Research on the Application of Virtual Reality Technology in Higher Education Management Reform

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Abstract

Virtual reality technology as one of the hottest research field today, are widely used in various fields, is gradually infiltrated technology medical entertainment, film and television each domains such as aerospace and military training. For an important impact on all aspects of people's life, for the development of education and reform will play an important role. This paper introduces the concept and function of virtual reality technology in detail, which mainly expounds its influence on higher education and the applied research of higher education management reform. At the same time, the optimization application of virtual reality technology in higher education is described, aiming to analyze the practical application of virtual reality technology in higher education management.

Keywords: *Virtual reality technology; Higher education management*

1. INTRODUCTION

Virtual reality technology is a comprehensive technology, including system simulation technology, sensor technology and big data network information technology, etc, has high practical value, the combination of this technology and higher education can play a certain role in promoting teaching design and performance analysis [3]. Higher education is an educational level with high frequency of application of new technology. As a virtual reality technology, it brings real visual experience to students and is a kind of experiential teaching. Through understanding the characteristics and advantages of virtual reality technology can be further expanded to the practical application level, and combined with higher education to make a practical attempt and research [4].

2. OVERVIEW OF VIRTUAL REALITY TECHNOLOGY

The emergence of virtual reality, originally originated from the need for some special environments.Such as chemical training and some dangerous environment simulation, or the atomic physics experiments, some microscopic world simulation, as well as the Newtonian mechanical world, mathematical environment and other abstract concept of simulation, for some do not exist environment simulation, or for expensive experimental equipment and experimental environment simulation, and so on.

Virtual reality technology is the use of computer to simulate the real environment to form a simulation environment technology, its technology can make people into a virtual space, its principle is through the computer to process all kinds of information to form a visual operation and interact with a way. The city, the virtual reality technology is the use of people's vision, hearing and touch receptors, such as through the clear picture and sound sensor, to create the virtual images of high-speed simulation for people, make people produce immersive feeling, also can use language and gestures, form the man-machine interaction pattern, give people a better experience. According to the research results of virtual reality technology, as well as the differences in different forms and degrees of participants' participation in virtual reality technology, researchers divide it into four types: desktop virtual reality system, immersive virtual reality system, distributed display system and augmented reality virtual system [6]. The development of virtual reality technology has gone through three stages, namely preparation stage, practical application stage and high-speed development stage. In today's society, virtual reality technology has gradually been the formal attention of the society, some people even think

that virtual reality technology, network technology, multimedia technology and become the three most potential technologies in the 21st century.
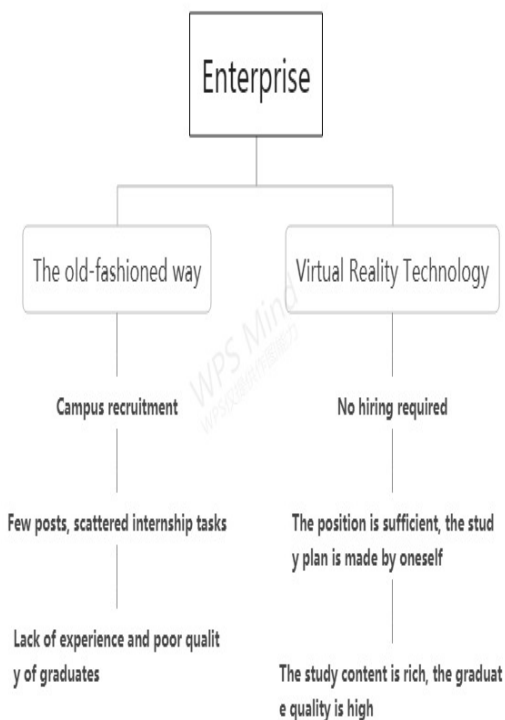

