

A Case Study of College Students' EFL Learning Experiences on Mobile Phone Applications

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Abstract—Mobile English learning (MEL) has become increasingly popular for its diverse advantages especially since the global COVID-19 pandemic. While a lot of studies have confirmed effectiveness of the mobile approach to learning English in a pedagogical context, there is very limited research that focuses on how students' MEL experiences vary depending on their individual habits and behaviors out of class. This study is aimed to explore college students' experiences of learning English as a foreign language (EFL) on mobile phone terminals. To this end, the study was conducted with a sample of 359 undergraduate students from 5 different grades by looking into their time spent after class in learning English on mobile phone applications (MPA), their practice preferences in MEL, the number of MPA used and their views on the helpfulness of EFL learning on MPA. The quantitative results derived provide a relatively comprehensive knowledge of the present situation of MEL in a higher education context. Statistically significant findings of the study are hopefully to offer insights for both policymakers and instructors in higher institutions to understand and promote MEL from more scientific and multi-dimensional perspectives.

Index Terms—mobile English learning, undergraduates, mobile phone applications, EFL, gender differences

I. INTRODUCTION

The past two decades have witnessed a booming growth of mobile learning (m-learning) in all levels of education across the globe brought about by technology. Thanks to the mobility and connectivity, the use of portable devices such as mobile phones is beginning to have an impact on how learning takes place in many disciplines and contexts, including language learning (Hulme, 2009). M-learning has a great advantage over traditional learning as learning process and management can be done online and accessible at anytime and from anywhere (Anshari et al., 2017). M-learning on portable devices such as laptops, tablets and smartphones (mobile phones) have dramatically redefined the process of learning by making learning ubiquitous through instant connectivity to the Internet.

With the advent of the 5th generation mobile communication technology, m-learning on smartphones is now taking place in an unprecedented manner. A mobile phone is such an integrated and handy computer with traditional phone functions that it has become a daily necessity. As mobile phones become an integral part of modern life worldwide, learning by mobile phones is also on the rise. Language users in higher education increasingly use out-of-class self-directed learning facilitated by mobile technology (Lai et al., 2022).

According to the latest statistical report released by China Internet Network Information Centre (CINIC), while the Internet is now deeply integrated into people's daily life, mobile phones have become the most widely accepted terminal for people to access the Internet in China (CINIC, 2022). Among over 1.03 billion Chinese Internet users, 99.7% of them get the connection with their mobile phones, followed by 35% with desktop computers, 33% with laptops and 27.4% tablets (CINIC, 2022), which may suggest a tendency of studying online nationwide as well. In fact, mobile phones are indeed a pervasive device for students in higher educational institutes. Apart from the basic needs such as social networking and mobile payment, students can find many reasons to use their mobile phones both in and out of class. In many universities for example, students are required to use their mobile phones to sign in for the course and participate in various learning activities in class. Instructors are also prone to mobile devices such as smartphones for grading and tracking students' assignments or collaborative learning in real time. In this case, students have to remain connected and access information and knowledge online through mobile phones inside and outside the classroom.

Although m-learning has become increasingly popular in schools, colleges and universities across the globe in recent years, especially after the COVID-19 pandemic, a large number of studies focus on language teaching and learning contexts, MEL in particular. MEL seems to make learning English easier and more fascinating to students. With user-friendly design, diverse learning resources with multi-interactive experience and high compatibility across operating systems, various English learning applications (app) have found their positions in students' mobile devices, smartphones in particular. Even those who were not keen on English cannot help but turn to the apps and begin to take a fresh look at learning the language. Many students are impressed by the immersive learning experience provided by rich and real audio-visual materials in mobile apps. The popularity of MEL is not only attributed to a better learner experience compared with the traditional mode of English learning, but also the effectiveness of learning. The use of

mobile phones and their apps could generate positive effects on learning English as a foreign language, especially in the development of learners' vocabulary and their increased motivation to study (Klímová, 2018; Lin, 2014; Yudhiantara & Nasir, 2017).

