Application and Practice of VR Technology in Basic Computer Teaching in Art Colleges

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Abstract—In the process of basic computer teaching in art colleges, the use of virtual reality technology can improve the efficiency of basic computer teaching and ensure the quality of teaching. At present, virtual reality technology is also constantly maturing and improving. The full application of virtual reality technology in the basic computer teaching of art colleges is conducive to saving teaching costs. This can not only give full play to the application value of virtual reality equipment, but also reduce the loss caused by teachers' continuous operation in the teaching process, and improve the teaching effect. However, it should be noted that in the process of basic computer teaching in art colleges, there are also some problems in virtual reality technology. We need to conduct in-depth research and analysis on these problems. This article discusses the practical strategies of virtual reality technology in the basic computer teaching of art colleges, hoping that these strategies can really improve the basic computer teaching level of art colleges.

1. INTRODUCTION

In the teaching process of basic computer courses, a variety of media technologies and corresponding software are integrated. Students mastering these media technologies and software will help students improve their practical ability after entering the society. In the teaching process, in addition to enabling students to master solid theoretical knowledge, it is more important for teachers to continuously cultivate students' practical ability so that students learn to use various advanced technologies and software to solve problems in computer applications. Especially with the changes in social economy, colleges and universities have some problems in the process of setting up basic computer courses, and they cannot keep up with the pace of development of the times. This leads to the problem of disconnection between basic computer courses and the times. In order to effectively solve this problem, we need to introduce advanced teaching technology and teaching equipment. VR technology is a relatively advanced new technology in the current teaching of basic computer courses. It is not only helpful to solve various problems in basic computer teaching, but also has a positive meaning for improving the efficiency of basic computer teaching.

2. OVERVIEW OF VR TECHNOLOGY

VR technology is currently a relatively fast-developing brand new technology. In the process of development and innovation, VR technology integrates computer technology, electronic information technology, and simulation technology. VR technology can use the virtual environment in the application to bring people a sense of real environment immersion. In the teaching of basic computer courses, teachers' application of VR technology can greatly improve the teaching effect. The application

of VR technology in the process of basic computer teaching in art colleges is of great significance, which is mainly manifested in the following aspects. Firstly, VR technology can greatly save teaching resources and help reduce losses. Because basic computer teaching has relatively high environmental requirements, the use of virtual reality technology can better protect the computer operating system when conducting basic computer teaching. Students only need to operate the files in the computer during the operation. Especially when conducting security tests and destructive tests on computers, the use of VR technology can effectively prevent adverse effects on computer equipment. This application advantage can prevent students from damaging the computer due to operating errors to the greatest extent. Second, backups can be installed during the application of VR technology to improve the application value of VR technology. With VR technology, different operating systems can be backed up, and the backup can be quickly installed on other devices. Using this feature can give full play to the application advantages of VR technology. It not only helps teachers reduce the time for preparing materials before class, but also helps students master the operating requirements and specifications of different operating systems, which is positively helpful to improve students' practical operating ability. Third, VR technology can carry out effective test operations. The use of VR technology can effectively avoid the harm to the computer system caused by the computer infection caused by the improper operation of the students. When applying VR technology, we can create a more realistic operating environment, which is helpful to reduce unnecessary losses when testing new software or new programs. In addition, the use of virtual machines can be used in the same computer to perform different system operations. This can not only use a separate computer to run, so that students can test different programs, but also help expand students' learning resources and reduce teaching costs [1].

