



Research Article

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## Research of university physics bilingual teaching based on virtual reality technology

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### ABSTRACT

*The virtual reality technology is combined by many new technologies, such as technology of computer graphics, multimedia technology, and network technology. In recent years, it obtained some fast development and application in many areas. With the development of multimedia technology and network technology, the traditional two-dimensional multimedia aided teaching are increasingly unable to meet the requirements of modern teaching, thus the application of virtual reality technology and the creation of three-dimensional network interactive scene in teaching is emerging as the times requiring under the environment.*

**Key words:** Virtual reality technology; VRML; University Physics; Bilingual teaching; Interactive technique; Simulation credibility.

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### INTRODUCTION

As broadband era, the virtual reality technology and network technology, multimedia technology racing are together bridle to bridle, which will have a more broad application prospects in the field of education. Virtual language VRML standards in reality network can not only promote the popularization and application of virtual reality technology, but also can bring the network teaching new teaching means, improve the quality of network teaching effectively [1-5]. With the development of multimedia technology and network technology, the traditional two-dimensional multimedia aided teaching are increasingly unable to meet the requirements of modern teaching, thus the application of virtual reality technology and the creation of three-dimensional network interactive scene in teaching is emerging as the times requiring under the environment [6-8].

### THE CONCEPT AND MAIN FEATURES OF VIRTUAL REALITY TECHNOLOGY

#### The Concept of Virtual Reality Technology

Virtual reality (Virtual Reality, referred to as VR), was created by an America company PVL Lanier . Janor Lamer proposed this concept in the early 80's, and also called Lingjing technology or artificial environment. It refers to the use of the computer to generate a simulation environment, and make the users "input" to the environment through a variety of special equipment in order to realize the interaction between user and the environment, which can allow the user to inspect or operate on the virtual world objects, at the same time provide visual, listening, touch and other intuitive real-time perception.

As a new integrated technology and science in computer field, virtual reality technology combines computer graphics, multimedia, artificial intelligence, human-machine interface technology, network technology, digital image processing, and other information technology, which has been involved in many research and application fields and is considered to be one of the important technology development and plays an important in the twenty-first Century and influence people's lives.

**Main features of virtual reality technology**

Through the study of relevant literature on virtual reality, we can find that virtual reality has its own unique advantages, which can be summarized in 3 characteristics.

**Immersion.** Immersion is referred to a three-dimensional image, which is generated by computer and makes the person involve in a virtual environment. Just like in the objective world of reality itself, it can give a person a kind of be personally on the scene feeling.

**Interaction.** In this virtual environment generated by computer, people can interact with a sensing device, which feeling is like in the real world. In the virtual environment, users can interactive virtual model according to demand, their rotation change model size, color method and virtual model.

**Imagination.** The virtual environment allows users to immerse them and get new knowledge, improve the emotional and rational, so the users can deepen the concept and the germination of new Lenovo, so we can say that virtual reality can inspire people's creative thinking.

**THEORETICAL FOUNDATION FOR THE APPLICATION OF VIRTUAL REALITY TECHNOLOGY****Media Teaching Theory**

In 30's to 50's of twentieth Century, USA educator Edger carried out a wide range of audio visual education in American period. Dell (Edger. Dale), in his publishing of *Audio Visual Methods In Teaching* publishing, proposed the "Tower of experience" theory, which become the main theoretical basis of audio-visual education at that time. Dell believe that human learning obtain the knowledge through two main channels, one is obtained by direct experience, and the other is obtained through indirect experience. He put forward the theory of "Tower of experience" of human learning experience. Also, he classified them into three classes of ten according to different degrees of abstraction.

**The Theory of Situated Cognition**

The famous psychologist Vygotsky found that "there is a defect in the individual, independent learning, because man is the product of society, therefore, the lacking of social interaction, will never develop his attributes and features formed in human evolution". Social interaction and cultural context is the cognitive process of the whole must. Vygotsky's theory of psychology and anthropology, sociology based on the theory of cognitive science, the cognitive theory of the situation in the last century 80's.

