The Empirical Study and Ecological Model Construction of College English Blended Teaching Based on Information Technology MOOCs

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ABSTRACT

With the gradual deepening of the integration of information technology and education, MOOCs have played an increasingly important role in online teaching and blended teaching. College English teaching based on Information Technology MOOCs is characterized with complex environment and numerous elements, which are interrelated, interdependent and interactive. From the perspective of language ecology, this paper systematically arranges and integrates the various elements in the environment of College English blended-teaching, and constructs the ecological model of College English blended-teaching, so as to grasp the laws and characteristics of the ecological change of teaching, improve the teaching mechanism and ensure the teaching quality. What's more, this study makes an empirical study of the blended teaching mode based on MOOCs. Based on the analyses of both the questionnaire data and the test scores before and after the experiment through SPSS (Statistic Package for Social Science), it is concluded that the blended teaching mode based on MOOCs is more innovative and effective, playing a significant role in improving students' English proficiency.

Keywords: College English, Blended teaching, Ecological model.

1. INTRODUCTION

The rapid development of information technology has brought about changes in global education, having promoted profound changes in learning resources, learning environment, teaching process and evaluation methods (Xu, 2019).The teaching model of "artificial intelligence + education" has become a new normal of current higher education. The 2020 edition of "College English Teaching Guide" points out that College English should give full play to the important role of modern educational technology, especially modern information technology used in English teaching, and vigorously promote the deep integration of modern information technology and courses teaching.

Many scholars in the foreign language field (He 2019, Chen 2019, Hu 2020, Wang 2020, etc.) have proposed facilitating the reform of foreign language informationized teaching to further promote the deep integration of information technology and foreign language teaching. In a short term, new online teaching forms such as micro course, MOOCs and SPOC emerge spontaneously. The teaching mode of "MOOC" platform represented by edX promotes the integration and globalization of higher education (Yang, 2019). In order to cater to the trend of global smart education and the development of MOOCs, the MOOC Alliance for Foreign Languages for Chinese Universities (MOOCs) was officially established in Beijing on December 23, 2017. However, as a new thing, MOOC is still imperfect in many aspects, such as lack of online process supervision, low retention rate of students online, unclear quantitative assessment standards and other problems. Relatively speaking, the blended online and offline teaching mode is increasingly favored and recognized by peers in the education field, as it can present a multi-mode efficient classroom teaching mode integrating technology, resources and teacher-student interconnection (Zhao, 2020). Hu Jiehui and Hu Jiasheng (2020) pointed out that

foreign language teaching is an organic and complex ecosystem in which all factors of the teaching system are organically related and maintain a dynamic balance.

In the process of the deep integration of information technology and foreign language teaching, the original balance has been broken, and the various elements of the teaching system are out of order. Therefore, from the perspective of language ecology, it is necessary to re-examine the relationship and interaction between the various elements in the system and the surrounding environment, grasping the laws and characteristics of the ecological change of teaching, and constructing the ecological model of college English blended teaching so as to make it develop harmoniously and healthily. Above all, the newly-built blended teaching mode also needs to be put into practice in order to test its validity and reliability.

2. REVIEWS OF COLLEGE ENGLISH MOOCS

This part mainly elaborates the advantages and disadvantages of college English MOOCs.

2.1 Advantages of College English MOOCs

It has been eleven (till 2023) years since MOOCs came into being in 2012, exerting an unprecedented impact on global higher education. MOOCs, one of the important means of fusing information technology and education teaching, use technical advantage to make up for the traditional space and time limit (Jiang,2020), many universities try to promote the combination of information technology and education in foreign language teaching based on MOOCs (Wang, 2019), which has played a vital role in both pure online teaching and blended teaching, having gradually penetrated into many aspects of higher education, such as classroom teaching methods, course structure, training program, cooperation between universities and ecological patterns (Wang, 2016).Therefore, MOOCs are characterized by openness, immediacy and convenience, breaking the limitation of time and space, enabling learners to study through mobile devices or laptops anytime and anywhere. The MOOC platform based on big data can timely provide learning data and analyze the learning situation of learners, which not only preserves the process assessment materials, but also

allows teachers to update and improve the teaching content timely, and learners to adjust their learning plans and methods.

