Effects of Mobile-Learning in the Flipped Classroom Model on Non-English-Majored Undergraduates in College English

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Abstract: This paper reviewed a one-term experiment on mobile-learning (M-learning) in the flipped classroom model in teaching the curriculum College English to 180 first-year non-English-majored undergraduate students majored in agriculture, plant protection, floriculture and veterinary from Yangtze University as participants. Participants in this study consisted of 90 non-English-majored undergraduate students in the control group (CG) and 90 non-English-majored undergraduate students in the treatment group (TG). The process of M-learning in the flipped classroom model in teaching the course College English was divided into the three parts: M-learning outside of the flipped classroom; M-learning inside of the flipped classroom; and M-learning outside of the flipped classroom. The results showed that 1) compared with a teacher-dominated approach for CG, M-learning in the flipped classroom model in teaching the course College English for TG did a better job in enhancing students’ ability applied in College English; 2) there were significant differences between males in CG and TG, and females in CG and TG; 3) participates in TG hold positive opinions towards mobile-learning in the flipped classroom model.

Key words: The Flipped Classroom, Mobile-Learning Non-English-majored

Introduction

Non-English-Majored undergraduates in colleges or universities have their own mobile devices such as smart phones, iPods, iPads and tablets. Technology has become a significant part of university life (Goode, 2010), and students can use their mobile devices both inside and outside of classroom to learn courses. Mobile learning (M-learning) has become a significant part for non-English-Majored undergraduates in learning College English. “M-learning” is a term regularly used to describe the many educational possibilities opened up by this convergence, whether it be getting exam results by mobile phone, watching lessons on mobile video, podcasting a lecture via iPod, or playing structured language games on a Nintendo or Playstation (Ken Banks, 2014). The challenge facing educators in higher education is how to leverage the students’ interest and experience of technology in fulfilling the learning outcomes of a course (Marion Engin, 2014). In this paper, the authors will study effects of mobile-learning in the flipped classroom model on non-English-majored undergraduates in College English. In mobile learning age, students watch College English videos made by teachers online by their mobile devices such as smart phones to learn the course knowledge and make tests by students themselves at home; in class students are led by the course teacher and organized to be divided into groups to discuss and share with their classmates on College English, “that which is traditionally done in class is now done at home and that which is traditionally done as homework is now completed in class” (Bergmann & Sams, 2012, p.13).

Literature review

According to the theory of Constructivism, knowledge is not taught but is learned by the learner himself through constructing the new knowledge on the basis of old knowledge, under certain settings, with the help of others, such as the teachers or learning partners, utilizing certain study resources. So the student is the center of teaching and student-centered methodology should be used. That is to say, the student is the center of teaching and the teacher works as the organizer, facilitator and motivator, utilizing setting, cooperation and dialogue to motivate students’ interests, activities and creative. Teachers should meet the students’ needs. The M-learning in the flipped classroom model agrees with the theory of Constructivism.

Mobile-learning in the flipped classroom teaching and learning model has got popularity and attention in recent years. Many researchers have studied mobile-learning in the flipped classroom model in the world. Junko Yamamoto (2013) studied combining American Council on the Teaching of Foreign Language (ACTFL) proficiency guidelines, pedagogies to promote language proficiency, and the idea of a flipped classroom to conceptualize the use of mobile technology applications to promote proficiency among language learners. The idea of a flipped classroom to conceptualize the use of mobile technology applications to promote proficiency among language learners may not be suitable for language learners in China. Lisbeth Amhag (2015) described and analyzed students’ learning activities in distance higher education program with online webinars (WEB-based semiNAR) by computer, laptop or mobile app for phones and tablets directly face-to-face (F2F) with other students and teachers introduced by “flipped
classroom”. Students’ learning activities in distance higher education program may be different from students’ learning activities in common colleges or universities in China. Hiroyuki Obari and Stephen Lambacher (2015) reported two case studies of EFL teaching using mobile technologies in a flipped classroom in Tokyo Japan. In their study, their goal was to examine the effectiveness of BL and flipped learning activities integrating m-learning for the purpose of improving the TOEIC scores. In China, non-English-majored undergraduates are required to learn College English to improve their College English Test (CET) scores and pass their CET 4 or CET6.

