

## Japanese University Students' Perceptions on the Use of ICT and Mobile-learning in an EFL Setting

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### Abstract

Low motivation and a lack of engagement have long been acknowledged as factors obstructing the progress of Japanese high school and university students of English as a Foreign Language (EFL). Educators have employed various methods to tackle these factors, among them integration of Information and Communications Technology (ICT) in the classroom, and more recently, mobile learning (m-learning). This research examined the perceptions of students towards ICT and m-learning in an EFL setting at Japanese universities. A research design with both quantitative and qualitative elements methods was used to determine student attitudes to their experiences with using technology in their university EFL classes over a twelve-week period. A pre and post-ICT usage questionnaire was administered to a total of forty-four students, followed by a series of semi-structured interviews which provided data for analysis and subsequent discussion. It was found that student attitudes towards ICT and m-learning were positive, with many students noting the freedom and convenience for learning that they provide. The distraction technology can cause in class was also acknowledged. This study highlighted the potential of ICT, especially m-learning, to create a more student-centred learning environment, thus improving EFL learning outcomes for students.

**Keywords:** ICT, m-learning, Japanese university students, EFL, motivation

### Introduction

In comparison with their counterparts from other countries, Japanese students lag in their use of technology for learning. Tasaki (2017) notes the infrequent use of ICT in Japanese schools and adds that many tests are administered in paper rather than via computers. The 2012 Program for International Student Assessment tests (PISA, 2012, p. 62), showed below average use of computers for searching for information online both at home and at school. It was also reported that only 50% of students indicated that they could create a multi-media presentation by themselves or with help. The report concludes that these figures raise doubts about “whether Japanese students are developing the kinds of communication competencies required for collaboration and innovation in a knowledge-based economy.” A study from Higuchi (2013) adds to these concerns and reveals a lack of independent-minded learning among Japanese university students. The study noted that between 2008 and 2012, the number of students who preferred to take classes where they had no interest but could gain a credit easily increased from 49.1% to 55%. Are Japanese university students genuinely this apathetic towards the use of technology in education? This study will examine these students' perceptions towards the use of Information and Communication Technology (ICT) and mobile learning (m-learning) in their EFL classes.

## Review of the Literature

Research on the use of ICT in English as a Foreign Language (EFL) classrooms in Japan is abundant and one of the more popular publications *The Language Teacher* from the Japan Association of Language Teachers (JALT) hosts an article on technology in each publication (JALT Publications, 2018). Among the studies that focus on mobile learning in the literature are a study from Stockwell and Liu (2015) which investigated student attitudes towards using mobile phones to learn vocabulary. Japanese university students' ICT competencies and the potential of m-learning was examined by Lockley (2013), and Burston (2018) looked at how teachers could adapt Mobile-Assisted Language Learning (MALL) into curricula by having students use their own mobile devices.

### ICT as a Pedagogical Tool

Literature contains many references to the positive effect ICT can have in education, such as Hawkrigde and Mc Mahon's (1992) claim that ICT has the potential to transform the teaching and learning process. Robertson, Shortis, Todman, John, and Dale (2004, p. 6) state that learning through ICT involves a shift away from the traditional style of teaching to "more open-ended areas of learning." Oliver (2002) agrees and adds that contemporary curricula now seek to promote competency and performance, emphasizing capabilities that relate to how information is used, rather than what that information is. There are additional claims that ICT in education promotes student motivation and a stronger desire to engage in collaborative learning, adds value to teaching and learning by improving the effectiveness of learning (NCCA, 2016), and provides opportunities for improved communication between teachers and students that have not existed previously (Dawes, 2001). Research from Milner and Chaikul (2018) demonstrated how teachers were able to help students become "better independent language learners" through the use of technology to access a free website which provides free English listening activities.

### Frameworks and Models Supporting ICT Integration

For teachers faced with integrating ICT in their teaching practice, many questions arise: How can I do this? How can I measure its success? In such cases, using either a framework or model can help teachers make the connection between what they know and how best to apply this knowledge with their students (Judge, 2016). Examples of such models and frameworks are Koehler and Mishra's (2009) Technological Pedagogical Content Knowledge (TPACK), and Ruben Puentedara's Substitution Augmentation Modification Redefinition (SAMR) model (Hallissy, 2015). The SAMR model below (Figure 1) is paired with Revised Bloom's Taxonomy (Pérez, 2014), where the task moves from the lower to higher levels of the taxonomy. The first two elements of SAMR, Substitution and Augmentation are associated with the three lower levels of Revised Bloom's Taxonomy (Remember, Understand, Apply). The two upper levels of SAMR, Modification and Redefinition are associated with Bloom's upper levels (Analyze, Evaluate, Create) (Judge, 2016).

