual reality technology application, digital media technology, computer application technology and other related majors to form a virtual practical training teaching steering committee to carry out regular virtual practical training teaching seminars, and improve teachers' abilities of virtual practical training hardware and software control, classroom management, virtual practical training teaching design and project development. In the design of virtual practical training platform, teachers' control of teaching progress, feedback and guidance of students' learning should also be considered, so as to increase teachers' control authority in virtual practical training, give play to teachers' subjective initiative and enhance teaching effect.

(2) University-enterprise cooperation to jointly develop virtual practical training resources

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All majors in vocational colleges conduct a survey on the talent needs of enterprises in related industries, and sort out the typical tasks of actual posts and the vocational skills needed to be cultivated, which will serve as the basis for the personnel training program and professional curriculum setting. The development of practical training projects should also carry out enterprise research, listen to the opinions of industry experts and enterprise elites, strengthen the cooperation between schools and enterprises, introduce real projects of enterprises, introduce new technologies and new standards of the industry, and improve the authenticity, practicability and innovation of projects.

For vocational colleges that do not have the ability to independently develop virtual practical training resources, it is necessary to make use of enterprise virtual reality development technology, combine the teaching philosophy and practical experience of the teachers of the school, cooperate with the school and enterprise to jointly sort out typical work tasks of practical training projects, design practical training scenarios, operation steps and human-computer interaction, and jointly complete the design and development of virtual practical training projects.

In view of the high cost of enterprise development, it is inconvenient to upgrade. Vocational colleges can organize industry enterprise consultants and teachers of digital media technology, virtual reality technology application, computer application technology and other related majors to form a virtual practical training project research and development team to promote the development, construction and future upgrading of virtual practical training resources. At the same time, strengthen the contact with enterprises, provide relevant enterprises with the training use and priority transfer of virtual practical training resources, win the financial support of enterprises, promote the transformation of virtual practical training project results, and achieve a win-win situation.

(3) We will actively guide the correct understanding of the relationship between the virtual and the real

Virtual practical training programs have a strong sense of immersion and bring students a multi-sensory real experience, but there are still some differences from the real learning environment and practical skills application. In the virtual practical training environment, I can skillfully operate the equipment, but when I return to the real practical training environment, I will feel uncomfortable. It is necessary to adapt to the real environment as soon as possible and truly master the practical training skills after several times of operation practice and self-emotional adjustment. Teachers should actively guide students to correctly realize that virtual practical training is not a subversion of traditional practical teaching, but to improve the effect of practical training teaching and a beneficial supplement to traditional practical teaching. They should never be addicted to the virtual world and ignore the real world.

All kinds of operations in the virtual world will not cause real harm, but can bring no limit to the number of stimulation experience, may lead to individual students to form a bold and irresponsible attitude. Teachers should actively guide students to correctly understand the relationship between virtuality and reality. Virtuality is only a means and a tool, which must be applied reasonably within the scope of morality. Real life is real.

6. Conclusion

The deep integration of virtual reality technology and practical training teaching in vocational colleges is a new field of vocational education informatization reform. It not only leads the innovation of practical training teaching mode, promotes the reform of practical training teaching thinking and methods, but also effectively expands the breadth and depth of practical training content. School-enterprise cooperation to develop virtual practical training projects, the real conditions do not have the implementation, the latest achievements of industrial

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development, the "high investment, high loss, high risk", "difficult to implement, difficult to observe, difficult to reproduce" practical training links into practical teaching, improve the effect of practical training teaching, and then meet the needs of vocational colleges in the new era of talent training. In the future, the research and development of virtual practical training projects will still be an important direction of practical training teaching reform in vocational colleges.

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