Investigation and Optimization Research on Online and Offline Blended Learning of Higher Vocational English from the Perspective of CoI Algorithm

Xu Jin*
Jinhua Polytechnic, General Education College, Jinhua Polytechnic, Jinhua, PR China

*Corresponding author: xujin2021@jhc.cn

Abstract. With the development of information technology, online and offline blended learning has become a universal learning form. In order to investigate and optimize the online and offline blended learning of English in higher vocational colleges, this paper introduces the CoI theory to analyze blended learning. First, design the questionnaire based on the three elements of the CoI theory. After analyzing the results of the questionnaire, conduct related experiments. In order to ensure the accuracy of the results, an experimental group and a control group are set up. After three months, most of the students in the experimental group have improved their performance. The experimental results show that blended learning has a certain positive effect on the improvement of vocational students' English performance. In addition, it is found through research that there are certain differences in the promoting effect of blended learning on English scores under different scores. Therefore, this article puts forward some suggestions for blended learning.

Keywords: Blended learning, CoI theory, questionnaire survey, experimental inquiry.

1. Introduction and Motivation

The development of electronic technology affects the change of teaching mode. The sudden epidemic has made online learning a new and universal learning method. In some countries where the epidemic is gradually under control, such as China, most students still retain the habit of online learning. The online and offline hybrid teaching model has become the main learning method in many universities. In addition, the rapid development of the times has also put forward higher requirements and heavier learning tasks for students. Single offline learning can no longer meet the needs of students' academic and psychological needs. In order to improve the efficiency of teaching, it is necessary to conduct research on the online and offline hybrid mode, and combine the actual situation of the students and the learning effect to make certain optimizations.

With the deepening of the internationalization of countries, English learning is becoming more and more important. English proficiency plays a very prominent role in publishing English papers, English speeches, oral presentations and other occasions. Therefore, the issue of improving the English performance of vocational students is very important.

Higher vocational students have low admission scores and low enthusiasm for classes. In the process of teaching in large classes, it is not uncommon for students to sleep in class and play with...
mobile phones. Compared with undergraduate students, the learning ability of higher vocational students is also relatively weak. If only the offline teaching method is adopted, the whole classroom may lead to low absorption efficiency of students, and a certain degree of negative emotions for learning. In addition, teachers may not be able to receive real-time feedback from most students in class. If only the online teaching method is used, students can interact with the teacher at any time and can clearly hear the content of the teacher's class. There are also situations where the teacher cannot see the blackboard, which brings a certain degree of interest in learning. For the ununderstood content, you can watch the playback for in-depth learning. However, the way of online learning also brings some problems: teachers cannot know the learning status of all students, and some students may be perfunctory. If the teaching model is not reformed, it will be difficult to achieve certain teaching results and students' performance will not be significantly improved. Therefore, blended learning is a more effective mode.

2. Related Works
Blended learning was first proposed by Professor He Kekang. Since then, blended learning has attracted widespread attention from many scholars, and the research on blended learning has gradually deepened.

In 2015, Su Xiaohong [1] and others took C language programming as an example to introduce MOOC into the teaching process and realized mixed teaching. And a comprehensive analysis of MOOC, listing the advantages and disadvantages of MOOC. In 2016, He Xiaoqing [2] used physics learning as an example to apply Moodle to the teaching mode. Instructors and students communicate in depth and help each other solve problems. In the same year, under the background that various social software has become an indispensable part of most people's lives, Zhu Lirong [3] combined social software and teaching to construct a hybrid teaching model. And through observation, interviews and other methods to apply this model to practice, practice shows that this model has a certain significance for improving students' learning enthusiasm and changing the traditional teaching model. The research on blended learning has been continuing. In 2020, Liang Huiyi [5] and others have analyzed qualitatively and quantitatively the relevance of blended learning to students' motivation and performance in English learning. Thirty-six people were used as the control group who only received offline teaching, and 39 people were used as the experimental group who received mixed teaching for the experiment. Experimental data shows that the blended teaching model of college English is successful and effective. Wu Jihong [4] divides the students into two groups with low English proficiency and high English proficiency according to their English proficiency. Finally, it is concluded that blended learning has a higher promotion effect on learners with high English proficiency, but has no effect on learners with low proficiency. Big. Therefore, the suggestion that the teaching should be classified and classified.

