Developing Chinese College English Learners' Vocabulary Proficiency with a Mobile-assisted Language Learning Application

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Abstract. By introducing the language learning mobile application BaiCiZhan, this paper conducts an experimental study on mobile technology-assisted vocabulary teaching for college non-English majors in order to explore the effectiveness of BaiCiZhan in English vocabulary learning and teaching. The results show that the vocabulary teaching based on BaiCiZhan has a positive effect on learners' vocabulary proficiency and it has a long-term retention effect in learning vocabulary. What's more, the learners also give a positive evaluation on mobile teaching as an effective aid to the traditional classroom teaching. Finally, some suggestions are made to further improve the application in English vocabulary teaching.

Keywords: Mobile learning application, College English vocabulary teaching, Experiment

1 Introduction

With the mature of mobile information technology and the popularity of smart phones, mobile learning applications are widely used in foreign language teaching. Mobile assisted language learning, hereinafter referred to as mobile learning, arises as a new teaching mode at the historic moment. Vocabulary is one of the basic language units and plays an important role in foreign language learning. Based on the cognitive theory of multimodality, this study examines the effectiveness of BaiCiZhan, a mobile assisted English vocabulary learning application, in developing Chinese college English learners' vocabulary proficiency in a 6-week teaching experiment, aiming to help English learners master a variety of effective English vocabulary memory strategies and expand their English vocabulary with this kind of mobile learning software.

2 Literature review

This section reviews the current research status of the application of mobile learning in vocabulary learning and teaching at home and abroad. And the theoretic foundation for vocabulary learning based on mobile learning application is provided.

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2.1 Mobile learning and vocabulary learning

In the field of mobile technology-assisted foreign language teaching and learning, a large number of empirical studies at home and abroad have proved that compared with traditional classroom teaching methods, the use of mobile learning can make vocabulary learning more effective.

Florence & Jeffrey studied 109 undergraduate students at a southeastern regional university in the United States and they found mobile learning had a positive impact on students' achievement and learning attitude [1]. Wang & Smith conducted a study in which learning materials were sent to students whereby mobile phone and students learned autonomously after class. The study showed that compared with the classroom teaching, the using of mobile phones is more effective [2]. Bernardo, Marco, & Hendrik explored the relationship between mobile devices and the ability of autonomous learning and they found that mobile learning applications had a positive impact on learners' time management, and can improve their autonomous learning ability [3]. The Research by Blanka shows that the use of mobile phones has a positive effect on English learning, especially on vocabulary building and the enhancement of learning motivation [4].

In China the field of mobile application in language learning is also drawing more and more attention in recent years. Sun Manting found in her research that mobile learning application, with its novel and visualized presenting mode, can help high school students expand their English vocabulary and develope the knowledge of vocabulary association, word formation and spelling strategies. However, it has poor effects on developing the skills in guessing the word meaning [5]. Xia Jing reported that compared with learning by paper books, mobile learning can facilitate the effectiveness of vocabulary learning for English majors, whose vocabulary performance and learning strategies have much improved [6]. In her research, Chen Xue found that students were more willing to learn vocabulary after using the mobile application [7]. Li Lingli found that mobile learning applications have significant effects on cultivating students' autonomous learning ability and learning interest and motivation [8].

To sum up, at present most of the researches on mobile learning or vocabulary learning software have proved that it can develop learner's vocabulary learning strategies and stimulate learner's learning motivation. However there are few studies on the influence of vocabulary learning applications on the English vocabulary teaching. Therefore, the author carried out a research on vocabulary teaching with the help of one of the most popular vocabulary mobile learning application BaiCiZhan, aiming to study the role of mobile learning in vocabulary teaching as well as the corresponding problems and countermeasures.

2.2 Theoretical support for mobile teaching based on BaiCiZhan

BaiCiZhan is a mature mobile learning application for college English vocabulary learning. After downloading and installing, learners can freely choose graded vocabulary, ranging from primary school English vocabulary to college English vocabulary, and learners can also set the number of the words for daily learning. The app provides Chinese meaning of each English word, which comes with pronunciation, pictures and contextual usages, etc. At the same time, there are also functions such as vocabulary contest, vocabulary radio as well as the function of rewarding for completing daily learning tasks, which not only meet the learning needs of different learners, but also greatly stimulate their enthusiasm for learning.

BaiCiZhan supports media forms such as text, picture, and sound, integrating verbal and non-verbal signs, with typical multimodal features. According to the cognitive theory of multimodality, when human brain receives text and image at the same time, the verbal and visual channels of the brain process two kinds of information at the same time, which is more conducive to information storage and meaning construction. Hence Gu proposes a hypothesis that "learning words and images together is better than learning words alone" [9]. For example, Liu Ling and Qin Xiaoqing have studied the influence of different ways of vocabulary presentation on vocabulary acquisition. They found that compared with vocabulary presentation in plain text, the co-presentation of pictures, images and animations is much more effective on vocabulary building and language output [10]. In traditional classes, the words explained by the teacher are usually presented on the blackboard, PowerPoint or textbook, and words usually are presented in a single mode. If teachers reasonably design learning tasks, upload the target vocabulary to the mobile learning platform for learners, it will trigger learners' multimodal learning and improve the process of vocabulary internalization and acquisition.

