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College English Blended Teaching Reform Based on VR Technology in the Post-Epidemic Era

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Abstract: This paper examines the subject of English as a case study and uses VR technology as a tool to explore the reform of blended learning college English based on VR technology in the post-epidemic era in order to provide recommendations for the reform of college English teaching. This paper elaborates on the related theoretical concepts of VR technology and blended mode teaching and their combination to propose the reform of blended learning of college English based on VR technology; then, through questionnaires and interviews, 100 freshmen of business management and accounting department of our provincial university were randomly selected as experimental subjects and divided into an experimental group (50) and a control group (50) according to the difference The experiment of blended college English teaching reform was conducted. Finally, analyzing the results of the experiment, it was found that after a semester of blended teaching, the test scores of students in the experimental group improved significantly compared to the previous ones; while the oral test scores of students in the control group improved slightly, their written test scores not only did not improve but also decreased by 0.3086 points. The study showed that the blended mode of college English teaching based on VR technology can help to improve students' English proficiency, which deserves to be promoted and improved in the university education system.

1. Introduction

Since the outbreak of the new crown virus in various parts in January this year, the whole country has entered a state of emergency alert. Universities, primary and secondary schools in various places have ended their courses early and went home for isolation. Until the beginning of spring in March and April, all schools have not yet opened classes, and all students are at home. Course learning is conducted through online classes. In the past, the traditional teaching mode was to only teaching in the classroom. However, due to the impact of the epidemic, schools in various places have opened cloud classroom services to teach students online, breaking the traditional teaching mode and making course learning no longer affected by time and time. Regional

restrictions, but despite this, some students cannot learn online due to their own environment and conditions. In addition, in the post-epidemic era, in order to deal with another emergency, the school's education and teaching system is also in urgent need of adjustment and reform.

English is widely spoken around the world, and a talent for it is in high demand. That's why college English courses are so important. VR technology is a new high-tech technology that has emerged in recent years. It can create three-dimensional virtual environments that mimic real objects and give users a very realistic experience. If VR technology is used to teach English in college, it can improve English teaching methodology and increase students' interest and enthusiasm for learning English, as well as their ability to self-learn. At the same time, the two-way nature of VR technology can improve students' practical ability in English. Therefore, blended learning based on virtual reality (VR) technology is becoming increasingly important in English language teaching after infectious diseases.

In recent years, trade and communication between China and abroad have become more frequent and the demand for English-speaking talent has increased. In order to nurture more English-speaking talent, several studies on English language teaching reform have been published. Cheng Yaping said that to fully implement the Party's education policy, the teaching of English in colleges in the transition period should follow a "comprehensive improvement in the quality of teaching to meet the needs of the country and society to train talent in the new era". Combining the modern goals of teaching innovative and applied talents in universities and the reality of students, it explores different models of college English teaching, improves students' ability to learn English independently and cultivates their comprehensive understanding of culture to help them become innovative and applied talents in the context of the new era transformation[1]. Wang Bing also said that English courses in colleges in China are now in a blue ocean, which has attracted deep attention from all walks of life, including students, teaching experts and English teachers. Based on the MOOCs introduced three years ago, college English classes have become more colourful, providing students with instructional videos, student self-discussions and previews before class [2]. In addition, Ma Xiaoyan also said that with the deepening integration of information technology and education, new learning models have emerged. MOOCs and microclasses provide strong support for the implementation of "flipped classroom", constructivist theory and connectivist learning provide strong theoretical support for blended learning. A blended learning mode combining MOOCs, microclasses and "flipped classroom" helps optimize the effect of English learning [3]. In short, the importance of superior English language teaching is obvious, and research in this area is not uncommon in recent years. This article is based solely on the research of predecessors, applying the new VR technology to them and putting forward some of our own relatively shallow views and opinions. To provide recommendations for the work of reforming English language teaching that a growing number of universities are acquiring.

The innovations of this paper are mainly reflected in the following aspects: (1) The shortcomings of the Chinese education system and teaching model have long been identified and reforms are urgently needed today. On this basis, the topic of this paper has great social reality, significance and discussion value; (2) This paper integrates modern advanced VR technology to propose the reform of blended college English teaching based on VR technology. Through the experimental analysis, it is found that this teaching mode is in line with current social trends and very suitable for students, it is worth adopting and promoting.