2.2 Disadvantages of College English MOOCs

Due to the lack of real-time supervision of learners in online teaching, MOOC platform data cannot truly demonstrate the learners' real learning situation. For example, the study time does not necessarily mean students have really studied the video seriously. According to the interview on some students, the author learned that many students just open MOOC videos and put aside. The data of homework completion does not necessarily mean learners complete their homework on their own, because students also share answers with each other. In addition, students only completed online videos and homework, but their oral and written communication skills have not been improved spontaneously. Therefore, as stated by Jiang Yan, because foreign language is a discipline that attaches importance to practice, it is not easy to comprehensively improve students' language ability through MOOCs (Jiang, 2018).

Because MOOC is a new thing of which many teachers are lack of scientific recognition and correct understanding. They still carry the traditional classroom teaching content directly into the online teaching platform, and many teachers whose information literacy is not enough also demonstrate their anxiety and concern for how to realize the online interaction (Xu, 2020). Furthermore, some foreign language MOOCs only present knowledge points through videos but lack interaction (Tan, 2019). Students also complain that online questions can not be replied promptly, and teaching evaluation is primarily conducted through automation program evaluation objective topics or peer interaction (Han, 2019), and teachers are completely absent in the process of students' online learning. So, it is difficult to grasp the students' study effect to make objective evaluation and suggestions.

What's more, online learners' retention and autonomy have always been one of the challenges facing online education. The retention rate of online courses is much lower than the registration rate due to learners' lack of self-control, low foreign language proficiency and interference from other affairs (Bai, 2016). Due to the lack of real-time supervision by teachers and poor self-control ability of some students, online learning efficiency is not

ideal. According to the survey respondents, most students browse videos online only to complete tasks assigned by teachers. Therefore, the online MOOC has certain limitations and uncertainties, and the real teaching effect is difficult to be grasped and verified. Therefore, it is urgent to establish scientific and reasonable supervision measures and evaluation mechanism. Combing the online teaching and the offline one to some extent seems a good solution to enhance the supervision and evaluation.

3. THE CONSTRUCTION OF THE ECOLOGICAL MODEL OF COLLEGE ENGLISH BLENDED TEACHING

From the perspective of language ecology, the ecological environment of College English blended

Teaching includes three elements: teachers, students and teaching environment. The three elements complement each other, and have their own components and connotations, which jointly build up the ecosystem of college English teaching. College English teaching activities are influenced by multiple factors of teaching ecological environment. The blended teaching based on MOOCs makes the whole college English teaching environment more complex and diverse, and the ecological balance has been broken, and each link has been out of order. So, it is necessary to rearrange the components in the system and to build a clear ecological teaching mode so as to reveal the dynamic balance between the elements and the internal logical relationships, as is shown in "Figure 1":
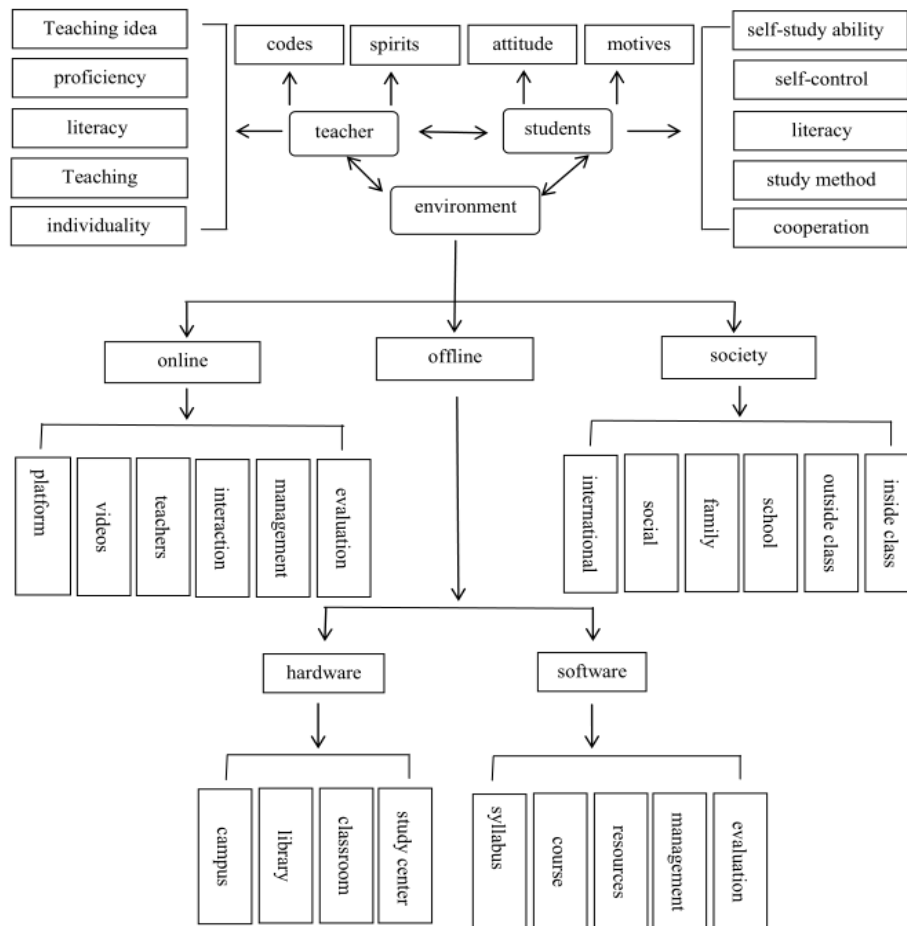