But the above studies have one thing in common, that is, mentioning online teaching factors, such as MOOC, Moodle, or social software is a continuation and improvement of the traditional teaching model, rather than replacement or threat. The below-the-line teaching mode has the advantage that online teaching cannot be realized. The above research shows that the research on blended learning should not be as good as the current results. Refining student groups or comparing online learning methods are of great significance to the development of blended teaching models.

3. Basic theory

3.1. Community of Inquiry (CoI)
Community of Inquiry is through three elements: social presence, cognitive presence and teaching presence for deep and meaningful learning. The three elements of CoI can also be referred to as social existence, cognitive existence, and teaching existence. CoI provides a unique and appropriate method for blended learning, and has become the theoretical basis for studying blended learning. In this article,
the use of CoI to study the blended learning of English in higher vocational education has certain theoretical support and rationality. The model framework is:

![CoI Model Framework](image)

**Figure 1. CoI Model Framework.**

Cognitive existence refers to the construction of meaningful knowledge through communication and reflection.

Sociality is a manifestation of human consciousness as a social animal. Social existence means to perceive the existence of other people, and to express their emotions and attitudes with the help of social software.

Pedagogical existence refers to certain design processing based on cognition and social interaction, so as to learn meaningful and valuable things. Cognitive existence and social existence are the basis of teaching existence.

The core of CoI is the creation of learning experience, which needs to meet the following principles:

1) Continue to carry out research activities, which should be purposeful and dynamic;
2) Plan to cultivate critical thinking through critical reflection and dialogue;
3) The establishment of a learning atmosphere and trust relationship should be carried out in a planned manner, and a qualified learning atmosphere is open to communication;
4) In order to carry out in-depth and meaningful learning, certain courses and learning situations should be arranged in advance. Including course content, study time, etc. In addition, effectively monitor and manage critical dialogue and collaborative reflection activities;
5) The research objects should respect each other and assume the responsibilities of the corresponding roles;
6) Build community cohesion by learning the collaborative relationship and formation of community members;
7) The research should be maintained until the research problem is solved;
8) In order to ensure correctness, the evaluation should be consistent with the expected process and results.

4. **Investigation methods**

In order to understand students’ attitudes towards blended learning in higher vocational English, a questionnaire survey and experimental research were conducted based on the CoI theory. The research ideas of this article are as follows:
In order to ensure the objectivity of the investigation, an anonymous investigation is used. The survey was distributed to students for anonymous filling. For student questionnaires, each questionnaire is divided into 3 parts according to CoI theory. Each part corresponds to the three elements of CoI’s social existence, cognitive existence and teaching existence.

There are 10 questions in the questionnaire, and each question has four options, corresponding to a high degree, a high degree, a general degree and a low degree. For ease of presentation, the results are shown as level 1, level 2, level 3, and level 4. Among them, the problems of social existence include: whether it is online or offline teaching, whether students’ feelings in the classroom are real, etc.; the problems of cognitive existence include: cooperation and cooperation between students Learning situation, students’ awareness and reflection on their own learning methods and efficiency; the pedagogical problems include: when students encounter problems that are difficult for them to solve, can they get help from teachers and classmates in a timely and effective manner; blended learning and The teaching effect of traditional learning methods and the degree of interest of students, etc.

