

Study on the Experimental Teaching of College English Virtual Simulation Four-Ring Linkage

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As the information technology has developed rapidly, smart education has become a significant developing way in the field of education. In the “Teaching Requirements for College English Courses”, the virtual simulation technology used in the teaching of college English courses requires advanced multimedia and network technology support, as well as a rich and large number of course background resources. This study focuses on college English teaching, innovatively proposes a virtual simulation four-ring linkage experimental teaching model, and illustrates the process of the model in composition and implementation. The study results show that the model has an important impact on improving college students’ comprehensive English abilities, learning interests and self-learning abilities, and gives new opinions and ways for the reform of college English teaching in universities.

Keywords: smart education, college English, virtual simulation, four-ring linkage

Introduction

In today’s developing globalization, there is a growing demand for highly qualified talents with comprehensive English skills. As a basis for talent training, the quality of college English teaching becomes very important. However, the traditional college English teaching mode often focuses on the transfer of knowledge, which has certain limitations in fostering students’ practical English application abilities, cross-cultural communication abilities, and self-automated learning abilities. Therefore, the rising use of smart education has brought new chances for the reform of college English teaching. Smart education is a new type of education model supported by information technology, aiming at cultivating students’ innovative thinking, practical ability, and wisdom literacy. First, artificial intelligence, big data, and other technologies can achieve intelligent management and personalized teaching of the teaching process; second, the contextualization uses virtual simulation, augmented reality, and other technologies to create realistic learning situations, so that college students can learn and practice in the situation; third, the openness can break the limitations of time and space and realize the sharing and openness of educational resources; fourth, interactivity can emphasize the interaction between teachers and students, which can promote knowledge sharing and innovation. With the help of advanced virtual simulation technology, a more realistic and vivid English learning environment can be constructed, which can enhance students’ interests and enthusiasm in learning and the teaching effects as well. Schweinhorst (2002) said that when the virtual world is used in the second language classroom, the virtual reality world can help

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students acquire language skills and develop language awareness through social interaction, teamwork, and critical thinking. The aim of this paper is to explore a four-ring linkage experimental teaching mode of college English virtual simulation which is based on the concept of smart education, so that it can provide a useful reference for the innovation and development of college English teaching.

The Construction in Virtual Simulation Four-Ring Linkage Experiment

With virtual simulation technology as the core, the virtual simulation four-ring linkage experimental teaching mode guides college students to conduct independent exploration, collaborative communication, evaluation and feedback by creating realistic English learning situations, so as to realize and improve students' construction of knowledge and abilities. The model consists of four closely linked links, namely, situation creation, independent inquiry, collaborative communication, evaluation and feedback, which promote each other and cycle to form an organic entirety.

Situation Creation

Situation creation is the basic part of the virtual simulation four-ring linkage experiment teaching mode. According to the teaching objectives and teaching content, teachers use virtual simulation technology to create English learning situations similar to real life, such as job interview scenes, English academic conference scenes, tourism reception scenes, etc. These situations are not only highly realistic, but also contain a wealth of linguistic information and cultural elements, which can stimulate students' interest and curiosity in learning, and provide students with a natural and authentic language learning environment.

Independent Inquiry

In the created context, students can conduct independent inquiry after clarifying the learning task. Students can solve the problems posed in the situation by observing, analyzing, practicing operations, and reviewing materials. For example, in a job interview scenario, students need to independently research the cultural background, interview habits, develop interview strategies, and conduct interviews in English. In this process, students' self-directed learning ability, information acquisition ability, and problem-solving ability have been exercised and improved.

Collaborative Communication

Collaborative communication is an important part of the virtual simulation four-ring linkage experimental teaching mode. On the basis of self-automated inquiry, students work in small groups collaboratively. Group members share their learning results and experiences in the process of their common learning tasks, discuss and inspire each other, and solve problems together. With collaborative communication, students can not only enhance their English expression and communication skills, but also acquire teamwork and intercultural communication skills. For example, in a virtual English-language academic conference scenario, group members play the role of scholars from different countries to communicate and discuss an academic issue with group members.

Evaluation and Feedback

The evaluation and feedback runs through the whole teaching mode of the virtual simulation four-ring linkage experiment. Teachers conduct a comprehensive and objective evaluation of students' learning process and learning results by observing students' performance in situations, as well as students' learning outcomes and group collaboration. Evaluation methods include teacher evaluation, student self-evaluation, and peer evaluation. The aim of evaluation is not only to understand students' learning situation, more importantly, to find out students'

problems and shortcomings in time, but also to provide targeted feedback and guidance for students, and to help students improve their learning methods and improve their learning outcomes.

Teaching and Experimental Design

Study Aims

The aim of this study is to explore the following two aspects:

1. The virtual simulation four-ring linkage experimental teaching mode has a significant impact on the improvement of college students' comprehensive English ability;
2. The virtual simulation four-ring linkage experimental teaching mode has the important guidance in students' English learning interests and self-automated learning ability.

Study Subjects

Two parallel classes of college non-English majors will be selected as the study objects, one of which is the experimental group, and the virtual simulation four-ring linkage experimental teaching mode is used for teaching. The other class is the control group and will be taught in the traditional English teaching mode. There are no specific differences between the two classes in terms of English proficiency and other basic information at the time of entry.

Study Methodology

1. Literature study method: Consult relevant literature at home and abroad to understand the application status and research results of smart education and virtual simulation technology in English teaching, and provide theoretical support and research ideas for this research;
2. Experimental research method: By comparing the changes in students' performance, learning interest, and self-learning ability between the experimental group and the control group before and after the experiment, the effectiveness of the virtual simulation four-ring linkage experimental teaching mode is verified;
3. Questionnaire method: After the experiment, questionnaires will be respectively distributed to the students in the experimental group and the control group in order to understand students' satisfaction with the two teaching modes, the change of students' learning interest, and the improvement of their independent learning ability;
4. Interview method: Some teachers and students will be chosen to implement interviews to obtain an in-depth understanding of their experiences and feelings in the experimental process, as well as their opinions and suggestions on the teaching mode of virtual simulation four-ring linkage experiment.