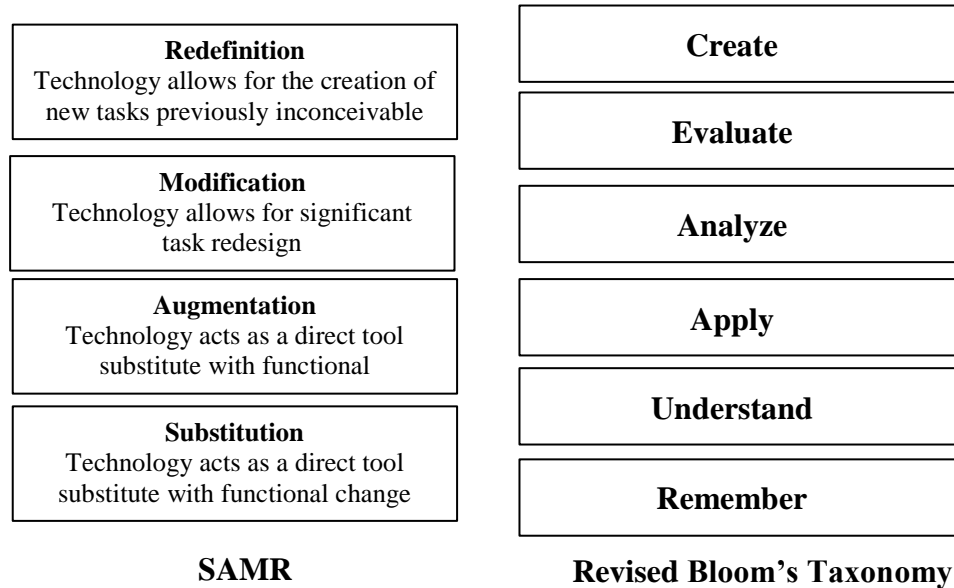


Figure 1. SAMR & Revised Bloom's Taxonomy. Adapted from “SAMR and TPACK: A Hands on Approach to Classroom Practice,” by R.R. Puentedura, 2014. p. 8. [Web log post]. Available under a Creative Commons Attribution-Noncommercial-Share Alike 3.0 License.

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### ICT in Japanese Education

Japan would seem to be in an ideal position to exploit use of ICT in education. It has the world's second highest number of fixed broadband subscriptions, and the second highest number of mobile broadband subscriptions (OECD, 2016). However, figures from the OECD indicate that Japan has not leveraged this strong position for ICT in education, with a student-computer ratio for 15-year-old students of approximately 4:1 (OECD average is 5:1), almost double that of Singapore (2:1) (OECD, 2015). With regard to usage of English in high school ICT studies, Lockley (2013) found that only 25% of the students reported having used English in their IT studies. In a 2011 study on the effectiveness of using new technologies to learn a foreign language for Japanese university students, it was noted that only 20% of the students used computers to do homework (Williams, 2011). Similar findings were reported in a 2012 PISA study which noted that Japan was the country where students make the least use of computers outside of school for schoolwork (OECD, 2015).

One possible explanation for why Japanese students make such infrequent use of computers may lie in their preference for accessing the Internet through their mobile phones. In their 2008 study on the diffusion of mobile Internet in Japan, Akiyoshi and Ono (2008) found that Internet access was more accessible from mobile phones than computers in Japan, and that perhaps not surprisingly, a large number of home computer owners did not use their computers. The degree to which Japanese youth are comfortable using their mobile phones is noted by Takahashi (2011, p.92) who cites the term “*oyayubibunka*” or “thumb culture” to describe the dexterity of Japan's youth with their mobile phones, operating them “by swift manipulations of their thumbs and without looking”.

## **ICT in Japanese Universities**

Japanese universities were initially slow to introduce use of computers and the Internet for teaching purposes, and Yoshida and Bachnik (2003) point out that although universities in Japan had Internet access, use of the Internet for teaching in classrooms was only at 11 %. Valance (2008) notes that there was almost no guidance in Japan on how best to integrate technology into curricula. More recent research suggests that Japanese university students are gaining more exposure to the Internet through the use Learning Management Systems, and a 2010 report from the Ministry of Education, Culture, Sports, Science, and Technology (MEXT) revealed that 40.2% of universities in Japan used Learning Management Systems (LMS) (MEXT, 2010). Taynton (2012) supports this and claims that students in Japanese universities are increasingly getting exposure to ICT through the use of Moodles and LMS. However, while students may be getting more exposure to the Internet through LMS at universities, the lack of experience with computers is a concern for those university EFL teachers wishing to introduce ICT related learning activities in their curricula. This was noted by Williams (2011), who found that her first-year university students were less proficient at ICT than expected, with 37% of students revealing that they had not used a USB memory stick before taking her class, and many were not able to use simple Microsoft Word functions.

## **Mobile learning (m-learning)**

Definitions of mobile learning have been debated, with constructs such as pedagogy, technological devices, context, and social interaction featuring in academic attempts to define mobile learning (Crompton, 2013; Kukulska-Holme, 2009; Traxler, 2009). Advice from Traxler (2009, p. 10) that any definition of mobile learning must recognize that it is, “essentially personal, contextual, and situated,” and be positioned “within informal learning, rather than formal learning” is appropriate for the purposes of this research as students will be asked to use their smart phones both inside and outside of class for learning purposes. M-learning encompasses a number of devices such as mobile phones, tablet computers, MP3 and MP4 players, digital cameras and gaming consoles (Hockley, 2013).

With smart phone ownership among Japanese millennials (18 – 34 years old) at 77% (Poushter, 2016), the potential for students to use their smart phones for academic purposes is high. Proof of this can be seen in a 2012 online study of American undergraduates covering over 100,000 students from 195 institutes which found that 67% of students used their smartphones for academic purposes (Dahlstrom, 2012). According to Kukulska-Hulme (2009, p.163), mobile learning can create situations where learning is “personalized, situated, authentic, spontaneous and informal.” Research from Attewell (2005) refers to the psychological and cognitive advantages of mobile learning, specifically that it promotes collaborative learning among students. Kim, Rueckert, Kim, and Seo (2013) agree and note that social communication features in mobile technologies facilitate more collaborative learning.

## **Mobile Assisted Language Learning (MALL)**

The growing popularity of Other Mobile Devices (OMDs) such as smart phones and eBook readers has led to the creation of a new acronym, Mobile Assisted Language Learning (MALL) (Achilleos and Jarvis, 2013). According to Kukulska-Hulme and Shield (2008), MALL differs from Computer-Assisted Language Learning (CALL) in that it makes use of

personal, portable devices which facilitate new ways of learning. It ensures continuity of access and interaction in different contexts. The authors add that such characteristics would seem to make MALL belong more to students than teachers. Hsu, Liwei (2013) notes that mobile applications create new learning environments for language learners, facilitating learning both inside and outside the classroom and are thus considered to be an ideal tool for language learning.

