A Study on the Blended Learning Based on Multimedia Platforms

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Abstract. With the increased penetration of mobile devices and the internet across China, the benefits of technology integration in learning have been widely reported. This paper explores the performance of a blended learning model based on multimedia platforms and constructivist theory on College Students' English learning. For this study, 107 students were split into an Experiment Class receiving the blended model of teaching and a Control class which received traditional teaching. The blended model split the teaching process into before class, during class and after class modules, which utilizes multimedia resources and multimedia platforms. The effectiveness of the teaching was analyzed using the results from an English reading attainment test at the start and end of a semester of learning. This study found that the blended learning model based performed better than the traditional learning model, with students showing an average score increase of 2.475 points over the semester compared to 0.208 for students receiving the traditional teaching method.

Keywords: Blended Learning · MOOC · Rain Classroom

1 Introduction

With the continuous development and penetration of mobile terminals and wireless communication networks, people can access information anywhere at any time. According to the 48th survey report of China Internet Information Center (2021), by June 2021, the number of Internet users in China had reached 1.011 billion, and the Internet penetration rate had reached 71.6%. The number of mobile Internet users had reached 1.007 billion, and the proportion of Internet users using mobile Internet had been 99.6%. For university students, who are "digital natives", technology in schools can provide an opportunity to improve education. Blended learning has become a sharp tool to innovate traditional classroom teaching mode, and improve teaching quality and teaching efficiency. The Horizon Report (2016) predicted that the prevalence of blended learning, Ed Tech and AI in the classroom would increase. This paper analyzes the impact on teaching of a blended learning model that is guided by constructivism, based on a multimedia platforms, MOOC and Rain Classroom, and for use in universities. This paper also proposes a blended learning model based on MOOC and Rain Classroom, which can be very important in improving students' English reading performance.

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2 Literature Review

In blended learning, a combination of web-based courses or computer-mediated communication practices and face-to-face instructions is used to deliver education [10]. Previous studies have explored how blended learning slowly gains its significance in the education world. The term blended learning refers to a language course that combines the use of technology and pedagogical approaches [6]. Some researchers give the definition that "blended learning also is used to describe learning that mixes various event-based activities, including face-to-face classrooms, live e-learning, and self-paced learning" [13].

Prior work has applied blended learning models to language learning. Adas and Bakir (2013) examined the use of a blended learning strategy in developing the writing competency of EFL learners. Grgurovic (2011) investigated the use of blended learning in an ESL context. Tosun (2015) investigated the effect of using a blended learning approach on teaching English vocabulary. Manan (2012) examined the effectiveness of blended teaching using one of the social media features. Banditvilai (2016) conducted a study that examined the use of blended learning to enhance English learners' language skills and learning autonomy in an Asian university.

3 Introduction to the Multimedia Platform of Rain Classroom

Rain Classroom is a multimedia platform and an online teaching tool. Rain Classroom provides the following features to support blended learning.

3.1 Integrating Diverse Learning Resources

Rain Classroom can take traditional PPT courseware as the carrier and integrate diversified learning resources. Teachers can share audio, video, pictures, words, test questions, and other related learning materials to students through the Rain Classroom.

3.2 Analyzing Real-Time Data Feedback

Before class, the teacher can push the preview materials to the students through Rain Classroom. After the students complete the preview tasks, Rain Classroom will collect and record the data of the students' learning behaviour, quantify the students' learning effect, and provide timely feedback, which is convenient for the teachers to monitor and master the students' learning dynamics in real time, and help the students form self-reflection according to the feedback.

3.3 Meeting Personalized Learning

Rain Classroom can meet the personalized learning needs of students. Students can repeatedly watch learning resources that best fit to their areas for development, and can adjust the learning pace in response to their actual situation. This encourages students to study and think deeply.

3.4 Supporting Cooperative Learning

Classroom teaching based on Rain Classroom is supported by data. Teachers guide learning activities, systematically explain the key points, difficulties, and doubts of the teaching content, carry out teaching in the way of cooperative exchange and exploration, and pay attention to the equal dialogue between teachers and students or between students.

