



The Impact of MALL on College English Blended Learning

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Abstract. With the development of Internet and 5G, new technologies involving artificial intelligence, big data and cloud computing occur, which brings a profound impact on digital education. The technological innovation inspires the emergence of Mobile-assisted Language Teaching (MALL) and blended learning. The aim of this paper is to investigate the application of Mobile-assisted Language Teaching (MALL) into foreign language blended learning based on quantitative data analysis. Quantitative data is collected through a test and questionnaire, and then analysed to investigate the impact of MALL on College English blended learning. Finally, the study demonstrates that MALL has a positive impact on College English blended learning.

Keywords: MALL · Blended Learning · Data Analysis · Quantitative Data

1 Introduction

With the emergence of the Internet and 5G, the 21st century has become a digital century involving the rapid development of digital economy and digital education. Digital education refers to teaching and learning via online platforms and devices such as computers, mobile phones, and alternative electronic devices. Facing major changes and a global pandemic unseen in a century, digital education representing the integration of education and technology seems to provide a feasible solution. Under the concept of digital education, new teaching methodology and principles involving blended learning and Mobile-assisted Language Learning (MALL) aroused a number of teachers and researchers' attention [1, 5, 8, 14, 16].

2 Research Background

2.1 Computers and Quantitative Data Analysis

The development of computers is divided into four stages, to be specific, the electronic tube stage, the transistor stage, the integrated circuit stage, and the large and very large scale integrated circuit stage [4]. As a modern electronic computing machine used for

high-speed computing, the computer can be utilized not only for numerical calculation, logical calculation, but also for memory storage. According to the specific program, big data can be processed automatically at the high speed.

Data analysis refers to the use of appropriate statistical and analytical methods to analyse a large number of collected data, summarize and present them aiming to maximize the development of data functions [15]. Data analysis is a process in which data is studied and summarized in detail in order to extract useful information and draw conclusions [15]. Quantitative methods have been widely used in foreign language teaching and research and have attracted widespread attention from applied linguistics scholars at home and abroad [6, 7, 13].

From a positive perspective, quantitative data analysis is a powerful research form, and is often associated with large-scale survey, but can be also used for smaller-scale investigations, with experiment, case studies, correlational research and action research [3]. Numerical analysis can be carried out utilizing software, for instance, SPSS, Minitab and Excel. Software packages apply statistical formulae and perform computations [3]. In this research, Excel is used to analyse the numerical data collected from a test and questionnaire.

2.2 Blended Foreign Language Teaching and MALL

Innovation driven by digital technology has become a significant thrust for the development of all countries, and has brought a profound impact on education. With the emergence of “Internet+” and digital technology, blended learning arouses teachers’ and researchers’ attention [5, 8, 14, 16]. Blended teaching involves online teaching and offline teaching, or classroom teaching. According to Hu (2021), Blended Language Learning (BLL) is the integration and innovation of “Internet+education”, which surpasses the view of technological tools, but the ecological view of technology. Ecological view of technology points out that language learning environment is a complex self-adaptive system emphasizing the interaction between language learning, language in use, and technology in use [8].

MALL refers to Mobile-assisted Language Learning, through which learning occur via some mobile devices such as computers, tablets and smart phones [10]. In this research, some applications which are provided for learners, involve Unipus Smart Teaching Cloud Platform, Fif Speaking Training System, and Pigai intelligent English essay correction online system. Unipus platform is utilized by learners for weekly independent learning, while Fif speaking system and Pigai system are used for assigning speaking and writing tasks.

2.3 SPOC and Flipped Classrooms

SPOC is short for Small Private Online Course, which occurs after MOOC (Massive Open Online Course). Flipped Classrooms refer to that students learn the lecture content via videos before class, in which process students can learn the difficult and significant knowledge at first, and then have the lecture with prior understanding of knowledge. Both SPOC and Flipped Classrooms can be applied into blended learning [1].

In this study, informants of the experimental group will have 2 periods' online independent learning on the Unipus smart teaching cloud platform, after which they will have 2 periods' face-to-face lectures by teachers. Unipus smart teaching cloud platform has both a computer version and application version on the mobile phones, on which students can complete the online learning tasks chapter by chapter. After class, they will complete the online assignment on the Fif speaking system and Pigai essay system. However, the control group involves learners who go through 4 periods' traditional classroom learning each week.

3 Research Method

3.1 Research Questions

The key research questions addressed in this paper are as follows:

- (1) What impact does Mobile-assisted Language Learning have on college English blended learning?
- (2) How can teachers perfect the teaching design according to learners' feedback at the end of term?

3.2 Informants and Data Collection

The test is taken by the experimental group and the control group. The subjects of the experimental group are Level A freshmen who are assigned to Level A College English class according to their College Entrance English Exam grades with a mean of 116 (Full score is 150). Class A students have a better English proficiency than that in Class B and C. Subjects of the control group are also Class A students, but they learn the college English by taking the traditional face-to-face lecture.

