Research On The Application Of Virtual Reality Technology In College Teaching

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***Abstract*—In the context of "Internet +", people's life and work and computer applications are getting closer and closer, and computer technology has become a professional ability that must be possessed by current social talents. Therefore, it is necessary to improve the quality of teaching in colleges and universities and to provide more talents in the computer field for the society. The application of virtual technology in college teaching meets the diversified teaching requirements, reduces the teaching cost and improves the teaching efficiency. This paper mainly analyzes the application advantages of virtual technology in college computer teaching, and discusses the specific application of virtual technology.**

Keywords-virtual technology; college teaching; informationization

I. INTRODUCTION

The popularization of advanced information technology in the development of teaching work in colleges and universities enables the quality of basic teaching in colleges and universities to be effectively guaranteed, especially the scientific application of virtual reality technology in specialized teaching, further improving the existing teaching environment and perfecting the basic construction of colleges and universities[1]. And the application of diversified teaching system provides effective technical support, fundamentally solves the difficulties of teaching practice and the low authenticity of experimental teaching[2], so that the current teaching work of colleges and universities is more in line with the basic needs of modern social development and students' comprehensive knowledge learning[3].

II. VIRTUAL REALITY CONCEPTS AND FEATURES

A.Basic Concept

The so-called virtual reality, as the name suggests, is the combination of virtual and reality. In theory, Virtual Reality (VR) is a computer simulation system that can create and experience virtual worlds. It uses a computer to generate a simulation environment to immerse users in the environment. Virtual reality technology is the use of real-life data, through the electronic signals generated by computer technology, combined with various output devices to transform into a phenomenon that people can feel, these phenomena can be real and real objects It can also be a substance that we can't see with the naked eye, and it is expressed by a three-dimensional model. Because these phenomena are not what we can see directly, but the real world that is simulated by computer technology, it is called virtual reality. Virtual reality technology has been recognized by more and more people. Users can experience the most real feelings in the virtual reality world. The authenticity of the simulated environment and the real world are difficult to distinguish between true and false, and people have an immersive feeling. At the same time, virtual reality has all the cognitive functions possessed by human beings, such as auditory, visual, tactile, taste, smell and other perception systems; Finally, it has a super-simultaneous simulation system that truly realizes human-computer interaction, enabling people to operate at will and get the most realistic feedback from the environment during the operation. It is the existence, multi-perception, and interactivity of virtual reality technology that has made it popular with many people.

B.Characteristics

(1)Immersive

Immersion is the most important feature of virtual reality technology. It is to let users become and feel that they are part of the environment created by computer systems. The immersion of virtual reality technology depends on the user's perception system. When the user perceives the stimulation of the virtual world, including touch, taste, smell, and motion perception, it wil resonate with thinking, causing psychological immersion and feeling like entering the real world.

(2)Interactivity

Interactivity refers to the degree to which a user can manipulate objects in a simulated environment and the degree of natural feedback from the environment. When the user enters the virtual space, the corresponding technology allows the user to interact with the environment. When the user performs some kind of operation, the surrounding environment also reacts. If the user touches an object in the virtual space, the user should be able to feel it. If the user acts on the object, the position and state of the object should also change.

(3)Multi-perception

Multi-perceptuality means that computer technology should have many ways of sensing, such as hearing, touch, smell, and so on. The ideal virtual reality technology should have the perceptual function that everyone has. Due to the limitations of related technologies, especially sensing technologies, most of the virtual reality technologies currently have limited sensing functions, such as visual, auditory, tactile, and sports.

(4)Conceived

Conceiving is also called imaginative. Users can interact with surrounding objects in virtual space, which can broaden the scope of cognition and create an environment in which the objective world does not exist or an environment that cannot happen. The idea can be understood as the user enters the virtual space, absorbs knowledge according to his own feelings and cognitive ability, diverges and broadens his thinking, and creates new concepts and environments.

(5)Autonomy

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Refers to the extent to which objects in the virtual environment act according to the laws of physics. When pushed by force, the object moves in the direction of the force, or falls over, or falls from the table to the ground.

III. KEY TECHNOLOGIES OF VIRTUAL REALITY

The key technologies of virtual reality mainly include:

A.Dynamic environment modeling technology

The establishment of the virtual environment is the core content of the VR system. The purpose is to obtain the three-dimensional data of the actual environment, and establish a corresponding virtual environment model according to the needs of the application.

Real-time 3D graphics generation technology

The technology of 3D graphics generation is relatively mature, so the key is to generate "real time". To ensure real-time, at least the refresh rate of the graphics is not less than 15 frames/second, preferably higher than 30 frames/second.

Stereo display and sensor technology

The interactive ability of virtual reality depends on the development of stereoscopic display and sensor technology. The existing equipment can not meet the needs. The research of mechanics and tactile sensing devices needs to be further deepened. The tracking accuracy and tracking range of virtual reality devices also need to be improved.