2. Reform Measures for College English Blended Teaching Based on VR Technology in the Post-Epidemic Era

2.1 Post-Epidemic Era

In January 2020, after the first outbreak of a new type of coronavirus in Wuhan, Hubei, our country, epidemics occurred across the country in just two months[4-5]. The country has entered a state of primary alert, and everyone is living at home in isolation[6]. The whole country has made concerted efforts. After several months of fighting the virus, the epidemic has basically stabilized, but reconstruction and recovery after the epidemic will be a long process[7-8]. The era after the new coronavirus epidemic has passed is called the post-epidemic era[9].

2.2 VR Technology

(1)Overview

VR (virtual reality) technology, also known as 'spiritual technology', is a new high-tech technology of recent years that uses computer and multimedia technology to give three-dimensional, dynamic effects to real-world objects. Designing in the virtual world creates a virtual real world, which is a crystallisation of the rapid development of computer software, hardware and robotics technology[10-11]. The virtual world constructed by VR technology is a dynamic three-dimensional space. In this virtual space, users can perceive and experience all virtual things with their visual, auditory, tactile, smell and other perception organs, and have a strong sense of reality and immersion Sense [12-13].

(2) Using VR technology

With the rapid development of social media and computerisation, the sphere of application of VR technology in our lives is becoming ever wider. Typical applications of VR technology include:

Firstly, entertainment, such as films, television and games. Traditional film and TV dramas and games can only satisfy the user with one-way viewing on a TV or computer screen, but once VR technology is applied to film and TV games, users can enjoy a 3D intuitive virtual reality experience. In other words, users can participate in dynamic movie, TV and game screen scenes on their own, and this virtual dynamic scene will give users a strong sense of reality and experience as if they were on stage. This sense of presence and realism of the 3D virtual reality world [14].

Secondly, the military aerospace sector. In general, military training and aerospace modelling environments are quite demanding. The use of VR technology can help the military and aerospace sectors to realise combat training simulations in any environment, reducing the physical damage caused to soldiers and pilots by harsh training conditions. At the same time, by controlling the training conditions, the entire battle process and its results can be evaluated to better create a realistic combat environment [15].

Thirdly, education. Today, the emphasis on combining classroom learning with extracurricular practice is leading to a desire for high quality education across the country. However, frequent training trips are not only unsafe but also costly. Using VR technology to combine virtual and real environments allows students to experience the joys of internships from the comfort of their own homes. In addition, they can conduct various experiments in a virtual environment and have the same experience as in real experiments. In this way, not only the safety of the students is taken into account, but also the cost of learning is significantly reduced while ensuring quality [16-17].

Fourth, the field of culture and art. The use of VR technology in paintings, sculptures and other aspects of art transforms what was originally static art into a dynamic form. This not only empowers people to understand paintings and sculptures, but also helps to protect culture and art.

Fifth, the inheritance and protection of cultural monuments. VR technology facilitates the inheritance and protection of cultural monuments. Simulation of images of cultural heritage and

historical relics allows for a more holistic and vivid representation, as well as a more intuitive user experience. At the same time, virtual reality representations of cultural heritage and historical relics need not be bothered and take geographical constraints into account. Maximise resource sharing. Moreover, viewing cultural relics virtually may allow for effective inheritance and protection, as they are realized in a virtual reality world and do not require direct contact with the relics [18].

Sixth, the field of production. In the manufacturing field, the most important application of VR technology is virtual vehicle development. Users can use 3D glasses to simulate the feeling of driving and sitting in a car on real roads, and in the car design and production process, this method can help designers analyse car deficiencies and make improvements in a timely and efficient manner, effectively reducing the cost of car production [19-20].

2.3 Blended Teaching

Through a mix of online and offline teaching, it can lead students' learning from shallow to deep. It usually has the following characteristics:

First, the combination of online and offline;

Second, online teaching is a necessary activity for the entire teaching task. It is not an aid to offline teaching, nor is it for icing on the cake;

Third, offline teaching is not a copy of classroom teaching activities in the traditional sense, but a more in-depth teaching activity based on the preliminary results of online teaching;

Fourth, the concept of this blended teaching is narrow, referring specifically to online and offline. It does not involve teaching theories, teaching methods and strategies, nor does it involve teaching organizational forms;

Fifthly, there is no single model of blended learning reform, but it has the same goal: to change the traditional teaching method used by teachers for "one word teaching" and fully mobilize students' enthusiasm and passion for learning by taking advantage of online and offline learning. Participation, bridging the gap between students.