In China, there are researchers to study mobile learning in the flipped classroom. Fan Wenxiang et al. (2015) reported a practical study in the flipped classroom based on WeChat under environment of mobile learning. In their study, they chose 50 students as participants, but they did not give more detailed information about 50 students such as non-English-majored undergraduates, English-majored undergraduates, graduates. Fang Xinmin and Zeng Haijun (2017) studied new training model of flipped classroom based on mobile learning. However, their study targets were adults with jobs and their study targets were trained in a short time. In this paper, we shall examine effects of mobile learning in the flipped classroom model in College English in China.

Methodology and Data Collection

Research Design

This study included two tests related to the course College English to provide the information on non-English-majored undergraduate students’ scores of College English before and after trained by M-learning in the flipped classroom model and interviews on M-learning in the flipped classroom model. The following research questions would be answered in this study:

As a result of implementing M-learning in the flipped classroom model, were there any significant differences between CG’s and TG’s improvement in College English applied skills and ability?

Were there any significant differences between male non-English-majored undergraduate students and female non-English-majored undergraduate students in CG and TG?

Did participants in TG hold positive opinions towards M-learning in the flipped classroom model?

Subjects

In February 2017, 180 first-year Non-English-majored Chinese undergraduates majored agriculture, plant protection, floriculture and veterinary from Yangtze University were volunteers in this study. 180 freshmen, taught by the same male instructor during the whole academic term (February 20, 2017 to June 20, 2017), were 99 females and 81 males, their average age 19, Chinese as their first or mother language. All 180 participants taught by the 40-year-old male College English instructor were divided randomly into two groups: 90 participants as the Control Group (CG) with the traditional grammar-translation teaching method and 90 participants as the Treatment Group (TG) with M-learning in the flipped classroom teaching and learning model. Both CG and TG had the similar level of education background, family background, personality and life experiences, which was to say, their overall learning and cognitive abilities were almost equal.

Instruments

The instruments utilized in this study were tests on College English applied ability with participants from CG and TG, and interviews with participants from TG on M-learning in the flipped classroom model.

College English applied ability pre-test

All the 180 non-English-majored undergraduates were attended the College English applied tests at 14:30-16:30 on February 23, 2017 in one classroom to gain students’ scores on College English applied ability in CG and TG before the experiment. All the 180 non-English-majored undergraduates were required to complete the tests in two hours. The College English applied ability test materials in this study were taken from June, 2016 National College English Test 4 (short for CET4), total 710 for CET4.

College English applied ability post-test

All the 180 Non-English-majored undergraduates were attended the College English applied ability tests at 14:30-16:30 on June 20, 2017 in one classroom to gain students’ scores changes in College English applied ability between CG and TG after the experiment. All the 180 non-English-majored undergraduates were required to complete the tests in two hours. The College English applied ability test materials were taken from December, 2016 National College English Test 4 (short for CET4), total 710 for CET4.

Interview

After the experiment, all 90 participants in TG in this experiment were interviewed via QQ (a kind of on-line instant message service tool in China) lasted two weeks and were required to fill out the following interview questions: 1) Do you think M-learning in the flipped classroom model has improved your college English ability? 2) What are difficulties when you participate in M-learning in the flipped classroom in College English? 3) Do you think M-learning in
the flipped classroom model in *College English* is beneficial to all of you in TG?

**Data Collection and Analysis**

Two tests on *College English* applied skills or ability before the research experiment (February 20, 2017) and two tests on *College English* applied skills or ability (June 20, 2017) were conducted to compare scores changes between CG and TG of non-English-majored undergraduate students in the course *College English*. Comparison of Means was adopted to compare the two groups of non-English-majored undergraduate students’ average scores of their pre-test and post-test on the basis of samples. And the independent sample T-test was adopted to examine if there were significant differences between CG and TG before the experiment and after the experiment. Also the independent sample T-test was adopted to examine if there were significant differences between male and female graduate students in CG and TG. Interviews were conducted to collect responses from participants in TG on M-learning in the flipped classroom. Before the experiment of M-learning in the flipped classroom on non-English-majored undergraduate students’ *College English* was ended, interviews were held from June 17, 2017 to June 30, 2017 via QQ in a teacher office to gain the responses from participants in TG on the *College English* teaching and learning method of M-learning in the flipped classroom model.

