Gender Differences in the Use of Smartphones and iPhones for Language Learning

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1. Introduction

> Mobile phone technology that has a huge impact on students' lives in the digital age may offer a new type of learning. The use of effective tool to support learning can be affected by the factor of gender. (Hilano and Wichadee, 2017, p. 68)

Smartphone and iPhones are part of today's students' everyday life since high school or earlier, and these 'digital native' students are increasingly becoming more comfortable with their use in all areas including education. Overwhelming positive feedback and satisfaction in the use of student smartphones and iPhones for studying and learning English has been demonstrated by non-English major university students in a combined Blended Learning and Mobile Assisted Language Learning (MALL) study using mobile devices for the technological component (Brown, 2016). Likewise, Obari (2012), in Japan in his Blended Learning project with mobile devices, with similar University undergraduate students as in this project, found that blended learning with mobile technologies significantly met students' needs and "had a positive effect on improving the Japanese students' English language proficiency." (p. 216) However, both these studies did not investigate any gender differences.

It is widely thought that females are better language learners than males. “In the field of language learning, there has been a long-standing idea that females are more adept at languages than males, excelling in their native tongue and also foreign language study.” (Merritt, 2014, para. 2) Conversely, it is also widely believed that males are more adept at using technology for learning. “Males tend to have more positive attitudes about the use of technology for learning than do females.” (Yau & Cheng, 2012, p. 74) However, Prensky (2005) suggests that the present generation is a digital generation that was born with digital technology readily available. This generation, he states is more attracted to technology and this interest is evident regardless of gender. Observation though years of teaching experience using CALL and MALL did not indicate a major difference between how males and females felt about using their mobile devices or concerning their impressions about the value and satisfaction in their use for language learning. In order to confirm this impression, this project was conducted to discover the differences, if any, between male and female, digital native students' perceptions of the usage of smartphones and iPhones for their English language learning.

> The gender gap is not like the Grand Canyon, that is, large and permanent. There is evidence suggesting that gender differences in Internet usage will decrease as technology becomes more pervasive in our lives (Miller, 2012, para. 11)

2. Project Aims

The aim of this projects is to see if there were any gender differences between the perceptions of how male and female students perceived their language learning and study using their smartphones and iPhones with a number of Blended Learning

classroom mobile activities conducted regularly in their one semester University English Language classes. Firstly, the project investigated differences between male and female student perceptions, on overall general use of smartphones and iPhones for language learning. Secondly it looked at any gender differences in perception for the specific language learning activities of weekly, mid-term and final term tests, class listening components and accompanying exercises, and the production of voice recordings and presentations on their devices.

3. Literature Review

3.1 Gender Differences in Language Learning

> We can expect females to use social learning studies more than male. Because social learning strategies have been found to be particularly important for exposing the learner to the target language, increasing the amount of interaction with native speakers, and enhancing motivation, it is reasonable to anticipate they will enhance verbal learning. (Ehrman & Oxford, 1987, p. 1)

Various studies and articles suggest that females are better disposed towards language learning. Bozinovic & Sindik (2011, pp. 1-19) cited a number of articles in their literature review suggesting females use better learning strategies for language learning. They discussed that (p. 17) 'female students used all learning strategies more frequently than their male counterparts, with the exception of socio-affective strategies, which corresponds to the findings of previous researches." The Acadsoc website (2014) suggests several reasons why women are better at learning languages than men : "First, women have the ability to listen more attentively than men." (para. 3), "Second, women naturally love to talk." (para. 4), "Third, the feminine tongue tends to deliver lengthy sentences compared to their

masculine counterpart." (para. 5), and "Fourth, females are less likely to feel embarrassed when they commit a mistake when using foreign expressions and words than men are" (para. 6). In Iran, Zoghi, Kazemi & Kalani (2013), in their research on the effect of gender on language learning found that their findings backed up the literature they had reviewed, that female students outperformed male students in their EFL achievement. In Pakistan, Arshad, Ali & Chaudhary (2013) had similar findings. "It is concluded from the overall result that socio-cultural attitude for female students at intermediate is in more favour of their learning English as compared to male students." (p. 414) In Turkey, a study by Varol & Yilmaz (2010) found "the girls seemed to behave more autonomously in and out of the class", "the female learners seemed to benefit from the opportunities of learning English more than the male learners" and "the female learners seemed to be more intrinsically motivated to learn English than the male learners" (p. 242). Piromohamed, Debowska and Boduszek (2017) looking at gender difference in academic achievement of university students also found gender differences in relation to motivation. They found intrinsic motivation for achievement goals to be higher for women but did not discover any significant gender differences in intrinsic motivation for learning value and in extrinsic motivation for performance goal. They also discovered that female students spent more time studying than males and were more likely to believe that academic success was directly connected to the amount of effort put into study.

Notwithstanding this widespread view of female students as superior language learners, in Thailand, a study by Viriya and Sapsirin (2014) on gender differences in language learning styles and strategies, found no significant differences between gender for language learning strategies. They said "From the researcher's perspective, I would like to suggest that Asian students tend to have learning strategies used in the same direction, which sometimes use the strategies." (p. 86)

They made a number of pertinent points as to why this result went against the findings of many other studies where female language learning strategies were seen as better. Firstly, is the age factor. All students in their study were ages of 20 or 21 years, which coincidentally is around the same age of subjects in this study. Secondly, is that the students were Asian. In their case students were from Thailand, and they suggest, referencing some other studies from China and Korea, that for Asian students it could be that there are no significant differences between male and female students for language learning strategies. However, they stress that further research is needed.