Figure 1: Advantages of virtual reality technology

3. IMPACT OF VR TECHNOLOGY ON HIGHER EDUCATION
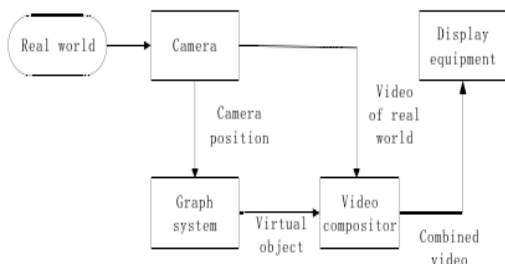

Figure 2: Research and improvement of Virtual Reality technology

3.1. *Impact of virtual reality technology on teaching philosophy*

The traditional teaching in our country generally takes the teacher as the main, the teacher occupies the dominant position in the teaching process, the student generally is in the passive accepting position. In the process of information transmission, students often lack an important sense of experience, and in this process, students' participation, initiative and enthusiasm are also low. When virtual reality technology is integrated with the education system in the future, the subject and concept of educational activities will change accordingly: in the process of learning, the dominant position of students has changed to some extent, which brings new experience to students and can bring them more intuitive feelings. The application of virtual reality technology has effectively changed the feeling brought by traditional concepts to students, broken through the limitation of teaching knowledge points as the focus of traditional education, and strengthened students' learning experience and active position in the learning process [1].

3.2. *The influence of virtual reality technology on teaching methods*

The influence of virtual reality technology on teaching mode is mainly reflected in distance teaching technology. Distance teaching technology can be realized through multimedia teaching video, but multimedia teaching video is often difficult to achieve the effect of virtual reality technology teaching. In higher education, the current teaching method is mainly taught by teachers, but virtual reality can break this traditional teaching method. Students can choose other teachers to teach in three-dimensional space, which can strengthen students' sense of participation and improve their learning effect Secondly, virtual reality technology can reproduce the natural phenomena or the change process of things that cannot be detected in life, and can help students solve problems in life [8]. The application of this technology can strengthen students' exploration in the learning process, which is of great help to scientific research and experiments.

3.3. *The influence of virtual reality technology on teaching content*

The teaching process of teachers is a kind of imparting knowledge, which is the main source for students to acquire knowledge, master skills and develop ability [11]. The application of virtual reality technology can enrich the teaching content and completely reproduce the teaching content. For example, in geography teaching, students can directly arrive through virtual reality technology. The application of virtual reality technology has broken through the limitations of traditional teaching content in the content of textbooks, especially in computer technology and network technology.

Virtual reality, as an idea, extends the teaching system in time and space.It overcomes the obstacles of time and space, and can also control the development process of things.The traditional school model teaching system is synchronized in time and space, and teachers and students complete the teaching activities at the same time. Later, with the development of radio and

television technology, the forms of distance teaching such as air school and TV university appeared. However, this kind of distance teaching only simulates the teaching system from the form, because its teaching communication form is basically a one-way transmission, and the interaction between teachers and students is very weak, failing to reflect the essence of teaching, that is, interaction. The development of computer technology and network technology has essentially solved this problem.Since the 1990s, names such as virtual classrooms, virtual schools, and virtual education systems have appeared.In particular, virtual schools, the realization of the learning process is quite flexible, students have a high status in the learning process, can be said to be a real student-centered virtual learning environment.

4. PROBLEMS OF VIRTUAL REALITY SYSTEM DESIGN AND APPLICATION

System navigation design problems when the user using virtual reality technology development education software, often hard to want to go, it is easy to get lost, do not know how to reach a specific position or Angle, since the education environment faces most ordinary users, so movement and cognitive space should be set relatively simple, although virtual environment can provide users with immersive feeling, but some education virtual environment through interactive interface to provide users with choice is difficult to understand and use. The problem of the single system function takes most of the virtual campus developed by colleges and universities as an example, due to the lack of more comprehensive consideration, bold attempt.Its actual use is still relatively simple. The actual function of virtual campus is mainly browsing, but with the rapid development of network education, people are no longer satisfied with browsing the campus environment, but a three-dimensional visual virtual campus based on educational affairs, teaching and campus life. People need a complete, interactive, plot-rich virtual campus.