Figure 1 The dynamic balance between the elements and the internal logical relationships.

Zhu (2017) once proposed that in the ecological system of college English teaching, teachers are the ecological subject, students are the object, and the teaching ecological environment is the intermediary.

Teachers impart knowledge to students through various media in the teaching environment. As ecological subjects, teachers are the planners and leaders of the whole teaching activities. Their

professional ethics, teaching ideas, professional ability, information literacy, emotional attitude toward students, diversified teaching methods and personalized teaching modes all play an important role in college English teaching. Students, as ecological objects, are the objects of teaching activities. Their learning attitude, learning motivation, autonomous learning ability, self-control ability, information literacy, learning methods and teamwork ability all determine their learning efficiency and effect to some extent. The teaching environment, as the medium of college English blended teaching, includes online teaching environment, offline teaching environment and social cultural environment.

Online teaching environment includes MOOC platform, MOOC videos, course supporting resources, teacher-student interaction platform, online management and evaluation of learning effect, etc. The elements of offline teaching environment are divided into teaching hardware and teaching software. The hardware includes teaching facilities such as campus network, library, multimedia classroom and autonomous learning center, and the software includes course syllabus, course design, offline teaching resources, teaching management and teaching evaluation. Social cultural environment can be a macroscopic factor outside teaching activities, which also plays a certain influence and role on teaching. Among them, the international environment and social environment are external factors based on the needs of learners and can provide them with opportunities and conditions, while the family environment is mainly the family background and expectation of learners and provides them with spiritual and material support. In addition, campus culture, campus informationization and school system belong to the ecological environment factors inside the campus, also exerting an imperceptible influence on learners' learning. Thus, it can be seen that teachers, students and teaching environment all have their own component elements and connotation meaning, and these component elements have internal logical connection and mutual influence. Teachers' component elements affect and determine students' learning, and students' component elements not only affect the adjustment of teachers' teaching methods but also play a role in the quality and effect of their own learning. Additionally, each component of the external teaching environment affects both teachers' teaching and students' learning, so teachers and students need to keep pace with the times, adapt to

the update and iteration of information technology and the optimization of teaching resources through learning in order to comply with various requirements of the ecological environment of the school, and timely respond to real-time changes in the international and social environment.

4. THE EMPIRICAL STUDY OF COLLEGE ENGLISH BLENDED TEACHING MODE

This study aims to test the effect of blended teaching mode of college English to determine whether the blended teaching mode is better than the traditional one. In view of the above newly-built teaching mode, the researcher adopted the blended teaching mode of classroom teaching and online learning on ehuixue platform to conduct college English teaching test for one semester (four months). The research subjects are 99 non-English major sophomore students from two classes of accounting in our school.

