

# Virtual Simulation Teaching Course Design based on Internet of Things Data Transmission

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## ABSTRACT

Accelerating the construction of educational informatization and leading the construction of virtual simulation experiment teaching center is an important reform plan put forward by the Ministry of education in the information age. Today's era has entered the information age. Advanced science and technology not only provides convenience for our life, but also plays a great role in the development of education. At present, China's colleges and universities have deficiencies in teaching mode and teaching experimental equipment, especially in interior design teaching and architectural design teaching, which makes it difficult to cultivate compound talents with both technology and theory needed in the new era. Therefore, it is necessary to apply the rapidly developing and powerful VR technology to teaching design. This paper briefly introduces the application of virtual simulation teaching mode in the teaching of virtual reality conference interpretation. By analyzing the key points of its long-term management, this paper explores the reform scheme of teaching mode, in order to achieve the ultimate goal of co construction and sharing of teaching resources.

**Keywords:** VR technology; Virtual simulation teaching; Interpretation Teaching

## 1 INTRODUCTION

Second life, released in 2003, explores the virtual network platform of education experts at home and abroad. As a product of science and technology in the information age, it has great advantages compared with the traditional teaching environment. Virtual reality environment has natural visual effects. Combined with its powerful synchronous interaction function, it provides learners with opportunities for language interpretation and communication, and realizes the sustainable development of virtual simulation teaching resources[1]. At present, although many colleges and departments have purchased some decision-making software for experimental teaching, due to the lack of immersion, authenticity and interaction, they can not bring immersive and direct experience to students, resulting in students' lack of learning interest and difficult to stimulate students' learning motivation. Therefore, how to build a new teaching model to solve the problems existing in traditional experimental teaching has become the focus of professional teaching reform. The development of VR technology is highly consistent with the interpretation teaching process, which is of great application value to the realization of teaching objectives.

Today's world is changing rapidly. In order to better deal with the change, we need to innovate the original

teaching design model and promote it to be further improved and optimized. At present, design teaching, especially in interpretation technology, is often backward in teaching equipment, resulting in Teachers' lack of specific expression in teaching, resulting in poor classroom effect and difficult to achieve the purpose of teaching[2]. The application of VR technology in virtual simulation teaching design can provide a new way for teaching methods. It can create corresponding design space environment for people. Authenticity and applicability coexist to immerse people. When explaining abstract concepts, it becomes quite easy for students to grasp, which can ensure the smoothness of communication between teachers and students. It is not difficult to find that the combination of virtual reality technology and design teaching has great advantages. Therefore, this paper intends to explore the introduction of VR technology into interpretation virtual simulation experimental teaching, conceive the interpretation virtual simulation teaching mode under VR technology from the characteristics of VR technology, and put forward practical suggestions according to the practical problems of experimental teaching under VR technology[3].

## 2 RELATED WORK

### 2.1 *Virtual simulation teaching*

VR technology, also known as virtual reality technology. Its core idea is to provide people with real sensory experience and build a situation infinitely close to reality. This technology organically combines the highly realistic vision, touch and hearing to create a virtual environment, so that people in it have a strong sense of experience. At the same time, combined with some technical equipment, users can carry out information feedback in the real environment and be reflected in the virtual environment. After entering the information age, the use of virtual reality technology for teaching has gradually become popular, and thanks to its great advantages, this application mode has developed into a virtual simulation teaching mode and become a new educational technology[4]. Virtual simulation teaching can simulate most of people's behavior in the real environment, increase the authenticity of teaching, and provide guarantee for teaching effect and teaching efficiency.

The application of virtual simulation teaching mode in VR conference interpretation specialty, through the creation of 3D virtual conference environment for language interpretation practice, and the addition of corresponding teaching contents in the environment setting, realizes classroom simulation language teaching, helps students intuitively participate in conference interpretation teaching activities, and overcomes the limitations of experimental venues, experimental equipment and experimental energy consumption. In foreign teaching institutions, many universities have established VR conference interpretation virtual simulation teaching system combined with second life. For example, Monash University in Australia has designed "China island" interpretation system with Chinese cultural characteristics. There are airports, cafes, bars and other virtual environments on the island. Students can carry out virtual exercises in their spare time[5]. Teachers will also be resident in the city to provide students with interpretation materials and dialogue practice opportunities. The VR conference interpretation virtual simulation teaching system in domestic colleges and universities mainly designs and completes the open language learning community, breaks through the restrictions on the cultivation of students' practical ability, and strives to cultivate interpreters with conference translation ability and coping with complex translation environment.