3. PROBLEMS IN BASIC COMPUTER TEACHING IN ART COLLEGES

There are some problems in the process of basic computer teaching in art colleges that directly affect the efficiency of basic computer teaching. Moreover, this also leads to insufficient computer operation ability of students, which has a great impact on students' working ability and practical ability after entering the society. At present, the problems existing in traditional computer basic teaching are mainly manifested in the following aspects. Firstly, colleges and universities do not pay enough attention to basic computer teaching. Because students in art colleges pay more attention to the study of professional knowledge, and do not pay enough attention to public basic courses. Students' computer application and practical ability are relatively low. In the actual basic computer teaching process, teachers only carry out teaching according to the requirements and content of the syllabus. This leads to students not interested in the boring teaching process, and more attention to online games, online videos, etc. This has affected the computer level of art school students to a certain extent. Secondly, insufficient investment in computer hardware equipment. During the development of basic computer courses, teachers need to use advanced computer hardware and related software to ensure the effectiveness of teaching. However, because the computer hardware and software are updated at a relatively fast rate, the computer room computers in many universities are mostly backward and obsolete computers, which cannot keep up with the pace of computer development. In addition, some colleges and universities do not have sufficient conditions to enable students to disassemble the computer mainframe to understand and master the structure of the computer. The computer rooms of some colleges and universities cannot keep up with the development of computer software and hardware. Traditional computer machines are still the mainstay in actual teaching. This has led to the failure of basic computer teaching to meet students' operational needs and practical needs, which directly affects students' computer skills. Thirdly, there are also some problems in the management of basic computer teaching. When developing basic computer teaching, most art academies ignore the differences in students' computer skills and carry out unified teaching. However, in the actual teaching, the computer operation level of students is uneven. Some students have relatively low computer operation ability, and some students themselves have a higher level of computer operation ability. It is impossible to teach students in accordance with their aptitude in actual teaching. The basic computer teaching on the basis of understanding and mastering the specific needs of students will result in the same teaching of basic computer courses, which will

affect students' interest in basic computer courses and their enthusiasm for learning. Moreover, because the students' computer skills are uneven, this will increase the difficulty of teaching and management of basic computer courses [2].

4. THE ADVANTAGES OF VR TECHNOLOGY IN BASIC COMPUTER TEACHING

In the process of applying VR technology, the use of the VR platform can not only meet the needs of students for immersive experience such as new technology experiments, but also will not adversely affect the specific operation of the real system. In the application of VR technology, teachers can use VR technology to actively guide students so that students can participate in practical teaching independently. Teachers can not only use different practices to verify the basic knowledge mastered by students, but also use case practice to improve the teaching effect of basic computer courses. In the process of applying virtual reality technology, students can also disassemble the computer in a virtual environment to show students the content that cannot be shown in real system teaching. This will help college students to have a deeper understanding and mastery of the computer system. Besides, the use of identifiers such as operation flow data flow in virtual reality technology can help students remember and understand computer-related knowledge and principles. The computer interface can also be displayed during the application of virtual reality technology, and the application cost is relatively low. Moreover, the simulation operation of virtual reality technology is relatively simple and convenient. It can not only show students an independent new technology experimental platform through computer equipment, but also meet the needs of students to experience new technologies. In addition, virtual reality technology can not only cultivate students' computer operation ability, but also increase students' interest in computer basic courses [3].

5. THE PRACTICAL STRATEGY OF VR TECHNOLOGY IN COMPUTER BASIC TEACHING

5.1.Use VR Technology to Carry out Experimental Teaching

In the basic computer teaching process, effective experimental teaching can be carried out when virtual reality technology is applied. Under normal circumstances, we can proceed from the following aspects to ensure the effectiveness of experimental teaching. Firstly, schools can carry out confirmatory experiments. In the experimental teaching of basic computer teaching, character encoding and information exchange are used to enable students to master the relevant theoretical knowledge of character input, query and display. At the same time, we need to enable students to distinguish between international codes, font codes and internal codes, so that students can more clearly grasp the utility and significance of Chinese characters. When applying virtual reality technology, we can show the whole process of Chinese character input to display in the experimental platform. This can not only satisfy the function of customizing Chinese characters, but also switch between different codes. Schools can use step-by-step operations to verify the relevant knowledge theories taught by teachers, and ultimately help students understand and master the relevant knowledge theories. Secondly, schools can carry out interactive experiments. In the basic computer experiment teaching, in order to enable students to master the relevant theories of computer viruses and firewalls, when simulating the computer startup, the teacher can let the students independently select the established target and attack. This is a typical example of interactive experimental teaching. In the course of practical teaching, teach students to conduct differentiated attacks on network viruses and stand-alone viruses, and observe and experience the different attack results of the two. This can show the overall start-up process of the computer, and enable students to understand and master the different types of onset times, onset principles, and onset characteristics of viruses. Using this kind of virtual interactive experiment can not only stimulate students' interest in preventive learning of different viruses, but also help students master the correct methods to deal with viruses. Thirdly, schools can carry out demonstration experiments. In the process of computer basic experiment teaching, in order to enable students of art colleges to master the composition of computer hardware, the school can not only use VR technology to demonstrate the scattered computer hardware assembly process to students, but also install and operate the

