

Creation of Teaching Situation in Virtual Reality Environment

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Abstract

Situational learning theory believes that knowledge has context and the learning should be conducted in the corresponding context. Virtual reality technology has been extensively used in education because of its characteristics of "immersion", "imagination" and "interactivity". Based on the theory of situational learning, this paper discusses the creation of teaching situations in virtual reality environment, proposes a architecture for creating teaching situations in virtual reality and analyzes the advantages of using virtual reality technology to create teaching situations and the problem needs attention.

Keywords

Creation, Teaching Situation , Virtual Reality Environment.

1. Introduction

Situational learning theory believes that knowledge cannot exist without context, and knowledge learning should take place in the corresponding context. In the traditional way of teaching, knowledge is solidified into specific symbols. Unlike the traditional approach of teaching, the situational learning method makes learning in a real and natural environment, and the learner's behavior is the result of the interaction between the learner and the situation. In the process of interaction between learners and situations, not only can explicit knowledge be acquired, but also a large amount of implicit knowledge can be learned in the subtle. In this way, learners continue to practice and reflection in the context, constantly applying the knowledge learned in the context of the situation, and the learner's knowledge is constantly growing. This puts forward new requirements for instructional design. Under the theory of situational learning, instructional design not only considers the analysis of teaching objectives, but also considers the creation of situations that help to students' learning, and regards situational creation as one of the most important content in teaching design.

2. Virtual Reality Technology Provides Favorable Conditions for the Creation of Teaching Situations.

With the gradual development and progress of China's education informationization and the further implementation of the "three links and two platforms", multimedia network classrooms, campus networks and other hardware facilities are gradually improving. Therefore, the application of virtual reality technology in education has a good hardware foundation. The three characteristics of immersion, interactivity and imagination of virtual reality technology have greatly overcome the limitations of traditional teaching environment, which is beneficial to stimulate learners' learning motivation, enhance learning an experience, and realize situational learning and knowledge transfer.

2.1 Enhance the Learning Experience and Stimulate Learning Motivation.

In general, according to the different sources of incentives generated by learning motivation, learning motivation can be subdivided into internal motivation and external motivation. Internal motivation is the motivation caused by people's interest in learning itself, which is come from the learner's pleasure and satisfaction with the activity itself. Virtual reality technology motivates learners' motivation by presenting personalized features, rich media forms, and encouraging conversations. A large number of cases have proved that virtual reality can bring learners positive emotions such as relaxation,

pleasure and interest, and inspire internal motivation. Learning motivation is not just influenced by the internal factors of the learner, but also by external factors such as the learning environment. Virtual reality technology creates realistic scenes that provide dynamic interaction settings in which learners show high motivation and engagement. Digital museum, virtual campus roaming, or simulated driving, virtual reality technology can create a situation for learners to solve authentic problems. In addition, learners learn in the context of virtual reality creation, are often given a positive role (role play) in the process of solving problems, such as car repair technicians. Learners are often accustomed to this way of self-representation, and will express their thoughts and feelings through the role. More importantly, this learning experience stimulates the learner's creativity and imagination.

2.2 Promote Knowledge Transfers

Situational learning theory believes that knowledge is actively constructed by learners in certain situations, emphasizing the dynamic interaction between knowledge and context. The main reason for the criticism of traditional teaching is that traditional teaching is separated from the concrete factual situation, resulting in insufficient knowledge transfer ability, low mobility and lack of migration awareness. Situational learning is devoted to solving this challenge and promoting learning by setting contexts similar to life situations. [3] Virtual reality technologies can provide powerful support for situational learning, providing rich perceptual clues and feedback from multiple channels (such as hearing, vision, touch, etc.), helping learners to transfer virtual contexts to real life.

3. The System Architecture of Creating Teaching Situations in Virtual Reality

The virtual teaching context consists of hardware facilities, virtual environments, learning processes, applications, technologies, and resources. The relationship between these elements is illustrated in Fig. 1.

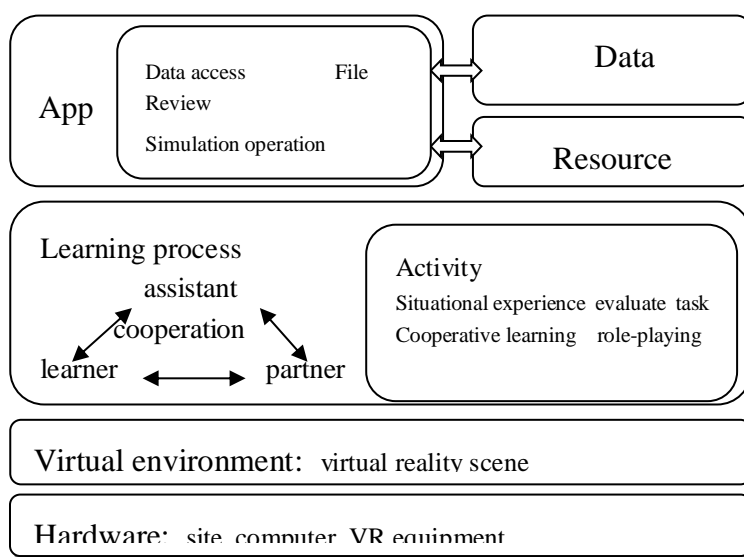


Fig. 1 Two or more references

3.1 Hardware Facilities and Virtual Environment

Hardware facilities are the material basis of the entire system, including site, computers, VR equipment, and so on. The virtual environment is a learning context created by using virtual reality technology and is the software foundation for the learning process.