2.4 Teaching reform measures

(1) Reform the teaching concept

Reforming the model of college English teaching first of all requires a change in the philosophy of college English teaching and college English teachers. Colleges and universities should take the role of role models, change the traditional concept of English teaching and try to offer small classes of college English. On the other hand, English teachers in colleges should pay close attention to the market demand for different professionals. For students of different majors, English teachers should explain the sentence introduced in the text according to the content of the textbook. Vocabulary should be adapted to CET-4 and CET-6, and real CET-4 and CET-6 questions can be included in lessons, and some lessons can be devoted to explaining the content of the exam .

(2) Reform the traditional teaching model

There is a growing demand for English application-oriented talent in China's social market. Many enterprises are increasingly focusing on developing students' practical skills in colleges and universities. College English teaching should consider that the introduction of modern elements such as multimedia, computers and VR network technology can not only increase students' enthusiasm and interest in learning English, but also increase students' participation in classes, allowing them to gain more English knowledge in limited college English courses. Therefore, colleges should take care of the reform of blended learning of college English and equip college

English classrooms with complete teaching aids and equipment, and college English teachers should study and use these blended learning tools to create more opportunities for students to use English to communicate and convey more information about the subject .

(3) The assessment and evaluation of English should be reformed towards comprehensive evaluation

The assessment and evaluation of students' English is not only based on daily class attendance, classroom performance, and test paper scores, etc., but also the comprehensive oral English ability of students should be included in the assessment criteria. The oral assessment must be conducted in a one-to-one manner. Taking into account that college English teachers are usually responsible for English teaching in multiple majors, they do not have the time and energy to conduct a unified oral test for students at the end of the semester. Therefore, it is recommended that universities can hire foreign teachers.

3. Teaching Reform

In today's rapidly evolving age of computer and multimedia technology, learning reform and educational innovation are becoming increasingly important. The shortcomings of traditional classroom learning models are becoming increasingly apparent. "Learning" is ineffective. College English is a compulsory subject at universities and colleges. Because of the practical and applied nature of language learning, many students excel in written tests, but their oral skills are at a low level, making them uncompetitive in the economic market. This is no longer a matter of course, and given the frequent internal and external exchanges in today's marketplace and the high demand for English language talent, the quality of college English teaching has a direct impact on students' future employability and career development. On this basis, this paper puts forward the idea of reforming the blended mode of college English teaching. By taking a college in our province as an individual case, combining the actual situation of college English teaching, from language knowledge, language skills, emotional attitudes, cultural awareness and learning strategy are five dimensions to comprehensively consider the construction of an English blended teaching model suitable for the university, and introduce the current advanced VR technology means, for which a VR technology-based blended college English teaching model map is formulated, such as shown in Figure 1.