### 2.2 *Characteristics of VR technology*

American scholars Philippe coiffet and burdea g put forward the "VR technology triangle", indicating that VR technology has the outstanding characteristics of immersion, imagination and interaction.

Immersion is the most important feature of this technology, which means that users immerse themselves in the virtual environment through their own perception system, using external interactive devices in a natural state, and strengthen this sense of reality through various sensory feedback. Just like the business of professional interpretation technicians in real enterprises, they have a real and direct experience of the content of the operation.

Interactivity is the degree to which users interact with objects in virtual reality environment and get feedback. When the user operates in the virtual environment, the system will analyze the user's various operation behaviors and give feedback to the user truthfully. As a subject, students feel the same in the virtual environment as in the real environment, accept work at any time, interact with everything in the virtual environment in an all-round way, and carry out cost accounting, accounting processing and profit carry forward in real time[6].

Imagination means that users reproduce the real environment or objective non-existent environment through imagination in the virtual environment. Users inspire students to have a deeper understanding of theoretical knowledge through the process of logical reasoning and association according to various information obtained in the virtual environment and their own behavior in the system, so as to generate new ideas and stimulate them to carry out creative activities.

### 2.3 *Key points of long-term management of virtual simulation teaching process*

The long-term management of virtual simulation teaching course can realize the sustainable development of teaching resources and the ultimate goal of resource sharing in education industry. Its core content is to explore new educational resources based on the existing virtual simulation teaching resources and combined with the development needs of professional disciplines, give full play to the long-term effectiveness of network virtual, and realize the long-term improvement of virtual simulation teaching technology. The core management points are mainly divided into the following points: first, establish a unified virtual simulation teaching curriculum resource standard, set up a standardized curriculum development process model, realize the scientific and standardized management mode of resources, and realize the exchange of teaching resources[7]. The second is to inte-

grate the education management virtual operation platform, which requires the platform to have perfect virtual simulation service function, good scalability and timely supplement teaching resources. Third, optimize the virtual simulation teaching team, strengthen the cultivation of professional teachers' virtual simulation teaching ability, effectively combine it with teachers' teaching ability, and give full play to the teaching function of virtual simulation teaching mode. Fourth, increase capital investment. After the virtual simulation teaching system is completed at one time, ensure the continuous implementation of funds and facilitate the expansion and improvement of teaching resources. Fifth, establish a perfect operation and management mechanism to ensure the sustainable development and management needs of virtual simulation teaching resources, serve the teaching practice, and complete the ultimate goal of long-term management of virtual simulation teaching courses.

### 3 DATA ANALYSIS

#### 3.1 Integrate teaching resources and build a practice base

The construction goal of virtual simulation teaching course is to realize the application and sharing of teaching resources. High quality and comprehensive teaching resources are an important factor to ensure the sustainable development of virtual reality conference interpretation teaching. To create a high-quality virtual simulation teaching course, we need to integrate teaching resources, build a practice base and form a circular feedback resource audit mode. The domestic VR conference interpretation teaching is developing towards standardization. Colleges and universities should build practical learning bases and virtual simulation teaching platforms according to their own characteristics to cultivate professional compound talents. During the construction of virtual courses in the school, according to the actual job requirements of the society for VR conference interpretation professionals, the school has continuously carried out the construction of learning base of simulation system to create a good training atmosphere. Only by combining virtual simulation teaching with curriculum practice teaching can we effectively improve the teaching level of professional knowledge of VR conference interpretation and enhance students' ability to analyze and understand the overall knowledge structure. Through the network simulation practical professional technology application website, clarify the specific work tasks of students' future employment, deeply understand the course content, use the PTS system in the virtual simulation technology platform, strengthen the talent training effect, consolidate the

course teaching content, and cultivate students' work adaptability and adaptability[8]. The school should strengthen cooperation with enterprises, provide students with a large number of internship opportunities, use the virtual simulation experiment teaching platform to create a real social construction environment, help students apply the course knowledge content, and improve the quality training of VR conference interpretation professionals. Based on the real enterprise case and the interpretation technician business of the enterprise, a new teaching mode is constructed by using multimedia, database and other tools to build a sustainable virtual enterprise to simulate the daily economic business and capital movement process of the real enterprise, as shown in Figure 1.