4.1 The Design of College English Blended Mode

In the pre-class stage, the researcher first set up courses on ehuixue platform by submitting or choosing the recorded teaching videos from existing online education resources as teaching content, arranging a certain amount of test questions, and learning tasks to the students who complete online study and tests. Teachers check students' learning and test results online, and then adjust the classroom plan of face-to-face teaching accordingly. This process can cultivate students' self-learning ability, and the teacher plays a good supervisory role in the process. At the stage of classroom teaching, feedback and explanation are given to students' self-learning before class, and the main content of material is supplemented. Students can actively participate in activities through offline group cooperative learning, and they can also use the quick response function on the learning platform to answer the questions raised by teacher. By extending, explaining, expanding and demonstrating the topic sentences, the teacher makes the teaching material easy to understand and impresses the students deeply. Teachers can also send online test questions prepared beforehand to test students in class so as to check the online test situation and adjust the offline teaching plan in time. In the after-class stage, students review and complete their homework independently online. Teachers check the completion status of students by

checking the background data and provide targeted guidance to them.

4.2 The Method

The research mainly adopts questionnaire survey and two scores comparison before and after the blended teaching mode to carry out this study. After four-month experiment, a questionnaire survey was conducted on the tested students to grasp their views on the blended teaching mode, and an English level test was also conducted on them. The questionnaire data will be collected and the test results before the experiment will be compared with those of the English level test at the end of the semester. Furthermore, the data will be statistically analyzed by SPSS software. Then, the independent sample t and paired sample t are tested to determine whether the blended teaching model is better than the traditional one in improving students' English proficiency.

4.3 Results

Following are the questionnaire results and comparison of two test scores before and after the experiment.

4.3.1 Questionnaire Results

Among the 99 valid questionnaires, 75.76% of the students claimed that blended teaching mode is more effective than traditional teaching in terms of teaching effect. 79.8% of the students agreed that this kind of teaching mode arouses their interests of learning English more. 68.6% of the students think that this kind of teaching mode makes them take the initiative to increase the investment of learning time after class so that they can have a more effective use of after-class practice, to achieve a good change from passive acceptance to active learning. In addition, 70.7% of students believed that with the blended teaching mode they can make more flexible arrangements in English study, which greatly improves the learning efficiency.

As for the most helpful aspects in online and offline learning, most students prefer online video-watching, online discussion, online case analysis, thinking questions, and online auxiliary learning materials and other online teaching methods. As for the ideal offline classroom in their mind, 82.8% of the students hoped that the teacher-based teaching is more in-depth and rich in content. 53.54% of the students held that the students' discussion should dominate in class activities and the teacher only play a guiding role. More than 75% of the students believed that the teaching videos, exercises and discussion areas on ehuixue learning platform are of great help to their learning this course.

66.67% of students claimed that the arrangement of online and offline teaching content in this semester is reasonable, 33.33% basically reasonable, and no one thinking it unreasonable. More than 90% of the students believed that blended teaching mode has improved their self-study and communication ability, making them interested in English learning and gain a lot at the same time. What's more, all the students who participated in the questionnaire expressed that they would still choose this blended teaching mode again, which indicates that students have a very favorable attitude towards the blended teaching mode on the whole.

4.3.2 Comparison of Two Test Scores Before and After the Experiment

The students were given an English level test before the experiment and a second English level test after four months of the blended teaching mode. Through statistical analysis, the different test was conducted on the two final grades of students, and the results were shown in the "Table 1" below:

Table 1. Independent-samples test

		Levene test of variance equation		t test for the mean value equation			
		F	Sig.	t	df	Sig.(two-sided)	Mean difference
Test Results	Equal Variances Assumed	16.746	.000	-5.367	196	.000	-8.727
	Equal variances not assumed			-5.367	168.73	.000	-8.727

According to the collected data, assuming that the variance of the scores before and after the blended teaching is equal, the significance level is 0, and the possibility is 0, so it is judged that the

variance is unequal. In the case of unequal variance, the data in the independent sample t test table shows that the significance level is 0.000<0.05, indicating that after the implement of the blended teaching mode, there was a significant difference between the two tests before and after, and this statistical result was statistically significant.

Table 2. Paired sample statistics

		Mean value	N	standard deviation	standard error of the mean
Pair 1	Scores before the blended teaching mode	68.29	99	13.548	1.362
	Scores after the blended teaching mode	76.90	99	8.861	.891

Table 3. Paired sample correlation coefficient

		N	correlation coefficient	Sig.
Pair 1	Scores before and after the blended teaching mode	99	.665	.000

As shown in the "Table 2" and "Table 3" above, assuming that there is no significant correlation between the scores before and after the blended teaching mode, the significance level calculated based on this assumption is 0, indicating that the previous hypothesis is not valid. However, the correlation coefficient between the scores before and after blended teaching is 0.665, indicating that there is a significant correlation between them.