A number of studies point to the advantages of using mobile learning for learning a language. Results from a study conducted by Attewell (2005) showed that learners' reading comprehension and spelling skills improved after using mobile learning games. The same study also noted that mobile learning aided collaborative learning among learners, and improved self-esteem and self-confidence. Seo and Choi (2014) focused on using a mobile application to improve the speaking skills of Korean middle school students. A control group used handouts and an experimental group used a mobile application. A standard listening was used to measure pre and post-test scores. The group using the mobile application had higher scores, especially at the elementary level. Wang and Smith (2013) conducted research into the use of mobile phones to develop reading and grammar skills and their findings pointed to a positive language experience for the learner. Their study also noted that the limitations of earlier mobile phones are starting to dissipate with the advent of smart phones that feature improved bandwidth using 4G networks, large five-inch screens with high resolutions, and Global Positioning System (GPS). Zhang, Song, and Burston (2011) note that some learners have been reluctant to use mobile phones for vocabulary learning, and that this may have been due to the device having a small keypad and display screen.

### **Mobile Technology in the Classroom - Friend or Foe?**

Literature contains evidence that points to student use of mobile technology in class as a distraction. In a study on the effect that texting, and posting to a social network site while in class has on student note-taking and class test scores, Kuznekoff and Titsworth (2013) found that students who engaged in texting and posting recorded fewer details in their notes and scored lower on free-recall tests. Furthermore, responses to an American online study which was distributed to 162 institutions and that received over 50,000 replies revealed that 37% of students admitted to using their smart phones for non-class related activities (Dahlstrom, Brooks, Grajek, and Reeves, 2015, p. 21). The same study noted that when asked for whom these devices were distracting, 41% of students answered that in-class use of mobile devices was distracting, "for me," "for other students" (49%), and, "for my instructors" (54%). These findings contradict comments from Langan, et al. (2016) that students often do not consider their use of personal technologies in class to be a problem.

### **Methods**

The purpose of this research was to add to the existing literature on the use of ICT and m-learning in EFL settings at Japanese universities. The study sets out to determine the attitudes of students towards ICT and m-learning in EFL classrooms at Japanese universities. It is hoped that this will help both educators and administrators to better integrate technology in classrooms. To achieve this, the following research question was posed:

What are students' attitudes to the use of ICT and mobile learning in EFL classes at a Japanese university?

## Research Design

The research design utilised a mixed methods approach. In order to gain a better understanding of their perceptions towards using technology to learn, students engaged with two kinds of technology during the semester and completed a pre-ICT usage questionnaire at the start of the semester and a post-ICT usage questionnaire towards the end of the semester. Five semi-structured interviews were conducted with pairs of students after the administration of the second questionnaire. Blaxter, Hughes, and Tight (2010) state that following up a survey with some interviews may help illuminate a more detailed perspective on issues raised.

## Instruments

The pre-ICT and post-ICT questionnaires targeted students' opinions of ICT in relation to efficacy, attitudes, motivation, and preferences for using computers or smart phones to study English. The questionnaires were pilot-tested with students from a different university one week in advance and problems such as ambiguity in questions were identified and amended accordingly. The pre-ICT questionnaire was administered in paper format in the third week of a 15-week semester. The post-ICT questionnaire was administered in the last class of the semester online through Survey Monkey (Survey Monkey Inc., 2017). Both questionnaires were administered in Japanese, and the English translation is presented in Appendices A and B. The semi-structured interviews were conducted with five pairs of students and were recorded with an IC recorder and transcribed.

## Sample

The sample for the quantitative aspect of this study was drawn from three English Communication university classes I teach, and consisted of forty-two students (twenty-six female, sixteen male) for the pre-ICT questionnaire and forty-four students in the post-ICT questionnaire (twenty-five female, nineteen male). The difference in sample numbers is due to the fact that two students joined the classes late in the semester. Students were majoring in English, and there were approximately fifteen students in each class. Their proficiency is approximately B1 (Independent user) of the Common European Framework of Reference for Languages (CEFR) (ETS, 2016). The students were taking a second-year compulsory credit course, and their ages ranged from nineteen to twenty years old.

## Data Analysis

In the pre-ICT questionnaire, questions three and four provided nominal data and this was presented in cross-tabulation form. The majority of the questions provided ordinal data and this was presented in tables. Results from questions number five and seven from the pre-ICT questionnaire, and the corresponding questions of number one and two from the post-ICT questionnaire were displayed together in a table. As the sample sizes for both questionnaires are slightly different, in addition to displaying the raw data, percentages are also given for ease of comparison. The post-ICT usage questionnaire also contained a number of open-ended questions which sought to expand on responses that students made in the quantitative type questions. Using open-ended questions in this manner can help to improve the validity of the quantitative findings (Hesse-Biber, 2010). Information was categorized along certain themes when analyzing the qualitative data, thus helping to identify patterns among the opinions expressed.

## Overview of Technology used in the Research

The technologies used were *VoiceThread*, a webtool that allows users to hold “on-going digital conversations built from text, audio, and/or video comments added by small groups of participants” (Ferriter, 2010, p. 1); and *Quizlet*, a web-based flashcard program which “enables learners to study second or foreign language vocabulary in a paired-associate format” (Dang, 2015, p.1). Appendix C explains how SAMR & Revised Bloom's Taxonomy (Puentedura, 2014), outlined in the Literature Review, was applied to the use of *VoiceThread* in this research. There is also an overview of *Quizlet*.

## Results and Discussion

### Use of ICT for study and non-study related purposes

The results presented in Table 1 establish that access to both desktop and laptop computers at home is high for students in this study, with thirty-five out of forty-two students stating that they had access to laptop computers at home. This reflects results from a 2015 OECD study that showed 92.4% of Japanese students had access to at least one computer at home (OECD, 2015). Not surprisingly, all students in this study answered that they owned a smart phone, and Table 2 clearly demonstrates that these smart phones are the preferred choice when it comes to accessing technology. The pre-ICT usage questionnaire revealed that while 95 % (40) of students reported using their smart phones to search for information related to weather or train times every day, no student used a computer for this task on a daily basis, and only 11 (26%) used a computer once a week for this task (Table 2). This is in spite of the fact that access to computers – desktops and laptops at home is high. Taynton (2012) had similar findings in a study which found that Japanese students’ use of technology in their homes was minimal, with 77% of students preferring to use their cell phones to access the Internet.