**Process of M-learning in the Flipped Classroom Model in College English Teaching and Learning**

New Voyage *College English* published by SHANGHAI JIAO TONG UNIVERSITY PRESS as the textbook was used in teaching *College English* for non-English-majored undergraduates in CG and TG. In the experiment, participants in the control group were instructed by the traditional grammar-translation *College English* teaching and learning model (teachers explaining knowledge points and difficult sentences in the passages through grammar-translation method, then students listening to teachers’ *College English* instruction). However, participants in the treatment group were instructed by M-learning in the flipped classroom model. M-learning in the flipped classroom model in *College English* in this study was divided into three parts. The first part was that participants in TG watched the videos on College English texts made by the College English teacher online or downloaded via students’ smart phones outside of the flipped classroom to complete the College English texts learning tasks and self-tested tasks before the class and summary of the texts they learned. The students can communicate with the *College English* instructor about the course *College English* learning via the communication platform online via QQ or WeChat (a kind of on-line instant message service tool in China) in their smart phones if students want to ask the instructor questions related to *College English*. The second part was that in *College English* class, the *College English* instructor created the *College English* teaching and learning environment to organize and guide students learning *College English* through independent study, collaborative learning, achievement exchange and reports. 3-4 students can be organized as one group according to their wills to discuss and share their learning, at the same time, to solve their *College English* learning questions they met. Then the representative of every group reports his or her group’s *College English* learning achievement. Inside of the flipped classroom in teaching *College English*, the instructor not only organized and guided the students’ learning activities but also joined in their discussion to scaffold students’ *College English* learning. The third part was that outside of M-learning in the flipped classroom on *College English*, the students needed write their lesson summary and evaluation about their learning in class, and submitted their lesson summary and evaluation online via their smart phones or other mobile devices to their *College English* instructor; then students could read the comprehensive evaluation and feedback of their *College English* learning from the instructor online via their smart phones or other mobile devices.

**Results**

The results in this study included three parts. The first part was *College English* tests’ results of pre-test and post-test between CG and TG. The second part was whether there were significant differences between males and females, as CG with a traditional *College English* teaching model compared to TG with M-learning in the flipped classroom model. The last part was responses to interviews on M-learning in the flipped classroom in *College English* teaching and learning from non-English-majored undergraduates in TG.

**Effects of M-learning in the flipped classroom model instruction and traditional instruction on non-English-majored undergraduates’ *College English* performance**

Table 1 showed that non-English-majored undergraduate students’ *College English* performance from CG and TG before and after the experiment. The results from Table 1 showed tests’ scores between CG and TG taught by different *College English* teaching methods in pre-tests’ scores between CG and TG and their post-tests’ scores between CG and TG. In the scores of pre-tests of *College English* between the two groups (CG, TG), there was no significant difference (t=.41, P=.68) between CG (M=338.27, S=57.22) and TG (M=337.41, S=56.77). However, after the experiment, in the scores of post-tests, a significant difference (t=-2.10, P=.04) was found between the two groups: CG (M=343.66, SS6.10=) and (M=352.56, S=55.49) in the *College English* tests. After the instruction of traditional *College English* method and M-learning in the flipped classroom model in *College English*, all the 180 non-English-majored undergraduates’ *College English* applied ability mean scores were higher than their *College English* applied ability mean scores before the experiment. However, after the instruction of M-learning in the flipped classroom model in *College English*, the participants’ mean scores of TG (M=352.56) were higher than that of the participants’ mean scores of CG (M=343.66).
Table 1. Results of non-English-majored undergraduates’ College English scores of pre-test and post-test

<table>
<thead>
<tr>
<th>Groups</th>
<th>Tests</th>
<th>CG (N=90)</th>
<th>TG (N=90)</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td>338.27</td>
<td>57.22</td>
<td>337.41</td>
<td>56.77</td>
<td>.41</td>
</tr>
<tr>
<td>Post-test</td>
<td>343.66</td>
<td>56.10</td>
<td>352.56</td>
<td>55.49</td>
<td>-2.10</td>
</tr>
</tbody>
</table>

M stands for Mean; S stands for standard deviation; *P<.05; **P<.01.

Results of the T-Test about Males and Females in CG and TG taught by different College English approach

Table 2 showed that significant differences were found between males and females in the two groups: CG and TG. Males (P=.01) suggested that a significant difference was found between CG and TG in their College English applied ability after M-learning in the flipped classroom and females (P=.02) suggested that a significant difference was found between CG and TG in their College English applied ability after M-learning in the flipped classroom model.