4 Constructivist Learning Theory

In today's society, students should not only learn to learn, but also learn to communicate and cooperate, and learn to learn better in communication and cooperation. The purpose of our education is to cultivate qualified talents for society, and qualified talents should not only have professional knowledge but also have good humanistic quality and cooperative spirit. On this point, the cooperative learning and interactive teaching ideas of Constructivism provide insights. Constructivism holds that interactive teaching is a "teacher-student interaction" designed against the background of the dialogue between teachers and students, which refers to the interaction and influence between teachers and students.

4.1 Definition of Constructivist Learning Theory

Applefield, Huber, and Moallem (2000) point out that the role of the learner in constructivism is conceived as building and transforming knowledge. According to Driscoll (2000), constructivism learning theory is a philosophy which enhances students' logical and conceptual growth. The constructivist learning theory views learning as a process in which learners actively construct or build up new ideas or concepts based upon current and past knowledge [1].

4.2 The Influence of Constructivist Learning Theory on English Teaching

4.2.1 Situational Reading Teaching and Learning

A constructivist learning environment is composed of four elements - situation, cooperation, conversation, and meaning. Among them, context is the basic condition of meaning construction. The conversation and collaboration between teachers and students, students and students are the specific course of meaning construction. If the teacher can introduce some relevant knowledge concerning the reading before the class and create a relevant situation for the students, it will greatly help students improve their reading competence.

4.2.2 Students to Be Self-constructed Instead of Passive in the Reading Learning

Constructivists hold that knowledge is not the accurate characterization of reality, but a kind of interpretation, and a kind of hypothesis. Although we endow knowledge with certain external forms through our utilization of language symbols, it does not mean that students get the same understanding as we expect. Whether students acquire the

knowledge depends on their own ability to interpret and construct an internal model for the knowledge. A successful attempt of knowledge-construction is the one in which the validity of knowledge is judged based on their own experience and belief. Students' learning lies not only in their understanding of new knowledge but also in their analysis, inspection, and criticism of the knowledge.

According to Constructivism's view of learning, the course of learning is namely the process of students' self-construction, which demonstrates that the whole learning process should be initiated. Students are required to make active choices and process exterior information sources.

4.2.3 Teachers as Active Instructors in the Reading Teaching

The traditional class model is "teacher-centered". Under the impact of this model, teachers are the dictators of the whole class activities. Students are the passive receivers of knowledge. In this kind of teaching model, students' learning process carries on the characteristics of "low efficiency and high cost". According to Constructivists, what a teacher should do is initiate students to construct new knowledge by regarding their previous knowledge as the new growing point of new knowledge. Constructivists stress that the process of teaching is completed by designing flexible tasks and questions to inspire students' enthusiasm for learning.

In the teaching of English reading, the reading class should be "student-centered". By using this model, students can make better performance in reading learning and realize the high unification of students' cognition, emotion, thought, and behaviour.

5 An Empirical Study on Blended Learning Based on Multimedia Platforms

5.1 Research Design

The subjects of this study were 107 students in a university in China. They were selected as the experimental class (EC) and the control class (CC). In EC and CC, the teacher adopted the same textbook and the same English reading materials. In EC, the teacher adopted the blended learning model, and in CC, the teacher adopted the traditional teaching model. Through a semester's experiment, this paper analyzed the impact of the blended learning model based on multimedia platforms, MOOC and Rain classroom, on students' reading performance. This study adopted quantitative research methods by English reading achievement tests. This paper aims to answer: (1) How could a blended learning model based on MOOC and Rain Classroom be constructed? (2) Can a blended learning model improve students' reading levels?

5.2 Process and Results

A blended learning model was constructed based on multimedia platforms, MOOC and Rain Classroom, as shown in Fig. 1. The blended learning model based on MOOC and Rain Classroom can be defined as the organic combination of online learning and traditional classroom. It cultivates students' abilities of inquiry learning, personalized learning, autonomous learning and cooperative learning.