The degree to which students use their smart phones for study-related purposes is also high, as can be seen from Figure 2 which shows that thirty-one of the forty-four (70.5%) students surveyed state that they have used their smart phones to complete a report or homework task. These findings concur with other research that shows in spite of the availability of computers in their homes, Japanese students make little use of them for study purposes (Williams, 2011; Lockley.2013; OECD, 2015).

Table 1  
*Access to computers and tablets outside university.*

	Desktop computer	Laptop computer	Tablet
I have access at my home	13	35	26
I have access at another place (Internet cafe/public library, etc.)	17	14	13
No access	8	5	13

*Note.* Pre-ICT usage questionnaire; n = 42. Multiple answers possible

Table 2  
Non-study related use of technology

How often do you engage in the following non-study related activities, and through which device do you do it?	Computer			Smart phone		
	Never or very rarely	Once a week	Every day	Never Or very rarely	Once a week	Every day
(a) Send and read emails	21	16	5	5	5	31
(b) Use social media (e.g. Facebook/Line/Twitter, etc.)	35	1	4	0	0	42
(c) Watch news online / Read blogs	25	13	2	1	10	31
(d) Search for information related to daily life (weather, train/bus times/shopping)	29	11	0	0	2	40
(e) Play games	36	4	0	19	6	16
(f) Watch YouTube videos	21	16	4	5	13	23
(g) Download apps	38	2	0	10	26	6

Note. Pre-ICT usage questionnaire; n = 42

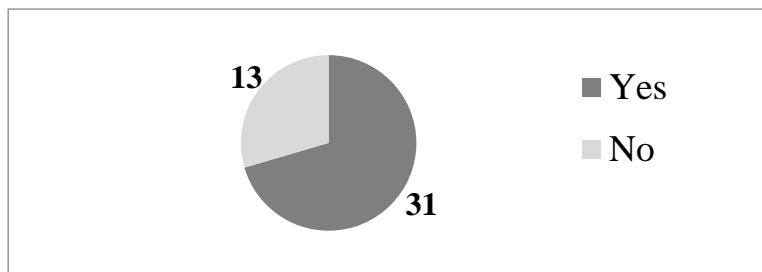


Figure 2. Have you used your smart phone to complete reports or homework tasks?  
Note. Post-ICT questionnaire; n = 44

### Teaching and Learning Styles

Table 4  
Teacher use of technology in your class

Category	Helpful	Can't say	Unhelpful	Never experienced
How helpful is it when your teacher projects lecture material onto a screen via PowerPoint or overhead camera?	41	0	0	0
How helpful is it when your teacher instructs students to use their smart phones to access the internet in class?	15	15	6	6

Note: Pre-ICT usage questionnaire; n = 42



When asked about how useful they felt teacher use of technology was in their classrooms, almost all students thought that the more traditional uses of ICT via teachers displaying lecture material on screen with either PowerPoint or overhead camera to be useful (Table 4). However, if a teacher were to ask them to be more independent and use their own smart phones to access information on the Internet as part of the learning process, only slightly over one third of students (15) thought this would be helpful. While the proportion of students who thought it would be useful to use their smart phones for study purposes during class in this study is higher at (36%), Lockley and Promnitz-Hayashi (2013) noted that only 8.5% of students in their study expressed a desire to use mobile phones as an educational resource in class. The reasons for this reluctance are not clear, but one possible reason may be related to class norms. Some teachers may be less than tolerant of students using smart phones and this may discourage students from using their phones for educational purposes, even when asked to do so by the teacher. The relatively low proportion of students who thought it would be helpful when their teacher asked them to use their smart phones in class to access the Internet (approximately one-third, Table 4) is in contrast to the high number of those who thought using their smart phones to study English would be helpful (78.5% in the pre-ICT and 84% in the post-ICT questionnaires – Table 5). It may be that students are happy to use their phones outside class for study purposes, but less so in class. An unwillingness to use their own data, and possibly a desire to preserve their battery charge may also explain why students do not want use their smart phones in class.

### Student attitudes to ICT and m-learning

Table 5

#### *Student attitudes to ICT and m-learning*

Category	Pre-ICT or Post-ICT questionnaire	Strongly disagree	Disagree	Not decided	Agree	Strongly Agree
Using technology engages students and thus creates a better atmosphere in class.	Pre-ICT quest.	2% (1)	19% (8)	31% (13)	29% (12)	19% (8)
	Post-ICT quest.	0% (0)	2% (3)	16% (7)	32% (14)	44% (20)
Using technology motivates me to learn.	Pre-ICT quest.	2% (1)	26% (11)	26% (11)	29% (12)	17% (7)
	Post-ICT quest.	2% (1)	11% (5)	16% (7)	41% (18)	30% (13)
Using a smart phone / mobile device to study English will help me to collaborate better with my classmates.	Pre-ICT quest.	2% (1)	21% (9)	19% (8)	24% (10)	33% (14)
	Post-ICT quest.	5% (2)	11% (5)	23% (10)	41% (18)	20% (9)
Use of smart phone / mobile devices to study English helps me make better use of my time	Pre-ICT quest.	0% (0)	2% (1)	14% (6)	42% (18)	38% (16)
	Post-ICT quest.	0% (0)	7% (3)	9% (4)	31% (14)	52% (23)
Using a smart phone/mobile device to study English would be helpful	Pre-ICT quest.	0% (0)	5% (2)	14% (6)	29% (12)	50% (21)
	Post-ICT quest.	0% (0)	7% (3)	9% (4)	38% (17)	45% (20)
Use of smart phones for study purposes is a distraction in class	Pre-ICT quest.	7% (3)	42% (18)	12% (5)	23% (10)	10% (4)
	Post-ICT quest.	11% (5)	25% (11)	31% (14)	18% (8)	11% (5)

*Note.* Figures in percentages are calculated on the total number of respondents who took the survey. Pre-ICT questionnaire; n = 42. Post-ICT questionnaire; n = 44. Raw data in parentheses. Percentages to the nearest percentage point.

