Discussion on the Application of Virtual Reality Technology in Pharmacy Vocational Education

Xing Zhou

Yichun Vocational Technical College Yichun, Jiangxi,336000, China
*Corresponding author's e-mail:309811587@qq.com

Abstract

With the rapid development of virtual reality technology in recent years, the virtual images in the virtual reality system can deeply interact with users. Virtual reality technology is now entering colleges and universities and has become a tool for many experimental teaching. Virtual reality technology has played an important role in pharmacy vocational education. This paper analyzes the benefits brought by virtual reality technology to pharmacy vocational education, and designs a virtual experiment teaching system based on B/S mode. The teaching system in this paper allows students to use computer equipment to learn online and choose to operate various experiments, so as to improve the efficiency and quality of experimental teaching.

Keywords-*Virtual reality technology; pharmacy; vocational education; teaching system*

1. INTRODUCTION

With the growth of China's economy, people's awareness of medicine has gradually deepened, and the country has also increased investment in the pharmaceutical industry. The pharmaceutical industry is closely related to people's lives and has become the priority development target of various countries. With the progress and rapid development of life sciences, the pharmaceutical industry is forming a health industry integrating treatment, prevention and health care. The key to making my country's pharmaceutical industry healthy, coordinated and rapid development, and ensuring the safety of the public's medication, lies in the cultivation of talents. Pharmacy vocational education has high requirements on students' practical ability. However, due to the high risk of pharmacy experiments, lack of experimental materials, and the long time required for experiments, schools need to change the experimental teaching. Virtual reality technology can bring real experimental experience to students without the defects of traditional experimental methods. The virtual experiment system constructed in this paper can allow students to perform experimental operations on the computer and improve their practical ability.

2. VIRTUAL REALITY TECHNOLOGY

Virtual reality technology is to use computer technology to simulate a three-dimensional virtual world for users, so that users feel as if they are in the real world, and can observe things in the virtual space instantly and without restrictions. Manipulate objects in 3D space [1]. Virtual reality technology is a combination of multiple technologies, including three-dimensional computer graphics technology, wide-angle stereo display technology, limb tracking technology, tactile feedback, stereo, network transmission, voice input and output technology and so on. Nowadays, there are two common ways of using virtual display technology in public life [2]. One is that the user controls the virtual three-dimensional space scene through the mouse and keyboard of the computer, and the second is that the user uses the wearable device to control the three-dimensional space through the body. Scenes. Relatively speaking, the cost of the former is lower, and users can operate the system by downloading the system on the network. The latter requires not only a computer, but also a wearable device, which is costly for college teaching [3].
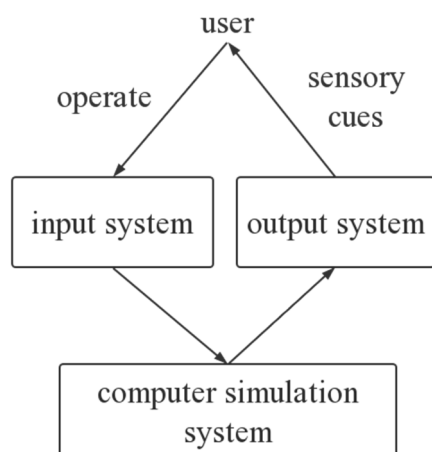
Figure 1. Basic elements of a virtual reality system

The virtual training environment is built on the basis of the real environment, and the operating rules are also based on the actual operating specifications. The ideal virtual environment can even make it difficult for users to distinguish the true from the false [4]. Virtual drill breaks the limitation of drill space, trainees can conduct centralized drills in any geographical environment, and users can enter the same virtual drill site for real-time centralized drills through relevant network communication equipment. Compared with actual drills, a major advantage of virtual drills is that they can simulate any training subject. With the help of virtual reality technology, users can conduct targeted training in various complex and unexpected environments to improve their adaptability and related skills [5]. Handling skills. Users can also spontaneously conduct repeated drills, so that users are always in the leading position of training, master the training initiative of training, and increase training time and training results [6].

3. BENEFITS OF VIRTUAL REALITY TECHNOLOGY FOR VOCATIONAL EDUCATION IN MEDICINE

Virtual reality technology is commonly used in medical education today, where students can practice simulated anatomy and surgery in a virtual laboratory. With the help of virtual reality technology, the surgeon can repeatedly simulate the operation on the monitor, move the organs in the human body, find the best surgical plan and improve the proficiency before the actual operation. Virtual reality technology is not often used in pharmacy vocational education now [7]. The application of virtual reality technology in pharmacy education can make teaching more interesting. The virtual reality system can enhance students' enthusiasm for the course through ingenious game-style course design, such as allowing students to play the role of nitroglycerin molecules in the system, experience the process of drug absorption in the body, and simplify and make difficult knowledge simple and interesting [8].

The virtual reality system has the function of human-computer two-way interaction, and users can train and practice in the virtual scene to lay the foundation for real pharmaceutical experiments. Virtual reality scenarios can provide direct real-time feedback on error messages. If the student makes a wrong operation in the process, the system will directly remind the student, and the student can correct their wrong concept in time, which is an advantage that the real experiment does not have [9].