3.2 Gender Differences in the Use of Technology for Learning

Considering gender and the use of technology for learning the common view seems to be that male students utilize technology better for learning than female students. Yau and Cheng (2012) stated that "past studies have found male students to have more confidence in using technology for learning than do female students" (p. 74), and indeed their research on gender differences in confidence in using technology in Hong Kong, came to the same conclusion. "male students have more confidence in using technology for learning than do female students in higher education in Hong Kong" (p. 78). Brunner and Bennett (1998) in their paper on technology perceptions said "We found to nobody's surprise, that girls are more ambivalent about technology than boys, who are more excited about their experiences" (p. 56). Likewise, Zhou and Xu (2007) in their study of gender differences in technology adoption in Canada found males to have more expertise and confidence in using technology than females, Hale (2002) in their study of gender differences in computer achievement talking about previous research in this area said "one would expect to see males with higher achievement levels than females" (p. 2), and indeed the results of their research partially confirmed this in

their computer broadcast module. However, in their computer animation module the results were the reverse with females doing better. Whilst the reason for this difference was unclear, one suggestion Hale made for the difference was that "students of today may be different to students used in earlier studies." (p. 4) In a later study in Spain by Gonzalez-Gomez et al (2012) investigating gender differences in e-learning, better achievement by females was also found "Contrary to expectations, female students score e-learning courses higher on average than male students" (p. 287). In Australia, Johnson (2011) investigated gender differences in the use of Internet Activities with digital natives and found no gender difference in school-based activities. Her premise was that this has to do with students being digital natives and the closing of the technology gender gap leading to "gender equity in school-based use of the Internet." (p. 70) In Taiwan, in answer to his research question "Are women equal to men in their use of modern technology?" Blasco (2016) in his study on the use of educational technology between genders, also found no significant difference between males and females stating "that male and female students studying in Applied Foreign Languages are equal in their use of computer technology." (p. 28) Whilst commonly viewed that male learners are better users of technology for learning than female learners, some studies have different findings.

3.3 Gender Differences in the Use of Mobile Phones

The students of this study aged 20 and 21 can be called the digital native users of mobile phones in line with Prensky's (2005) definition of digital natives as the vast majority have been using smartphones and iPhones since middle or high school. Forgays, Hyman & Shreiber found in their study on gender and age differences in cell phone use that this age group is more likely to communicate and use text and social media in a greater variety of situations. Andone et al (2016) in their similar

study on how age and gender affect smartphone usage found similar results. On the question of gender differences in mobile phone usage Andone et al (2016) found "Females spend more time on their phones than males, …… On average, women spend more time in communication and social apps while men spend more time playing games." (p. 3) However, they did note the differences between age groups were bigger than those between gender. In a similar study in Greece, Economides and Grousopoulou (2008) discovered that there were only small differentiations between the genders when researching on the volume of phone calls made. They stated that "females students appear to make more phone calls than male students. Moreover, they take more photos and record more sounds than their male peer." (p. 739)

A study by Chen et al (2017) on gender differences with smartphone addiction among medical students in China found "no significant gender differences in the prevalence of smartphone addiction." (para. 20) However, they did find some differences in how smartphones were used by the different genders. They declared that "Male students were more likely to play games, watch mobile phone videos, and listen to music, whereas female students were more inclined to use the mobile phone communication functions and social networking services." (para. 20) RealityMine a market research agency, reporting on the Mobile Marketing Association (MMA) website (2015) found that "When it comes to gender differences, women's main mobile device use is socializing, whether it be via SMS, social media or sharing photos, while men prefer communicating through email, listening to music and watching videos." (para. 18)

Yet despite the differences in how the genders use mobile devices reported in the previous studies, other studies had different findings. Goswami and Dutta (2016) in their literature review of Gender Differences in Technology said "it can be observed that there are mixed results with respect to the influence of gender on

technology adoption." (p. 56) Whilst with computers they found men "to be more technologically adept compared to women" (p. 56) with regards to some mobile applications and social networking gender differences were not observed. Forgays, Hyman and Shreiber (2013) had similar findings

> when evaluating the impact on social situations, there were no consistent gender differences in patterns of cell phone use. The absence of gender differences in use could be interpreted as support for how firmly embedded cell phones are as an emerging social interaction vehicle. (p. 320)

3. 4 Gender Differences in the Use of Mobile Phones for Language Learning

With the exponential spread of mobile devices in the world and their growing use in educational situations, including language learning, some studies are looking at gender issues associated with their use. Kay, Benzimra and Li (2017) primarily looking at factors that caused distraction in students using Bring Your Own Devices in the classroom found that female students "claimed they engaged in on-task behaviors significantly more often than male students." (p. 8) leading to gender having a "moderate impact on participation in distracting behavior." The different distracting mobile behaviour use they found coincides with that previously reported in the previous chapter, 3. 3 "Female students reported engaging in social media or networking more frequently than male students, and male students engaged more frequently in gaming" (p. 8). Scheid (2015) in her study on Cultural and personal factors affecting Mobile Language Learning found "significant gender differences resulting in a faster speed of progress for female participants and higher amounts of exercise duration, tries, exercises per day and week for male participants" (p. 53). She went on to say that this was "in line with established findings pointing at women's better linguistic skills". She also found in relation to age groups that "the

youngest participants produced the highest speed of progress using the least amount of time, tries, exercises per day and week" (p. 53). However, she made no study or discussion on the value or perceptions students made concerning the use of the mobile phones for language learning.