In order to let students fully understand blended learning, at the beginning of the questionnaire, it explained the concept of blended learning as online and offline blended teaching, and listed the platforms and methods of online learning, such as social software, MOOC, conference software, etc. In order to ensure the objectivity of the investigation, an anonymous investigation is used. The survey was conducted in the form of electronic questionnaires and a total of 76 copies were collected. The results of the questionnaire are shown in a table as follows:

| Question number | Content                                                                 |
|-----------------|-------------------------------------------------------------------------|
| 1               | Good efficiency in class.                                                |
| 2               | In class, my emotions will affect the emotions of other students.        |
| 3               | During class, the emotions of other students will affect my emotions.    |
| 4               | I can concentrate on listening in class.                                |
| 5               | I can feel the teacher’s attention in class                             |
| 6               | The concentration in class is very high.                                |
| 7               | The teacher can give timely feedback on the questions I put forward.   |
| 8               | Can follow the teacher’s ideas.                                        |
| 9               | When in doubt, willing to reflect to the teacher under current conditions. |
| 10              | Teachers can deliver learning resources in time, such as PPT, etc.      |

4.1. Questionnaire

In order to understand the attitude of vocational students towards blended learning when learning English, two questionnaires were designed for blended learning and traditional learning methods. After a mixed teaching experience, all the questionnaires were distributed to students for anonymous filling. For student questionnaires, each questionnaire is divided into 3 parts according to CoI theory. Each part corresponds to the three elements of CoI’s social existence, cognitive existence and teaching existence.

The concentration in class is very high.

The teacher can give timely feedback on the questions I put forward.

Can follow the teacher’s ideas.

When in doubt, willing to reflect to the teacher under current conditions.

Teachers can deliver learning resources in time, such as PPT, etc.
According to these questions, the questionnaire results are divided into questions for statistics, and the following pictures are obtained:

![Graph](image1)

a. Survey results of traditional teaching methods  
![Graph](image2)

b. Survey results of blended teaching methods  

Figure 3. Survey Results.

It can be seen from the above that after the transition from the traditional teaching method to the mixed teaching method, the enthusiasm of the students has been improved and the communication between the students and the teacher has been facilitated.

The online method allows students to experience the teacher's class up close, and it is also convenient to communicate with the teacher at any time. Therefore, it will increase the enthusiasm of the students to interact with the teacher, which will help increase the feedback of the problem. However, online teaching methods cannot completely replace offline teaching. In the survey of this article, some students were randomly checked to evaluate the way of teaching completely online. Some students think that although the way of online teaching feels that the teacher is at close range, this way of teaching is a test of self-control. If the self-control is not enough, you will unconsciously do other things or get lost in class. If you take classes in this way for a long time, you will feel lazy and it is difficult to devote yourself to the class.

In terms of self-control, in most cases, students with higher academic performance have stronger self-control, and students with lower academic performance have lower self-control.

A second questionnaire survey was conducted among 10 students with excellent grades and students with poor grades. The survey questions are the same as those of the first questionnaire survey.

The survey results show that most students with excellent grades can have a good learning experience in online learning, but they also hope to retain a certain amount of offline teaching. However, students with poor academic performance tend to get distracted or do other things while studying online. The above conjecture is verified.

4.2. Performance test
The best way to test the effectiveness of class is academic performance. First, select some students with small differences in English proficiency as experimental subjects. Some of the students are taught in a mixed way, while others are taught in a traditional way. A test will be conducted three months later to compare the English performance of the two groups of students. Due to limited conditions, 30 experimental subjects were selected in this article. 15 people per group.
The above figure shows the changes in the performance of the experimental group. It can be seen that the grades of most students have risen. The decline in the performance of a small number of students may be caused by other factors, such as physical, psychological, and performance. The results of most students show that blended learning is indeed conducive to the improvement of students' English performance.

In the control group, the students' performance still fluctuates to a certain extent, but there is no improvement in the performance of most students. Therefore, the results of the experimental group are reliable.

Students with low academic performance and high academic performance are still grouped. Define the performance improvement rate as the number of people in the group whose performance has improved divided by the total number of people in the group. It is found that the improvement rate of higher grades is greater than that of lower grades. It shows that students with higher grades are more suitable for mixed teaching methods than those with lower grades.