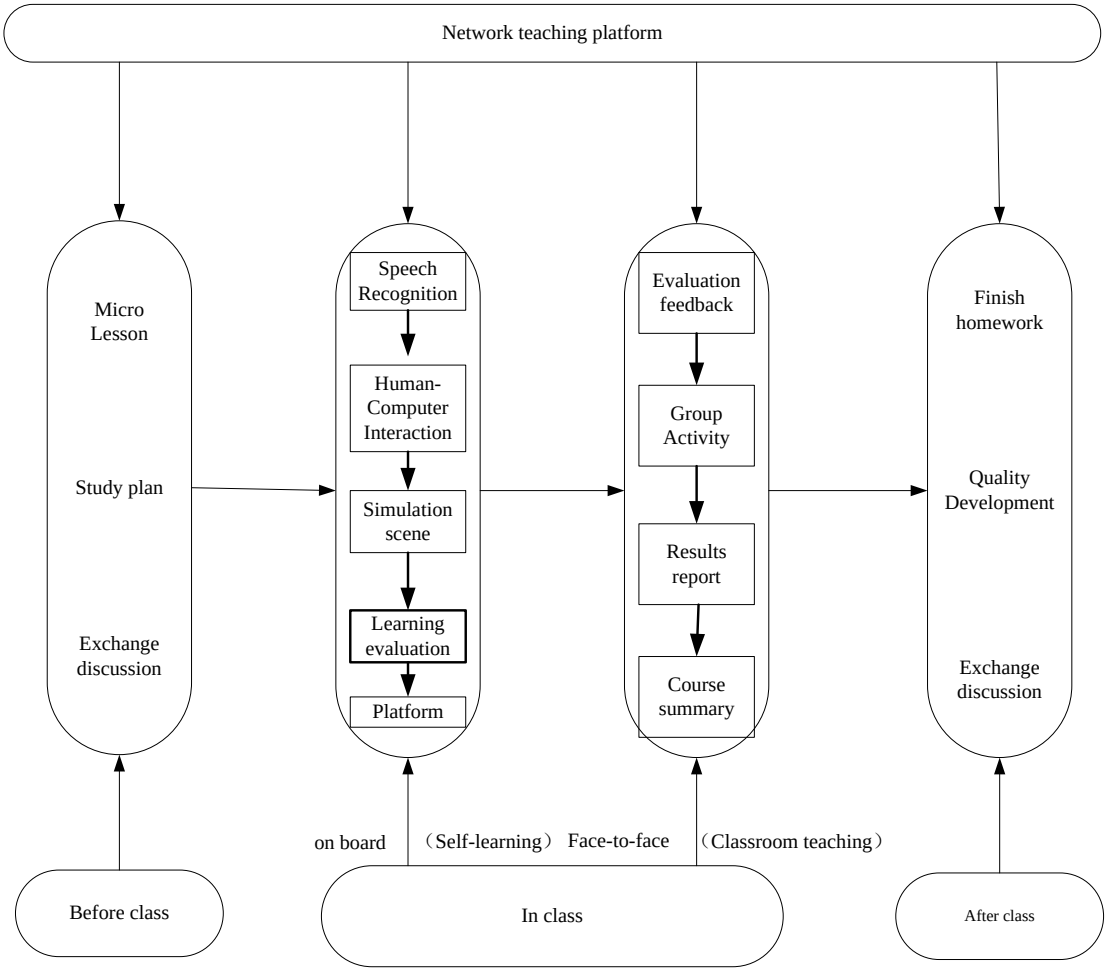

Figure 1.Blended college English teaching model

Figure 1 shows that teachers are no longer teaching pupils in a one-word class style, blindly imparting knowledge to pupils, but acting as facilitators and assistants, guiding and supervising pupils in their learning. The teacher's role in preparation and assessment before and after the lesson is much greater than in the past, and pupils are always the main drivers of learning before, during and after the lesson. This is very different from the previous model of teaching 'teacher speaks and pupils listen'.

With the development of network communication technology, particularly the era of 5G networks, the network coverage and network speed among users have reached unprecedented heights, and a variety of English learning applications have appeared in a never-ending stream, from QQ to WeChat, and the emergence of various English learning platforms provides a solid foundation and guarantee for mobile English learning in colleges and universities. Currently, college students born in 1995 are the main user group of all types of smartphones and electronic communication devices. Their speed and comprehension ability is higher. Mobile phones and the Internet bring them new experiences and entertainment. It goes without saying that they use smartphones. They are not familiar with the experience of learning English on mobile phones and tablets.

A VR-based English learning platform not only provides learning management and relevant

supplementary instruction in English courses, but can also serve students' computer-based learning in and out of school and provide students with a variety of digital materials for learning English. These types of real foreign life, workplace scenarios and role-plays allow students to apply English in practical situations, interact face-to-face with foreigners and experience the joy of learning, which is different from previous paper textbooks. At the same time, it is a completely new learning experience for college English teachers. Nowadays, there are many platforms for learning English such as MOOCs, micro classes, Fluent English, etc. Nowadays, college students are very dependent on mobile phones. They don't forget to take their mobile phones with them wherever they go. Colleges and universities can take advantage of this feature of college students and allow them to learn English through their mobile phones. Thanks to continuous improvements in the system, the various English language learning platforms now have relatively complete capabilities. You can view student attendance, class dynamics, grades and learning outcomes, offline learning, oral homework and revision, etc. Since this type of micro-classroom is not limited by time and place, students can use fragmented time of everyday life to learn English and gain fragmented knowledge, which is more in line with the lifestyle and learning characteristics of the new generation.