In the virtual education environment, the role of the teacher should change from knowledge solution to learning partner or mentor, and some teachers are not aware of this change, thus affecting the application of virtual reality technology. At the same time, given the quality of the teachers themselves, using the education software is also exist difficulties, from the perspective of students, students in the virtual environment, their learning style need to change, thinking thinking also need to change, but many students did not find suitable for this environment of learning style and way of thinking, caused the students cannot keep up with the teacher explained the problem. As is known to all, it takes a lot of manpower, material resources and financial resources for the application of virtual reality technology to develop a set of educational software.

Especially for some ordinary primary and secondary schools, this is a considerable expense.So this means that it is not necessary for all courses to apply virtual reality technology to develop courseware. At the same time, because the learning of some courses focuses more on the memorization of knowledge, that is to say, suitable for teacher teaching teaching methods, then it is not necessary for such courses to seek the assistance of educational software.

When the entertainment of an educational software product is greater than its educational nature, it will have many negative effects on the learning subject. When the learning subject is immersed in a high-resolution, panoramic virtual space, it becomes very difficult for the learning subject to maintain a distance from the virtual environment. The virtual coexistence of learning subject and virtual environment, the distance with virtual environment disappears, no distance, in the scope of virtual "existence", human cognitive mechanism is affected, and leads to the emergence of cognitive problems that cannot be underestimated.

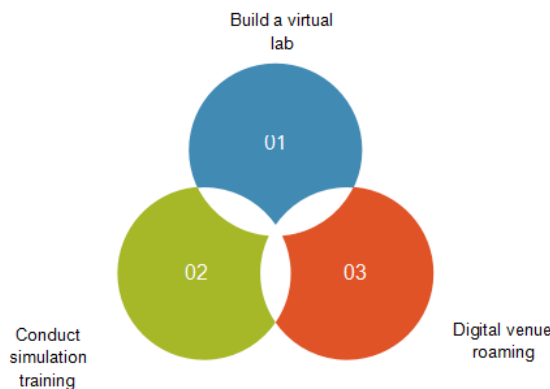## 5. OPTIMALIZED APPLICATION OF VIRTUAL REALITY TECHNOLOGY IN HIGHER EDUCATION

Figure 3: Optimalized application of Virtual Reality technology in Higher Education

5.1. *Build A virtual laboratory*

In different disciplines of higher education teaching, need to cultivate the students' practical ability, so often appear some practice class, the practice course is often accompanied by a portion of the risk, in order to ensure the safety of the students, at the same time meet the needs of teaching, the virtual reality technology can be used to create a virtual laboratory, such as burning experiments, some dangerous experiment. Using this technology can meet the cognition of the situation and intelligent media teaching and other teaching needs, can improve the learning efficiency of students [14]. The virtual hardware mode provides hardware-level

virtualization by using the virtualization layer. That is a VM provides a set of virtual Intel x86 compatible hardware for the operating system image running on the VM. This set of virtual hardware virtualizes all devices owned by a real server: mainboard chip CPU memory SCSI and IDE disk device interfaces. Display and other INPUT and output devices in addition, each VM can be independently encapsulated into a file, enabling flexible VM migration.

5.2. Conduct simulation training

In addition to theoretical knowledge, simulation training is a form of teaching, which mainly uses virtual reality technology to simulate a variety of scenarios for students: for example, we often use the teaching training area, 3 D simulation military culture simulation, etc., need to be combined with the Internet and other technologies to achieve.On the one hand, it can improve students' practical operation ability, and on the other hand, it can meet the needs of education in the new era.The simulation algorithm is mainly divided into the following steps: first calculate the error matrix Q of each vertex in the original model; then select the effective shrinking vertex pair; then calculate the optimal new point v'for each vertex pair (v1, v2); finally put all the vertices in the order of contraction cost, with the minimum cost at the top.The algorithm can be used for manifold objects or merge some other models without necklaces, and can maintain high quality.

