M-Learning at a Japanese University: Limitations and Opportunities

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Facts and figures show that Japan has the highest percentage of mobile ownership and usage in the world, and thus has an advantageous position in which to best utilise mobile devices in the M-Learning field. This paper offers an analysis of traditional findings regarding the advantages and disadvantages contained within M-Learning. Emphasis will be placed on how the rapid expansion of new mobile technologies, such as 'Smartphones', offers possible solutions to the challenges that have faced more traditional mobile devices. The paper will conclude with results from a survey of 290 students conducted at Hiroshima University that will show that universities need to respond to the high levels of mobile-phone ownership amongst Japanese university students by designing more mobile-phone inclusive English language courses. The survey will also conclude that Japanese university students are willing — provided the correct study environment — to embrace Smartphone technology as part of their English language study.

Introduction: M-Learning In and Out of the Classroom

It is perhaps to state the obvious, but technology continues to drastically reshape the parameters of how English is taught and studied at universities in Japan. Mobile phones are a prime example of how technological developments have altered an instructor's approach in the classroom. Instructors of English have moved away from a trend of excluding mobile phones and are now allowing students to integrate mobile phone technology, such as anytime Internet access, as a useful part of their study process.

Widespread ownership of mobile phones and the increasing diversity of other portable devices such as Tablets and portable media players (Apple - iTouch / Microsoft - Zune) have dramatically changed the landscape of technology - supported learning (Kukulska-Hulne, 2009). With M-devices currently dominated by mobile phones, (Smartphones and Feature Phones) proponents say that M-learning happens mostly when people are away from the classroom (Wang & Higgins, 2006). For this reason, M-learning through convenient portable devices, offers university students "*anytime, anywhere learning*" (Geddes, 2004) that allows them to improve how, when, and where they study English.

The aim of this paper is to show what M-learning offers instructors and learners at universities in Japan by reflecting on the results of a student survey conducted at Hiroshima University on how first-year and second-year students use their mobile phones. However, just because students have mobile phones and are allowed to use them for study does not necessarily mean

that they will be used for educational purposes (Corbeil & Valdes-Corbeil, 2007). Before concentrating on specific results of the survey, it is important to clarify what is meant by 'mobile learning' and why it is becoming increasingly important to Japanese students (Kukulska-Hulne, 2009).

What is M-Learning?

To answer this question fully would exceed the parameters of this paper as the truth is that the field is constantly growing and diversifying as new technology becomes readily available. One of the areas that creates the biggest debate revolves around how 'mobile learning' can be defined. Does it refer to the mobility of the device, or the mobility of access by the learner, or even the mobility of the knowledge? (Kukulska-Hume, 2009). The answer could be all three as M-Learning could be defined by spatial, temporal, or contextual borders. Or to put it more simply, are the aspects of interaction 'a where', 'a when', or 'a how'? (Kakihara & Sørensen, 2002)

I believe the key to interpreting M-Learning is that the term itself offers an ambiguous definition, and so can be adapted as required. Presently, the key element of M-Learning is an understanding that mobile devices are essential to facilitate the M-Learning process. However, it is also predicted that as technology increases to become an ever-more-integral part of our environment, people will no longer have to possess a mobile device in order to interact with the information they require (Kukulska-Hume, 2009).

For the purposes of the survey results contained within this paper, I will adopt the definition of M-Learning as set-out by Kukulska-Hume & Shield, who concluded that "*mobile learning refers to learning mediated via handheld devices and potentially available anytime, anywhere*" (2008). Whilst acknowledging the enormous impact that media player devices have had on M-Learning, especially in the field of podcasting (Abdous, et al, 2009), this paper will focus on mobile phones, as these devices are the most easily accessed by Japanese university students.

M-Learning in Japan

Mobile Phones

A 2006 paper on the limitations of mobile phone learning estimated that the number of mobile phones around the world was 1.7 billion (Wang & Higgins, 2006). Only five years later in December 2011, the number of mobile phones owned globally now stands at 6.9 billion (www.totaltelecom.com), which is almost one phone for every person on the planet.

Figures in Japan indicate that Japanese people use the mobile Internet (3G / Wi-Fi / WAP) more than people in any other country. Japan has 121,246,700 mobile phone subscribers, around 95% of the entire population. Of those subscribers 120,030,000, or 99% of all users own 3G devices, with 81% of those, or 98,683,500 being mobile Internet subscribers (TCA, Japan Statistics Bureau, June 2011). Regular usage of the mobile Internet are also higher in Japan than in any other

country, with 47% of mobile Internet subscribers accessing the Internet regularly each month compared to 43% in urban China, 22% in the USA, and only 12% in Europe (Reitsma, 2011).

These figures indicate that Japan is a 'mobile-phone nation' with mobile phones being widespread and popular, the vast majority of which are devices that are easily accessible to 3G technology. These mobile phones give users a variety of functions such as email, Internet access, cameras, videos and downloading capabilities which offer educators and learners opportunities to enhance the learning process.

M-Learning with Mobile Phones

One of Japan's biggest struggles at the beginning of the 21st Century is how to cope with a decreasing population. In 2011 Japan recorded a 0% birth rate; the serious result is that Japan's population is predicted to have decreased by 21% from 127 million currently to around 100 million by 2050. Only four other countries (Ukraine, Bulgaria, Romania & Estonia) are predicted to have higher decreases in population by 2050 (Rosenberg, 2011). Furthermore, a United Nations study in 2000 also highlighted how stagnate birth rate could significantly damage Japan's future economic welfare, one that is predicted to be heavily reliant on information technology (Katsumata, 2000).