For the experiment of blended learning reform in college English based on VR technology, we randomly selected 100 first-year non-English speaking students between 17 and 20 years old majoring in business management and accounting, 56 of whom are majoring in business management and 44 in accounting. In order to test the impact of using mobile APP for English language learning, we will take one student from each of the two vocational classes for "blended learning" and the remaining students for traditional learning. The students receiving "blended learning" become the experimental group, and the students receiving traditional learning are called the control group. The experimental students receive CET-4 and CET-6 results in the first half of the year as pre-test results and CET-4-6 results in the second half of the year as post-test results. The teacher of the experimental group is a professor of English who has been working in the school for ten years, has extensive experience of teaching English and is familiar with the characteristics of the school's students.

The specific stages of the experiment are as follows:

(1) Pre-lesson.

Before the beginning of the lesson, teachers should design courses for students, create teaching materials, prepare teaching materials, and make detailed plans for students' independent work online. The teacher will record a video for the micro-class of about 10 minutes to systematize the knowledge of each section. Microclass videos can increase students' interest in learning the content of a unit. Teachers can create courses for students based on specific content, give out transcripts and, when importing course topics, assign specific learning tasks so that students can familiarise themselves with the content of a unit before the lesson begins. At the beginning of the course, create a QQ group and a WeChat group for the experimental group and upload the microlearning videos to the QQ group, WeChat group and MOOC platform respectively. Students can use the fragmented time to download and view on their mobile phones or computers. Study. Each unit has different types of micro-lessons, including introduction, learning, assessment of knowledge, analysis of difficulties and different recording methods. Existing learning environments use a recording of the instructor's lecture or a whiteboard recording accompanied by the instructor's voice. Due to the popularity of QQ and WeChat, every student finds time to watch them every day. Therefore, students usually do not miss the learning tasks that are assigned to them.

(2) Links in class

During the class, the experimental team conducted English classes twice a week, each class

lasted 90 minutes, and they were arranged in a regular classroom and a networked multimedia computer room. In the multimedia computer laboratory, the main content of the course is to conduct self-study based on the specific learning tasks proposed by the teacher before the class, that is, the learning plan, through the use of computer voice recognition technology, oral training and contextual learning simulation through human-computer interaction. Teachers can set passing scores in advance. Students need to complete specific tasks before proceeding to the next learning task. After the task is completed, the learning content will be immediately converted, that is, the input knowledge will be immediately converted into output technology, and the system will automatically evaluate and give this part For scoring, students can choose whether to continue their study according to their own learning situation. If you need intensive practice, please choose again. Students can also initiate questions or discussions through the "discussion bar" of the system platform, and discuss with classmates to achieve collaborative or discussion-based learning. In this process, teachers mainly answer questions, answer questions, correct student pronunciation problems, and monitor and Respond to students as needed and provide personalized guidance.

(3) After class

Extracurricular learning is mainly divided into two parts: independent learning in the computer lab outside school hours and learning in the classroom. The learning process mainly depends on the self-study of the students and the assessment of this process by the students and the teachers. In accordance with the learning content of this chapter, students have to complete a bank of questions from a system that is organised by the teacher on a smartphone, tablet or in the computer lab. At the same time, according to their own personal situation, students need to start from their own interests and choose the modules they like or that they have not mastered and need to practice hard. Due to university conditions, it is currently impossible to achieve full coverage of the wireless network on campus, so the platform client provides an offline learning method. After downloading the learning content to the mobile phone, students can learn regardless of the Internet. And if there is a wireless network, the student's study time will be automatically recorded in their files.

Assessment of learning is an important part of a teacher's teaching. The extent to which teachers' assessment is sound and scientifically sound determines whether their teaching can be applied to pupils. The way we teach has changed, so assessment standards should change accordingly. The requirement not only reflects the students' level of writing but also assesses the students' ability to apply English in practice, which undoubtedly increases the complexity of the teachers' work. Therefore, in this experiment, we use the process assessment method and abandon the previous summative assessment. While reinforcing basic English language skills, reading and writing, students also focus on improving their oral listening and practical application skills. At the same time, process evaluation helps to encourage students to learn independently, stimulate their enthusiasm and passion for learning, keep students' attention on learning, improve students' learning in the long term and make process evaluation a positive driving force.