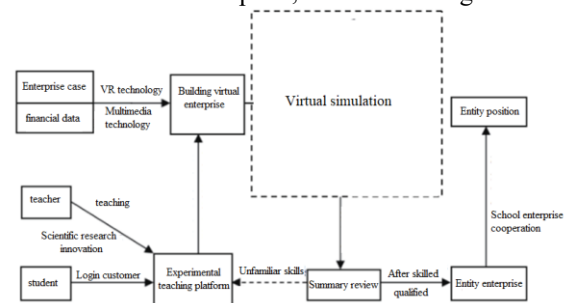


Fig. 1. Virtual simulation teaching mode

Under the new teaching mode, school enterprise cooperation is the foundation, and the case of experimental teaching is the public financial data of cooperative enterprises in previous years. A virtual simulation experimental teaching platform is constructed by using VR technology and multimedia technology to introduce the management norms, post standards and workflow process in real enterprises into experimental teaching. Enable students to immerse themselves in the virtual environment and participate in the whole process of enterprise management movement[9].

#### 3.2 pay attention to top-level design and build a network platform

Resource management network platform is the core part of VR conference interpretation virtual simulation teaching course. All teaching activities can be realized on the basis of existing teaching resources. When planning the virtual simulation course, the management department shall pay attention to the top-level teaching design, formulate semester tasks and annual plans, implement them in sections, whether they are communicated in the school, avoid the repeated construction of similar platforms under the coordination of the state-owned assets management department, and use modern communication tech-

nology to interpret the experimental data, teaching elements and User information is initialized. In order to ensure that the most real teaching situation can be simulated in classroom use, the platform needs to have complete teaching course development functions, including practical teaching affairs, teacher-student communication, information notification, role management, etc., It can accommodate the virtual simulation course resources of other platforms, debug the courseware content according to the data of the data layer and the use of experimental instruments, realize the standardized output function, and help VR conference interpretation students carry out virtual simulation teaching and training. Through the computer database terminal, record the experimental data generated in the whole teaching link, and complete the visual research of the teaching platform, including teaching information, resource management, annotation report, interactive comment, etc.

$$E(t)\dot{x}_{d+1}(t) - E(t)\dot{x}_{k+1}(t) = E(t)\Delta\dot{x}_{k+1}(t) = f(t, x_d(t)) + B(t)u_d(t) - f(t, x_k(t)) - B(t)u_k(t) - d_k(t) = f(t, x_d(t)) - f(t, x_{k+1}(t)) + B(t)\Delta u_{k+1}(t) - d_{k+1}(t) \tag{1}$$

The core task of VR conference interpretation major is to translate the information received by students. In this process, students are required to understand the correct expression of the interpretation content and truly "speak a foreign language and communicate with foreigners". Virtual simulation teaching can provide students with a broad space for interpretation and communication. Community teachers and learners from all over the world practice interpretation with a sincere attitude and create a good communication environment, which is an ideal way to solve the "dumb translation" of Chinese VR conference. This kind of "face-to-face" chat activity can improve the real communication consciousness, alleviate the embarrassment of students' communication and conversation with strangers in real life, and alleviate the tension. The test students said they "don't have to worry about making mistakes" and "aren't as nervous as before". The test operation method is as follows:

$$\|\Delta x_{k+1}(t)\| \leq (pk_f + m_2 + m_3) \int_0^t \Delta x_{k+1}(\tau) d\tau + \int_0^t (m_1 \|\Delta u_k(\tau)\| + pd) d\tau \tag{2}$$

They also created some entertainment facilities in the virtual system to help students chat and make friends in the process of entertainment, and strengthen cooperation with partners in other countries.

### 3.3 Optimize the teaching situation and create a vivid classroom

The course model of virtual simulation teaching will focus on creating real situations. Based on the technical advantages of the Internet, all the information in the virtual platform is created on the basis of the real world, which can effectively meet the teaching needs of learners' VR conference interpretation. In addition, in this process, teachers can complete scene switching according to the teaching content and play color in the corresponding environment, which can quickly bring students into the corresponding roles, and the translation practice becomes relatively simple. For example, taking the conference as the learning background and with the help of VR conference interpretation virtual simulation teaching system, students are familiar with the conference background and on-site environment in advance, such as the specific location of national leaders, the distance between leaders and listeners and translators. With the advancement of teaching activities, gradually get familiar with the conference process, such as opening ceremony, conference speech discussion, closing ceremony, etc.