Table 5 displays the results from questions aimed at discovering whether students' attitudes towards ICT and m-learning changed after using technology throughout the semester. In

general, results reveal these attitudes to be positive and they are discussed in more detail here. Evidence that students were engaged by their use of technology emerged from the questionnaires and in the pre-ICT usage questionnaire, a total of twenty students (48.9%) agreed that using technology increased student engagement in class. This proportion jumped to thirty-four (77.3%) in the post-ICT usage questionnaire. Students' comments in the post-ICT questionnaire reinforce the sense of engagement and one student stated:

“There were no bad points. If we could study with something as different as *Quizlet*, our interest would increase greatly.”

Those students who agreed that using ICT motivated them to learn rose from nineteen (45.2%) in the pre-ICT questionnaire to thirty-one (70.5%) in the post-ICT questionnaire. Regarding the use of *Quizlet*, one student commented:

“It motivated me to learn and was enjoyable.”

The freedom to choose which platform to access technology on, computer or smart phone, facilitated student autonomy, and this in turn may have increased motivation. This has implications for teachers, as Ushioda (2013, p. 5) notes that “autonomy, flexibility, and choice are intrinsic to mobile learning,” and that by exploiting these features, teachers can promote internalized motivation for independent learning.

There was little change in opinion between the pre-ICT and post-ICT questionnaires with regard to whether using smart phones / mobile devices to learn English helped students to collaborate better with their classmates, with twenty-four (57.1%) agreeing that it helped them in the pre-ICT questionnaire and twenty-seven (61.4%) voicing the same opinion in the post-ICT questionnaire. Comments made in the post-ICT questionnaire present a mixed view on whether technology helped students to collaborate more. Some students thought using the technology did provide opportunities for collaboration, as illustrated by these comments;

“It was great that it (*VoiceThread*) let us share with all the class.”

“Quizlet allowed us all to study together”

While another students expressed doubts on how *VoiceThread* could help with collaboration;

“We recorded the comments on *VoiceThread* alone so how does that help collaboration?”

Literature alludes to the benefits of mobile learning, claiming that it can help to facilitate collaborative learning among students (Attewell, 2005). The use of mobile technology to help with content that features social communication aspects (listening or watching content then commenting) can encourage students to take part in more collaborative learning (Kim et al. 2013). This was the intended role of *VoiceThread* in this study and students were expected to view the content created by their classmates, then leave comments, thus using some of the social communication features that Kim et al. (2013) claim mobile technology is capable of exploiting. However, for a number of reasons, including time constraints, and technical issues, use of *VoiceThread* was somewhat restricted in this study. This may have impacted on students' ability to collaborate during the completion of the exercise, thus influencing their responses in the questionnaire.

The large proportion of students who felt that using their smart phones would help them to make better use of their time to study English indicates that students see potential for the use of m-learning. There was a significant increase in *Strongly agree* responses between the pre-ICT usage questionnaire 38.1% (16) and post-ICT questionnaire 52.3% (23) (Table 5). M-learning facilitates continuity of access to learning at any time and in any environment (Kukulka-Hulme and Shields, 2008; Mills, Bolliger, and McKim, 2018). This is confirmed by the large number of students (ten out of forty comments) who wrote in answer to the question, *Which was easier to use Quizlet on, computer or smart phone?* that they preferred their smart phones, because they could do the exercises anywhere.

With regard to smart phone usage in class being a distraction, while the proportion of those agreeing that it was a distraction hardly changed between the pre-ICT questionnaire (fourteen or 33.3%) and post-ICT questionnaire (thirteen – 29.5%), the fact that the number of students who answered that they were undecided almost tripled from five (11.6%) in the pre-ICT questionnaire to fourteen (31.8%) in the post-ICT questionnaires would suggest a certain ambivalence towards using smart phones in class. In the interviews one student commented on using technology in class that,

“ it helped to motivate me to study but I may have done some things that were not related to study!”

Table 6

*Which platform was easier to use Quizlet /VoiceThread on, computer or smart phone?*

Choice of platform for both <i>Quizlet</i> and <i>VoiceThread</i>	Computer	Smart phone
Which device was easier to use <i>Quizlet</i> on, computer or smart phone?	32	12
Which device was easier to use <i>VoiceThread</i> on, computer or smart phone?	20	20

*Note.* Post-ICT questionnaire; n = 44

Table 6 displays the results for students' preferences for using either a computer or smart phone when using *Quizlet* and *VoiceThread*. Computers was a more popular choice for *Quizlet*, whereas the choice was more evenly split with *VoiceThread*. From comments made by students explaining these preferences, it would appear that preferences expressed are related to the functionality of each device.

Table 7  
Which was easier to use *Quizlet* and *VoiceThread* on, computer or smart phone?

Functionality	Device preference	
	Computer	Smart phone
Screen size	“The screen is much bigger so it’s easier to use.” “Because the screen is big.” “It’s easier to see.” “Because it’s easier to use the game function in <i>Quizlet</i> on a large screen.”	
Keyboard	“The keyboard is easier to type on.” “Typing on keyboard is easier than smart phone” “Because it’s easy to hit the wrong button on smart phone.”	
Voice recording		“Because it’s easier to record.” “Because I can record without headphones and microphone set.” “Because it’s easy to work the microphone.”
Convenience		“Because I can study anywhere with it.” “Because I can do it anywhere and I do not need to start up the computer.” “Because I can do it anywhere, even when I commute to school.”