**The Inquiry Learning Theory**

At present, our understanding of the core concept is mainly from the USA national science education standards "shoulder" to explore the definition: "inquiry is many activities, including the observation; problem; through the review books and other sources of information to find out what is already known conclusions: developing the research plan according to the experimental evidence; evaluating the existing conclusion; tool collection, analysis, interpretation of data; provide answers, explanations and R test; and the exchange of results. Researches on determining the critical assumptions and logic is considered as the wing, which can replace explain. Therefore, the inquiry learning is that students in the teaching situation identify problems, analyze problems, put forward the hypothesis, collect evidence, solve problems and communicate through a series of research activities. And later the learning process will flow.

**Similarity theory**

Everything has their own properties and characteristics, but when there exist some common attributes, among these features and characterizations some of these values and characteristics may differ, then we said these common characteristics are similar characteristics. When there is similarity between things, we say that there is similarity between things. Similar appearance characteristic is called similar phenomena.

"The theory of similarity" is engaged in the study of natural science and thinking science by China famous scholar Mr. Zhang Guangjian, who put forward the theory. Similarity theory is science and technology similar to law and its application study in the objective world. It start from the view of system science research. The forming principle and the use of the object in the objective world are similar as well as different types. But different levels of system have similarity characteristics for essentially similar kinds of objective world understanding.

**VIRTUAL REALITY MARKUP LANGUAGE****Introduction to VRML**

VRML (Virtual Reality Markup Language) formerly known as virtual reality markup language, then renamed as the virtual reality modeling language in order to highlight its graphics processing ability. It is a virtual reality language

according to ISO international standard, and a HTML 3D simulation. VRML can be used to create virtual reality scenes in internet. As a new technology in the field of a multimedia and Internet, virtual reality is closely related to some new technology. VRML has currently become a worker Internet , which is based on the mainstream language of WWW 3D interactive virtual worlds and known as the second generation of Web modeling language, are shown in figure 1 and 2.