Concerning differences in attitude towards using mobile phones in language learning Hilano and Wichadee (2017) found male and female students had similar mean scores in all items they researched and using Mann－Whitney U tests, concluded "that there was no difference in attitude between males and females" (p. 73). They suggested the reason for their findings was due to students seeing "the potentials of mobile phone in enhancing various activities in the English course. Not only they gain a new learning experience, they realize that they can improve the language proficiency with this technological tool." They concluded that "gender has no impact on students' attitude." (p. 75) Regarding usage of mobile phones, unlike the study by Kay, Benzimra and Li, they also found "no difference in how males and females used phones" (p. 75). Furthermore, concerning performance, unlike Scheid, they also found that their study "did not find any difference in males and females' language learning performance" (p. 75). Snell and Snell-Siddle (2013) researching the effects of gender on the perception of the use of mobile tools had similar results to Hilano and Wichadee, finding that "though the means for males were slightly higher, there was no statistically significant differences between genders which indicates that both males and females had similar perceptions of the mobile enhanced learning environment" (p. 278). Jambulingam and Sorooshian (2013) investigating mobile learning with undergraduate students found like Hilano and Wichadee, "no differences in the usage of mobile features are observed between male and female students" as their results showed "that the five most important features used by female and male students are similar" (p. 131).

Wang, Wu and Wang (2009) investigating the determinants in M-learning and

how they differed by age and gender found “that the effects of performance expectancy and perceived playfulness on behavioural intention were significant, but no gender or age differences were found to exist”（p. 111）. Students with “high performance expectancy and playfulness perception towards using m-learning had a higher intention to use m-learning than those with lower performance expectancy and playfulness perception” and this was not different between genders. Liaw（2015）investigating gender perspectives with attitudes towards mobile learning ended up with similar findings to Wang, Wu and Wang, finding “perceived usefulness has the highest contribution on behavioral acceptance toward m-learning for both female and male learners.” However, “perceived anxiety is a positively significant predictor for female learners while perceived self-efficacy and perceived self-regulation have more positive contribution for male learners（p. 953）. “Bao et al（2013）exploring gender differences in mobile learning adoption found gender variation significant “in perceptions of perceived ease of use and behavioral intention to use but not for perceived usefulness.”（p. 17） They explained that both genders perceive mobile learning helpful for their studies regardless of the other differences. Investigating mobile devices and LMS integration in higher education on the subject of gender differences in student perceptions, Cavus（2010）had similar results to the other studies referenced here ;

> There is no statistically significant difference between genders’ perceptions about new trend learning environment. The mean of female students’ perceptions on new trend learning environment was 4. 46 compared to 4. 44 for male, a difference that was found not to be statistically significant（p = . 690, p > . 05）（Cavus, 2010, p. 1472）

3. 5 Conclusion of the Literature

The literature concerning gender differences in language learning points towards female students being better language learners, however some alternative views were found suggesting for young Asian students, similar to those in this project, these differences are less apparent. With regards to the gender differences in the use of technology in language learning, the generally accepted view, with accompanying supporting literature, points towards male students being better at using technology than females. However, a lot of this research is outdated and may be applicable more to computers and older technology. Other studies were found suggesting that the gender gap in the use of technology has narrowed with less difference between the genders with the younger generation growing up now as 'digital natives'. A number of studies found some differences between mobile phone usage between the genders. However, through examination of the available research in this area it is accepted that young people of both genders are integrated in their use of mobile devices for a wide variety of uses and it is not clear if any differences in usage by the genders would affect structured mobile device usage for language learning in class. Finally, other studies, similar to this project involving gender differences in attitudes and perceptions towards using mobile devices for language learning were examined. Some of these studies involved younger Asian students and most were with participants who could be classed as 'digital natives' as are the participants in this study. Many of these studies reported little differences between the genders in their attitude towards language learning with mobile devices.

4. Project Context and Participants

The project was carried out at Matsuyama University in Ehime Prefecture, Japan with seventeen mixed gender classes of non-English majors. Students

belonged to a range of faculties in the 2016 academic year. All classes were compulsory English classes with class sizes ranging between 15 to 25 students. Each class course was for one semester and was composed of 15 ninety-minute classes. There were 246 students in total, 148 males and 94 females. 193 students were first year students in fourteen classes; while 53 students were second year students from 3 classes. All classes used textbooks and were primarily aimed at improving students' oral communication skills. The use of smartphones and iPhones was not the main aim of the classes, nor did it take up the majority of class time, which involved considerable pair work speaking practice. However, smartphones and iPhones were used in Blended Learning mode, for short periods in class where it could have advantages over traditional face-to-face learning and enhance learning in class. Whilst different textbooks were used, the same Blended Learning activities were used with smartphones and iPhones in every class. All classes had their own individual 'home' website through a Learner Management System called Schoology. All mobile phone activity directed in class was conducted through this tool. The teachers who has considerable experience with Mobile Assisted Language Learning has taught and refined the same courses over the previous 3 years and also reported on the overall success of the use of students' smartphones and iPhones with Blended Learning in a previous study (Brown, 2016).

5. Research Method

At the end of their 15-week course all students completed an online survey (see Appendix A) using the Survey tool web page SurveyMonkey, 〈https://jp.surveymonkey.com〉. The survey was composed of eight Likert scale ranking, multiple choice questions and two open-ended questions. The male students and female students did different surveys in order to separate the results by gender but

the questions were identical in both surveys. All questions were in both English and Japanese. Open ended questions could be answered in either English or Japanese.