However, while most studies speak highly of MEL, some researchers tend to make the assessment from a different perspective and argue that the effectiveness of MEL has been overstated. For example, Kuznekoff and Titsworth (2013) found that students who were not using their mobile phones could write down considerably more information in their notes, were able to recall more details from the lecture and had much better grades than those who were actively using their mobile phones. This is in accordance with the finding by Fried (2008) that students who spent considerable amount of time using electronic devices such as mobile phones decreased in self-reported understanding of course material and the overall course performance. Incorporating mobile phones in the learning process needs to counter the misuse of activities in class (Anshari et al., 2017). Frequently, students are not self-disciplined in MEL as required and they may use their mobile devices for pleasure purposes other than learning. Besides, instant messages from social media, sudden phone calls or app popups, etc. can be great disturbance in the process of MEL as well. What's more, the quality of learning materials online may not be desirable and even unreliable for pedagogical purposes (Shen, 2016; Yang, 2020). Overall, these scholars tend to see mobile devices used by students for English learning as interference rather than assistance. To them, students' use of mobile devices (phones) has taken learning far away from its original purpose and even out of control.

In addition, in order to discourage m-learning, there are studies that try to examine the negative effects of smartphone radiation on students. According to Zhong et al. (2013), there is a significant connection between mobile phone radiation and students' memory capacity for learning. In other words, the more radiation students receive from mobile phones, the less capacity of memory they will be equipped with for learning. The radiation from mobile learning also poses threat to students' sensory system, causing visual and hearing impairments (Li et al., 2017) for example. Generally, all electronic products are probably endowed with radiation, the damage of which is closely related to how long people are exposed to them. Long exposure to mobile phones has given rise to another problem with regard to m-learning: students' reliance on mobile phones or smartphone addiction, which is immensely associated with sleep quality. According to Schweitzer et al. (2017), students with considerable screen time of mobile phones face greater difficulty falling asleep at night and are also more likely to have sleeping disorders. Students' obsession with mobile phones would also result in their reduction of interpersonal skills and quality physical interactions (Kosnik & Dharamshi, 2016).

Despite the negative voices arising from time to time in MEL, the majority of studies tend to believe that learning English with smart apps on portable devices, mobile phones in particular, is becoming a trend across the world, especially for students and instructors in higher institutions. A large number of studies in China have examined and confirmed the popularity and effects of learning English through MPA for college students in different learning contexts such as vocabulary (Cui, 2018; Qiao, 2020), listening (Li et al., 2017; Zhang, 2020), speaking (Liu et al., 2021; Pei, 2019), writing (Geng, 2021; Hu & Zhang, 2014), reading (He, 2018; Wang & Jiang, 2021), translation (Luo, 2018; Zhu, 2014) etc.. Most of the studies tend to shed light on MEL with smartphones from a pedagogical perspective, where students more than often are engaged in MEL under pressure from the course and supervision from instructors. In this case, those junior and senior students in college who have freed from the required English course program (Ministry of Education, 2020) are usually neglected in such research. In fact, however, many students without the course requirement are still learning English on their own for different purposes. What's more, even for those, freshmen for example, who have received most research attention with regard to MEL on smartphones, there are so far few studies that focus on how students' MEL experiences vary depending on their individual habits and behaviors, especially out of class. Therefore, there is a need to understand how students, in a more natural condition, are learning English through MPA from a comprehensive perspective by taking students of all year levels into account.

II. DESIGN AND METHODOLOGY

A. *Objective of the Study*

This study aims to explore the present situation of college students' English learning experiences on mobile phone applications. Specifically, it tries to find out the answers to three research questions (RQ) as follows:

RQ1: What are the characteristics of college students' MEL on MPA?

RQ2: What are students' attitudes towards their MEL experiences on MPA?

RQ3: Do gender differences make a difference in students' MEL experiences?

B. *Methods*

In order to reach a relatively full coverage of samples, a stratified sampling method was adopted in the survey to target students in different grades from a Chinese university. 500 questionnaires were distributed with the support of the Student Union of the university with each grade 100 copies. The questionnaire consisted of 7 questions with multiple-choice options concerning variables in students' MEL on mobile phones such as the number of English learning apps they used, time spent in learning English per week on the apps, learning preferences, and their views on the effectiveness of learning English on mobile phones in addition to their genders and grades. Since there was no

significant difference in students' time spent on MEL in the classroom, this study focused on their time allocated for learning English per week on smartphone apps out of class.

