# Effects of Mobile-Learning in a flipped classroom Model on Non-English-Majored Graduates in Graduate English

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**Abstract：** This paper reviewed a one-term experiment on mobile-learning(M-learning) in a flipped classroom model in teaching the curriculum *Graduate English* to 122 first-year non-English-majored graduate students majored agriculture, plant protection, floriculture, history, economics, business and veterinary from Yangtze University as participants. Participants in this study consisted of 61 non-English-majored graduate students in the control group (CG) and 61 non-English-majored graduate students in the treatment group (TG). The process of mobile-learning(M-learning) in a flipped classroom model in teaching the course *Graduate English* was divided into the three parts: M-learning outside of a flipped classroom, M-learning in-class of a flipped classroom and M-learning outside of a flipped classroom. The results showed that 1) compared with a teacher-dominated approach for CG, M-learning in a flipped classroom mode, student-centred approach, in teaching the course *Graduate English* for TG did a better job in enhancing students' ability applied in Graduate 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 a flipped classroom model.

**Keywords:** A flipped classroom, Mobile-Learning Non-English-majored,

## 1. Introduction

Technologies have changed our education environment. Advanced devices have been applied in education to improve English teaching and learning. Non-English-Majored graduates 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 graduates in learning *Graduate 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 a flipped classroom model on non-English-majored graduates in *Graduate English*. In mobile learning age, students watch *Graduate 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 the precious class time, students are led by the course instructor and organized to be divided into groups to discuss and share with their classmates on *Graduate 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).

## 2. 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 students are the center of teaching and student-centered methodology should be used. That is to say, the students are the center of teaching and the teachers work as the organizer, facilitator and motivator, utilizing setting, cooperation and dialogue to motivate students' interests, activities and creative. Teachers should meet the students' needs in learning English. The The M-learning in a flipped classroom modelagrees with the theory of Constructivism.

Mobile-learning in a flipped classroom teaching and learning model has got popularity and attention in recent years. Many researchers have studied mobile-learning in a 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 a flipped classroom to conceptualize the use of mobile technology applications to promote proficiency among language learners. The idea of a 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 "a 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 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 graduates are required to learn *Graduate English* to improve their Graduate English Test (CET) scores and pass their CET6. .

In China, there are researchers to study mobile learning in a flipped classroom. FAN Wenxiang et al. (2015) reported a practical study in a 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 graduates, English-majored graduates, graduates. Fang Xinmin and Zeng Haijun (2017) studied new training model of a flipped classroom based on mobile learning. However, their study targets were adults with jobs and their study targets were trained in a short time. Wen-Chi Vivian Wu *et al*.(2017) reported their study on creating an online learning community in a a flipped classroom to enhance EFL learners' oral proficiency. The participants in their study were 50 English-major sophomores enrolled in required English Oral Training classes at a four-year university in central Taiwan. From the literature review above, there was few studies on effects of mobile learning in a flipped classroom model in *Graduate English* in Mainland China. In this paper, we shall examine effects of mobile learning in a flipped classroom model in *Graduate English* in Mainland China.

## 3. Methodology and Data Collection

### 3.1 Research Design

This study included two tests related to the course *Graduate English* to provide the information on non-English-majored graduate students' scores of *Graduate English* before and after trained by The M-learning in a flipped classroom modeland interviews on The M-learning in a flipped classroom model.T he following research questions would be answered in this study:

1) As a result of implementing The M-learning in a flipped classroom model, were there any significant differences between CG's and TG's improvement in *Graduate English* applied skills and ability?

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

3) What opinions did participates in TG hold towards The M-learning in a flipped classroom model?