In recent years, pharmacy has developed rapidly. If schools want to provide students with an advanced educational environment, they must invest a lot of money to create a training environment, such as GMP production workshops, pharmaceutical preparation production equipment, tablet presses, fluidized beds and other equipment [10]. If schools have to buy new equipment every time there is a new equipment on the market, it will cause a lot of waste of equipment resources, but if the speed of updating equipment is reduced, students will not be able to learn real job skills [11]. Virtual reality technology can provide students with an environment that is completely integrated with real production for students to learn and practice, and update them in time, so that students can keep up with the development of the times and reduce the gap between school teaching and real work. The training environment constructed by virtual reality has no geographical and time restrictions. Through the network, college resources can be shared, which improves the utilization rate of resources, reduces the waste of equipment resources, and greatly reduces the teaching cost.

In the pharmacy training, there will be some chemical experiments involving the possibility of combustion and explosion. These experiments are very important for the construction of students' knowledge system, but due to their certain dangers, students rarely come into contact with these experimental projects. Virtual reality technology has strong interactivity [12]. In virtual experiments, users can prepare chemical reagents, observe chemical reactions, and use various large-scale drugs in the production and preparation of drugs. Students can carry out dangerous experiments in the system, and at the same time avoid the occurrence of dangerous experiment safety accidents, which greatly improves the safety of experiments [13].

4. FRAMEWORK OF VIRTUAL EXPERIMENT SYSTEM

In recent years, the advantages of high bandwidth and low latency of 5G technology can bring strong

technical support to virtual reality teaching. The high-speed transmission data rate of 5G can transfer the massive data and computing-intensive tasks related to virtual reality teaching to the cloud. Reduce the data processing pressure of only the terminal. The virtual reality system in this paper is constructed based on the current network communication technology. The virtual experiment system constructed in this paper uses the web-based B/S mode. The B/S structure does not require users to install special software, but only requires users to use a browser, and the browser interacts with the database through a web server.
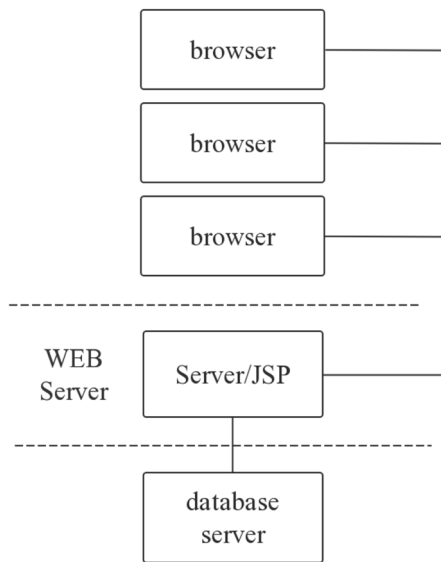
Figure 2. B/S system framework

There are three main parts in this system: server, database and client. The core software system required in the virtual experiment system is installed in the server, and a large amount of data generated by the virtual experiment is processed and analyzed. The database is used to store the data needed in the virtual experiment, including chef data, the standard answer of each experimental item, the experimental results that students need to carry out the virtual laboratory, and so on. The client is used to install the client software required by the virtual experiment system, such as the flash player plug-in and so on [14].

The system function module requires functions such as user registration, experimental teaching, experimental operation, and online forums. The modules set up in this system according to these requirements mainly include user management module, experimental teaching module, experimental operation module and forum module.
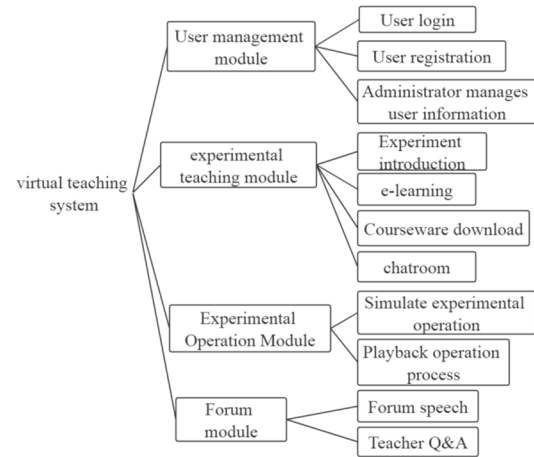

Figure 3. System Module Architecture

The user can enter the correct and legal user name and password in the user management module to log in. The user information will be stored in the background database after registration, and the administrator can edit the user information. In the experimental teaching module, students can exchange learning experiences with other students in real time and make progress together [15]. After watching the experimental video, students can perform experimental operations to test their learning. The forum module in the system allows users to publish their own experimental results and experimental data on the forum to communicate with others [16].
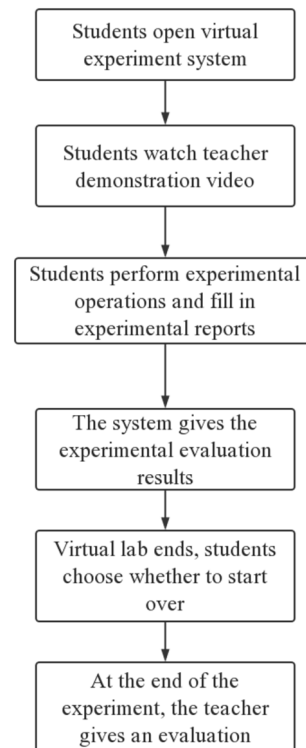

Figure 4. Teaching methods based on virtual reality technology

5. CONCLUSION

Pharmacy virtual experiment system is a new digital teaching platform based on network teaching. The virtual reality system can provide students with a complete knowledge system, create a good environment for students to learn independently and collaboratively, help to cultivate students' comprehensive quality, cultivate students' innovative spirit, and strengthen students' ability to study, research and explore problems. The system constructed in this paper has certain use value, but it needs to be further improved for better promotion and experimentation.

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