B.Application development tools

The key to virtual reality application is to find suitable occasions and objects. Choosing the right application object can greatly improve production efficiency, reduce labor intensity and improve product quality. To achieve this goal, you need to study the development tools of virtual reality.

C.System integration technology

Since the VR system includes a large amount of sensory information and models, system integration technology plays a vital role. The integration technology includes information synchronization technology, model calibration technology, data conversion technology, data management model, identification and synthesis technology, etc.

IV. THE APPLICATION OF VIRTUAL REALITY IN COLLEGE TEACHING

A.Simulation of the content of the lesson plan

Mainly for different teaching directions, to provide teachers with relevant teaching opinions, and to carry out simulation experiments on the teaching content and teaching items under the application conditions of virtual application technology .Through the experimental results,the feasibility of selecting the content of the teaching plan is analyzed, so as to provide analysis and suggestions for the optimization of the content of the teacher's teaching plan. The application of virtual reality technology is not a single modular teaching. Instead, it integrates the key teaching content and the creation of teaching situations. It adjusts the teaching objectives from the immersive experiment of teaching environment, and realizes the scientific application of the selection of teaching materials. Teaching can give better play to its teaching advantages in practical teaching, so as to improve the quality of comprehensive teaching and the effectiveness of teaching.

B.Simulation library

The creation of the simulation library should be based on the students' basic book reading appeals and the teacher's teaching requirements. The relevant characteristics of different basic teaching projects are different. Therefore, in the creation of simulation libraries, we should use the advantages of virtual reality technology to optimize different library contents. At the same time, select appropriate book content for virtual context creation, and provide students with relevant professional content search function to help students provide the book content they need in the virtual reality technology environment. Improve the application of virtual implementation technology from the aspect of infrastructure, improve the effectiveness of virtual reality technology application, ensure the interactive benefits created by teachers and students and simulation libraries, and help students and teachers establish a good communication bridge. Timely feedback related book reading information, improve the library construction management environment, and enable students to be comfortable in book reading, in order to play a positive role in the establishment of virtual reality technology in the simulation library.

C.Virtual practice training

Virtual practice training will literally be a practical application of theoretical knowledge teaching, but in fact theoretical knowledge practice is only part of virtual practice training. Relevant content includes disaster drills, practical training and post simulation, which enable students to have a deeper understanding of professional knowledge and ensure that students develop a good sense of practical thinking in basic knowledge learning. Recognize the insufficiency of learning of professional knowledge from the simulated virtual environment, and gradually improve self-improvement under the guidance of teachers, improve the initiative of students, and fundamentally solve the problem of imperfect students' professional knowledge learning and lack of professional practice ability. To help students develop rationalized training according to the basic characteristics of the major, simulate the professional work environment of students, and lay a solid foundation for students to better integrate into the relevant professional work environment and deepen their professional knowledge in the future stage. The practical training content in the traditional sense is relatively rich, but the implementation of practical training is slightly insufficient, and it needs to be compensated by using virtual reality technology. From the immersive environment, students should be added to practical training, avoiding the study of professional knowledge only in the content of textbook knowledge. It is necessary to fully understand the practical importance of knowledge practice and change the practical training cognition under the traditional thinking of students. In turn, it provides virtual reality technology support for

modern teaching for the improvement of students' comprehensive learning ability and practical ability.

D.Making multimedia courseware

CAI courseware is a teaching system, which is an integrated computer-aided system courseware based on WORD, PPT, projector and SWF animation. Rational design and production of CAI courseware is critical to the utility of computer science and technology in teaching. Teachers should follow the principle of "focusing on the key and being brave in innovation" to choose the theme of CAI courseware, develop innovative thinking, and make interesting courseware. In the courseware design process, improve the process preparation effect, edit the courseware according to the professional teaching objectives, teaching objects, divide the teaching content, design the links of each unit, and design the complete courseware script.

E. Simulate various teaching scenarios

In the teaching system of colleges and universities, due to various aspects such as classroom teaching venues and abstraction of teaching content, it is difficult to directly expand the content of body teaching. After using VR technology, these teaching contents can be presented to students in various forms such as sound, pictures and videos, simulating various teaching scenes and improving the final teaching results. For example, in the teaching process of mechanical mechanics in colleges and universities, VR technology can be used to demonstrate the process of various types of gear meshing, so that the meshing lines of different gears are displayed in 3D space and environment. After observing the gear meshing movement, the students can strengthen the understanding of the meshing line and strengthen the memory and mastery of this part of knowledge.

V. CONCLUSION

After applying VR technology to the university teaching system, the final effect of college teaching can be significantly improved, which can promote the leap-forward progress of college teaching. For each university, it is not difficult to introduce VR technology and apply it to the teaching system. Especially in the context of the continuous advancement of informatization teaching, the information teaching equipment of various colleges and universities is relatively sufficient, which brings certain hardware and software support to the application of VR technology. Not only that, VR technology also has diversified functions in college teaching, and the flexibility of specific use is relatively high. It can achieve good results in many teaching fields and has broad prospects in future applications.

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