### 3.2 Subjects

In September, 2016, 122 first-year Non-English-majored graduates majored agriculture, plant protection, floriculture, history, economics, business and veterinary from Yangtze University were volunteers in the current study. 122 first-year graduate students, taught by the same male instructor during the whole academic term (September 5, 2016 to December 16, 2016), were 69 females and 53 males, their average age23 ranged from 21-26, Chinese as their first or mother language. All 122 participants taught by the 43-year-old male *Graduate English* instructor were divided randomly into two groups: 61 participants as the Control Group (CG) with the traditional grammar-translation teaching method and 61 participants as the Treatment Group (TG) with M-learning in a 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.

### 3.3 Instruments

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

### *Graduate English* **applied ability pre-test**

All the 122 non-English-majored graduates were attended the *Graduate English* applied tests at 14:30-16:30 on September 13, 2016 in one classroom to gain students' scores on *Graduate English* applied ability in CG and TG before the experiment. All the 122 non-English-majored graduates were required to complete the tests in two hours. The *Graduate English* applied ability test materials in this study were taken from June, 2015 National Graduate English Test 6 (short for CET6), total 710 for CET6.

### *Graduate English* **applied ability post-test**

All the 122 Non-English-majored graduates were attended the *Graduate English* applied ability tests    at 14:30-16:30 on December 21, 2016 in one classroom to gain students' scores changes in *Graduate English* applied ability between CG and TG after the experiment. All the 122 non-English-majored graduates were required to complete the tests in two hours. The *Graduate English* applied ability tests materials were taken from June 2016 National Graduate English Test 6 (short for CET6), total 710 for CET6.           .

### *Interview*

After the experiment, all 61 participants in TG in this experiment were interviewed via QQ (a kind of on-line instant message service tool in China) lasted two weeks before the end of experiment and were required to fill out the following interview questions: 1) Do you think The M-learning in a flipped classroom modelhas improved your English applied skills or ability? 2) What are difficulties when you participate in applying M-learning in a flipped classroom in *Graduate English*? 3) Do you think The M-learning in a flipped classroom modelin *Graduate English* is beneficial to all of you in TG?

### 3.4 Data Collection and Analysis

Two tests on *Graduate English* applied skills or ability before the research experiment (September 13, 2016) and two tests on *Graduate English* applied skills or ability (December 21, 2016) were conducted to compare scores changes between CG and TG of non-English-majored graduate students in the course *Graduate English*. The analytic method, comparison of means, was adopted to compare the two groups of non-English-majored graduate students' average scores of their pre-test and post-test on the basis of samples. And another analytic method, 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. One of qualitative research method, the interview, was conducted to

collect responses from participates in TG on M-learning in a flipped classroom. Before the experiment of M-learning in a flipped classroom on non-English-majored graduate students' *Graduate English* was ended, interviews were held from December 5, 2016 to December 16, 2016 via QQ in a classroom to gain the responses from participants in TG on the *Graduate English* teaching and learning method of The M-learning in a flipped classroom model.