Question 1 was about the comfort level of using smartphones and iPhones in general in class. Three answer options were available, (3) a little, (2) okay, and (1) very. Questions 2, 3 and 4 were about the general usefulness, enjoyment and interest level for using the smartphones and iPhones in class. For these Questions 2-4 four options were given (4) Not at all, (3) a little, (2) somewhat, and (1) very much. Question 5 had multiple parts asking about the ease of use and usefulness of the specific different individual mobile learning activities conducted in class; tests, listenings, extra activites, graphs and recordings. Answers for this section were in a 1-4 Likert scale (4) Not so, (3) somewhat, (2) quite, and (1) very. Question 6 also had multiple parts comparing the individual mobile learning activities to their traditional classroom learning methods, asking which was easier and which was better for each individual activity. Question 7 used a 1-4 Likert scale answer: (4) Not at all, (3) a little, (2) somewhat, and (1) very much, to ask students if they thought using smartphones and iPhones could be useful in other classes or courses in the university. Question 8 asked about which type of mobile device students had. Questions 9 and 10 were open ended questions for students to make comments in English or Japanese about the good points/benefits and bad points/problems in using smartphones and iPhones in class.

The data analysis looked primarily at Questions 1-4 to analyse the students' general perceptions in their use of smartphone and iPhones for language learning and sections from Questions 5 and 6 to analyse the students' perceptions relating to the three-major specific mobile language learning activities; class tests, listenings and recordings. Comparison between male and female results were validated for independence by use of Chi-square tests and Fishers exact test.

6. Smartphones, iPhones and Technology Issues

Students used their own personal mobile devices, Android smartphones and iOS iPhones, in this project in a method known as 'Bring Your Own Devices'. Internet access was necessary for the online mobile based activities. Students could access the Internet through their own 3G/4G data or through a classroom Wi-Fi established for students with limited personal data contracts so as not to disadvantage them. All mobile phone activities were the same whether smartphones or iPhones were used, as all the learning activities were not dependent on the operating system of the mobile devices, including the 'home' website from the Schoology LMS. Thus, for the purposes of this study there was no distinction made between which mobile device was used as it would not influence the project. Three students did not have either a smartphone or iPhone so in those cases the teacher lent them a smartphone for use in class time. Also, on occasion a student would attend class without their mobile device due to accident, loss or forgetfulness. On those occasions, they were also lent a spare mobile device the teacher had on hand for such emergencies. 81% of female students had iPhones and 19% smartphones whilst for the male students 59% had iPhones and 41% smartphones.

7. The Mobile Learning Activities —Smartphone and iPhone Usage in the Project

7.1 Blended Learning

Friesen (2012) in his report looking at the development of Blended Learning as well as various definitions came up with a current composite definition of "Blended Learning designates the range of possibilities presented by combining Internet and digital media with established classroom forms that require the physical co-presence

of teacher and students. "Numerous research has pointed out the potential of mobile devices in mobile assisted language learning (MALL) (Brown, 2016) for the technological and digital media part of Blended Learning due to portability and ease of use of technology in any classroom not just computer dedicated classrooms.

7.1 Learner Management Systems (LMS)

The use of a Learner Management System creating a class 'home' is a basic requirement for using mobile devices in the classroom with Blended Learning. Schoology has been singled out after years of research and comparison (Brown, 2014, p. 113) as the most suitable user friendly and capable tool which can run equally well on both android and iOS formats. The Schoology 'home' site served as a hub for all the blended learning mobile activities and could be accessed both in and out of class. Furthermore, with Schoology the students were able to receive course information, updates and notifications instantly and were also able to contact the teacher electronically any time. Schoology can be accessed via smartphones without the use of computers.

7.2 Testing

One of the primary uses of smartphones and iPhones in class was short, weekly multiple-choice tests given at the beginning of every class, as well as final and midterm tests. These tests were on the content of the textbooks used in the class and made up part of their final grade for the course. All tests were multiple-choice. The weekly tests consisted of ten or fifteen questions from the previous class unit. Some of the tests included listening questions and other questions are mostly grammar or vocabulary cloze like questions. From the mobile devices with Schoology all tests were automatically corrected and graded with individual results instantly given back to the students, including feedback on their actual errors. The

results were also displayed and entered into the teacher's online gradebook provided by the LMS. Previous research (Brown, 2016) found this activity overwhelming seen as useful by the students. Although usually students do not like tests, they appreciated the ease of use of doing them on their smartphones and iPhones and also the instant feedback of their test results provided by Schoology immediately on completion of their test, something not possible with paper-based tests.

7.3 Audio Listenings

All the textbooks used in the project had a listening component for each unit of the text. Although the particular listening activities to be carried out by the students varied from text to text, in all cases it involved the student listening to some prepared audio and choosing answers to exercise questions in the textbook. Through Schoology the students were able to listen to the audio individually at their own pace, being able to repeat the listening as many times as they felt necessary. They recorded their answers in their textbooks and answers were checked after completion either with their partners or from the teacher. Previous research (Brown, 2016) found this activity seen as the most useful of all for students and considered more useful than the traditional all class listening because students could listen individually at their own pace and replay as many times as necessary.

7.4 Voice Recording and Presentations

The 1st year text book has an activity where students go around the class and do a short survey of all their classmates relevant to the unit studied and then give a short mini presentation of their survey question on the blackboard, drawing an accompanying graph. In the 2nd year text book the final activity of each unit is for the students to write their own short dialogue performance, relevant to the unit studied, and perform that for the class. These activities were carried out with the

voice recording capabilities of the mobile devices and then the digital sound files were uploaded to the Schoology 'home' page. From there they could then be played by any member of the class at a later time or watched individually at any time by any class member. With the 1st year students they also sent a relevant graph as a picture file, created on their smartphones or iPhones with a graph creating app. Previous research (Brown, 2016) also found this activity was seen as useful by students and superior when used with smartphones and iPhones compared to the traditional method of speaking live in real time and using the blackboard.