5. Conclusions and Prospects

5.1. Conclusions
From the above research, it can be seen that blended learning not only conforms to the reform of teaching methods of the times, but also has a certain effect on improving the English performance of vocational students. However, the effect of blended learning is inconsistent for students with higher grades and students with lower grades. The most effective way to teach is to separate the students with higher grades from those with lower grades, and use graded and classified teaching. But considering the current teaching conditions are limited. Grouping students according to their grades will inevitably require more teaching resources. Therefore, teachers need to take on more responsibilities in the course of teaching. After analyzing each student's situation in detail, they will consider the teaching method suitable for all students as a whole.

In the process of mixed teaching, teachers should supervise students with poor grades more for the part of online teaching. When the course is in a part, they can arrange some small tasks or ask questions. After class, some small homework can be assigned to test the effect of students in class. Talk to students who do not complete the homework well or fail to hand in repeatedly. For offline teaching, we should take advantage of face-to-face teaching and actively interact with students. Teachers should actively give feedback to students' problems and re-explain the knowledge points that most students do not understand during class. And regularly communicate with students, according to students' learning progress and learning level in real-time adjustment of the teaching form, teaching content and teaching progress, etc.
5.2. Prospects
The continuous development of the times has put forward higher requirements for teaching methods. The study plan designated according to the development of the times and the actual situation of the students is the most scientific and rigorous. However, due to the limitations of current teaching conditions, it is impossible to provide students with the most suitable teaching methods. This defect can only be remedied in other ways. For example, teachers can focus on some students with poor grades, and increase the interest of the classroom by reforming classroom teaching methods. How to complete an interesting and comprehensive course is a question that teachers should think about and explore.

English learning requires not only teaching in class, but also accumulation in class. Therefore, teachers should instill learning methods and so on. You can also combine your own English learning experience to provide the basis and experience for students to specify their own learning methods.

In short, the optimization of teaching requires not only the teachers, but also the cooperation of students. Students' enthusiasm, knowledge reserves, teachers' sense of responsibility, and class skills are all factors that affect the efficiency of teaching.

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References
[1] Su Xiaohong, Zhao Lingling, Ye Lin, Zhang Yanhang. Exploration and practice of MOOC+SPOC-based hybrid teaching [J]. China University Teaching, 2015 (07): 60-65.
[2] He Xiaqing. The construction of mixed teaching mode under the Moodle platform [D]. Central China Normal University, 2016.
[3] Zhu Lirong. Research on the application of social software-based hybrid teaching mode [D]. Yunnan University, 2016.
[4] Wu Jihong. An Empirical Study on Blended Learning Effects of Learners with Different English Proficiency [J]. Journal of Bengbu University, 2020, 9 (06): 66-70.
[5] Liang Huiyi, Liu Xiangping. The effect of blended teaching mode on college students' English learning performance and motivation under the background of education informationization [J]. Journal of Guangxi Institute of Education, 2020 (06): 222-227.
[6] Lan Guoshuai. Exploring the theoretical model of the community: online learning and blended learning research paradigm [J]. Open Education Research, 2018, 24 (01): 29-40.
[7] Hua Man. Research on Teaching Interaction in Synchronous Classroom under CoI Perspective [D]. Central China Normal University, 2016.
[8] Huang Na. Research on the Application of Blended Teaching Model in Higher Vocational English [D]. Northwest Sci-Tech University of Agriculture and Forestry, 2018.
[9] Fang Qimei, Bao Zhengwei, Yang Ning. Research on practice of blended learning based on the theory of exploring community [J]. Digital Education, 2019, 5 (01): 31-36.
[10] Yao Gang, Dai Kehan, Yuan Xiaoyi, Lin Yuhui, Li Weizhi. Theory and Practice of College English Blended Learning Based on Inquiry Community Theory [J]. Examination and Evaluation (College English Teaching and Research Edition), 2020 (01): 72-76.
[11] Huang Qinghuang, Li Yubin, Ren Yonggong. Exploring the influence of learners' online learning input from the perspective of community theory [J]. Modern Distance Education, 2018 (06): 73-81