3 Research design

This section elaborates the research design of this teaching experiment, including research questions, research subjects, research instruments, experimental procedure and data collection.

3.1 Research questions

In order to verify the effectiveness of mobile application BaiCiZhan in English vocabulary teaching, the following questions are discussed: (1) Is there a significant difference in immediate vocabulary test scores between the control group and the experimental group? (2) Is there a significant difference in delayed vocabulary test scores between the control group and the experimental group? (3) What is the attitude of the experimental group towards the vocabulary teaching mode based on mobile learning application?

3.2 Research subjects

The subjects of this experiment are a total of 104 students, including 52 in the experimental group and 52 in the control group. They come from two natural classes in the first year of non-English majors at the author's university, and there is no statistically significant difference in gender and age. And in the experimental group, smartphones are available to everyone. What's more, the Wi-Fi at campus is fully covered in the teaching building, dormitory, library and cafeterias, ensuring the mobile vocabulary learning and teaching well under way.

3.3 Research instruments

Target vocabulary. This study takes the vocabulary in Book one of New Horizon College English Reading and Writing (Third Edition) as the target vocabulary. Under the guide of the vocabulary teaching requirements of the curriculum syllabus, the author identified 20 untaught new words from unit 1 and unit 2 respectively. And these new words are mainly content words, prepositions and verb phrases and more than 80% of them belong to high-frequency words in college English test band 4 vocabulary.

Test. The English vocabulary tests are the main reference to understand the changes of the subjects' vocabulary proficiency before and after the teaching experiment. The vocabulary tests used in this study are designed based on the vocabulary knowledge framework constructed by Nation [11], including four knowledge dimensions: vocabulary spelling, translation between English and Chinese, collocation of fixed phrases and guessing words in the contexts. There are three vocabulary tests in this study, namely pre-test, post-test and delayed post-test, and 40 multi-choices and 10 blank fillings in each test, which make up a full score of 100 points. The pre-test paper is used to measure the basic vocabulary level of students, so as to determine whether they can be used as research subjects for experiments. The post-test paper is used to detect the effect of vocabulary learning after the subjects have used the language learning mobile application BaiCiZhan. The delayed post-test is used to detect the effect of the subjects' vocabulary retention one month after the experiment.

Questionnaire. After the experiment, a questionnaire will be conducted in the experimental group. The questionnaire is designed based on the questionnaire used by Wu Xia and Wang Qiang in their vocabulary learning study [12]. The questionnaire consists of three parts. The first part is to collect students' personal information. The second part investigates students' attitudes about vocabulary learning through the app, and self-assessment of vocabulary learning. The third part aims at understanding students' overall evaluation and suggestions for vocabulary teaching based on BaiCiZhan. There are 10 questions in the questionnaire and the answers to the questions are designed in a Likert Scale from 1 to 5, and 1 means completely or almost completely inconsistent with the case, 2 means usually inconsistent with the case, 3 means sometimes consistent with the case, 4 means usually consistent with the case, and 5 means completely or almost completely consistent with the case. The questionnaire is required to be completed within 10 minutes.

3.4 Experimental procedure

The experiment lasted for a total of 6 weeks. The vocabulary teaching steps of the experimental group as follows. In the first week, the author conducted training on how to download and use the app BaiCiZhan for the students, guiding them to be familiar with the interface and various functions of the app, ensuring that students can correctly use and fully utilize the various functions of the software. At the same time, students are instructed to select and set the vocabulary book, which are corresponding to the vocabulary list in Book one of New Horizon College English Reading and Writing (Third Edition). During the six weeks of experimental teaching, students in the experimental group will use BaiCiZhan to learn the vocabulary of Unit 1 and Unit 2 online in class under the teacher's instruction, and then complete the vocabulary training on the BaiCiZhan platform. The training items include viewing pictures and choosing words, listening and selecting meaning, completing spelling, blank filling, speed listening etc. And there is also two extended tasks including word video and word radio. In the learning process, the teacher will actively interact with the students, answer the questions that the students put out, and give feedback about their vocabulary learning. In week 6, an immediate vocabulary test will be taken and questionnaires will be completed in class.

The vocabulary teaching in the control group will be carried out by using the traditional vocabulary method by using the paper text book of New Horizon College English Reading and Writing (Third Edition), following the three steps of "Presentation, Practice and

Production". To be specific, in the teaching process, the teacher first introduces new vocabulary to students; try to arouse students' interest and attention. Then, students are asked to practice the newly learned vocabulary repeatedly so as to improve the accuracy of vocabulary use. Finally, students will be given more exercises such as making sentences, translation and writing so as to make vocabulary output.