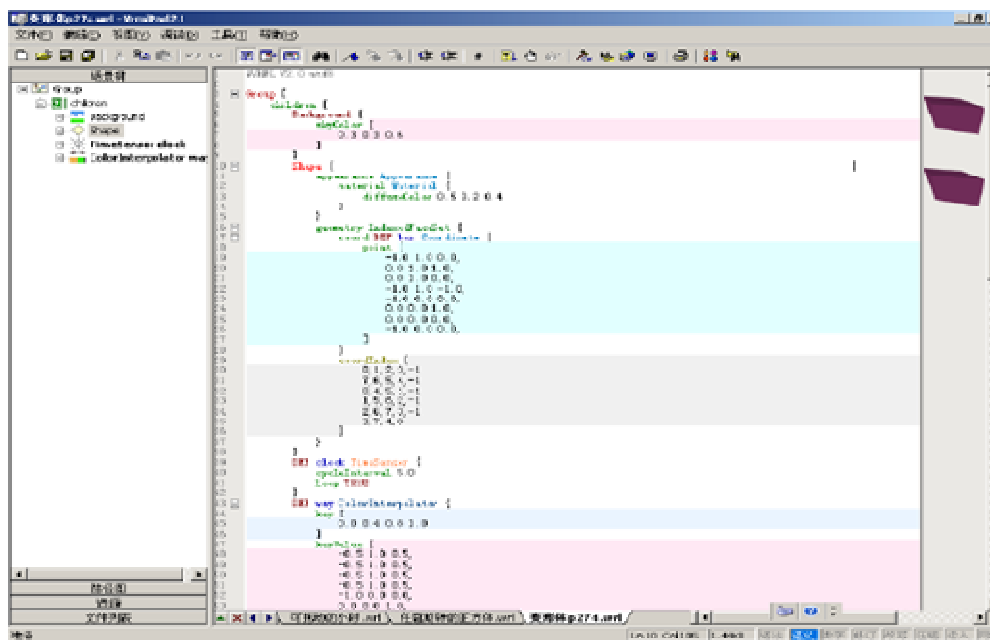


Fig1. The interface of VrmPad2.1

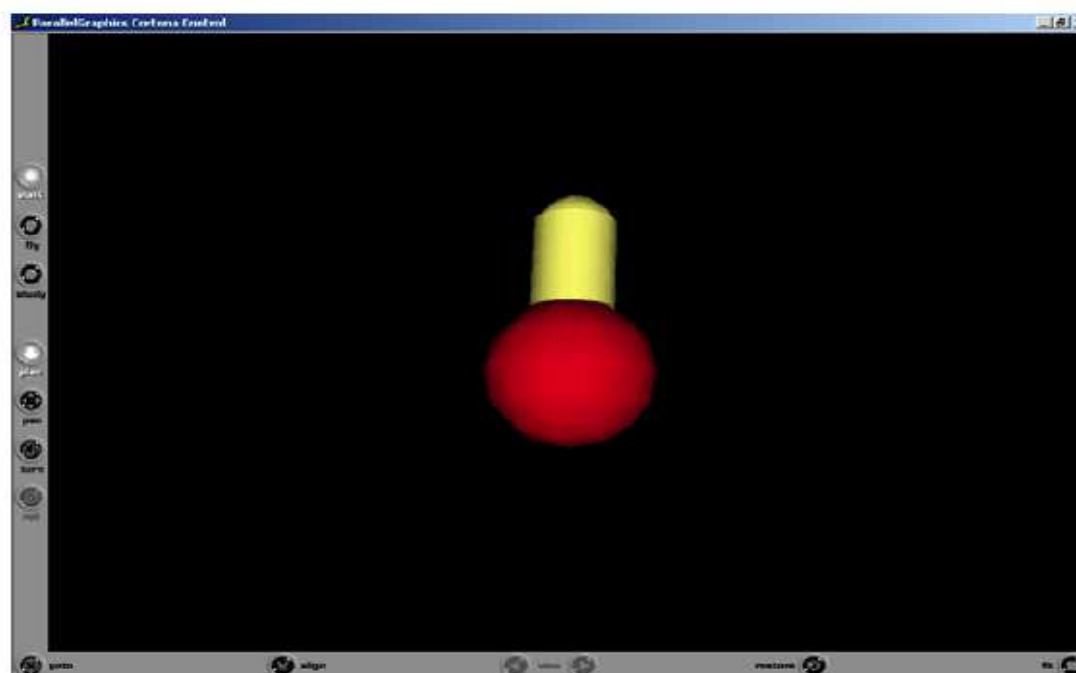


Fig2. The browser display interface of VRML

### The working principle of the VRML

The basic principle of VRML can be summarized as: text description, remote transmission, and the local generation of VRML. With similar HTML tagged text language, it can describe the 3D scene, using a text description, which can reduce the volume of data and is conducive to the file transfer in Internet. Then, VRML remote transmission mode will describe the scene and transfer the local text through Internet. Virtual scene data will explain the local

computer browser for it, thus reducing the load of the network, dynamically generated virtual scene its working principle as shown in figure3.