8. Results

Results of the all the surveys clearly showed both males and females in this project perceived the use of smartphones and iPhones for English Language learning in the class very positively and mirrored the results found in a previous study by the author (Brown, 2016). This study found no major differences in students perceptions regarding the use of their smartphones and iPhones for language learning between the genders. The result of both chi tests and Fisher's exact tests carried out on the data confirmed no significant relationships between gender and the students' view at $p < .05$. The small percentage of students with negative views was very similar between the genders. In relation to the degree of positive feelings for the use of mobile phone this too was similar in many areas, although there were a few questions where a slightly higher degree of positive feeling appeared to be expressed by females compared to males.

As Figure 1 shows, it can be seen that on the survey question, about how comfortable the students felt at the end of their course about using their smartphones and iPhones for learning in the class, the results were almost identical for both genders. The percentage of very comfortable was 48.6 for males and 48.9 for

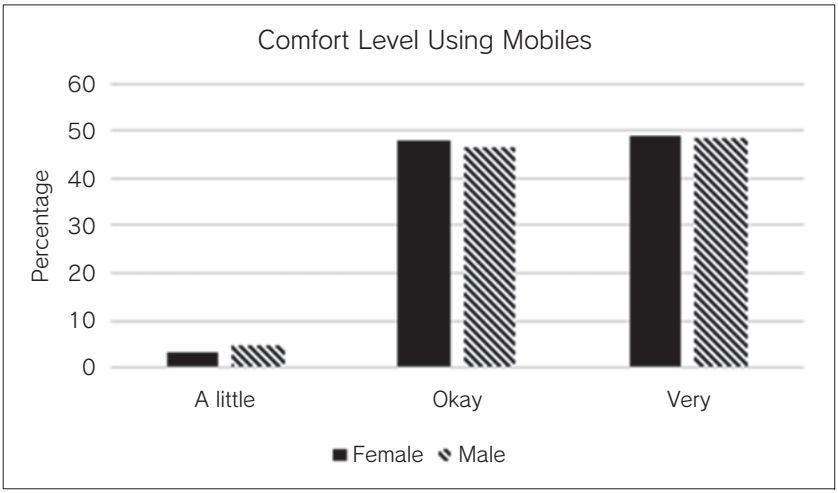

Figure 1

females. The chi-test results X2 (2, N = 242) = 0. 3492, p = . 839773. confirmed no relationship between gender and choice of answers at p < . 05.

The table in Figure 2 shows the results for the three general questions about the use of smartphones and iPhones concerning their usefulness, enjoyment and interest levels as Yes/No questions and the results of Fisher's exact test showed no relationship between gender and choice of answers to a high certainty. Figures 3, 4 and 5 show the answers to these three-same question as measured on a 4 answer Likert scale. The chi test results X2 (2, N = 242) = 0. 3492, p = . 839773, X2 (2, N = 242) = 0. 3492, p = . 839773 and X2 (2, N = 242) = 0. 3492, p = . 839773 confirmed no relationship between gender and choice of answers at p < . 05. On the question of usefulness (Figure 3) slightly more males at 33. 1% found mobiles very useful compared to females at 30. 9%. The percentage finding it not useful at all was almost identical at 4. 1% and 4. 3%. Concerning enjoyment (Figure 4), the percentage of females finding it very

Do you think using your mobile phone for class learning activities was useful for study and learning ?				
	Yes	No	Total	p-value (Fisher's exact test) = 1. 000
Male	142	6	148	
Female	90	4	94	
Did you enjoy using your mobile phone for the class learning ?				
	Yes	No	Total	p-value (Fisher's exact test) = 0. 4886
Male	141	7	148	
Female	92	2	94	
Using your mobile phone made the class more interesting				
	Yes	No	Total	p-value (Fisher's exact test) = 1. 0000
Male	141	7	148	
Female	89	5	94	