C. Participants and Data Collection

The survey was conducted from November 7 to December 5, 2021. A total of 377 undergraduate students from 5 grades were involved in the study, in which 11 incomplete or non-conforming samples were excluded and 7 samples who reported not having smartphone apps for MEL were considered invalid given the purpose of the study. Finally, 359 valid samples with 187 (52.1%) female students and 172 (47.9%) male ones, included 89 freshmen, 81 sophomores, 74 juniors, 62 seniors and 53 fifth medical graders. A quantitative approach with comparison was applied to data analysis in the study.

III. RESULTS

Statistical results derived were presented in accordance with the research questions of this study.

A. Characteristics of College Students' MEL on MPA

The characteristics of students' MEL experiences on MPA were mainly explored in three dimensions as follows: the number of MEL apps used, time invested out of class in MEL and their MEL preferences on MPA.

(a). The Number of MPA Used by Students in MEL

As to how many apps they used to learn English on their smartphones, 38.4% undergraduate students reported 3, followed by 26.5% who reported 2, 14.8% using 4 and 7.8% more than 4. Meanwhile, there were 12.5% students who said they deployed only one app in learning English on their mobile phones. As is shown in Figure 1, most undergraduate students would use 2-3 apps when learning English on their mobile phones.

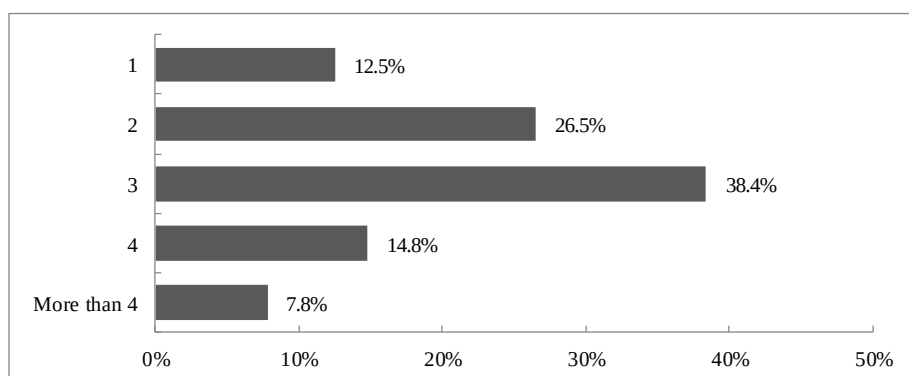


Figure 1 The Number of MPA Used for MEL by Students (N=359)

(b). Students' Time Spent on MEL

Figure 2 shows that most undergraduate students (64.6%) tended to spend less than 3 hours (H) on a weekly basis in learning English through mobile phones after class, in which 25.3% students reported investing less than 1 hour in MEL every week. Students who spent 1-3 hours (39.3%) per week on MEL outside class were almost three times as many as those who would spend 3-5 hours (13.6%). Besides, 12.3% students reported spending 5-7 hours per week in learning English on smartphones after class while only 9.5% said they would invest more than 7 hours a week doing so.

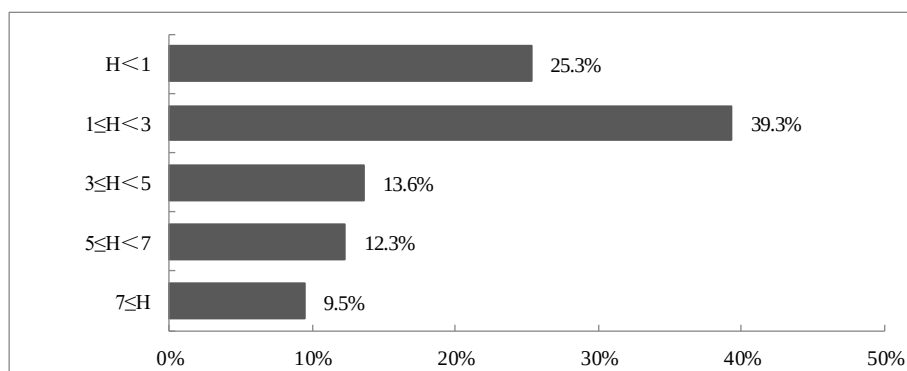


Figure 2 Students' Time Spent per Week on MEL After Class (N=359)

(c). *Students' Practice Preferences in MEL*

When it came to their practice preferences in MEL on MPA, students were required to choose no more than 3 options among the 6: listening, speaking, reading, writing, translation and vocabulary. Figure 3 reveals that vocabulary learning was seen as a top priority for the majority of undergraduate students (82.2%) when learning English on mobile phones. Listening (68.5%) was the second most favorite practice in MEL, followed by translation (40.9%). However, as is shown in Figure 3, writing (9.7%) was reported to be the least popular learning activity among students on mobile phones, followed by reading (21.4%) and speaking (28.1%).