3.2 Learning Process

The learning process is right on the heart of the overall system architecture and consists of learning participants and learning activities. Learning participants include learners, collaborators, and assistants. The learner is the main part of the system and the center of learning activities. In the whole system architecture, the learning activity area is the principal space for learners to learn. Five learning

activities are provided for learners to take part in, namely, situational experience, activities and tasks, role-playing, collaborative learning and evaluation. Learning activities carry out under the guidance of learning strategies to achieve goals. The learning process area and the application area directly exchange data, and the data required in the learning activity is provided by the application area, and the data generated by the learning activity are also transmitted to the application area for processing.

3.3 Application

The application area contains the various applications that learners need to learn in the system and is a key component of the overall system operation. According to the function of the application, it can be separated into four parts: data access, file review, simulation operation and phenomenon simulation. When the learner uses the application in the application area, the program will read, write, and call the data and resources as needed.

3.4 Data and Resources

The data area and the resource area are responsible for storing various data and data in the system, which can be named by the application layer.

4. The Problem of Teaching Situation Creation Should be Paid Attention to in Virtual Reality

With the rapid development of hardware technology, the simulation effect of virtual reality devices has been continuously improved, laying a solid foundation for teaching in virtual environments. With the continuous advancement of education informatization in China, teaching and learning in the virtual reality environment will be broadly applied in the future. The creation of teaching situations in virtual reality should also pay attention to:

4.1 The Creation of the Situation Should be Close to the Real Environment

In the situational learning theory, creating a situation is a necessary prerequisite for learners to learn knowledge and acquire skills. Creating a situation is to set knowledge and skills in real (or similar to reality) activities based on certain teaching goals. The actual situation is close to the reality of life, and it is easier to “resonate” with the learner, which is conducive to the learner's construction of the meaning of the learning content. Therefore, when using virtual reality technology to create virtual situations, we must pay attention to the use of virtual reality simulation technology to make vivid social and natural situations. When creating a simulated situation, the material should be taken from real-life, combined with the advantages of various technologies, to minimize the technical processing and modification of the material.

4.2 Conduct Real Activities in the Situation

Brown et al. (1989) argues that knowledge and activities are inseparable. According to the situational learning perspective, the development of learners' cognitive function, the construction of knowledge, the acquisition of skills, and the change of emotional attitudes is all attributed to learning activities. The authenticity of activities and tasks makes opportunities for understanding and interaction with experience. [4] Conducting real activities does not mean that situational learning must be carried out in real life. In school teaching, the background of teaching activities can reflect the way knowledge is used in real-life, and can ensure that the complete situational content is not split, we can think that the learner is doing genuine activities.

In a situational learning environment, learners clarify learning objectives, determine learning methods, and need to be completely prepared. In the various resources provided by the situation, learners must first find the problem, then address the problem, and finally conduct evaluation to form experience. In this series of processes, teachers should guide and clarify rather than directly telling the conclusions, which is to encourage the learners to complete the task themselves rather than impose their own experience on the learners.

4.3 Situation Creation Should Meet the Learner's Cognitive Structure Level

If the problem or task faced by the learner in the learning activity is too strenuous, the learner will not only generate too much anxiety and nervousness, but also frustrate the learner's self-confidence, which is not conducive to the effective completion of the task. If the problem or task is too simple, the learner will lose interest and cannot effectively improve the learner level. Therefore, the creation of learning situations should pay attention to the analysis of learners' learning characteristics and the grasp of teaching content, so the two should be at similar levels of difficulty.

When designing new questions and tasks for learners, the basic framework should be established in accordance with the "recent advance zone" of the learner's intelligence. When the learner encounters difficulties in the process, the learning situation should provide guidance and support to the learner in a timely manner. The purpose of the guidance is to ensure learners with strategies and cues to facilitate the learners to consciously reflect and complete the task. In contextual learning, the role of the scaffold is to constantly raise the learner's cognitive level from one level to another. The "Scaffolding" can be a teacher or other person who has the capacity to help the learner. With the help of the "Scaffolding", learners gradually changed from "newbie" to "expert" and became "central participants" from the "legal edge participants" of learning activities.

4.4 Situational Creation Should Support the Construction of Collaborative Knowledge

Learning requires interaction and cooperation. Learners participate in learning activities on an equal basis, learn from each other, learn from each other, support each other, and gain more knowledge transfer. Collaborative learning is an approach for organizing learners in groups or groups. The interaction in collaborative learning is not only the interaction between people, it includes all the factors related to the learner in the learning situation and the interaction between the learners: between teachers and students, between learners, learners and Learn the interaction between resources and more. In situational learning, members of a group's collaborative activities with a "practice community" that learns in a pattern of competition, debate, cooperation, problem solving, partnering, design, and role-playing. The collaborative learning process has greater autonomy and openness, but it does not rule out external guidance and support. Educating organizers must design the collaborative learning process.

5. Conclusion

Situational learning theory emphasizes the impact of learning situations on learners. How to create a good learning environment to promote students' learning is the focus. Virtual reality technology has unique strengths in virtual context creation. Combining situational learning theory with virtual reality technology can help create an appropriate learning environment that will enable learners to gain knowledge and acquire skills in learning situation

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