Figure 2

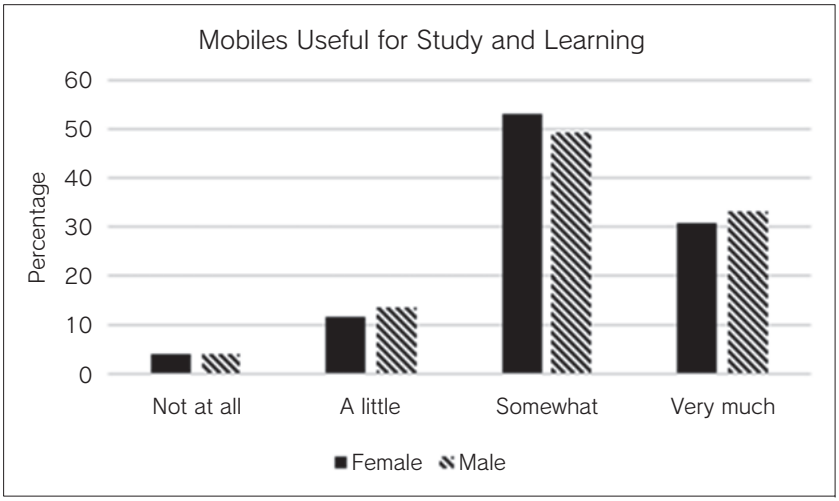

Figure 3

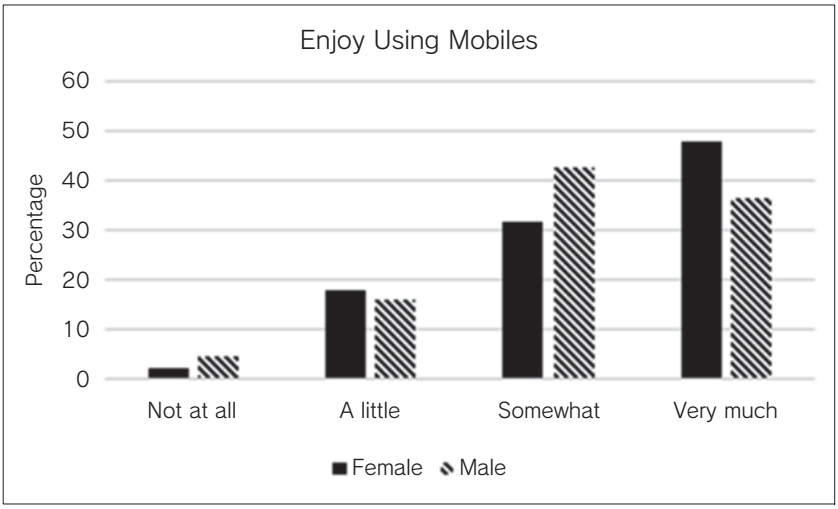

Figure 4

enjoyable was somewhat higher than males at 47.9% and 36.5% respectively. However, the difference between the percentages finding it not enjoyable at all was only slightly different at 2.1% and 4.7%. On the question of making the class more interesting (Figure 5) the percentage of females at 41.5% was higher than males at 36.5% but less markedly than for the previous question and the percentages finding it not interesting at all were almost the same at 5.3% and 4.7%.

Looking at the results on how students perceived the usefulness of the three-main individual mobile based activities : doing tests, the class listenings and making recordings and class presentations, Figure 6 shows the results as Yes/No questions and again, as with the results for the general question of usefulness, the results of Fisher's exact test showed no relationship between gender and choice of answers. Figures 7, 8 and 9 show the answers to these three-same question as measured by percentages on a 4 answer Likert scale. The chi test results for the usefulness of

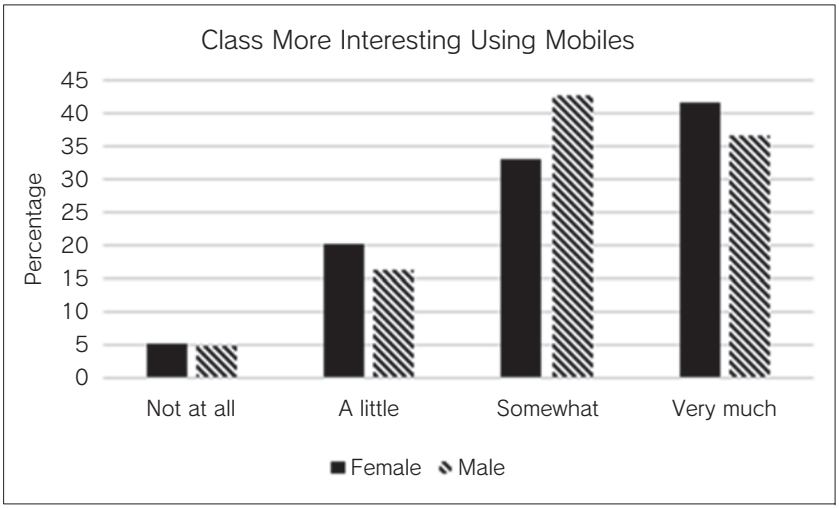

Figure 5

Using your mobile phone was useful for doing tests.				
	Yes	No	Total	p-value (Fisher's exact test) = 0. 2961
Male	136	12	148	
Female	90	4	94	
Using your mobile phone was useful for doing the class listenings.				
	Yes	No	Total	p-value (Fisher's exact test) = 0. 3238
Male	140	8	148	
Female	92	2	94	
Using your mobile phone was useful for recording and making the research question.				
	Yes	No	Total	p-value (Fisher's exact test) = 1. 0000
Male	142	6	148	
Female	90	4	94	