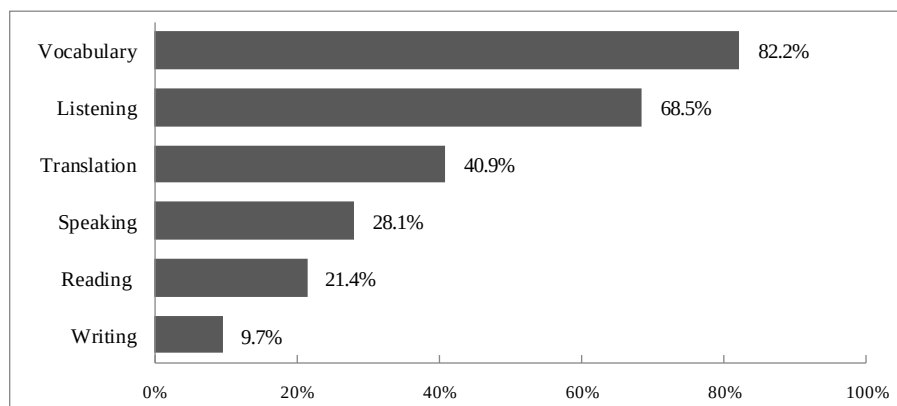


Figure 3 Students' MEL Preferences on MPA (N=359)

B. *Students' Attitudes towards MEL on MPA*

Students' attitudes towards their experience of MEL on smartphones were indicated by their 5 levels of agreement with the statement that MEL on MPA is helpful. Figure 4 shows that most undergraduate students (80.5%) were positive about learning English on mobile phones. However, almost 1 in 7 students (14.2%) did not believe that MEL on MPA was helpful. Besides, a few students (5.3%) felt difficult to assess whether MEL on smartphones was helpful or not.

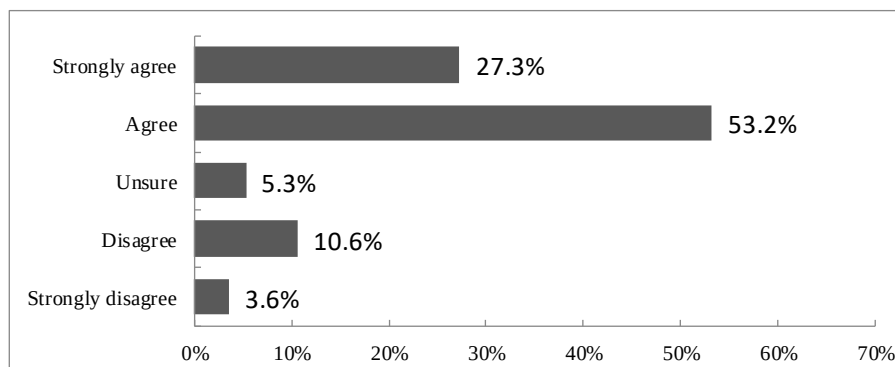


Figure 4 Students' Views on Helpfulness of MEL on MPA (N=359)

C. *MEL With Gender Differences*

Students' MEL on MPA with regard to their genders was examined and analyzed by 4 variables as follows.

(a). *Time Commitment*

When it came to the time involved in MEL on MPA with genders, Figure 5 shows that overall, female (F) students tended to invest more hours than their male counterparts in learning English on mobile phones. This was particularly evidenced by the fact that students who spent less than 1 hour per week on MEL were 29.6% male (M) students compared with 21.4% female ones, while those who would spend 3-5 hours were 9.3% males in contrast to 17.6% of their counterparts. Nonetheless, there were no significant differences between male and female students who spent either 1-3 hours or more than 5 hours a week in learning the language on their mobile phones.