5.3. Digital Venue Tour

Digital venue roaming is a demanding technology project in virtual reality technology. It mainly uses the combination of big data technology and Web3D technology to create a realistic virtual scene, construct immersive and creative virtual digital venues, create realistic teaching scenes for students, so that every student can be immersed in the virtual environment to stimulate students' interest. In addition, in higher education teaching, teachers can use computer technology to set differences according to professional characteristics, and realize the purpose of combining virtual reality technology with education and teaching.

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Virtual reality technology application to promote learning subject psychological pleasure and relaxation based on the virtual reality technology of digital virtual art brings learning subject on psychological experience, brought learning subject psychological pleasure and self-satisfaction, increase the confidence and motivation of learning, in some virtual system, such as virtual campus, virtual world and some virtual games, based on their digital virtual art to learning subject experience has expanded to all human spirit and consciousness, it is a pure learning subject self vent experience. This is a release of spiritual pressure to the learning subject. This kind of experience does not require deep spiritual pleasure and soul purification. It no longer pursues the traditional artistic conception and intriguing, but pays attention to the happy response of the current body. Through it we can perceive the construction of knowledge. Mark post said: "in the communication of electronic media, the main body is now floating, suspended in the object between different positions, different configurations make the subject with accidental situation and accordingly repeatedly rebuilt" virtual reality education application of the most important point is to provide education field a mirror to observe and analyze how we perceive and construct knowledge.

Virtual reality technology can provide environments and roles that exist or do not exist in virtual reality. The educational application of virtual reality technology such as objects has developed classroom teaching and made up for the deficiencies in teaching. The obvious application of this is virtual experiments, for those experiments that have high requirements on conditions and can not be done in reality, or highly dangerous trials, virtual experiments can be used. At the same time, virtual test has the advantages of traditional test incomparable cost saving.
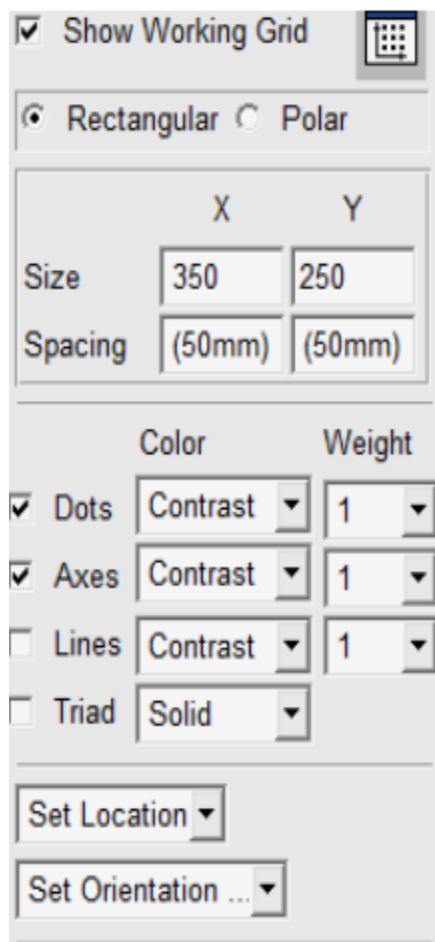
Figure 4: Technical experiment report of the virtual prototype

6. CONCLUSION

Virtual reality technology is the current information technology under the high speed development of new products, the virtual reality technology and the integration of higher education, not only can stimulate students' interest in learning, develop students' thinking, can also for the optimization of the structure of teaching methods and teaching and improve, for the traditional education towards diversified education development lay a certain foundation. In this paper, while researching virtual reality technology, we also understand the actual value and corresponding characteristics of virtual reality technology, which can promote the comprehensive development of virtual reality technology + higher education in a certain aspect.

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