corresponding operating system and commonly used application software. This will not only enable students to master the basic knowledge while improving their practical operation ability, but also can effectively stimulate students' interest and initiative in computer basic courses. Fourth, schools can conduct guided experiments. In the teaching of basic computer courses, it is a difficult point for students in art colleges to learn computer language and binary conversion. When using VR technology, teachers can use its setting corresponding scenes to explain to students the principle of conversion between binary and decimal and related methods step by step. Simultaneously, teachers should provide effective guidance to students so that students can understand the conversion methods between octal, decimal and other systems. Otherwise, in the teaching of basic computer courses, the use of VR technology can also solve the problems existing in traditional computer teaching, stimulate students' interest in learning, and make students pay more attention to basic computer teaching. Teachers can use VR technology to simulate computer problems encountered by students in real life, so that students can have an immersive experience. For example, checking and repairing common computer failures, handling methods after viruses in computers, assembling computers, installing operating systems, and commonly used application software are all problems that students encounter when using computers daily. Schools can not only use these common problems in the computer application process to stimulate students' interest and enthusiasm in learning, but also make students aware of the application value of basic computer knowledge in daily life [4].

5.2.Other Practical Applications

Except to carrying out effective experimental teaching, we can also use VR technology to simulate part of the computer's hardware during the teaching of basic computer courses. In classroom teaching, teachers can minimize the process of students adjusting input and output devices while using computers. This can reduce management problems in teaching. Using virtual reality technology, teachers can guide students to carry out some input and output device operation method training, increase students' sense of learning experience. With the development of social economy, people's demand for computers is constantly increasing. In this case, colleges and universities need to continuously improve the computer skills of students. Teachers can use computer virtual reality technology to establish a computer environment when teaching. In this process, colleges and universities only need to install parallel computer software on the virtual machine, and then run the software and related execution commands to allow students to accept the same computer environment. This can reduce the demand for computer equipment in teaching and achieve the goal of saving educational resources. When applying VR technology, universities can also use it to carry out effective software testing tasks. In the basic computer teaching, web design courses and software design are the main components. Only when students perform many practical operations can they have a certain understanding and mastery of software design and web design courses, so that students can use basic operating functions to design software and web pages. In this case, teachers can use virtual reality technology to create a good environment and system for students' practical operation to carry out teaching activities [5].

6. THE SPECIFIC APPLICATION PROCESS OF VR TECHNOLOGY IN COMPUTER SYSTEM AND MAINTENANCE

The full application of VR technology in the teaching process of computer basic courses in art colleges can be used in computer system maintenance, helping students to master the relevant knowledge of computer system maintenance, and at the same time training students' practical operation ability. Computer system maintenance teaching pays more attention to cultivating students' operational skills, which has strong practicality. The main purpose of this course is to help students understand computer hardware knowledge, and at the same time enable students to be familiar with the skills of system installation and maintenance in the computer hardware group. At this stage, in the practical teaching of basic computer courses in art colleges, the teaching is mainly based on the display of computer objects or the use of computer hardware assembly and system installation and maintenance related videos. However, these teaching methods will have drawbacks. For example, in the classroom, using physical