In terms of the questionnaire, totally 1200 students participated in the survey, who joined an English test first, and then completed the digital questionnaire through Wenjuan Star (A professional online questionnaire platform). Finally, 1004 effective questionnaires were collected. Among 13 questions, except that 4 questions can be chosen more than once, nominal data on 9 multiple-choice questions was collected (As seen in the Appendix). Results and discussion are analysed based on quantitative data analysis tool, Excel.

4 Results and Discussion

4.1 The Test Result

The experimental group involves learners who learn college English under MALL, while control group learners are those who learn college English according to the traditional classroom learning. The test contents are questions selected from College English Test Band 4 (Full mark is 100 points). As shown in Table 1, the test score of the experimental group is 7.31 points higher than the control group, which demonstrates that MALL has a positive impact on college English blended learning.

Table 1. The test result.

	Experimental Group	Control Group
Mean	68.83	61.52

Table 2. Student adaptation.

Item	Number of Informants	Percentage
Totally	317	31.57%
Almost	452	45.02%
Basically	189	18.83%
No	46	4.58%
Total	1004	100%

Table 3. Student satisfaction.

Item	Number of Informants	Percentage
Totally	311	30.98%
Almost	426	42.42%
Basically	209	20.82%
No	58	5.78%
Total	1004	100%

4.2 Student Satisfaction

Based on Question 1, 2, 4, 5, 6 (As shown in the Appendix) in regard to students' satisfaction, most students are satisfied with the new learning mode, and show that their learning outcome and learning habit have been enhanced. According to Table 2, after one semester of "2+2" college English blended learning, most students (95.42%) show they have been used to the new teaching and learning mode, while only 4.58% students show they are not used to it. Furthermore, students who are satisfied with their learning outcome account for 94.22%, among whom 30.98% learners showing that they are "totally satisfied" and 42.43% showing that they are "almost satisfied" (See Table 3). Therefore, it can be concluded that learners are satisfied with their "2+2" blended learning result.

4.3 Advantage of "2+2" Blended Learning

In terms of benefits of "2+2" blended learning, the first and foremost advantage is that learners are able to learn the online resources repetitively with a percentage of 75.6%.

Table 4. Benefits of “2+2” blended learning (See appendix).

Item	Number of Informants	Percentage
A	759	75.6%
B	650	64.74%
C	710	70.72%
D	502	50%
E	476	47.41%
F	472	47.01%
G	429	42.73%

Table 5. Online tasks (See appendix).

Item	Number of Informants	Percentage
A	304	30.28%
B	613	61.06%
C	71	7.07%
D	16	1.59%

(As shown in Table 4.) Alternative benefits which are selected over 50% are more flexible learning style, more flexible learning location, and able to form the habit of independent learning. Additionally, around 45% subjects indicate that alternative advantages of “2+2” blended learning involve more teacher-student interaction in the small-sized classes, being able to develop personal learning according to students’ need, and more abundant teaching resources. Thus, teachers can perfect the teaching design of next semester by keeping the existed teaching resources and adding more motivating and targeted ones.

4.4 Online Tasks

In terms of online tasks (Question 7 and 9), approximately 91% students indicate they can complete online learning tasks on time according to the requirements of the teacher and online independent learning checklist, while the remainder who cannot complete or complete the online tasks on occasion account for about 8.6% (As shown in Table 5). This shows that teachers have designed the number of online tasks appropriately.

4.5 Language Skill and Content

Traditional language teaching focuses more on language skills teaching rather than content [2, 11, 12, 17], so Question 8 and 12 are designed to analyse the status of language skills and content teaching and learning under “2+2” blended learning. According to Table 6, students are more satisfied with their learning result of listening and speaking

Table 6. Language skill and content (See appendix).

Item	Number of Informants	Percentage
A	599	59.66%
B	559	55.68%
C	667	66.43%
D	478	47.61%
E	416	41.43%
F	320	31.87%
G	10	1%

tasks, vocabulary and text. However, they are less satisfied with that of workbook, skills explanation, and background introduction. Correspondingly, when the subjects are asked what online learning content needs emphasizing in the offline lecture, they put grammar and problem-solving skills of listening, speaking, reading, writing and translation in priorities (See Table 6). It could therefore be concluded that teachers can perfect the teaching design of next semester by emphasizing relevant grammar and problem-solving skills of listening, speaking, reading, writing and translation in the offline lecture, or under the circumstance of limited time of lectures, making some micro lectures concerning those topics, and then adding those micro lectures to the online independent learning tasks for students' after-class learning.