3.5 Data collection procedure

Before the experiment, the pre-test needs to be taken and graded, and then the scores have to be typed into Excel for analysis. If there is a significant difference, no further experiments can be conducted. After the experiment, both the experimental and the control groups take the post-test of this teaching experiment. Then the test scores are analyzed with SPSS software. And to further verify the results of this teaching experiment, a delayed post-test will be conducted on the experimental group one month after the post-test.

4 Results and discussion

The following table is a description of SPSS data on the test results of the experimental and control groups.

Table 1. Descriptive statistics and the results of paired sample t-tests

	pre-test				post-test				delayed post-test			
	M	SD	t	P	M	SD	t	P	M	SD	t	P
EG	74.85	12.670	.227	0.812	83.77	8.647	3.489	0.001	81.94	8.089	2.907	0.004
CG	74.29	12.393			77.33	10.126			76.83	9.779		

4.1 Analysis and discussion of the vocabulary tests

In order to understand the initial vocabulary level of the students and to ensure the validity of the research subjects, the students in the two classes were pre-tested before the experiment. As can be seen from Table 1, the average score of the experimental group is 74.85, and that of the control group is 74.29, with a difference of only 0.56. The average scores of the two groups are relatively close. In addition, the independent sample T-test conducted on the pretest scores shows that there is no significant difference ($P=0.812>0.05$) in the scores between the two groups. Therefore, it can be explained that the vocabulary proficiency of the experimental and control classes before the experiment is equivalent, and comparative experimental research can be conducted.

The first research question of this study is "Is there a significant difference between the control group and the experimental group in immediate vocabulary test scores?" As can be seen from Table 1, the statistical results of the post-test of the two groups show that the experimental group scored 83.77 points and the control group scored 77.33 points. The independent sample T-test conducted on the post-test scores shows that there is a significant difference ($P=0.001 < 0.05$) between the two groups, which means the English vocabulary proficiency of the experimental group is higher than that of the control group, indicating that the mobile technology assisted teaching exerts the expected teaching effect. Actually from the

perspective of multimodality, with the help of visual and auditory modes, students can learn vocabulary from a multi-modal perspective such as pictures and videos. This process brings learners' various senses into the vocabulary learning process, helping students better understand the usage and meaning of vocabulary. Meanwhile, there are rich example sentences and text videos in the app, which can make up for the deficiency of learners' language environment and the lack of resources in the teaching process.

The second research question of this study is "Is there a significant difference in vocabulary delay test scores between the control group and the experimental group?" As can be seen from Table 1, The statistical results of the delayed post-test between the experimental group and the control group show that the average score of the experimental group is 81.94, while the average score of the control group is 76.83, and the average score of the experimental group is 5.11 points higher than that of the control group. In addition, the standard deviation of the experimental group and the control group is smaller than that of the post-test, especially the experimental group, indicating that the polarization of the scores of the delayed post-test in these two groups is less serious than before. And the independent sample T-test conducted on the delayed post-test scores shows that there is a significant difference ($P = 0.004 < 0.05$) between the experimental group and the control group, which indicates the English vocabulary level of the experimental group is still higher than that of the control group even one month after the experiment, although the overall vocabulary score has slightly declined.

4.2 Learner's attitude towards the mobile teaching mode

The third research question of this study is "What is the attitude of the experimental group towards the vocabulary teaching mode based on mobile learning application?" All 52 students in the experimental group submitted questionnaires. Among them, 47 are in favor of vocabulary learning based on BaiCiZhan. All students believe that the teaching is more flexible and convenient for them to set their own pace. 45 students report that the learning style reduces their anxiety in classroom learning. 50 students hold the idea that the ways of vocabulary presentation on the app allow them to fully pay attention to the spelling, pronunciation and meaning of words. Finally, all the students believe that BaiCiZhan can help them make a personalized review. However, it is worth noting that 11 students think that they are easily distracted by the advertisements and online games of the software in the process of learning, and they need teachers' guidance and supervision as well as effective feedback.

5 Conclusion

From the results of the vocabulary tests and questionnaire, we come to the conclusion that the app BaiCiZhan can significantly enhance students' interest in learning. Due to the real-time speech function, pictures and videos provided by its auditory and visual modes, students can achieve better learning outcome in vocabulary teaching compared with the traditional classroom teaching mode.

Finally, the author puts forward some suggestions for mobile teaching in the future. In vocabulary teaching, teachers should strengthen students' first impression of new words and enhance their interest and motivation by adopting a multi-modal approach. Teachers should not only use pictures and videos for auxiliary teaching, but also allow students to open their

mouths and do actions to trigger their multimodal learning. When teaching difficult articles or vocabulary, teachers should not simply present the meaning of words in both Chinese and English, and should not teach by rote learning. At the same time, in terms of teaching management, if students have conditions to use mobile APP at school or at home, teachers can carry out online management by using the clock-in system of the software, so as to track students' vocabulary learning in real time, strictly monitor students' learning progress, so as to improve the completion of mobile learning tasks.

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