## 4. Process of The M-learning in a flipped classroom modelin Graduate English Teaching and Learning

ACTIVE *ENGLISH FOR POSTGRADUATES (Reading and Writing)* published by FOREIGN LANGUAGE TEACHINGAND RESEARCH PRESS as the textbook was used in teaching *Graduate English* for non-English-majored graduates in CG and TG. In the experiment, participants in the control group were instructed by the traditional grammar-translation Graduate English teaching and learning model (teachers explain knowledge points and difficult sentences in the passages through grammar-translation method, then students listen to teachers' explanation and answer the questions from the *Graduate English* teacher). However, participants in the treatment group were instructed by The M-learning in a flipped classroom model. The new teaching model: The M-learning in a flipped classroom modelin *Graduate English* in the current study was divided into three parts: outside of the *Graduate English* class, in class of *Graduate English* and outside of *Graduate English* class. The first part, outside of the *Graduate English* class, was that participants in TG learned knowledge on watched the videos on *Graduate English* texts made by the Graduate English teacher online or downloaded via students' mobile devices such as their smart phones outside of a flipped classroom to complete the Graduate English texts learning tasks and self-tested tasks before the Graduate English class and to make the summary of the texts they learned. The students can communicate with the *Graduate English* instructor about the course *Graduate English* learning via the communication platform online via QQ or WeChat (a kind of on-line instant message service tool in China) by their smart phones if students want to ask the instructor questions related to *Graduate English*. The second part, in Graduate English class, was that the *Graduate English* instructor organized and guided students learning *Graduate English* through independent study, collaborative learning, group discussion, achievement exchange and reports. For example, 3-4 students can be organized as one group according to their wills to discuss and share their learning to solve their *Graduate English* learning questions they met. Then the representative of every group made the summary of his or her group's *Graduate English* learning achievement. In class of a flipped classroom in teaching *Graduate English*, the instructor organized and guided the students' learning activities also joined in students' discussion to scaffold their *Graduate English* learning. The third part, outside of M-learning in a flipped classroom on *Graduate English*, was that the students needed write their lesson summary about their learning in class, and submitted their lesson summary online via their smart phones or other mobile devices to their *Graduate English* instructor; then students could read the comprehensive evaluation and feedback of their *Graduate English* from the instructor online via their smart phones or other mobile devices. The graduate students could watch Graduate English videos made by the Graduate English instructor many times in any time

online without place limitation.

## 5. Results

The results in this study included three parts. The first part was *Graduate 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 *Graduate English* teaching model compared to TG with The M-learning in a flipped classroom model. The last part was responses to interviews on M-learning in a flipped classroom in *Graduate English* teaching and learning from non-English-majored graduates in TG.

### 5.1 Effects of The M-learning in a flipped classroom modelinstruction and traditional instruction on non-English-majored graduates' *Graduate English* performance

Table1 showed that non-English-majored graduate students' *Graduate 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 Graduate 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 *Graduate English* between the two groups (CG, TG), there was no significant difference (t=.533, P=.596) between CG (M=383.492, S=27.293) and TG (M=382.656, S=25.629). However, after the experiment, in the scores of post-tests, a significant difference (t=-2.344, P=.022) was found between the two groups: CG (M=389.082 S=22.594) and (M=395.344, S=24.003) in the *Graduate English* tests. After the different instructions, traditional *Graduate English* method and The M-learning in a flipped classroom modelin *Graduate English*, all the 122 non-English-majored graduates' English applied ability mean scores were higher than their English applied ability mean scores before the experiment. However, after the instruction of The M-learning in a flipped classroom modelin *Graduate English*, the participants' mean scores of TG (M=395.344) were higher than that of the participants' mean scores of CG (M=389.082).

**Table1 Results of non-English-majored graduates' *Graduate English* scores of pre-test and post-test**

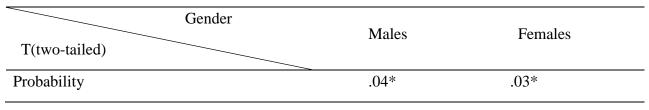| Tests / Groups | CG(N=61) | | TG (N=61) | | t | P |
|---|---|---|---|---|---|---|
| | M | S | M | S | | |
| Pre-test | 383.492 | 27.293 | 382.656 | 25.629 | .533 | .596 |
| Post-test | 389.082 | 22.594 | 395.344 | 24.003 | -2.344 | .022* |

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

### 5.2 Results of the T-Test about Males and Females in CG and TG taught by different *Graduate English* approach

Table 2 showed that significant differences were found between males and females in the two

groups: CG and TG. Males (P=.04) suggested that a significant difference was found between CG and TG in their *Graduate English* applied ability after M-learning in a flipped classroom and females (P=.03.) suggested that a significant difference was found between CG and TG in their *Graduate English* applied ability after M-learning in    a flipped classroom model.

