Research on the Application of Virtual Reality Technology in Vocational Education

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Keywords: Virtual Reality Technology; Vocational Education; Education Application

Abstract: The application of virtual reality technology in vocational education can promote learners' understanding and mastery of knowledge and cultivate students' ability to analyze and solve problems. Virtual reality technology provides learners with a virtual environment that is close to the real world, provides learners with an immersive learning environment, stimulates learners' interest in learning, and helps schools save money and space. This paper briefly introduces the concept of virtual reality technology, analyzes the characteristics of vocational education, learners' learning characteristics and application advantages, and finally expounds the practical application of virtual reality technology in vocational education at present.

1. The concept of virtual reality technology

Virtual Reality (VR) technology is a computer simulation system that can create and experience Virtual world. It was proposed by Jaron Lanier, founder of American VPL company in the early 1980s [1].The specific connotation is: it is a collection of simulation technology and computer graphics, man-machine interface technology, multimedia technology, sensing technology, network technology and other technologies, and it is a kind of multi-source information fusion, interactive three-dimensional dynamic vision and entity behavior simulation system to immerse users in the environment [2].

2. Analysis of the advantages of vocational education

2.1. Characteristics of vocational education

Vocational education is employment-oriented, providing learners with education and training of theoretical knowledge and practical skills for a certain occupation, highlighting the cultivation of talent skills and skills [3]. The ultimate goal of vocational education is to equip learners with skilled vocational skills and the ability to adapt to the uncertain labor market. Compared with general education and adult education, vocational education focuses on the cultivation of practical skills and practical working ability. The two most fundamental characteristics of vocational education are occupation and skill.

Professionalism refers to the employment-oriented training of application-oriented talents with comprehensive abilities for the contemporary society. Skills refer to the ability of laborers to engage in social production, and the skills of learners formed through repeated practice by using their existing knowledge and experience. The main objective of vocational education is to enable learners to acquire vocational skills required for a certain occupation or productive activity.

2.2. Learner learning characteristics

1) Learners start at a variety of levels. The recruitment channels of vocational education are various, and the existing knowledge level of students varies greatly, which is a great challenge for

teachers. When implementing education and training for students, it is necessary to consider the knowledge level of different students and implement focused education.

2) Learning is dependent. Most of the students in vocational education have unclear learning objectives and lack of learning initiative. They are not clear about their career planning after graduation, so they tend to rely on the arrangement of teachers and lack the initiative in learning.

3) Students lack knowledge reserve and tend to practice learning. For the students of vocational education, the knowledge reserve is relatively insufficient, and from the perspective of the teaching objectives of vocational education, their learning process tends to pay more attention to the practicality of knowledge and prefer practical learning.

4) Learners are not motivated enough. Most of the students in vocational colleges are prone to mood swings and their learning continuity is not strong. If the expected learning effect is not achieved within a short period of time, students are likely to be impatient, get bored with learning and lose interest in learning.

2.3. Application advantages

After analyzing the characteristics of vocational education and the learning characteristics of learners, it can be found that the application of virtual reality technology in vocational education has the following advantages.

2.3.1. The simulated learning situation is beneficial to the learning based on the real situation.

Constructivist learning theory holds that knowledge is acquired by learners through active construction based on a certain situation. Virtual reality technology can provide learners with a near-real learning environment or professional working environment, help students complete the transfer of knowledge and skills from classroom knowledge to practical work, improve students' cognitive deficiencies, and promote students' deep learning. To enable students to deal with emergencies in practical operation, not just limited to book knowledge.

2.3.2. Immersive learning environment can easily stimulate learning interest.

One of the characteristics of virtual reality technology is immersion. Immersion teaching can break traditional vocational education class, change the traditional teaching way, eliminate the learner's resistance to the traditional classroom, then naturally take learners into and immersed in a virtual learning environment, which can stimulate learners' interest in learning. It is more conducive to learners actively construct knowledge.

2.3.3. Interactivity contributes to the training of vocational skills.

Another feature of virtual reality is interactivity. Learners can interact with virtual worlds through interactive handles or gloves. Therefore, the application of vocational education can simulate complex practical operations, eliminate unnecessary factors in practical operations and avoid the risk of some practical operations, strengthen key knowledge, and enable learners to repeat operation training and improve practical operation ability.

2.3.4. Three-dimensional models make up for the lack of cognitive ability.

The virtual reality technology presents the teaching content through the three-dimensional model, which is more vivid, vivid and intuitive than the traditional picture or video. It makes up for the deficiency of learners' cognitive ability, helps solve the key and difficult points in teaching, and contributes to the construction of knowledge.

2.3.5. Virtual environment can make up for the shortage of teaching resources in reality.

In practical teaching, due to the shortage of funds, space and technology, many vocational colleges do not have the conditions to provide the teaching environment for learners' vocational skills training, and most learners cannot obtain many high-quality learning resources. Virtual reality technology presents virtual learning resources for learners by creating a virtual simulation teaching environment to meet the needs of learners. It makes up for the shortage of teaching resources in

reality and can also solve the problems of funds and venues in vocational colleges.

3. The practical application of virtual reality technology in vocational education

The application of virtual reality technology in vocational education is mainly reflected in the following four aspects.

3.1. Physical display

Physical display mainly realizes the three-dimensional display of teaching tools, parts, instruments and other equipment. It helps learners understand the internal structure of the device, the relationships between its parts, and how it works. The use of virtual reality technology for physical display can help learners to understand the unimaginable part of real teaching, and solve the key teaching points and teaching difficulties, and overcome the cognitive barriers.

3.2. The simulation teaching

In vocational education, simulation teaching is mainly used to simulate the role of learners. Using computer technology to simulate the real environment, learners simulate to play a role of a post for skill training. Simulation teaching makes up for the deficiency of real conditions, provides learners with a training environment close to the real one, and enables learners to master theoretical knowledge and vocational skills in a short time.

3.3. Virtual experiment

In vocational education, virtual experiment mainly provides learners with a virtual laboratory to configure, connect, adjust and use experimental instruments and equipment by themselves. In such an environment, learners can also put themselves in others' shoes to test and repair equipment. The teaching effect in this virtual laboratory is equal to or even better than that in the real laboratory. For both teachers and students, the virtual laboratory breaks through the traditional laboratory's restrictions on "time and space" and concerns about funds. They can enter the virtual laboratory freely to operate instruments and conduct various experiments. Through trying various operation schemes, the exploration spirit and innovation ability of learners are cultivated. When learners enter the real professional environment, virtual training is carried out to acquire skilled operating skills, so that learners will not be at a loss in the real professional environment. The establishment of virtual laboratory is helpful to improve the quality of experimental teaching.

3.4. Skills training

Skills training mainly utilizes two characteristics of virtual reality technology: immersion and interaction. Immersion makes learners become participants of virtual learning environment and perfectly reproduce the real professional environment. Interactivity enables learners to operate and get feedback in a virtual environment just as they would in a real situation. In vocational education, it is applied to the training of aircraft driving skills, surgical skills, physical circuit operating skills and track driver driving skills. Skills training based on virtual reality technology can avoid adverse factors such as condition limitation, lack of funds and danger in real situations.

4. Conclusion

The application of virtual reality technology in vocational education is a great leap in educational technology. It has created an environment of "independent learning" and changed from the traditional way of "teaching for learning" to the way that learners acquire knowledge and skills by interacting with the virtual learning environment. With the development of virtual reality technology, vocational education will become more and more dependent on virtual reality technology. How to make full use of virtual reality technology to improve the teaching quality of vocational education and solve the existing problems will be the problems to be solved in the future.

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