Figure 6

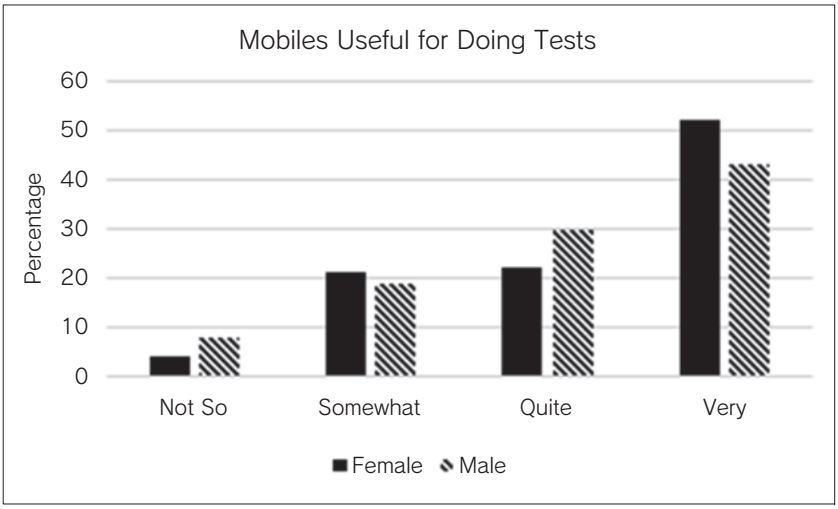

Figure 7

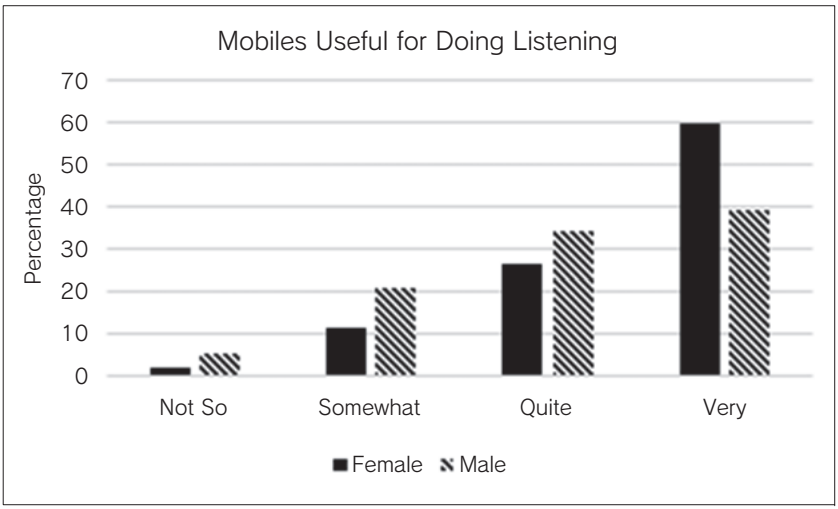

Figure 8

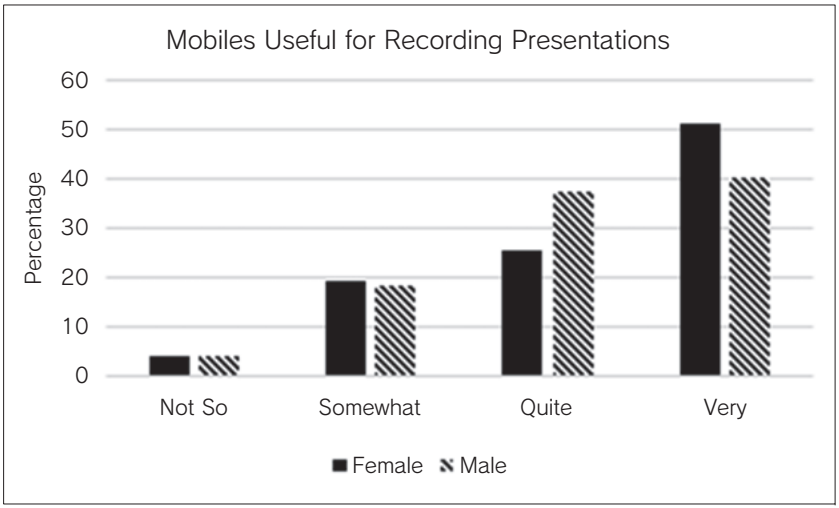

Figure 9

tests and recordings X2 (3, N = 242) = 3.5922, p = .308997, and X2 (3, N = 242) = 3.8395, p = .279328 confirmed no relationship between gender and choice of answers at $p < .05$ (The chi test for the usefulness of the listenings was not used as the low value in one of the answers fell outside the Central Limit Theorem for the chi test and the resultant X2 would likely be invalid). For all three activities the percentage of females was greater for finding the activities very useful was greater for females, than males for all activities. For doing tests it was 52.1% to 43.3%, for the listenings 59.6%, to 39.2% (the greatest difference in the observed data), and for the recordings 51% to 40.5%. However, for all three activities the difference was minor between the percentages finding the activities not so useful. So, whilst similar percentages of both males and females found all three activities useful it appears females might have appreciated a slightly greater degree of usefulness than males. However, this contrasts to the general question of usefulness in Figure 3 where the results showed similar percentages for the degree

of usefulness for both males and females in all the Likert choices, somewhat contradicting the individual results.

Figures 10 and 11 show the students preference regards using their smartphones and iPhone in class for the three main activities versus doing those three activities in the traditional learning methods without mobile devices and were very similar between the genders. The Fischer's Exact Test was conducted on all the data yielding p-values of .2865, .1547 and .6772 for mobile phones being easier for tests, listenings and presentations, and .7537, .8624 and .5214 for mobile phones being better for tests, listenings and presentations, showing no relationship between gender and choice of answers at $p < .05$. Looking at which activities are better 76.6% of females and 78.4% of males found mobile device better for tests, 81.9% of females and 83.1% of male found listenings better on the mobile devices and 91.5% of females and 88.5% of males found doing the recordings and presentations better on mobile devices. Looking at which activities are easier on