Note. Post-ICT questionnaire n = 44

Table 7 gives some examples of these comments classified according to the particular function. When using *Quizlet* many students value a large screen to read the words, and play the game-related activities, with fifteen of the respondents making comments about ease of use with computers in this case. With *VoiceThread*, students expressed a preference for using their smart phones because of the convenience of being able to record any place they wish to (four comments), or because using a smart phone meant they did not need to use an external microphone when recording their voices (ten comments). Other issues included a desire to use a keyboard when typing for *Quizlet* – (five comments); convenience offered by smart phones when using *Quizlet* - students can do it on their commute, or whenever they have spare time (five comments).

### Answering the Research Question

In answering the research question, student attitudes towards ICT and m-learning in their EFL classes was clearly positive, with many stating that they were more engaged and motivated.

Evidence on whether use of the technology tools *Quizlet* and *VoiceThread* promoted collaboration in class is less conclusive. It was noted previously that students encountered some problems when using *VoiceThread* and that these problems may have influenced the degree to which students were able to collaborate when making their *VoiceThread* projects. Reflecting on how *VoiceThread* was used in the classroom, there may also have been additional reasons for the lack of collaboration. In research designed to illuminate the pedagogies of *VoiceThread*, Gao and Sun (2010) utilised a conceptual framework from Garrison, Anderson, and Archer (2000) called the *Community of Inquiry Framework*. Gao and

Sun (2010, p. 14) claim that when seeking to integrate technology into their lessons, educators should use learning theories “to guide the design and use of technologies for learning.” They add that educators must be familiar with what exactly is feasible with these technologies. During this research sufficient attention may not have been given to the learning model used (SAMR), especially the upper levels of Modification and Redefinition. Improved scaffolding, which according to Ertmore and Simmons (2006) are tools and strategies that allow learners to reach higher levels of understanding that they could not achieve on their own, would have helped students better understand how to use *VoiceThread*, thus facilitating better collaboration. Comments from Stockwell (2008 p. 269) mirror those of Gao and Sun’s (2010), and relate that learners will be satisfied with their learning experience provided educators utilise a design framework for the technology “in terms of the relationship with the pedagogical goals, the interface, and the learning environment.”

With regard to preferences for studying with either smart phones or computers, the results show that this is not a straightforward choice. Previous studies have revealed contrasting findings in regard to the choice of platform. Thornton and Houser (2005) found in a study that 71% of students preferred to use mobile phones rather than computers when learning vocabulary, while Stockwell (2010) found the opposite, that when given a choice, a high percentage of students chose to use a computer rather than a mobile phone for vocabulary learning activities. While the findings from this research clearly demonstrate that students are interested in using their smart phones to study English and thus match the results from the Thornton and Houser (2005) study, it is also clear that the choice between computer and smart phone for study purposes is not straightforward, and is very much dependent on the affordances of the device being used, as well as the degree of convenience offered by either platform. When choosing which technology to use, it need not be a straight choice between smart phone or computer and Cote and Milliner (2017) state that students can be shown how to better collaborate between the two devices by using cloud computing services such as Dropbox and iCloud to integrate content from their mobile devices with computers.

Students acknowledged that using smart phones in class can be a distraction, and research proves that students do use technology in class for non-study related matters. Lenhart, Ling, Cambell, and Purcell (2010) found that 64% of teenagers who owned cell phones have texted during classes, despite the practice being banned. That distraction caused by smart phones can impinge on learning is obvious. Accordingly, educators need to consider this when issuing classroom guidelines.

Although not directly referenced in the results, one problem for teachers wishing to have students use mobile devices in class for study purposes is that students are often much more proficient at using smart phones than the teachers they are learning from. Langan et al. (2016, p. 4) note that this is often framed as a *digital natives* (students) versus *digital immigrants* (instructors) scenario. For teachers who are struggling to look confident about using computers in front of their students, teaching with smart phones becomes even more intimidating. Farley et al. (2015) agree and point out that many teachers find m-learning daunting, as they do not have the skills to introduce m-learning, or are too busy to learn how to do it effectively. Educators may also feel that they have to change their teaching style if they wish to incorporate m-learning into their teaching, and Crompton (2013) claims that many are either unwilling or unable to do so. Implementing teacher training on the use of ICT in classrooms is one way to help teachers overcome such problems, and in a study on professors’ attitudes to the use of mobile devices in class, Moreira, Pereira, Durão, and

Ferreira (2018) note that teachers believe if they are more confident with using mobile devices in class, students will become more engaged in the class.

## **Limitations and Recommendations**

The study has a number of limitations, the most significant being the small sample sizes ( $n = 42$ ;  $n = 44$ ). In addition, the fact that the sample for the pre-ICT and post-ICT questionnaires were not the same size makes it more difficult to accurately draw conclusions from the findings. As the sample was concentrated in one university and with students that may have had differing competencies with ICT, the degree to which findings can be generalised is further limited. Further research should try to increase sample sizes. In relation to student perceptions of ICT and m-learning, it is suggested that any future research take place over a longer time-scale. This research was conducted over a fifteen-week semester and this limited the amount of technology that could be used. Student use of technology was focused on the use of just two applications, and as such, this is a further limitation on the degree to which the findings can be generalized. Further research could try to expose students to more applications; however, it should be noted that student comments from the interviews indicated that they were sometimes confused by having to use two different applications in one class period. This suggests that any future research might benefit if conducted over two semesters rather than just one.

## **Concluding Comments**

The study confirmed that while Japanese students were happy to use both computer and m-learning to access technology for learning, the inherent convenience offered by smart phones means they are more likely to use their smart phones. However, teachers need to be aware of the affordances and limitations of both platforms when choosing which technology to use. The study also demonstrated that there is an opportunity for university administrators to improve learning outcomes for students by making themselves more familiar with student preferences in regard to use of ICT and m-learning in the classroom.