4.6 Problems

Question 10 and 11 are designed to collect the informants' learning problems encountered while "2+2" blended learning (See Appendix). As shown in Table 7, among 1004 subjects approximately 50% demonstrate that "I'm not good at independent learning, so I can't complete the online learning tasks on time", while 44.62% subjects have difficulty in figuring out the important and difficult knowledge due to low English efficiency. Around 30% informants show that their problems occur owing to the fact that their language proficiency is relatively low; they cannot complete online tasks on time; and they do not have time to ask questions in the limited 90-min offline lecture. In order to address those problems, most of them choose to discuss with classmates and ask the teacher or TA for help online. Hence, teachers can perfect the teaching design of next semester by dividing students into different groups and encouraging them to have more group discussions after class. Peer-assisted Learning (PAL) and mutual assistance are conducive to improving learners' classroom participation and learning effects [9].

Table 7. Problems (See appendix).

Item	Number of Informants	Percentage
A	506	50.4%
B	448	44.62%
C	324	32.27%
D	326	32.47%
E	308	30.68%
F	25	2.49%

5 Conclusion

In conclusion, the research demonstrates that Mobile-assisted Language Learning has a positive impact on college English blended learning. The quantitative data analysis also shows that students are satisfied with their “2+2” blended learning in the first semester, and teachers can perfect the teaching design of next semester by encouraging Peer-assisted Learning and increasing teacher-led online question answering. In the future research, more empirical studies could be done to enrich the practice of MALL applied in blended learning from the perspective of alternative disciplines.

Appendix

Questionnaire

- After “2+2” blended learning for one semester, have you been used to the mobile-assisted learning mode? A. Totally (100%) B. Almost (80%) C. Basically (50%) D. No (0%)
- Are you satisfied with your learning performance in this semester? A. Totally (100%) B. Almost (80%) C. Basically (50%) D. No (0%)
- What do you think of the benefit of “2+2” blended learning? (You can choose more than once)
 - Be able to learn the online resources repetitively.
 - More flexible learning location.
 - More flexible learning style.
 - Be able to form the habit of independent learning.
 - More teacher-student interaction in the small-sized classes.
 - Be able to develop personal learning according to students’ need.
 - More abundant teaching resources.

If any, the appendix should appear directly after the references without numbering, and not on a new page.

- Compared with traditional teaching, what impact do you think “2+2” blended learning has on mastering knowledge?

- A. Very well.
 - B. well.
 - C. I think the result is not so good.
 - D. I almost haven't mastered the knowledge at all.
5. Compared with traditional teaching, how do you think "2+2" blended learning has influenced your learning?
- A. Greatly improved.
 - B. Improved a little.
 - C. Almost the same.
 - D. Decreased a little.
6. To what extent do you think "2+2" blended teaching has changed your learning habits compared to traditional teaching?
- A. Greatly improved.
 - B. Improved a little.
 - C. Almost the same.
 - D. Becoming worse.
7. Can you complete all online learning tasks on time according to the requirements of the teacher and online independent learning checklist?
- A. I can complete all the tasks.
 - B. I can complete most of the tasks.
 - C. Sometimes I can.
 - D. I can't complete the tasks at all.
8. During online independent learning which part are you more satisfied with? (You can choose more than once)
- A. Vocabulary.
 - B. Text.
 - C. Listening and speaking tasks.
 - D. Workbook.
 - E. Skills explanation.
 - F. Background Introduction.
 - G. Alternatives.
9. What do you think of the number of online tasks based on "2+2" blended learning?
- A. There are so many tasks that I can't complete them on time.
 - B. The number of tasks are large, but I can accept it.
 - C. I think it is moderate, and I can complete them on time.
 - D. The number is small, so I can complete them very quickly.

10. What are your main problems in the “2+2” learning process? (You can choose more than one answer)
- A. I’m not good at independent learning, so I can’t complete the online learning tasks on time.
 - B. I have difficulty in figuring out the important and difficult knowledge due to low English efficiency.
 - C. My independent learning result is poor due to the poor learning atmosphere.
 - D. I can’t complete the online task on time, so that I can’t catch up with the offline learning.
 - E. The lecture time is limited, so they couldn’t ask teachers for help instantly.
11. How do you resolve the problems encountered during online independent learning?
- A. Don’t ask for help.
 - B. Ask the teacher or TA questions online.
 - C. Discuss with classmates.
 - D. Ask teachers while offline learning
12. Which of the following online learning content do you think needs emphasizing in the offline lecture? (You can choose more than once)
- A. Grammar.
 - B. Text.
 - C. After-class exercise.
 - D. Problem-solving skills of listening, speaking, reading, writing and translation.
 - E. Cultural background.
 - F. Vocabulary.
 - G. Others.
13. Which of following learning mode would you like to take in the next semester?
- A. “2+2” blended learning: 2 periods’ online independent learning+2 periods’ small-sized classroom learning
 - B. “2+2” blended learning: 2 periods’ teacher online lecture+2 periods’ large-sized classroom learning
 - C. “2+2” blended learning: 2 periods’ teacher-led online independent learning in the classroom+2 periods’ small-sized classroom learning
 - D. 4 periods’ large-sized classroom learning: 2 classroom lectures each week (one lecture involves 2 periods)

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