Teaching and Experimental Process

Experimental Implementation Phase

In the experimental implementation phase, according to respective teaching modes, the experimental group and the control group will be taught in the following teaching processes: According to the unit teaching content, the teacher creates the corresponding English learning situation on the virtual simulation teaching platform, and introduces the situational background and learning tasks to the students. Students independently explore and learn in a virtual situation, and teachers observe students' learning in real time through teaching platforms, like the U campus platform, and provide necessary guidance and assistance. Students work in small groups on the basis of independent inquiry. Teachers design group discussions in part of brainstorm in smart classroom to ask students to share their learning outcomes and experiences and solve problems with their group members. Teachers

evaluate students' learning process and learning results, provide feedback on the evaluation results in time, and put forward suggestions for improvement in response to students' problems. Students implement self-assessment and peer evaluation, reflect on their own learning process, and summarize knowledge acquired. The control group adopts the traditional English teaching mode, with teachers' illustrating and demonstrating in class, and students learning by listening to lectures and doing exercises.

Experimental Summary Phase

In the process of experimenting between the experimental group and the control group, the students will be tested for English proficiency, and teachers can compare the changes in English scores of the two groups before and after the experiment. With regard to the two teaching modes, questionnaires will be distributed to students of the two groups to collect students' feedback on the two teaching modes. Some students and teachers will be conducted interviews to gain an in-depth understanding of their ideas and suggestions on the teaching mode of virtual simulation four-ring linkage experiment. The experimental data will be counted and analyzed, and the advantages and disadvantages of the virtual simulation four-ring linkage experimental teaching mode will be summarized, so as to provide a basis for further improvement of teaching.

Findings and Discussion

Improvement of Comprehensive English Ability

Through the statistical analysis of the pre-test and post-test data of the students in the experimental group and the control group, the results can show that the comprehensive English scores of the students in the experimental group are higher than those before the experiment, and the performance improvement is more evident than that in the control group. Specifically, in terms of listening, speaking, reading, and writing, the results of the students in the experimental group can improve significantly. The results show that the virtual simulation four-ring linkage experimental teaching mode can effectively improve students' comprehensive English abilities. In the virtual simulation situation, students have more opportunities to practice English, and through independent inquiry and collaborative communication, students' language skills are fully exercised. Through virtual simulation teaching, students can immerse themselves in the three-dimensional virtual environment created by computer technology, so as to solve the problem of lack of real context in English practical teaching, and play a great advantage in stimulating students' enthusiasm, strengthening student-centered communication and interaction, and reducing students' learning anxiety (Tao, 2015, p. 126).

Changes in Learning Interests

The results of the questionnaire show that students' interests in the experimental group in English learning are significantly higher than that in the control group. In the virtual simulation four-ring linkage experimental teaching mode, students can learn English in vivid and interesting situations, and their initiative and enthusiasm for learning have been greatly stimulated. The students can feel that this teaching mode makes them feel the joy of learning English, and they no longer find learning English boring. In addition, through collaborative communication, students are able to explore problems with their group members and share their learning results, which can enhance their sense of accomplishment and self-confidence.

Improvement of Self-Directed Learning Ability

From the results of questionnaires and interviews, it can be seen that the self-directed learning ability of the students in the experimental group has been significantly improved. In the virtual simulation situation, students

are required to explore and learn independently as well as obtain information and solve problems actively. This learning method cultivates students' awareness and ability to learn independently, so that students can learn how to make study plans, choose learning methods, organize the learning process, and evaluate learning results. During the experiment, students can gradually develop the habit of self-directed learning and are able to take more initiative in learning English.

Conclusions

In this study, we draw the following conclusions by constructing a virtual simulation four-ring linkage experimental teaching model and applying it to the practice of English teaching in colleges and universities.

The virtual simulation four-ring linkage experimental teaching mode can significantly improve students' comprehensive English ability, including listening, speaking, reading, and writing. This teaching mode can enhance students' interests in English learning and improve students' initiative and enthusiasm for learning. The virtual simulation four-ring linkage experimental teaching mode helps to cultivate students' independent learning ability, so that students can learn to think independently, explore independently, and learn collaboratively.

Although this study has achieved certain results, there are also some shortcomings. For example, the development of virtual simulation teaching resources is not perfect enough, and the creation of some scenarios is not realistic enough. Although the experiment is short, the long-term impacts on students keep to be seen. In future study, it is necessary to strengthen the construction of virtual simulation teaching resources and improve the quality and richness of teaching resources. At the same time, the time of the experiment can be extended and follow-up studies will be carried out to obtain an in-depth understanding of the long-term impact of this teaching model on students. In addition, it is necessary to explore how to combine the virtual simulation four-ring linkage experimental teaching mode with other teaching methods organically, and how to achieve better teaching results as well.

In conclusion, the virtual simulation four-ring linkage experimental teaching mode in the context of smart education provides a new way and method for the reform of college English teaching. By creating realistic learning situations and guiding students to explore independently, communicate collaboratively, and provide feedback on evaluation, students' comprehensive English ability and learning literacy can be effectively improved. With the continuous progress of technology and the innovation of teaching methods, the application prospect of virtual simulation technology in language education will be broader, providing a richer and more efficient way to cultivate foreign language talents in the new era (Shi & Wei, 2025, p. 8).

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