Table 2. Results of the T-Test about Males and Females in CG and TG taught by different College English approach

<table>
<thead>
<tr>
<th>Gender</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability</td>
<td>.01*</td>
<td>.02*</td>
</tr>
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</table>

*P<.05; **P<.01.

Results of responses of interviews from non-English-majored undergraduates in TG on College English teaching and learning through M-learning in the flipped classroom model

Before the experiment of M-learning in the flipped classroom on non-English-majored undergraduate students’ College English was ended, interviews were held from June 2, 2017 to June 16, 2017 via QQ in a teacher office to gain the responses from participants in TG on the College English teaching and learning method of M-learning in the flipped classroom model. All the 90 participants in TG as volunteers attended interviews to provide their answers to the following three written questions: 1. Do you think M-learning in the flipped classroom model in College English has improved your College English applied skills and College English applied ability? 2. Was it difficult for you to apply M-learning in the flipped classroom model in your future English learning even work practice? 3. What do you learn about M-learning in the flipped classroom model in College English?

Among 90 participants in TG, 69 participants said that they had to spend the more time in College English learning due to watching College English teaching videos online via the smart phones or downloaded via smart phones, then completing the course learning tasks sent by the College English teacher and self-test learning tasks online via the smart phones before the College English class, but their College English applied skills and College English applied ability had been improved because they could learn the course at their own pace and time online via their smart phones to watch the College English instructor’s teaching videos more times outside of the classroom and they could provide their questions online to get helps from the College English teacher online; in class, they could discuss the College English problems they met in learning College English with their classmates or the instructor face-to-face to increase their participation in the classroom to strengthen their grasp in College English, and they could gain their comprehensive College English evaluation from their College English instructor according to their learning practice in class and out of class online record; 10 participants told that it was really difficult for them to complete their College English learning tasks through watching the College English instructor’s teaching videos online via their smart phones, and they also thought College English was difficult to them because they could not spend the more time in College English learning by themselves out of the flipped classroom online learning and did not know how to discuss their questions with their group members in class; 11 participants said that they did not have ideas on M-learning in the flipped classroom model in their College English. 80 participants thought M-learning in the flipped classroom model in College English teaching and learning was beneficial to their College English performance and improvement of their College English applied skills and ability because they could learn the course at their own pace, time, place online without the limitations of class time, place and they could not only prepare for College English but also learn the course online via their smart phones in advance to increase the participation in the classroom; but 10 participants thought M-learning in the flipped classroom model in College English teaching and learning was not beneficial to their College English learning because they could not control themselves to spend their online learning time to other things such as playing online games, watching online movies, online shopping, and spending a long time mobile online learning was harmful to their eyesight.

Discussion

The authors in this study want to investigate the answers to the three questions. One of the purposes in this study is to investigate if the College English teaching and learning through M-learning in the flipped classroom model can improve non-English-majored undergraduates’ College English applied skills and ability. Improvement of participants’ College English applied skills and ability in TG shows the important role of the flipped classroom model played for non-English-majored undergraduates’ College English learning.

According to the results in Table 1, we find that participants in this study trained by the different College English instruction methods: the traditional College English model for CG and M-learning in the flipped classroom model for TG, participants’ College English applied skills and ability scores in two groups (CG and TG) were both improved. However,
the TG’s scores were higher than that of the CG’s, which means that the M-learning in the flipped classroom model can improve non-English-major undergraduates’ *College English* applied skills and ability. The results in this study agree with findings in the study of Hiroyuki Obari and Stephen Lambacher (2015). We think that M-learning in the flipped classroom model encourages non-English-major undergraduates to watch the *College English* teaching videos made by the instructor online or downloaded online via their smart phones to complete their learning tasks *College English* knowledge self-tested by themselves online mobile learning before the College English class, and in college English class, they are organized or guided by their *College English* instructor to share what they have learned or to discuss their questions in learning *College English* with their classmates in groups in class to get help from the classmate or the instructor, after class they can get their comprehensive *College English* evaluation from their instructor. We may find that M-learning in the flipped classroom model agrees with the theory of Constructivism to encourage non-English-major undergraduates learn knowledge by themselves (according to the theory of Constructivism, knowledge is not taught but is learned by the learner himself through constructing the new knowledge on the basis of old knowledge, under certain settings) and M-learning in the flipped classroom model, provides students mobile learning *College English* in any time, any place and helps from their classmate or their instructor if they met questions in learning *College English*, agrees with the theory of Constructivism (with the help of others, such as the teachers or learning partners), and utilizes certain study resources (such as smart phones, teaching videos, online resource).