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

| Gender<br>T(two-tailed) | Males | Females |
|---|---|---|
| Probability | .04* | .03* |

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

### 5.3 Results of responses of interviews from non-English-majored graduates in TG on Graduate English teaching and learning through The M-learning in a flipped classroom model

Before the experiment of M-learning in a flipped classroom on non-English-majored graduate students' *Graduate English* was ended, interviews were held fromDecember 5, 2016 to December16, 2016 via QQ to gain the responses from participants in TG on The M-learning in a flipped classroom modelin *Graduate English*. All the 61 participants in TG as volunteers attended interviews to provide their answers to the following three written questions: 1. Do you think The M-learning in a flipped classroom modelin *Graduate English* has improved your *Graduate English* applied skills and *Graduate English* applied ability? 2. Was it difficult for you to apply The M-learning in a flipped classroom modelin your future *English* learning even work practice? 3. What do you learn about The M-learning in a flipped classroom modelin *Graduate English*?

There were different responses from participates in TG on the M-learning in a flipped classroom in *Graduate English.* Among 61 participants in TG, 58 participants said that they spent the more time in learning *Graduate English* because they had to  watch *Graduate English* teaching videos online via the mobile devices or downloaded via their mobile devices, then completing the course learning tasks sent by the Graduate English teacher and self-test learning tasks online via their mobile devices before they attended the *Graduate English* class, but their *Graduate English* applied ability had been improved after trained by the new teaching and learning method because they could learn the course at their own pace and time online via their mobile devices to watch the *Graduate English* instructor's teaching videos with the voice and pictures more times outside of the classroom, which enhanced their interests in learning Graduate English, and they could provide their questions online to get helps from the Graduate English teacher or classmates online; in class, they could discuss the *Graduate English* problems they met in their self-taught with their group members or the instructor face-to-face to increase their participation in the classroom to strengthen their grasp *Graduate English* knowledge, especially their oral English,

and they could gain their comprehensive *Graduate English* evaluation from their *Graduate English* instructor according to their behavior such as discussion, presentation    in class and out of class online record; 3 participants told that it was really difficult for them to complete their *Graduate English* learning tasks through watching the instructor's teaching videos online via their smart phones, and they also thought *Graduate English* was difficult for them because they could not spend the more time in *Graduate English* learning by themselves out of a flipped classroom online learning and did not know how to discuss their questions they had with their group members in class. 59 participants told that the new teaching and learning method, the The M-learning in a flipped classroom modelin *Graduate English,* was beneficial to their *Graduate English* performance and improvement of their *Graduate English* applied skills and ability because they could learn the course at their own pace, time, place online without suffering the limitations of class time, place and they could not only prepare for *Graduate English* but also learn the course online via their smart phones in advance to increase the participation in the classroom; however, 2 participants thought the new teaching and learning method, the The M-learning in a flipped classroom modelin *Graduate English* was not beneficial to their *Graduate 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, which distracted their mind from their learning Graduate English, so much of their time was wasted online.

## 6. Discussion

The authors in this study want to investigate the answers to the three questions.

**Research Question 1**: As a result of implementing The M-learning in a flipped classroom model, were there any significant differences between CG's and TG's improvement in *Graduate English* applied skills and ability?

According to the results in Table 1, we find that participants in this study trained by the different *Graduate English* instruction methods: the traditional *Graduate English* model for CG and The M-learning in a flipped classroom modelfor TG, participants' *Graduate English* applied skills and ability scores in two groups (CG and TG) were both improved. However, after the experiment, the TG's scores are higher than that of the CG's, which means that the The M-learning in a flipped classroom modelcan improve non-English-majored graduates' *Graduate English* applied skills and ability. The results in this study agree with findings in the study of Hiroyuki Obari and Stephen Lambacher (2015) and agree with findings in the study of Wen-Chi Vivian Wu et al. (2017).We think that The M-learning in a flipped classroom modelencourages non-English-majored graduates to watch the *Graduate English* teaching videos made by the instructor online or downloaded online via their smart phones to complete their learning tasks *Graduate English* knowledge self-tested by themselves online mobile learning before the Graduate English class, and in Graduate English class, they are organized or guided by their *Graduate English* instructor to share what they have learned or to discuss their questions in learning *Graduate English* with their classmates in groups in class to get help from the

classmates or the instructor, after class they can get their comprehensive *Graduate English* evaluation from their instructor. We may find that The M-learning in a flipped classroom modelagrees with the theory of Constructivism to encourage non-English-majored graduates 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 The M-learning in a flipped classroom model, provides students mobile learning *Graduate English* in any time, any place and helps from their classmates or their instructor if they met questions in learning *Graduate 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).