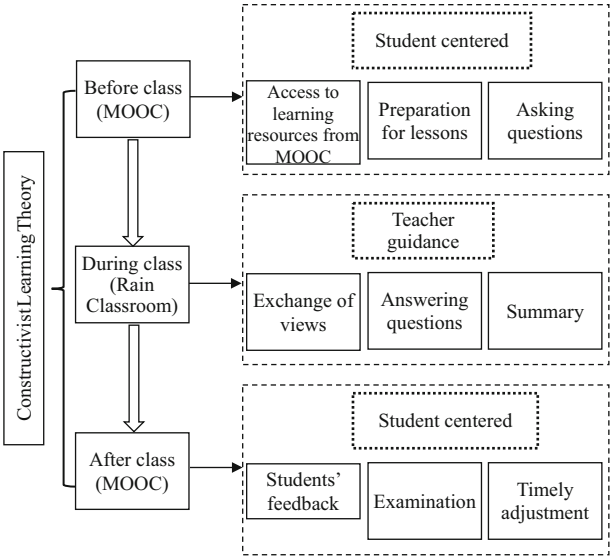

Fig. 1. Blended learning on multimedia platforms

5.2.1 Part I: Before Class

Before-class learning aims to impart knowledge, be student-centered, and guide students to discover and construct knowledge independently. In the arrangement of the teaching plan, teachers can design a series of preview questions related to the theme of the text, integrate network resources related to the theme, such as videos, pictures, articles, etc., and students can further deepen their understanding of the text using in combination with online learning materials. By reviewing learning resources through the multimedia platform, MOOC, students actively explore knowledge. If there is any confusion in the preview process, students can ask teachers and other students online instantaneously. Teachers can clearly understand the difficulties commonly encountered by students in the learning process, adjust the focus of classroom teaching, and improve the efficiency and impact of classroom teaching.

5.2.2 Part 2: During Class

Another multimedia platform, Rain Classroom, is used during class and is synchronized to the students' mobile phones. Students mark the points they do not understand, and teachers receive tips to timely adjust the progress and explain the difficulties. Teachers discuss and give guidance on the difficulties encountered by students in the learning process. Following the student-centered principle, students are more likely to participate in topic discussions and find solutions to problems under the guidance of teachers.

5.2.3 Part 3: After Class

After-class learning is to expand the knowledge that students have learned in the course. Teachers can not only push exercises and expansion training through MOOC, but also evaluate each student's performance timely.

6 Effect of Blended Learning Based on Multimedia Platforms

This study collected the data before and after a semester of the experiment and analyzed the results of blended learning model improve college students' English reading performance.

In Table 1, the posttest means of EC and CC are both higher than the pretest means, which shows that students' reading performance of EC and CC has improved in one semester. The posttest mean of EC is 33.339, which is 2.475 higher than the pretest mean, and the posttest mean of the CC is 31.041, which is 0.208 higher than the pretest mean. This shows that students in EC have made greater progress. SD (Standard Deviation) and SEM (Standard Error of Mean) in both pretests are higher than those in both posttests.

Paired Samples T-Test in Table 2 shows that the T value in EC is −3.004, and −.198 in CC. The different T value shows different mean differences. A Larger absolute value of T value reveals a larger mean difference. In EC, $P = 0.004 < 0.05$, df (degree of freedom) = 58, there is a significant difference between the pretest and posttest in the experiment. In CC, $P = 0.844 > 0.05$, df = 47, there is no significant difference between the pretest and posttest in CC.

The results of the Independent Samples T-Test in Table 3 show that there is no significant difference between EC and CC students in the pretest ($P = 0.982 > 0.05$), while there is a significant difference between EC and CC in the posttest ($P = 0.008 < 0.05$). The results show that students' reading performance has made greater progress with blended learning used in reading teaching.

Table 1. Descriptive statistics of EC and CC

Group	Tests	N	Mean	SD	SEM
EC	Pretest	59	30.864	5.955	.775
	Posttest	59	33.339	4.36	.569
CC	Pretest	48	30.833	7.966	1.150
	Posttest	48	31.041	4.307	.621

Table 2. Paired Samples T-Test of EC and CC

Group	T	df	P
EC	−3.004	58	.004
CC	−.198	47	.844

Table 3. Independent Samples T-Test of EC and CC

Tests	T	df	P
Pretests	−.023	105	.982
Posttests	−2.722	105	.008

Overall, from the above data, it can be concluded that there is no significant difference in reading performance between EC and CC before the experiment. After the experiment, the reading performance of EC has made more remarkable progress. Therefore, blended learning based on MOOC and Rain Classroom is an effective teaching method in College English learning.