In this experiment, questionnaire and interview methods were used to collect data and SPSS22.0 statistical analysis software was used for data processing:

$$\sigma = \sqrt{\frac{1}{\mathrm{n}}\sum_{i=1}^{N}(x_i - \mu)^2} \quad (1)$$

$$s^2 = \frac{(M - x_1)^2 + (M - x_2)^2 + (M - x_3)^2 + \ldots + (M - x_n)^2}{n} \quad (2)$$

$$t = \frac{\overline{X_1} - \overline{X_2}}{\sqrt{\frac{\sigma_{x_1}^2 + \sigma_{x_2}^2 - 2\gamma\sigma_{x_1}\sigma_{x_2}}{n-1}}} \quad (3)$$

4. Teaching Reform Experiment Results

In the third part of this paper on experimental subjects, we selected 100 first-year non-English speaking students from a university in our province, specialising in business administration and accounting, and conducted a controlled experiment on blended and traditional learning. Specific analysis and discussion.

Students in the experimental and control groups took the National College English Test Band 4 and 6, respectively, in the first semester. We used this test score as a provisional score for the written test, and a separate provincial oral English test certificate as a provisional score for the speaking test. Table 1 shows the statistical scale of the pre-test score for the two groups of students.

Table 1. Pre-test score statistics table of experimental group and control group

Group		N	Mean value	Standard deviation	The standard error of the mean
Written pre-test results	Experimental group	50	59.4671	12.3467	1.6478
	Control group	50	60.4328	15.3976	1.9879
Oral pre-test results	Experimental group	50	2.2001	0.64371	0.08471
	Control group	50	2.0121	0.6123	0.07694

Table 1 shows that the mean score of 50 students in experimental group on written test is 59.4671, standard deviation is 12.3467, standard error is 1.6478; mean score of 50 students in control group is 60.4328, standard deviation is 15.3976, standard error is 1.9879. In the oral test, the mean pre-test score of 50 students in the experimental group was 2.2001, standard deviation was 0.64371, standard error was 0.08471; the mean pre-test score of 50 students in the control group was 2.0121, standard deviation was 0.6123, standard error was 0.07694. A t-test of the pre-test scores of the two groups of students showed that there was no significant change in the pre-test scores of the two groups of students for the written test and the oral test. This shows that prior to the mixed reformed teaching, the English language proficiency of the two groups of students is equivalent and there is no obvious difference, which is consistent with the requirements of the experiment.

After a semester of blended learning, the experimental group made significant progress compared to the control group. The changes in the written and oral test scores of the experimental group are shown in Figure 2.

Figure 2. The changes in the test scores of the experimental group students

Figure 2 shows that the average score of the experimental group after the written test is 68.3124, which is 8.8453 points higher than before the written test, and has improved from a "failed" to "passed" average score. In addition, the average score of students in the experimental group after the written test was 2.9876 which is 0.7875 points higher than before the test. This shows that after the implementation of blended learning, the students' English proficiency increased significantly.

To further prove that the English proficiency of the experimental group increased significantly after the implementation of blended learning, the results of the written test and the oral test of the control group are now calculated. The results are shown in Figure 3.