Table 4. Paired samples test

		Paired difference				
					95% confidence interval for the difference	
		Mean value	standard deviation	Standard error of the mean	Lower limit	Upper limit
Pair 1	Scores before the blended teaching mode - Scores after the blended teaching mode	-8.606	10.119	1.017	-10.624	-6.588

Table 5. Paired samples test

		t	df	Sig.(two-sided)
Pair 1	Scores before the blended teaching mode - Scores after the blended teaching mode	-8.463	98	.000

According to the above analysis results of the paired sample t test,("Table 4", "Table 5") it can be seen that the probability of no significant difference between the scores before and after the blended teaching mode is zero, indicating that there is a significant difference between the scores before and after this experiment. The average test score before the blended teaching mode was 68.29. Nevertheless, the average test score after the blended teaching mode was 76.9. So, students' English proficiency has been significantly improved after the experiment of the blended teaching mode.

To sum up, compared with traditional teaching mode, the blended teaching mode is more recognized and accepted by students and more effective in improving students' English proficiency.

5. DISCUSSION

Based on the ecological construction of blended college English teaching and ecological teaching evaluation system, this research holds that college English teaching needs a systematic integration of various elements in the ecological environment of teaching, building and maintaining the ecological

balance of the blended teaching environment, promoting the depth of the online and offline teaching fusion as well as its healthy and harmonious development. The key to the success of blended teaching lies in the learner's learning attitude, autonomy and learning motivation. Teachers should first guide students to take a good learning attitude, stimulate their learning motivation, and cultivate their autonomous learning ability. Secondly, students should be required to deepen their understanding and mastery of the knowledge through online learning and offline question-answering, feedback and discussion, and gradually improve their cognitive ability. Thirdly, leadership, teamwork and interpersonal skills should be organically integrated into the teaching content so as to cultivate students' multiple abilities and establish a personalized learning model in order to maintain a harmonious ecological balance between individual behavior and social environment.

The experiment and data analysis show that the blended teaching mode plays an obviously positive role in English teaching. First of all, the blended teaching mode can guide students to develop good habits in English study and thinking mode. Students can really participate in every step of English teaching process, and their initiative to learn English has been significantly improved. By completing the independent learning tasks assigned by the teacher before class, both students' independent learning ability and English proficiency have been greatly strengthened. Additionally, the teaching materials carefully designed by teachers on the ehuixue platform can also help students build up relevant English background knowledge in a short time, so as to better understand the learning materials. Secondly, the online test runs through the whole teaching process. After completing the online test, students can detect their self-learning effect before class and actively listen to the teacher in class so as to find out their shortcomings and make further improvements. Finally, with the implementation of the blended teaching mode, students' English studying content has been expanded, their learning time has been increased, their self-learning ability and performance have been improved, and their interests of studying English have been aroused.

6. CONCLUSION

In the information age of education, college English teaching based on MOOCs has made the whole teaching ecological environment more complex and diversified. Therefore, it is necessary to re-examine and adjust the functions of various elements and continuously improve the blended teaching mechanism. The blended teaching mode has become a main trend of the information age. The ecological model construction of College English blended teaching is a new stage and a new situation of China's foreign language education, able to clarify and maintain the function of each factor, guarantee the ecological harmony and balance of the college English teaching, and promote the harmonious and sustainable development of the ecological environment of education in the future.

Based on the experiment, it is concluded that compared with traditional teaching mode, the blended teaching one is more innovative and effective, playing a significant role in improving students' English proficiency. As a teaching strategy combining "face-to-face teaching", "network learning" and "practice", the blended teaching mode conforms to the development of the times and improves the efficiency of both teaching and learning. Being an advanced teaching model, the blended teaching is bound to be more widely used in college English teaching. However, as a hot topic in today's research, the blended teaching mode still needs a lot of further research and exploration. In addition, its applied research is still in the initial stage to some extent, and there is still a long way to go, needing to be perfected by researchers and front-line teachers through further practice.

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