$$\Delta\dot{x}_{k+1}(t) = P^{-1}(t)(f(t, x_d(t)) - f(t, x_{k+1}(t)) + B(t)\Delta u_k(t) - (B(t)L(t)\dot{C}(t) + B(t)L(t)C(t))\Delta x_{k+1}(t) - d_{k+1}(t)) \tag{3}$$

Through the experiment of "virtual simulation teaching + teaching evaluation", students can understand the interpretation knowledge of the United Nations General Assembly, improve personalized task teaching, and obtain real-time evaluation feedback, on-site assessment and evaluation form, as shown in Table 1. Some students commented: "when you complete the answer to the question, the avatars of teachers and students will make corresponding applause and other actions. They feel that they have really come to the corresponding scene environment, can also hear applause and communicate with life almost at the same time."

**Table 2.** On-site Assessment and Evaluation Form of Virtual Simulation Teaching Course

	Name:	School Number	Class
Evaluation items Learning Activities	Speciated time	Completion Time	Total Results
	Standard points	Evaluation criteria	Reult

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Inter-  
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Practice  
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Set up fluent communication between various spoken languages existing in real enterprises in virtual enterprises. The teaching mode under this method is a cognitive method to reproduce the changes of things and environment in the real world through VR technology simulation or virtual simulation, and then learn. This design teaching mode not only has the characteristics of high efficiency, strong inspiration, intuitive and closer to reality, It can also enable the educated to improve their cognitive ability and understand the teaching content in a short time. Situational simulation teaching mode attaches importance to the systematic reasoning and teaching strategies of existing knowledge and teachers' experience, which is beneficial to students' ability and intellectual growth and progress, and has a long-term impact on optimizing teaching level[10].

#### 4 EXAMPLE ANALYSIS

Based on the advantages of virtual simulation teaching mode of VR technology, the application of VR technology in virtual teaching should start from the aspects of scientifically constructing experimental teaching platform, strengthening school enterprise cooperation, enriching teaching resource database, establishing entrepreneurial virtual training base and so on.

##### 4.1 *Scientifically build an open experimental teaching platform and preset a pragmatic and efficient platform system*

Carefully build an open virtual simulation experiment teaching platform. To build a teaching platform, we should first pilot the experimental projects to ensure basic recognition in schools and industries; Experimental projects must conform to the law of teaching development, be based on the realization of teaching objectives, and conform to the development direction of interpretation

practice teaching; Encourage innovation in various projects, strengthen school enterprise cooperation, and jointly promote the innovation of teaching mode and teaching technology.

Preset pragmatic and efficient platform system. The platform system should be designed into two systems: teacher system and student system. In the teacher system, teachers are not only system administrators, but also enterprise managers; Teachers record the training rules into the laboratory system in advance, and successfully set the objectives, contents, rules and training duration of interpretation training by modifying the preliminary data of student accounts. In the student system, students carry out the training and process operation of each post on the basis of teachers' setting.

##### 4.2 *Strengthen school enterprise cooperation and create a real enterprise environment*

In the context of VR technology, in order to solve the problem of enterprise practice, the interpretation major in Colleges and universities should adopt the alternative mode of virtual reality, strengthen the cooperation between schools and enterprises, and take the financial process and publicly available data of cooperative enterprises as the basis. On this basis, guide students to learn translation knowledge and skills, as shown in Figure 2. Enterprises can open the positions of interpretation technicians. Students first train through virtual enterprises, take several positions, clarify the work and tasks of each position, analyze various projects and integrate financial data, so as to improve the management ability of strategic planning, operation management and risk control, organically combine interpretation single and comprehensive skills with professional quality, and improve students' own professional ability. Through the continuous practice of skills, after the experimental training is skilled, go to the real post for training. If the skills are not skilled in the real post, return to the virtual enterprise for experimental training; For the posts that enterprises are unwilling to disclose, they will use the financial data disclosed in previous years to set them in the virtual enterprise, and then carry out post training, so as to promote emptiness with reality and complement each other with the combination of emptiness and reality[11]. Using VR technology to establish a virtual simulation laboratory to simulate real enterprises, students can train the financial work of real enterprises in school. In this way, most students can work directly before graduation, which shortens the internship time. Enterprises do not have to worry too much about the leakage of financial information. Not only does the school alleviate the difficulty of internship, but also students effectively solve the problem of employment. This teaching mode fully realizes the resource sharing and

joint innovation between schools and enterprises, and finally achieves a win-win situation.