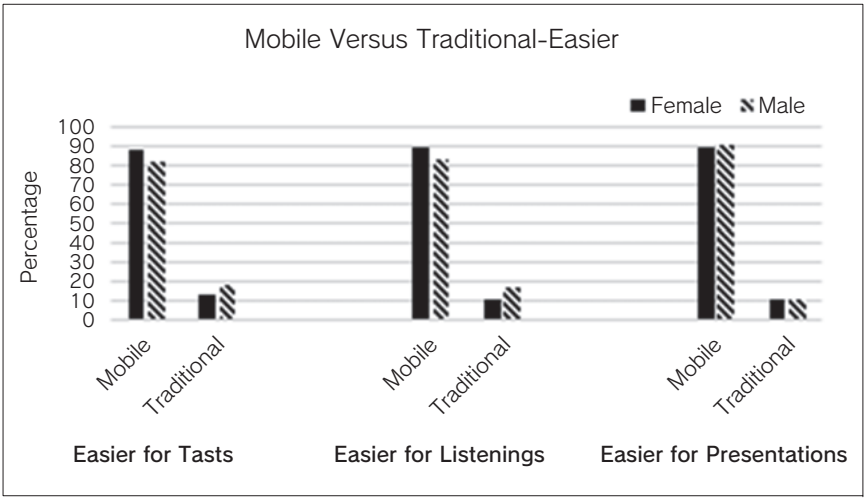

Figure 10

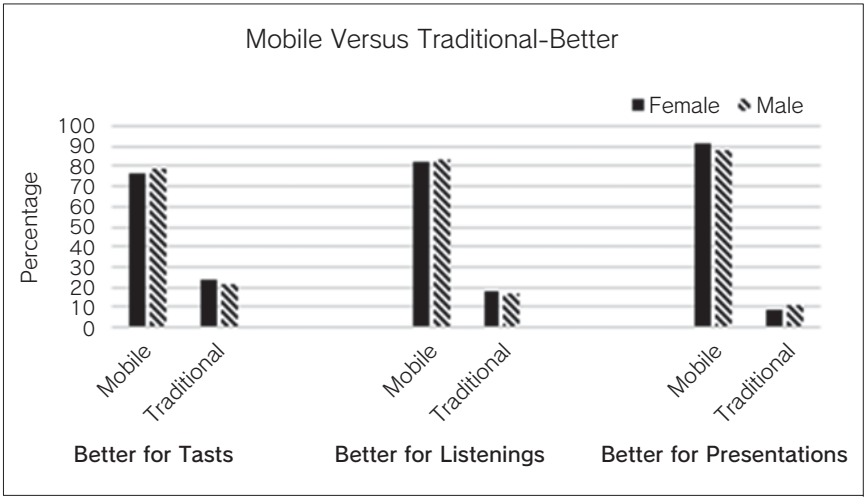

Figure 11

mobiles devices than traditional methods, for tests it was 87.23% for females and 81.76% for males and for listenings, 89.36% for females and 83.11% for males. This showed a slight variation between males and females however for the recordings and presentations the percentage finding mobile devices easier than traditional methods was the same 89.36% of females and 89.86% males preferring mobile devices. Overwhelmingly students found mobiles both easier and better than traditional methods for use with the three main activities and with very closely corresponding percentages between males and females that indicate very little difference between the perception of males and females to the use of their smartphones and iPhones for language learning in classroom.

9. Conclusion

The finding of this project largely matched both my expectations and the

conclusions of corresponding studies by Hilano and Wichadee (2017), Snell and Snell-Siddle (2013), Jambulingam and Sorooshian (2013), Wang, Wu and Wang (2009), Liaw (2015), Bao et al (2013) and Cavus (2010). There is very little difference between the attitudes and perceptions of student gender regarding the use of smartphones and iPhones, for language learning in the classroom. This is not surprising with today's generation of 'digital natives' both male and female, who have equally grown up with the use of smartphones or iPhones as an accepted and natural part of their lives for a variety of uses, and thus, would see no difference in their use for language learning. This points towards the idea of perceived impediments for females in using technology for language learning as also not valid when talking about the use of mobile technology for language learning with both males and female 'digital natives' who are generally equally familiar with the use of mobile devices. This narrowing of the gap or little variation between genders for the use of technology for learning was alluded to by some researchers such as Goswami and Dutta (2016), Forgays, Hyman and Shreiber (2013), Johnson (2011) and Blasco (2016). Cavus (2010) talked about how males and females work together in all fields nowadays without discrimination and "in today's world they (females) are successful as males in using new Technologies" (p. 1472). Concerning the view that females make better language learners than males although not clearly supported by the results of this project there were some mixed indications of a higher degree of the perception of usefulness for using smartphones and iPhones by females in some of the project results. Whilst this might be an indication of this factor, of females as better language learners, further research is needed to confirm whether indeed with normalisation and equality in the use of technology, and mobiles devices in particular, by both genders of 'digital natives' if this will happen.

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Appendix A − End of Class Student Survey

〈Surveys conducted online using the Survey Monkey website 〈https://jp.surveymonkey.com〉 All questions and answer options were in both English and Japanese.

1. Are you comfortable using your mobile phone for the class learning activities now?
   Answer Options A little / Okay / Very
2. Do you think using your mobile phone for class learning activities was useful for study and learning? Answer Options Not at all / A little / Somewhat / Very much
3. Did you enjoy using your mobile phone for the class learning activities?
   Answer Options Not at all / A little / Somewhat / Very much
4. Using your mobile phone made the class more interesting
   Answer Options Not at all / A little / Somewhat / Very much
5. Using your mobile phone

was easy for doing tests.	Answer Options	Very / Quite / Somewhat / Not so
was useful for doing tests.		Very / Quite / Somewhat / Not so
was easy for doing the class listenings.		Very / Quite / Somewhat / Not so
was useful for doing the class listenings.		Very / Quite / Somewhat / Not so
was easy for doing extra class activities		Very / Quite / Somewhat / Not so
was useful for doing extra class activities		Very / Quite / Somewhat / Not so
was easy for making the research question graphs		Very / Quite / Somewhat / Not so
was useful for making the research question graphs		Very / Quite / Somewhat / Not so
was easy for recording and making the research question		Very / Quite / Somewhat / Not so
was easy for recording and making the research question		Very / Quite / Somewhat / Not so

6. Comparing using your mobile phone for class learning activities or usual classroom learning method

Easier for doing tests	Answer Options	Mobile / Traditional
Better for doing tests	Answer Options	Mobile / Traditional
Easier for doing class listenings	Answer Options	Mobile / Traditional
Better for doing class listenings	Answer Options	Mobile / Traditional
Easier for doing extra class activities	Answer Options	Mobile / Traditional
Better for doing extra class activities	Answer Options	Mobile / Traditional

Easier for making the research question graphs Answer Options Mobile / Traditional
Better for making the research question graphs Answer Options Mobile / Traditional
Easier for doing the research question presentations Answer Options Mobile / Traditional
Better for doing the research question presentations Answer Options Mobile / Traditional
Easier listening to research question presentation recordings Mobile / Traditional
Better listening to research question presentation recordings Mobile / Traditional

7. Do you think using your mobile phone could be useful in other classes or courses at the university ? Answer Options Not at all /A little /Somewhat / Very much
8. What is your type of phone ? Answer Options iPhone / Android
9. What were the good points or benefits of using your mobile phone in the class ?
Open ended answers
10. What were the bad points or problems of using your mobile phone in class ?
Open ended answers

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