Research Question 2: Were there any significant differences between male non-English-majored graduate students and female non-English-majored graduate students in CG and TG?

After trained by the M-learning in a flipped classroom model, most of male and female non-English-majored graduate students in TG have successfully learned how to improve their *Graduate English* applied skills and ability by completing their learning tasks and *Graduate English* knowledge self-tested, then in Graduate English class, they discuss their questions related to *Graduate English* with their group members or their instructor to get help from them, so they show better in learning *Graduate English*, compared with male and female non-English-majored graduates in CG with the traditional teaching and learning method without chances to discuss their questions with classmates or the instructor. And there are significant differences between males and females in CG and TG. Male and female non-English-majored graduate 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 the *Graduate English* instructor could help them solve their questions or difficulties they met during their independent *Graduate English* learning process, then their *Graduate English* learning questions or difficulties are solved.

Research Question3: What opinions did participates in TG hold towards the M-learning in a flipped classroom model?

Non-English-major graduates in TG generally hold positive responses for the M-learning in a flipped classroom model, which suggests that the M-learning in a flipped classroom model applied into regular non-English-majored graduate students *Graduate 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 a flipped classroom lessons and motivated by the Blended Learning (BL) environment that incorporated mobile learning"(p.433). The M-learning in a flipped classroom model is tentative method for non-English-majored graduates to learn *Graduate English*. Although 58 participants in TG think the M-learning in a flipped classroom model has improved their learning *Graduate English*, but the M-learning in a flipped classroom model in *Graduate English* is not beneficial to all 61 participants in TG, so the instructor needs help solve learners' learning difficulties such as how to provide more chances

for students to apply the *Graduate English* knowledge, how to protect students' eyesight when using the mobile devices to learn graduate English online, how to control students themselves in spending time in playing online games. All the 61 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 mobile devices in advance  so they could save the precious time in class to increase the participation in discussion, presentation, problem-solving and strengthen their grasp *Graduate English* knowledge.

**Limitations and Suggestions for Further Research**

Though the present study has investigated a survey of the M-learning in a flipped classroom model among the 61 non-English-majored graduate students in *Graduate English* teaching and learning, there are still some limitations in the study.

Firstly, time limitation (just more than 3 months from September 5, 2016 to December 16, 2016) and other practical restrictions such as the participants in the study consisted of only 122 non-English-majored graduate students in one university in mainland China are needed to be broadened in further research.

Secondly, the instruments used in this study to investigate the non-English-majored graduate students' *Graduate English* instruction involve two tests to measure non-English-majored graduate students' *Graduate 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 graduate students in only one university in mainland China. The study will be better if more participants from other universities all over the world 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 The M-learning in a flipped classroom model on non-English-majored graduate students' *Graduate English*.

**7. Conclusion**

The paper wants to investigate effects of the M-learning in a flipped classroom model in *Graduate English*. Taken as a whole, these results in this study would indicate that the M-learning in a 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, the M-learning in a flipped classroom model in teaching and learning the course *Graduate English* for TG did a better job in enhancing students' English ability applied in Graduate English; 2) there were significant differences between males in CG and TG, and females in CG and TG; 3) generally, participates in TG hold

positive opinions towards the M-learning in a flipped classroom model. The M-learning in a flipped classroom model increases non-English-majored graduates English knowledge input and their English applied skills and ability are improved, but the instructor needs teach students how to use the mobile devices properly in learning *Graduate English*.

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