After trained by M-learning in the flipped classroom model, most of male and female non-English-major undergraduate students in TG successfully learn how to improve their *College English* applied skills and ability by completing their learning tasks and *College English* knowledge self-tested, then in College English class, they discuss their questions related to *College English* with their group members or their instructor to get help from them, so they show better in learning *College English*, compared with male and female non-English-major undergraduates in CG. And there are significant differences between males and females in CG and TG. Male and female English-major undergraduate students in TG could have the opportunity to discuss their questions or difficulties with their group members or their instructor, so their group members or their *College English* instructor help them solve their questions or difficulties they met during their *College English* learning process, which would provide chances for non-English-major undergraduate students in TG to improve their *College English* applied ability because of their *College English* learning questions or difficulties being solved.

Non-English-major undergraduates in TG generally holding positive responses for M-learning in the flipped classroom model suggests that M-learning in the flipped classroom model applied into regular non-English-major undergraduate students *College English* curriculum is a worthy try. Results in this study agree with findings in the study of Hiroyuki Obari and Stephen Lambacher (2015): “students were satisfied with their flipped classroom lessons and motivated by the Blended Learning (BL) environment that incorporated mobile learning”(p.433). The M-learning in the flipped classroom model is tentative method for non-English-major undergraduates to learn how to learn *College English*. Although 69 participants in TG think M-learning in the flipped classroom model has improved their learning *College English*, but M-learning in the flipped classroom *College English* teaching and learning model is not beneficial to all 90 participants in TG, so the instructor needs help solve learners’ learning difficulties such as how to provide more chances for students to apply the *College English* knowledge and how to control themselves in spending time in playing online games. All the 90 participates, they could learn the course at their own pace, time, places without the limitations of class and limited class time, and they could prepare for the course via their smart phones mobile learning in advance to increase the participation in the classroom and strengthen their grasp with *College English* knowledge.

**Limitations and Suggestions for Further Research**

Though the present study has investigated a survey of M-learning in the flipped classroom model among the 90 non-English-major undergraduate students in *College English* teaching and learning, there are still some limitations in the study.

Firstly, time limitation (only 4 months from February 20, 2017 to June 20, 2017) and other practical restrictions such as the participants in the study consisted of only 180 non-English-majored undergraduate students in one university are needed to be broadened in further research.

Secondly, the instruments used in this study to investigate the non-English-majored undergraduate students’ *College English* instruction involve two tests to measure non-English-majored undergraduate students’ *College English* applied ability and interviews to gain responses from participants on the new teaching and learning method. The study would be much better, if it were combined with other instruments such as verbal report. More instruments should be used in investigating in the further research.

Finally, participants in this study were the non-English-majored undergraduate students in only one university. The study will be better if more participants from other universities can be participated in the experiment.

Despite of the restraints of the study, we hope that it can offer some guidelines for further research of M-learning in the flipped classroom model on non-English-majored undergraduate students’ *College English*.

**Conclusion**

Taken as a whole, these results in this study would indicate that M-learning in the flipped class model can
effectively be integrated into the language learning curriculum and play a positive role in improving the language proficiency of second language learners Hiroyuki Obari and Stephen Lambacher (2015). The results in this study showed that 1) compared with a teacher-dominated approach for CG, M-learning in the flipped classroom model in teaching the course College English for TG did a better job in enhancing students’ ability applied in College English; 2) there were significant differences between males in CG and TG, and females in CG and TG; 3) participates in TG hold positive opinions towards mobile-learning in the flipped classroom model. M-learning in the flipped classroom model increases non-English-major English majors' undergraduates English knowledge input and improve their English applied skills and ability, but the instructor needs teach students how to use the mobile devices such as smart phones properly.

References
Bergmann J, Sams A. 2012. Flip your class: Reach every student in every class every day. Washington D.C.: International Society For Technology In Education
Fan Wenxiang, Ma Yan, Li Kai, Qiu Bingfa. 2015. A Practical Study in the Flipped Classroom Based on WeChat under Environment of Mobile Learning. Open Education Research, 21(3): 90-97.
Junko Y. 2013. FLIPPED APPROACH TO MOBILE ASSISTED LANGUAGE LEARNING. International Conference Mobile Learning 2013:221-224.