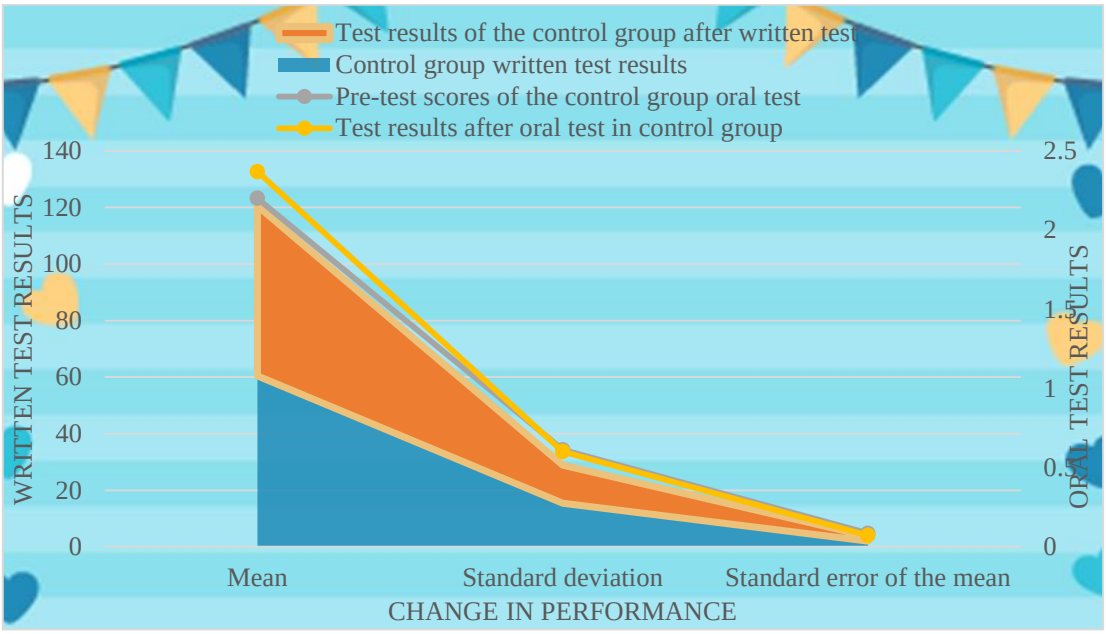

Figure 3. The changes in the test scores of the control groupstudents

Figure 3 shows that in the control group, without any change in teaching and learning methods, students' scores on the written test decreased by 0.3086 points compared to their pre-test scores, indicating that scores on the written test did not improve, but regressed; scores on the oral test, by contrast, were higher. Pre-test scores increased by 0.1691. In the calculations, the correlation coefficient for the pre and post written test scores of the experimental group was 0.976, $P<0.05$, indicating that the pre and post written test scores of the experimental group have significant statistical differences; the correlation coefficient for the pre and post oral test scores of the control group was 0. 459, $P<0.05$, indicating that there are statistically significant differences in the pre and post oral test scores of the control group.

Written and oral test results for both groups are shown in Figures 4 and 5.