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## Appendix A

### Pre-ICT Questionnaire Student Attitudes To Using Technology

**No. 1** Gender (please circle)    M / F

**No. 2** Do you use a smart phone?    Yes / No

#### Access to technology outside university

**No. 3** Which kinds of technology do you have access to outside university? (Check all relevant boxes)

	At my home	Another place (Internet cafe/public library, etc.)	No access
Desktop computer			
Laptop computer			
Tablet/ e-readers/ mobile devices (e.g. iPod Touch, Kindle, etc.)			

#### Non-study related use of technology

**No. 4** How often do you engage in the following activities outside university and through which device do you do it? (Check the appropriate box)

How often do you engage in the following non-study related activities, and through which device do you do it?	Computer			Smart phone		
	Never or very rarely	Once a week	Every day	Never Or Very rarely	Once a week	Every day
(a) Send and read emails						
(b) Use social media (e.g. Facebook/Line/Twitter, etc.)						
(c) Watch news online / Read blogs						
(d) Search for information related to daily life (weather, train/bus times/shopping)						
(e) Play games						
(f) Watch YouTube videos						
(g) Download apps						

**Attitudes towards using technology**

**No. 5** To what extent do you agree with the following statements about using technology for learning?

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
(a) Using technology to learn is important					
(b) Using technology to learn will be beneficial because it will be useful for any job I get in the future					
(c) I want my teachers to use more technology to support learning					
(d) Using technology helps me to better understand what I am learning					
(e) Using technology helps me to remember what I am learning					
(f) Using technology engages students and thus creates a better atmosphere in class					
(g) Using technology motivates me to learn					
(h) Using technology in class is a distraction (students will use the internet to check social media, etc.)					

**Teacher use of technology in your classes**

**No. 6** With regard to your teachers' use of technology in your classes, how helpful is it to your learning when teachers do the following?

	Never experienced	Not at all helpful	Somewhat unhelpful	Can't say helpful or unhelpful	Somewhat helpful	Very helpful
(a) Project lecture material onto a screen via PowerPoint/overhead camera						
(b) Display material from Internet sites on a TV or projector screen (YouTube, Wikipedia, podcasts, blogs etc.)						
(c) Play audio and video clips						
(d) Instruct students to use their cell phones to access the internet.						

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(e) Use Interactive White Board (may need a picture of this!)

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(f) Use a video camera to record video in class

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(g) Use voice recorder to record audio in class.

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**Using mobile devices for learning**

**No. 7** To what extent do you agree with the following statements about using smart phones or other mobile devices such as tablets for learning?

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
(a) I am interested in using a smart phone/mobile device to study English					
(b) Using a smart phone/mobile device to study English would be helpful.					
(c) Using a smart phone/mobile device to study English would help me utilize my time more productively.					
(d) I am willing to install a learning app on my mobile device to help me study English.					
(e) Using a smart phone/mobile device to study English will help me to collaborate better with my classmates.					
(f) Using my smart phone/mobile device <u>in class</u> would be a distraction to my fellow students and me					

## Appendix B

### Post-ICT Questionnaire. Student Attitudes to Using Technology Attitudes towards using technology

**No. 1** To what extent do you agree with the following statements about using technology for learning?

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
(a) Using technology to learn is important					
(b) Using technology to learn will be beneficial because it will be useful for any job I get in the future					
(c) I want my teachers to use more technology to support learning					
(d) Using technology helps me to better understand what I am learning					
(e) Using technology helps me to remember what I am learning					
(f) Using technology engages students and thus creates a better atmosphere in class					
(g) Using technology motivates me to learn					
(h) Using technology in class is a distraction (students will use the internet to check social media, etc.)					

### Using mobile devices for learning

**No. 2** To what extent do you agree with the following statements about using smart phones or other mobile devices such as tablets for learning?

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
(a) I am interested in using a smart phone/mobile device to study English					
(b) Using a smart phone/mobile device to study English would be helpful.					
(c) Using a smart phone/mobile device to study English would help me utilize my time more productively.					
(d) I am willing to install a learning app on my mobile device to help me study English.					

---

(e) Using a smart phone/mobile device to study English will help me to collaborate better with my classmates.

---

(f) Using my smart phone/mobile device in class would be a distraction to my fellow students and me

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Q.3 Which was the easier platform to use *Quizlet* on, computer or smart phone?

- a) Computer
- b) Smart phone

Please comment on your answer.

Q.4 Which was the easier platform to use *VoiceThread* on, computer or smart phone?

- a) Computer
- b) Smart phone

Please comment on your answer.

Q.5 Please comment on the good and bad points of your experience with using *Quizlet* and *VoiceThread*

Q.6 Having used both *Quizlet* and *VoiceThread*, do you want to use other applications or software? Yes / No

Q.7 Have you used your smart phone to submit either an assignment or homework? Yes / No



## Appendix C

### Overview of Technology Used: *VoiceThread* and *Quizlet*

Students completed a number of tasks with *VoiceThread* during the semester. These tasks included explaining a process such as preparing a dish (Figure C1), or introducing campus facilities to an exchange student visiting from overseas. A brief explanation of how these tasks were applied to the SAMR & Revised Bloom's Taxonomy (Puentedar, 2014) outlined in the Literature Review is given here

