

Cultivating the Innovation Ability of College Students Through Reusing Old Equipment

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Abstract

Virtual reality technology is the comprehensive computer technique with great three-dimensional display and high performance in the end of 20th century. It has the strong “personally on the scene” of immersion, friendly interaction with thrill to develop people’s imagination. With the teaching system revolution, the practice part of computer teaching in higher vocational college has been the important circle for the students to deeply understand the theory and grasp the practical ability. In recent year, the personal computer function developed very fast. The virtual reality technology applied in the computer teaching for higher vocational colleges. Through the virtual lab, virtual training room, and other methods we can improve the teaching effectiveness. This is one kind of beneficial attempt.

Keywords

Virtual Reality Technology, Computer, Teaching.

1. Introduction

In the past education, students are living in the two international space-time environments. One is the experiment environment and the other is the languages environment. However, the present education is out of line with the both sides. Professor Sang Xinmin during the new learning mode of exploring the information environment, he provides there must combine the three worlds’ learning experiment all together and promote the organic combination. In actually, this thinking has the instructive significance for each layer and type learning. The present education technique is creating the third world as well as the virtual reality world. It will be the important bridge to communicate the front two worlds. Therefore, under the big background of informatization period, the education teaching will has great development filed. Especially the virtual reality technique that combines with multi-media and emulation technique, it can use the unique advantage to guide and promote the learning activity and experience in the experience world and language world. The ceaseless encourage can promote autonomy, cooperation and creativity for the students in the three worlds. Especially the computer teaching in higher vocational colleges, we can operate virtual reality technique and provide some migratory experiences or abundant non-virtual reality experiences. Through the reflection of reality world, we provide various selections for the participant. However, there has no dangerous, cost or time can lost for the real things. Teachers and students can try the different plans that cannot select in the real world to determine the best way of some plans. Therefore, this method can avoid the harm for the learner and the cost lost.

2. Theory and characteristics of virtual reality technique

2.1. Theory of virtual reality technique.

The virtual reality technique is also called VR technique. It is provided by Jaron Lanier, which one is the VPL Company founder in the 80s of 20th century. It is also called artificial environment. The virtual reality is the ideal human-computer interface between computer and

users. Compare with the traditional human operation, virtual reality system can stay the user in the virtual environment that brings imaginary space. The user can do the operation through sensing equipment that fully expresses the interactivity between people and machine. As one of the top technologies during the technological development, the virtual reality combines the graph technique, computer emulation technique, artificial intelligence, sensor technology, display technique, and network technique. It is the high technological stimulate system. With the help of computer technology and hardware equipment, we can obtain the user interface of information power through multidimensional information channels of vision, hearing, olfactory and touch feeling. Virtual reality has been widely applied in entertainment, medical treatment, project and building, education and training, military stimulation, science and financial visualization. The new technology widely used in 21st century.

2.2. Main characteristic of virtual reality technique

Interactivity: Interactivity means the user operation degree and the natural degree of environment feedback (include instantaneity) in the stimulation environment. Virtual reality is the open dynamical system that user can operate the system through controlling and monitoring. The user can use the special input/output equipment and through the natural ability to realize the stimulation environment research and operation. The human-machine interaction in the virtual reality system is the interaction that nearly the natural condition. The user can use the keyboard, mouse even do the interaction through the special helmet, data gloves or other sensors. The computer can adjust the diagraph or sound through the user's head, hand, eye, language, and body movement. The user's language, body movement, or action can research or operate the objects in the stimulation environment. The virtual reality is different from the model in CAD system. The virtual reality is not a statical environment but the open environment. It is can response for the user input (such as gesture, language order). For example, the user can use the hand to scratch or move the objects in the stimulation environment. He can feel the scratch feeling and the weight. The user can pick up one virtual torch just like in the reality. He can fire the torch in the virtual environment. Virtual reality technology changes the interactive mode between human and computer fundamentally.

Illusion of immersion: Illusion of immersion is the main characteristic of the virtual reality. It means in the natural condition, there can obtain the participant effort level through the interaction equipment and self-sensory perception. Virtual reality is the virtual world, which is vivid to puzzle people by computer generation. This can lead to the user megrim that cannot describe the real world. People can feel everything in the virtual world by vision, listening, olfaction and touch feeling. In this world, everything is looks real, listens real, and moves real. However, this is also the final target that virtual reality seeking. The users can immerse in this three-dimensional environment as the part of virtual environment. They can personally on the scene not only the bystander.

Imagination: Imagination is the abstract specific degree through virtual reality technique. Emphasize the virtual reality technique should has the imagination. This can wide human acknowledge range not only in the virtual environment but also conceive the nonexistent or something that never happen. Virtual reality is not only the media, power user interface. It is the application software that designing for solving multiple problems. The exaggerated mode reflects the designer thinking. For example, before building a modern building, there need to think about the structure. The lost of quantified design-paper readers are the few professional. In the virtual reality, the designer thinking can reflect by other ways. The function is more powerful than the stiff drawing. Therefore, some foreign scholars believe the virtual reality can magnify interior as well as the artificial reality.