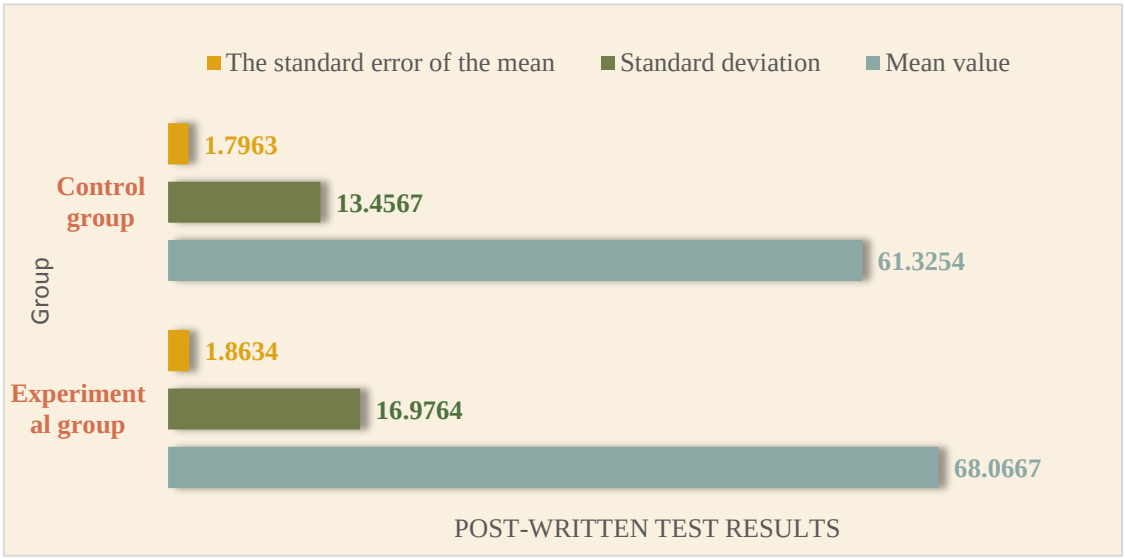

Figure 4. Comparison of the written test results of the two groups of students

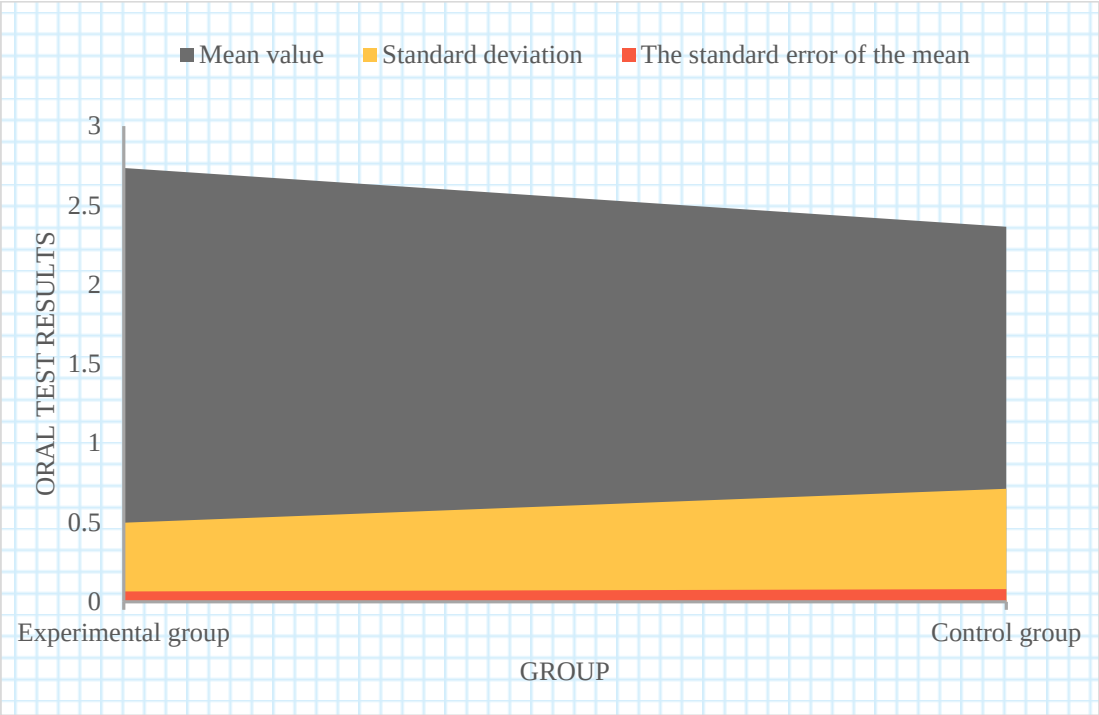

Figure 5. Comparison of the oral test results of the two groups of students

Figures 4 and 5 show that after the semester-long blended learning experiment, the experimental group and the control group improved their written and oral test scores, but the degree of improvement varied between the two groups. The experimental group improved their written test scores by 8.8453 while the control group not only did not improve but also decreased their written test scores by 0.3086; the experimental group improved their oral test scores by 0.7875 while the control group increased their oral test scores by 0.1691. Comparing the variance and mean of the pre and post-training scores of the two groups, we found that regardless of whether the scores were written or oral test scores, the scores of the experimental group generally improved much faster than the scores of the control group.

Overall, there were no significant differences between the written and oral test scores for the two groups. However, after the semester of the learning experiment, the performance and English language proficiency of the two groups differed significantly. The written and oral test scores of the experimental group were significantly higher than those of the control group. This suggests that the hybrid VR-based learning model can help improve the English proficiency of college students and should be popularized and promoted in universities.

5. Conclusions

Constant development and changing times, in particular the outbreak of a new coronavirus, have created new opportunities and challenges for the education system within the country. To protect students, schools must stop teaching, but at the same time they must not abandon learning. The education system must therefore develop a learning model to make it easier for students to learn at

home remotely.

Based on traditional face-to-face teaching, blended learning combines online and offline teaching to make best use of learning resources and provide the most effective learning experience for students. In this way of teaching, the teacher is the leader and the student is the subject. The introduction of VR technology not only brings a variety of learning pleasures to students, but also increases students' enthusiasm for learning and independent learning, and provides teachers with a whole new learning experience.

In this study, 100 undergraduate non-English students from our provincial university were used as experimental subjects to conduct an experiment on reforming blended English teaching. The results showed that the English proficiency of the students in the experimental group increased significantly after one semester of blended teaching. This suggests that blended learning mode is useful for improving English language proficiency.

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