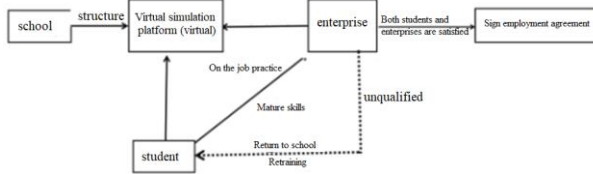


Fig. 2. School enterprise cooperation model

4.3 Enrich the teaching resource base at different levels according to the analysis of learning situation

There are many interpretation training projects and they are highly professional. In the process of developing virtual simulation projects using VR technology, the collection, summary and application of data, and then to dubbing and dubbing, professional technicians need to carefully organize and study, and develop training projects at different levels to meet the needs of different schools and students.

The curriculum resources of virtual simulation teaching should pay attention to hierarchical design. Different virtual teaching courses should be designed according to the learning conditions of schools and students at different levels, so as to achieve the combination of easy and difficult, from easy to difficult, and improve the pertinence of teaching. Case teaching resources should meet the learning situation and improve students' learning enthusiasm. To develop case teaching resources, we must consider the individual differences of different students, the task difficulty should meet the needs of students at different levels, set up a variety of role application systems, and facilitate the statistics and summary of multiple identity roles.

In the virtual enterprise, when organizing business training, we should reflect the enterprise's strategic management thought, financial management consciousness and professional ethics standards, so as to ensure the comprehensive practice and application of students' professional knowledge, operation skills and professional judgment. Firstly, in the virtual enterprise, the background of the industry, the operation status of the enterprise and the production and processing process of products in the case should restore the real enterprise; Secondly, the role setting of each post should be reasonable, give full play to students' initiative, arrange corresponding posts, and enhance the sense of assistance of the team; Finally, in dealing with business links, it is necessary to reasonably set the operation process of each post. For example, the procurement link of students in virtual enterprises should be consistent with the actual social practice. In case of doubt,

teachers should inspire, guide and impart skills. At the same time, teachers should always teach students to abide by professional ethics and cultivate a rigorous attitude towards work.

4.4 Establish a virtual entrepreneurship training base to encourage students to carry out entrepreneurship project training

With the launch of the policy of "mass entrepreneurship and innovation", it is suggested that virtual simulation teaching should be combined with innovation and entrepreneurship policy, establish entrepreneurship virtual training base, encourage students to carry out entrepreneurship project training through the virtual training base, and simulate the real environment outside the enterprise, including the whole process of capital movement (financing, investment, operation, etc.). In the laboratory, students only need to log in to the client, wear helmets, data gloves and other equipment, immerse themselves in the virtual enterprise environment, and simulate the exchange of various interpretation business skills. After the operation of each skill is proficient, design the entrepreneurial project by yourself, operate the entrepreneurial project in the virtual enterprise, and continuously improve in the operation process until the project is mature and verified. However, sometimes one person's strength or resources are not enough for entrepreneurial activities. In a virtual enterprise, a team can also carry out entrepreneurial project training together, so as to share information and resources. After the entrepreneurship project is verified, it shall be applied to the entrepreneurship center of the University for approval, while the academic affairs office, logistics management office, assets and equipment department and other functional departments of the university need to provide material support for students' innovation and entrepreneurship activities, so as to realize entrepreneurship in the University.

In this mode, students have conducted sufficient simulation training through the panoramic virtual simulation laboratory, which lays a solid foundation for the success of entrepreneurial activities. Many ideas of entrepreneurial activities can also be verified and trained through the panoramic virtual simulation laboratory, which not only stimulates students' learning motivation, but also saves teaching costs, At the same time, it also cultivates students' innovative and entrepreneurial thinking.

5 CONCLUSION

With the deepening of virtual simulation teaching curriculum resources and the deep integration of educational environment at home and abroad, virtual simulation

teaching curriculum design will meet the needs of schools, international cooperation and enterprise development in the future. VR technology provides a realistic method for experimental teaching. Setting up experimental projects through the combination of virtual and real and complementary ways to make up for the shortcomings of traditional experimental teaching is not only conducive to enhance students' learning experience and improve their interest in learning, but also effectively solve the problem of students' lack of social practice and improve the quality of interpretation teaching. It is believed that with the continuous development of VR technology, it will be widely used in teaching, which will also become the main development direction of experimental teaching reform in the future, effectively improve the resource utilization of virtual simulation teaching technology, realize co construction and sharing, and realize the sustainable development of virtual simulation education resources.

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