7 Conclusions

The experiment shows that the blended learning model based on multimedia platforms MOOC and Rain Classroom in EC can improve students' English reading learning level.

Firstly, blended learning based on multimedia platforms MOOC and Rain Classroom can promote the construction of students' English reading knowledge. In the blended learning model, the author designs the teaching process as three parts: before-class learning, during-class learning, and after-class learning. Using Rain Classroom, teachers can push preview courseware with MOOC videos, exercises and voice to students' mobile phones. Rain Classroom scientifically covers every teaching link before, during and after class, and provides data and intelligent information support for students' learning process, which provides an external technical environment for developing students' English reading knowledge.

Secondly, compared with the traditional model, the blended learning has the advantage of the ability of students to review material at any time. The traditional model has a fixed time and place, and in the blended learning model, students can study at any time. Due to the flexible learning time, blended learning can improve students' autonomous learning ability. The model of blended learning emphasizes the use of flexible time in English reading teaching to strengthen the interaction between students and teachers. The interaction occurs both inside and outside of the classroom, and students share information resources. Students can not only share English reading resources but also learn from each other's different reading strategies.

For a long time, China's educational reform has emphasized the educational concept of "student-centered", which requires the attention to and the reflection on the main role of students in educational and teaching activities, but at the same time, no ignorance of the role of teachers, that is, the organizer and guide of teaching.

In the context of educational informatization, this study integrates teaching methods with modern educational technology, designs a blended learning model based on multimedia platforms MOOC and Rain Classroom. This model is guided by constructivist learning theory, in which teachers should help students analyze and understand what students have learned, rather than simply tell students the results or answers. In the teaching process, students are the active constructors of knowledge, and teachers

are the organizers, guides, and promoters of the teaching process. This study not only guides and inspires teachers to carry out teaching, but also has a positive impact on improving students' academic achievement. Students can not only enter more learning resources, but also have flexible learning time. In addition, the empirical study has proved that blended learning model is effective in improving college students' English reading ability. Whether the blended learning model based on multimedia platforms MOOC and Rain Classroom is also effective in improving college students' English listening, speaking, and writing ability needs testing and verifying in the future teaching.

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References

1. Adams, N.B. 2007. Toward a model for knowledge development in virtual environments: Strategies for student ownership. *International Journal of Human and Social Sciences* 2: 71–77.
2. Adas, D., and A. Bakir. 2013. Writing difficulties and new solutions: Blended learning as an approach to improve writing abilities. *International Journal of Humanities and Social Science* 3: 254–266.
3. Applefield, J.M., R. Huber, and M. Moallem. 2000. Constructivism in theory and practice: Toward a better understanding. *The High School Journal* 55: 35–53.
4. Banditvilai, C. 2016. Enhancing students' language skills through blended learning. *Electronic Journal of E-Learning* 14: 220–229.
5. CNNIC .2021. The 48th Statistical Report on China's Internet Development Status.
6. Driscoll, M. 2002. Blended learning: Let's get beyond the hype. *e-Learning* 1: 1–4.
7. Driscoll, M. 2000. *Psychology of learning for instruction.* Boston: Allyn & Bacon.
8. Grgurovic, M. 2011. Blended learning in an ESL class a case study. *CALICO Journal* 29: 100–117.
9. Manan, N.A.A., A.A. Alias, and A. Pandian. 2012. Utilizing a social networking website as an ESL pedagogical tool in a blended learning environment: an exploratory study. *International Journal of Social Sciences & Education* 2: 1–9.
10. Mortera-Gutierrez, F. 2006. Faculty best practices using blended learning in e-learning and face-to-face instruction. *International Journal on E-Learning* 5: 313–337.
11. NMC .2016. Horizon Report: 2016 Higher Education Edition.
12. Tosun, S. 2015. The effects of blended learning on EFL students' vocabulary enhancement. *Procedia-Social and Behavioral Sciences* 199: 641–647.
13. Valiathan, P. 2002. Blended learning models. *Learning Circuits* 3: 50–59.