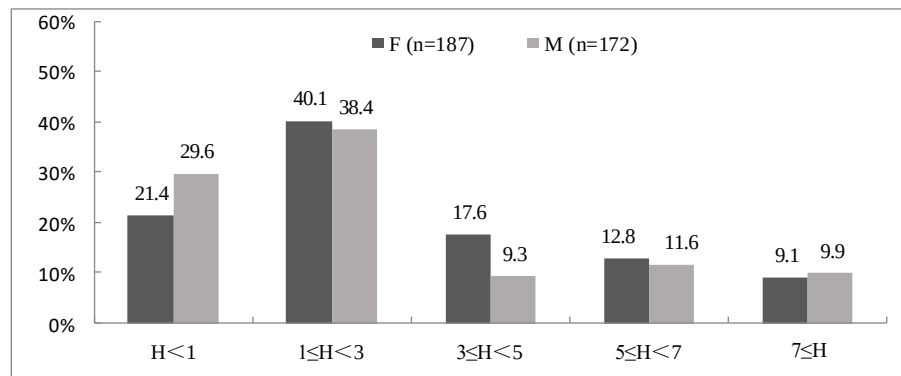


Figure 5 Gender Differences on Time Spent in MEL per Week

(b). *The Number of MEL Apps*

Although generally speaking, students favored 2-3 apps when learning English on mobile phones, (revealed in Figure 1), male students were more likely to use diverse smartphone apps in MEL than female ones according to Figure 6. For example, students with more than 3 apps in MEL were 29.7% from the male group but 16% from the female group. There were also considerably more female students (15.7%) who reported using only one English learning app compared to male students (9.6%).

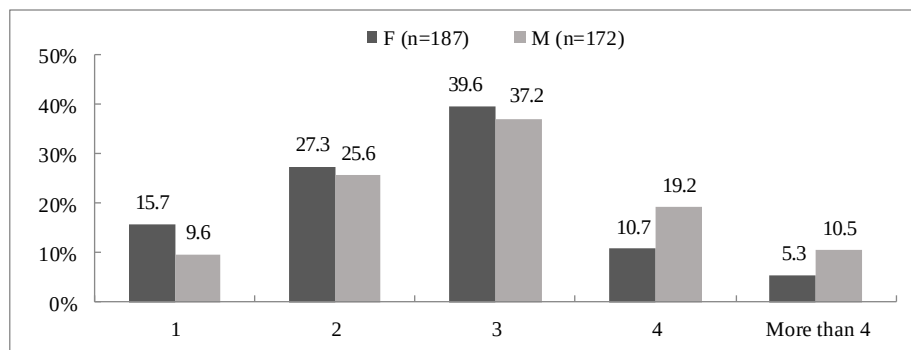


Figure 6 Gender Differences on the Number of MPA Used

(c). *Practice Preferences*

Figure 7 indicates that no significant gender differences were found with regard to students' most (vocabulary) and least (writing) favorite practice in MEL on MPA. But it was found that female students seemed to put more emphasis on speaking and reading than their male counterparts, while male students tended to attach more importance to translation and listening.

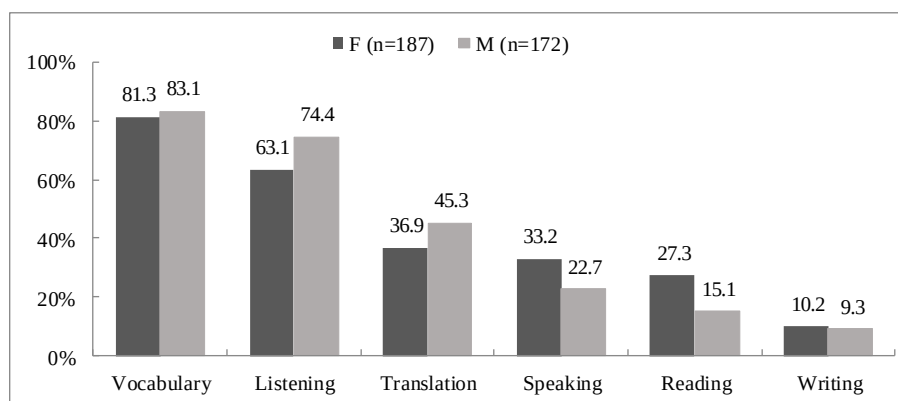


Figure 7 Gender Differences on MEL Preferences

(d). *Views on Helpfulness*

Figure 8 reveals that while both male and female students held a positive attitude towards MEL on MPA, female students were more likely to agree to the helpfulness of MEL on smartphones. As can be seen from Figure 8, there were 33.7% female students who “strongly agree” that learning English via MPA was helpful, a lot more than 20.3% male ones who thought alike. Meanwhile, there were also more male students (16.5%) who did not believe in the helpfulness of MEL on MPA in contrast to their counterparts (12.1%).