objects to display, students cannot fully understand the hardware due to perspective problems. Moreover, the students' disassembly and assembly experiments are mainly conducted in small groups. Some students can only watch the experiment process, and the specific teaching effect is not good. Some colleges and universities will purchase obsolete hardware during this teaching process, which cannot meet the needs of normal hardware operation. In the hardware assembly experiment, students need to disassemble and install the machine. However, frequent disassembly and assembly will cause loss of computer hardware. During the system installation process, students need to understand various functions such as DIOS settings, hard disk partitioning, formatting, system backup and recovery. This will also have a certain impact on the computer system, and the use of VR technology can effectively solve these problems. When explaining the hardware content, the teacher can use the VR experiment platform to show the computer hardware modules to the students, and also enable the students to carry out the assembly process according to the displayed hardware modules. When displaying hardware modules, teachers need to collect the latest computer hardware data from the Internet, and then use the corresponding software to complete the three-dimensional modeling of computer hardware. In addition, teachers need to use computer tools to create interactive experimental scenes, import the generated models, text, sounds, animations, etc. into the scenes, and express them in the form of web pages to bring students an immersive scene. This will enable students to understand the latest computer hardware information more clearly and comprehensively. Students can view the hardware model, function and specific parameters. Meanwhile, students can observe computer hardware from different angles through mouse operation. What'smore, students can operate various objects in the virtual scene, which is conducive to improving students' independent learning ability and practical operation ability. When disassembling and assembling computer hardware, students can use virtual modules for experimental teaching. Students can complete the computer hardware assembly process by themselves, and use the simulation function of the corresponding software to observe and experiment the dynamic disassembly and assembly of computer hardware in a virtual environment. In the process of virtual assembly of students, there will be certain prompts and feedback information at every step. This can help students judge whether their assembly sequence and operation are correct. For example, when installing the memory, it must be inserted into a suitable card slot on the motherboard before proceeding to the next installation. The VR experiment platform enables students to operate various computer equipment and system installations immersively. This can effectively solve the problem of insufficient computer equipment and large computer loss [6].

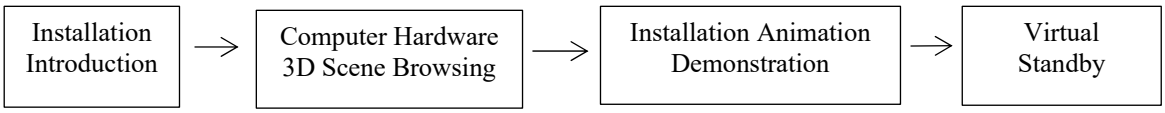

Figure 1. Schematic Diagram of the Virtual Machine Installation Process

7. Ease of Use

In summary, the full application of VR technology in the teaching process of computer basic courses in art colleges can greatly improve the teaching efficiency and teaching effects of computer basic courses. However, it should be noted that when applying VR technology, we must improve and innovate the original computer basic course teaching methods according to the specific conditions of art schools and the actual computer level of students. We need to ensure that basic computer teaching is compatible with the current social and economic development. Only in this way can we really improve students' computer skills and improve students' computer practice ability.

References

[1] Zhu Xishu. Application of VR technology in basic computer teaching in art colleges [J]. Information System Engineering, 2017, 000(012):176.

[2] Wang Yingchao, An Zhilong. Discussion on the application of computational thinking in the teaching of basic computer courses in art colleges [J]. Northern Literature Xunkan, 2015, 000(002):199-199.
[3] Meng Hongyuan, Li Ni, Huang Zebin, et al. Application analysis of virtual reality (VR) technology in university laboratories[J]. Information and Computers (Theoretical Edition), 2018, 417(23): 150-151.
[4] Shu Bo, Fan Fang. Application of virtual reality technology in the teaching of material metabolism pathway [J]. Basic Medical Education, 2019, 021(005):401-403.
[5] Chi Rui. Research on the application of VR technology in basic teaching of digital media art [J]. Information Recording Materials, 2019, 020(011):142-143.
[6] Ba Yue. Research on the Application of VR Virtual Reality Technology in the Environmental Art Design Teaching of Art Schools [J]. Satellite TV and Broadband Multimedia, 2019(24).