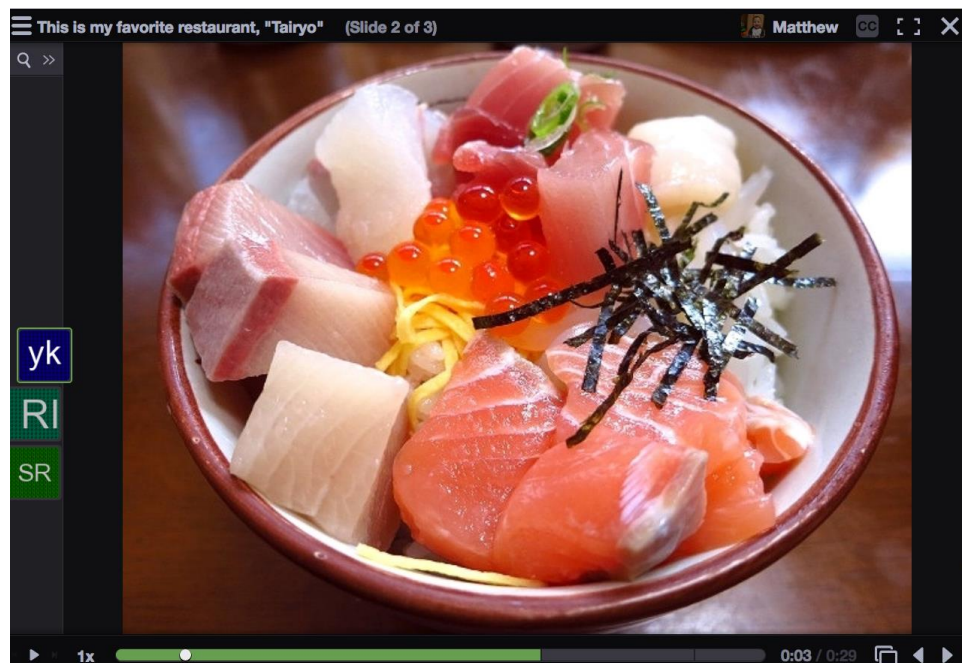
#### *VoiceThread* & SAMR

Substitution - Instead of using textbooks, students use their smart phones to take pictures that they will use in the creation of their *VoiceThread* projects. In this sense, the smart phones are replacing textbooks or other print material that the teacher might distribute in class.

Augmentation – Students use the computer microphones, or the *VoiceThread* app on their smart phones to record their voices describing the contents of their pictures. By recording their sentences, students are adding or enhancing what they might have done previously - a gap fill exercise in a textbook or writing the steps of a process out in a workbook.

Modification – *VoiceThread* contains a doodle function whereby users can draw lines on top of their pictures to either explain, or add to their pictures as they record their voices. This allows for significant modification of the task - students can annotate their pictures as they narrate through the pictures. This is something they cannot do in their textbooks.

Redefinition - This activity is completely different from what they might have done in textbooks - it has been redefined - from something quite passive and transmissive in nature to something that requires research, collaboration and communication with their classmates



### *Quizlet and Quizlet Live*

*Quizlet* allows user to create digital flashcards that contain a word on one side and a definition on the other. The application allows users to use a number of different modes to study the words; Flashcard (the cards flips over), Learn – the user inputs the definition upon seeing the word (or vice-versa); Spelling - a recording of the word is played and the user must input the spelling; Test – a test with either multiple-choice, matching, or true-false questions is generated. There are also two games allowing users to test their recall of the terms (Wright, 2016). There is an additional game called *Quizlet Live*, which randomly assigns students into teams to compete against each other using the *Quizlet* vocabulary they have been learning (Figure C2). This encourages students to get to know students they may not have talked to before and encourages collaboration (Wolff, 2016). The students race against each other to match vocabulary terms with their definitions. Questions appear on each student’s screen with a list of choices, and students must decide whether the correct answer is listed on their screen or not. They can also see that their teammates have a list of possible answers (these answers are not visible to the student answering).

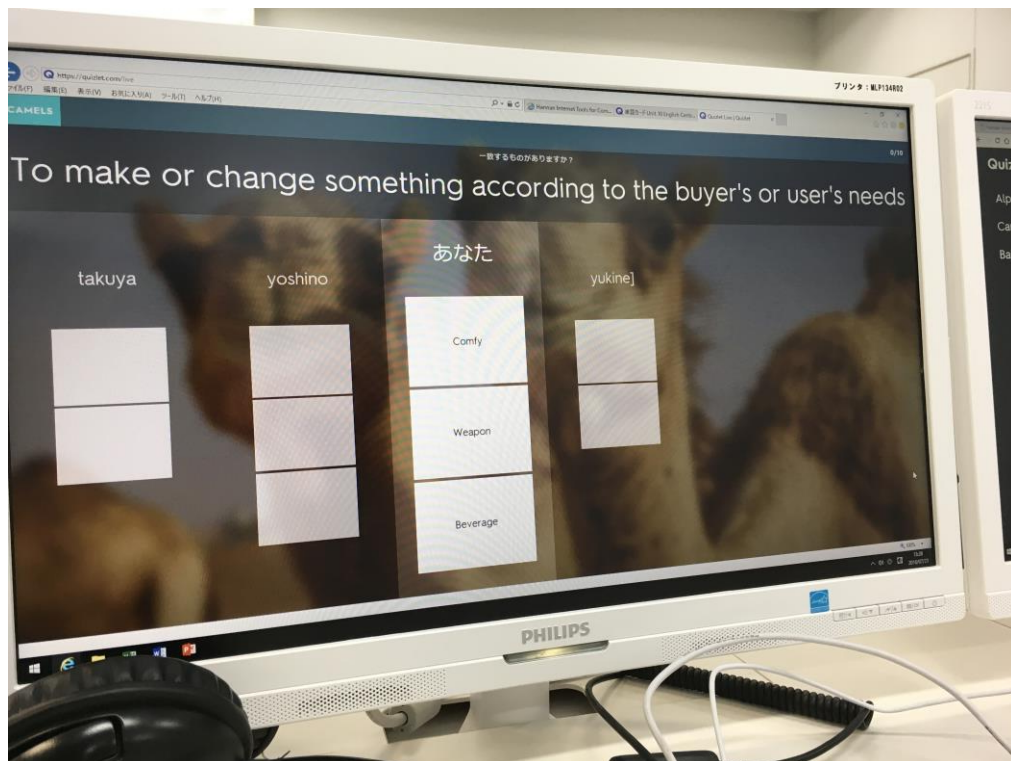


Figure C2. Screen-shot of student’s computer during use of the *Quizlet Live* game.