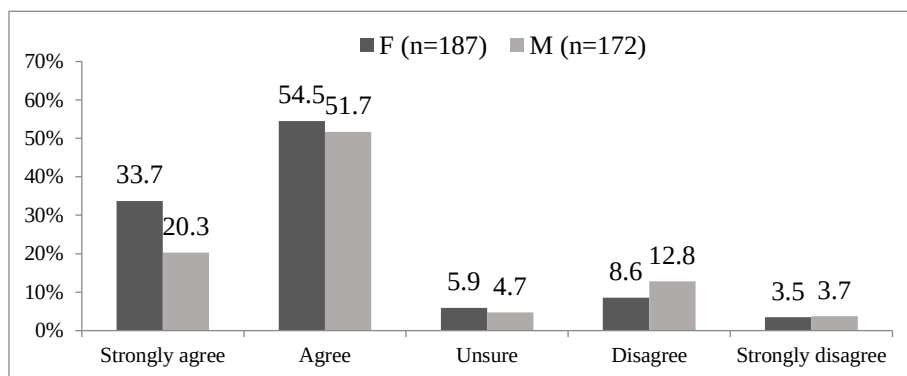


Figure 8 Gender Differences on Attitudes to MEL on MPA

IV. DISCUSSION

One of the major findings derived from the study is students' limited time invested in MEL out of class, regardless of gender differences. For most college students, there is no dramatic difference in learning English inside the classroom given the shared learning environment with the limited course period every week (Ministry of Education, 2020), which implies that a lot of learning activities have to take place after class based on students' self-autonomy. Therefore, students' time involved in learning English outside the classroom would make a remarkable difference as to how well they would end up with the course and even how proficient they could be in the language. However, as was revealed in the study, more than 60% undergraduate students invested less than 3 hours on a weekly basis in learning English on mobile phones out of class. More surprisingly though, 29% students said that they spent less than 1 hour per week on MEL after class, which means that, on the average, these students spent approximately 8 minutes every day in learning the language on MPA. The amount of time is possibly enough for some fragmented learning, skimming a passage or dashing off some vocabulary for example, but it is less likely to make a deeper and more effective learning happen.

Certainly, chance is still there that students might have moved their English learning activities somewhere else, on other devices like laptops, tablets, etc. or by traditional means such as studying non-electronically in the library for example. But the chance seems pretty slim in consideration of the growing trend of MEL on more portable devices together with the statistical facts revealed in this study that 98.1% (359 out of 366) undergraduate students have been learning English through MPA and that 80.5% of them believe in the effectiveness of such MEL experiences. Therefore, students' insufficient time commitment to MEL could be attributed to their inefficiency of time management in studies or incapability to find the balance between academic and non-academic activities in university. However, another fact worth noting is that junior and senior undergraduate students may have a tendency to invest less time in learning English compared with the first and second-year graders because there is no required English curriculum for them. As much as student-centered learning environments have often been highlighted in education, policymakers and instructors should not take it for granted that students would always make the most of their time and learning resources when it comes to MEL. Therefore, instructors and policymakers in higher institutions may play a more critical role than were assumed in students' sustainable and effective MEL both in and out of class.

When it comes to English practice preferences on mobile apps, both male and female students were focused considerably on vocabulary learning, which implies that vocabulary plays a fundamental role in EFL learning even for college students. Listening and speaking should have been bonded together in learning practice given that the design in both curriculums and mobile apps usually comply with the blending mode of developing the two language abilities simultaneously. Students' preference for listening in MEL may result from the fact that compared with speaking, listening practice seems a lot more natural and spontaneous. It can be easier when learners even have no urgent needs of comprehension. However, when practicing speaking, students have to open their mouth with the needs to speak the language logically and appropriately, which would undoubtedly put them under pressure. Besides, students who favor listening practice in MEL may be fascinated with the diverse video resources which would facilitate their hearing incidentally even for recreational purposes.