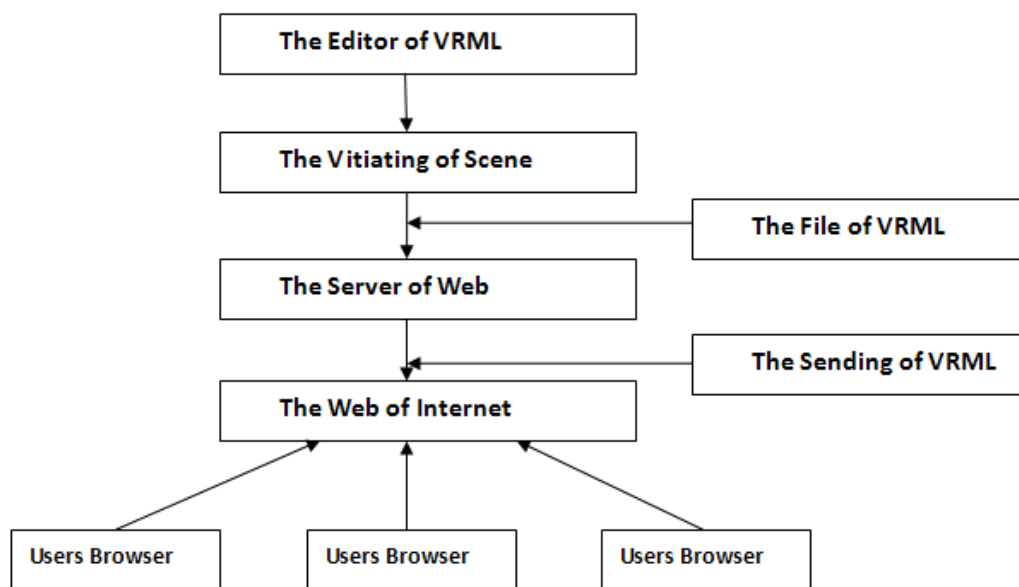


Fig3.the working principle of the VRML

## THE BILINGUAL VIRTUAL TEACHING IN UNIVERSITY PHYSICS

### The Front Analysis of Bilingual University Physics Teaching

In the following part, we will do some front analysis of Bilingual University Physics teaching, which is mainly explained in the objectives and requirements.

**Analysis of the objectives in bilingual physics teaching.** According to the application of virtual reality technology in the second chapter, it referred to theory teaching, not virtual simulation process of Bilingual Physics Teaching. Based on VRML is blind, but we should have planning, regard teaching theory as the basis in order to analyze learner oriented and realize the teaching content for the task. Thus, the process will follow the physics rule.

**Analysis of the characteristics and requirements of learners.** Constructivism learning theory believes that the acquisition of knowledge is the individual gradually formed the cognitive structure through their own activities and the environment interaction, which emphasizes the student's role in cognition, learning, and by that, learners will master the knowledge. That is the process of meaning construction. So in order to achieve good teaching effect, we need to analyze learner's characteristics and needs.

### The Design of Virtual Physics in Bilingual Teaching Situation

According to the Inquiry learning theory, which is mentioned in chapter two, the carrying out of inquiry learning activities should create learning situation inquiry for learners firstly. Inquiry learning can stimulate learner's interest. Analysis on the characteristics of the teaching goal, teaching section of content and learner, the creation of a virtual physics bilingual teaching should be roughly divided into two types: the physical situation and bilingual context.

**Design of virtual physical situation.** Based on the situated cognition theory, which is mentioned in the second chapter, we want to provide a scientific law, which can reflect the image of learning, more real; more stimulate the learning interest of learning situation. According to the abstract physical concepts, we create the situation to make learners feel that their facing of learning object is no longer abstract physics concept, fuzzy the phenomenon of life but realistic, three-dimensional full color in order to improve the learning interest. In the process of learning, the learning environment is not just textbooks and teachers, but the simulation of the realistic, without outside interference phenomena.

**The Design of Bilingual Virtual Context.** The connotation of bilingual teaching is not only the translation of Chinese expressions into English. Language expression is a kind of form, more is to allow to mastery the foreign culture connotation understanding. Especially for natural sciences physics, it basically translate from abroad, the more difficult the connotation and the more essence of translation expression. We should provide bilingual learning resources for learners, experience to make learners understand the different teaching style and culture, broaden the vision and international standards, the real heart to understanding of bilingual learning.

### CONCLUSION

The virtual reality technology is combined by many new technologies, such as technology of computer graphics, multimedia technology, and network technology. In recent years, it obtained some fast development and application in many areas. As broadband era, the virtual reality technology and network technology, multimedia technology racing are together bridle to bridle, which will have a more broad application prospects in the field of education. Virtual language VRML standards in reality network can not only promote the popularization and application of virtual reality technology, but also can bring the network teaching new teaching means, improve the quality of network teaching effectively. This paper studies how to use VRML virtual reality technology construct Bilingual University Physics 3D network learning platform on the research and practice of the design process. I have consulted a lot of literature, extensive reading of relevant articles, through in-depth study of the VRML language and the development of technology, the harvest is enriching of their knowledge, improving of the virtual reality technology.

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