Multi-sensory: Multi-sensory means the virtual reality system can provide sensor channel, width, and depth to obtain the information. Virtual reality provides multi-sensory channels and

comprehensive information that similar with the real world. Except some having senses, there has listening, force sense, touch feeling, and motion sense. Even the taste sense and smell sense that can reach the feeling being there. The ideal virtual reality should have all the sense that people have. For the limitation of technique, especially the sensor technology, the present virtual reality only has vision, listening feeling, force sense, touch feeling, and motion.

3. The application of virtual reality technique in the computer teaching of higher vocational college

3.1. Use virtual reality technique to learn the knowledge

Use the virtual reality technique we can reproduce the variation process or natural phenomena that cannot be seen in the real world. This technique can provide vivid and reality materials for the students that make the theory more visualization to understand. Especially teaching the network theory, it works effectively. On the other side, virtual reality technique is convenient for student to do the real-time interaction learning and objectively obtain the required knowledge. Virtual reality technique can make the students can feel the real world has micro shape, transitory, dangerous and long-term character that other methods are hardly observe and test. In the class, teaching can experience the virtual environment, observe, and explain with the student. Otherwise, the students can use the virtual things to independently learn and understand the theory and knowledge. Through this kind of interactive learning can express the student subjective initiative. They can participate in the learning activity as the main body of learning. Moreover, this method can encourage their learning enthusiasm and the imagination.

3.2. Use virtual technique to do the inquiry learning

Virtual reality technique provides various suppose during the learning. Through the virtual system, students can directly observe the result and effect. For example, during the maintenance system installation of the virtual computer, student can make error and observe the result or check the random problems. Through the investigative study can encourage the creative thinking and train the students' innovation.

3.3. Use virtual technique to do the virtual experiment

During the experiment teaching, there needs lost of money with the characteristic of danger, great reaction, and long time. All these can use the virtual reality technique. The virtual reality technique can also establish network virtual lab of various subjects. For example, when checking the computer power problems, there has danger to directly contact with 220V voltage. We can use the virtual experiment equipment to do the training. It can effectively encourage the learning interest. Student is not only the observer, but also the participant. On the other hand, this will reduce the danger ratio to 0.

In the virtual environment, student sense (vision, listening feel, force sense and touch feeling) can connect and interactive with virtual situation. This is not same with the computer assisted instruction that student can only receive the vision and listening information. The virtual reality technique can greatly improve the learning initiative and effect. In some places, the economic civilization is backward and the bad experiment facilities lost the chances for student learning. On this condition, we can make up with the virtual reality technique. Students can improve the learning quality and effectiveness without the limitation of learning condition, experiment equipment, or infrastructure.

3.4. Use virtual reality to do the skill training

The immersion and interactive of virtual reality can make students to play a role in the virtual learning environment and put heart into the learning environment. This is good for reaching

the target of motor skill teaching. Use the virtual reality technique we can do lots of ability training. For example, students can do the training of computer packaging and maintenance, network security and other various professional abilities. These virtual training systems are conforming to the reality condition without danger. Students can train tirelessly until know well of these operation abilities. v. Use virtual reality to do the networked education With the daily development of virtual reality technique and network technology, use network virtualization to do the assistant instructions is the new method that placing the leader position for the further education. Establish the combination of learning context and reality condition with the characteristic of richness and vitality. This will promote the students' cognitive competence development. However, in the computer teaching of higher vocational colleges, there exist the limitation of space and time. The virtual reality technique can break the limitation that each student can find the condition during the production practice and reproduce the special condition. Combine the virtual reality technique and the internet. Build the teaching and academic environment with intelligent, interactive, distributed and strongly recommend teaching.

4. Conclusion

With the rapid development of information education, the new technique application has been the progressive direction for the education field. It can help the learner to train the self-learning ability and knowledge update skill. The virtual reality technique is the one of the hottest searching field. It has been widely applied in the education filed. Especially in the computer teaching in higher vocational colleges, it replenishes the traditional education. Virtual reality technique is the new birth education technique. They have not form the perfect operation model, and only apply in the small range of education, training, experiment, and visit. However, they have the irreplaceable advantages beyond other common education technologies—the encouraging best further. The forward-looking educators treat the virtual reality as the logical development process based on computer teaching system. The application of virtual reality technique during the teaching will change the learning model and improve the study efficiency. Apply virtual reality technique during the teaching can fully mobilize the learners' thinking and sense organ that all the visual things are realistically in the front. The difficult teaching details that hard to reduce can through the virtual reality technique to do the interior multidirectional observation and situation reproduction. Certainly, virtual reality can combines with other multimedia techniques to express the lagger function during the teaching experiment.

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