Theoretically, both writing and translation are time-consuming yet significant learning activities for they serve as critical means to put what students have acquired into practice. Surprisingly however, the two activities met with different preferences by most students. Writing became the least favorite practice in MEL while translation was one of

the three most popular activities next to listening (see Figure 3). Apart from time commitment, writing or translating practice on portable devices, mobile phones in particular, can be demanding for the user-unfriendly experience brought about by the limited but interactive interface for written language output. Therefore, given students' time involved in MEL in addition to user experience, the practice claimed to be translation was less likely to take place at a textual level, but most probably carried out at lexical or sentential levels, which was actually more of a practice on vocabulary. Reading is one of the most reliable sources of language input, which unfortunately however, most students seemed to have ignored. When reading, learners can build up their vocabulary incidentally yet effectively (Chen, 2017; Laufer, 2011). Therefore, while undergraduate students attach great importance to vocabulary in MEL, they didn't feel like an incidental approach through reading activities.

When it comes to the helpfulness of MEL on MPA, a relatively positive correlation, regardless of gender differences, is found between students' number of MEL apps and their views on helpfulness. In other words, overall, the more apps students use for learning English, the more they agree that MEL is helpful. Those who used only 1 smartphone app in MEL were more likely to disapprove of the helpfulness of MEL. Instead, students with 4 apps were more likely to say that MEL was effective. More MEL apps imply potentially more learning experiences, which does not necessarily predict the success of MEL, but students with more apps are entrusted with more credibility to tell through their rich experiences how useful a certain MEL app might be. Nevertheless, the positive association of students' views on MEL with the number of apps used is not absolute, which is confirmed by the fact that students with more than 4 apps were a little more likely to get confused about the helpfulness of MEL and some even held a negative attitude. Therefore, with regard to how many apps can best serve the purpose of MEL for undergraduate students, the answer is not supposed to be the more the better. Besides, there is no significant connection found between students' views on helpfulness of MEL and their time engaged. Students may have a stronger voice in telling how helpful MPA would be, more obviously however, it is not only how much time students spend in MEL but also how effectively they spend the time that matter.

V. CONCLUSION AND LIMITATIONS

The present study sampled 359 undergraduate students from 5 grades in a Chinese university by exploring their learning habits and behaviors of MEL on MPA. The study has confirmed the overwhelming popularity of MEL on MPA in higher educational institutes in China. Quantitative results show that when learning English on MPA, undergraduate students generally use 2-3 apps and vocabulary acquisition is their top priority whereas writing is the most ignored learning practice. It is also found that while most students believe in the helpfulness of MEL on MPA, they tend to invest less than 3 hours on a weekly basis in learning the language. Meanwhile, gender differences are also reflected in students' MEL habits and behaviors. Statistical findings of this study provide a relatively comprehensive understanding of the current MEL situation in higher education contexts, which is hopefully enlightening for language instructors, policymakers and app developers as well to play a better role in the ubiquitous m-learning environment.

There are some limitations despite the statistically significant findings of the study. First of all, while the study covered undergraduate students with all year levels, it sampled only a small portion of different graders, less than 10% in each except the 5th grade to be more specific. Therefore, the results derived might not be a truly typical representation of all undergraduates in the university. If samples had been more sufficiently covered, the statistical findings could have been more scientific. Meanwhile, although the study covered students from all year levels, it failed to look into students' MEL experiences from a grade perspective. This could be significant given the potentially diverse data derived. In addition, the present study explored only 4 variables pertaining to students' MEL experiences. Many other factors that would shape students' MEL experiences need to be examined. For example, it is unknown what challenges students are confronted with in MEL on MPA, and whether peer or instructor influence could make a difference and how. Finally, the survey in this study was conducted in a rather traditional way with printed questionnaires, which added to the cost of the study in addition to environmental impact. Actually, this was also a potential factor that contributed to the relatively small sample size of the study. Future studies in this field could target a much larger size of samples and focus on other elements concerning MEL by taking a more eco-friendly approach such as e-questionnaires. However, the case study still offered some insights into college students' real MEL experiences by providing limited but statistically significant findings from a macro perspective.

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