In an effort to counter these future problems, Japanese universities have been promoting M-Learning as a way to attract overseas and non-traditional students (Zhang, 2008). Traditionally many of these programmes have been vocabulary based, and have been accessed by SMS messages or web-based videos being sent to the learners at specific times (Levy & Kennedy, 2005 / Houser & Thornton, 2005). However other mobile-based programmes such as iTree, developed by the University of Tokyo, aims to allow the learner more freedom by providing learners with real-time updates through information displayed on student's mobile phones (Zhang, 2008).

Another new approach called video blogging (Vlogging) has become a new and dynamic way in which students can record, upload, and view video clips from their mobile phones, thus placing the learner nearer towards 'anytime, anywhere' material acquisition. By utilising video recording applications on mobile phones learners gain more freedom as to when, where, and how they interact not only with the material, but with other students and even the instructor.

Social networking sites such as Facebook and YouTube have also allowed a new form of mainstream personal interaction to be readily accessed by anyone and at any time (Rosenbloom, 2004). Both sites can be accessed from a mobile handset which allows the user to create and upload/download material from their device at a time and place convenient to their needs at that time (Gao, at al, 2009).

M-Learning Disadvantages

Although M-Learning is having a larger role in the learning process, there are clear areas that are currently restrictive and require overcoming before mobile devices can fully exploit the full potential of the technologies available. These three areas have been identified by Wang and Higgins (2006) as *pedagogical*, *psychological* and *technical*, and present clear barriers to the positive aspect of 'anytime, anywhere learning' (Geddes, 2004).

Technical

Perhaps the best place to start is that mobile phones offer much reduced screen size and smaller function keys as opposed to a desk-top or lap-top computer. Therefore, input time is almost always longer via a mobile device than from a standard computer (Stockwell, 2010). Other major issues centre on factors such as battery-life, printer synchronisation, and access to the Internet. Nonetheless, Wi-Fi Hotspots are becoming more common, with fast-food chains, hotels, educational institutional and the Bullet Train (Shinkansen) providing free Internet access (www.japan-Guide.com). Yet, free locations are limited, with most requiring a fee for Internet connection for a set duration of time. Therefore, access to learning tools can clearly be restricted by location, time, and finance.

The other significant hurdle to harmonisation of mobile phones in the classroom is that there are different manufactures, operators, and software materials in competition with each other (Wang & Higgins, 2006). The two leading software operating systems, Android and iOS have been designed by two different manufactures (Google and Apple) who are unwilling to share data and software applications.

Pedagogical

The monitoring of students is the area that provides the most pedagogical concerns regarding M-Learning courses. Is the environment chosen by the learner conclusive to study? Is there any forbidden assistance? Is the respondent undertaking the assignment the same one registered for the class? (Wang & Higgins, 2006) There is clearly a requirement from the learner for a certain amount of self-discipline in the learning process, which might make mobile phones difficult to integrate into a course involving younger or de-motivated students.

Psychological

Students expect to study in the classroom, in the library, or at home, but all these places are usually fixed locations. The attractiveness of M-Learning is the opportunity for the learner to choose locations and times that best suit their study needs, 'anytime, anywhere'. Yet, realistically the learners need to concentrate, so how practical is it to expect them to study or learn whilst commuting? (Wang & Higgins, 2006) Time constraints are often a major factor in the completion of an assignment (Abdous, at al, 2009) and although mobile phone devices are portable, the reality is that students organise their study time in 'chunks', rather than exploiting

spare moments for study (Wang & Higgins, 2006).

All three areas currently present hurdles to fully utilising the potential of M-Learning via mobile phone devices. The next segment of this paper details the results of a survey conducted at Hiroshima University on the usage of mobile phones by students undertaking English language courses.

University Mobile Phone Student Survey Feedback

A blind sample survey in English of mobile phone usage was conducted amongst 290 undergraduate students. Respondents were first-year and second-year (151 males, 134 females aged 18–37) students from various departments at Hiroshima University. The survey's aim was to provide some insight as to how students used their mobile phones, and what situations, if any, resulted in them using their mobile phones as part of their study. It was hoped that by a better understanding of mobile phone usage, instructors could learn how to best utilise these devices.

The first surprise of the survey was that not every student owned a mobile phone, although the numbers do tally within the overall national level of ownership in Japan (Reitsma, 2011). Of the seven students who did not own a mobile phone, three students owned a Tablet (iPad 2) and used the phone applications on that device. Therefore, out a total of 290 students surveyed, only four did not own any mobile phone device. When asked why, the respondents cited that they felt they did not need a mobile phone.

The next section of the survey asked students if they owned a Feature phone or Smartphone. Feature phone is the term generally used to describe traditional mobile phones, whilst Smartphones describe high-end devices. There is no standardised definition to distinguish the categories (Wikipedia). However, for the purpose of this survey, Smartphones were defined as only having touch-screen capabilities.

The survey then asked students the reasons behind their ownership choices regarding mobile phones. Amongst male and female students, (m-63/103, f-58/95) a majority of those who answered wrote they wanted to own a Smartphone in the future. Amongst Female respondents 'Internet Access/Apps' and 'Convenience' (19/58) were chosen as the main reasons. Male respondents overwhelming chose 'Convenience' (37/103) as the main reason they wanted to own a Smartphone. Amongst negative answers the reasons were more evenly spread out, but the biggest category written by both male and female respondents was 'Don't like' (m-12/40, f-17/38). There were two male respondents who did not want to own a Smartphone, but who did reply that this was because they wanted to own a Tablet. They felt Tablets would be more useful in the future compared to mobile Smartphone devices.

The results for respondents who already owned a Smartphone device showed 'Convenience'

(13/39) as the most popular answer amongst females. Amongst male respondents 48% of them also chose 'Convenience' (23/48). However, 'Cool & Fashionable' was also a popular choice (13/48) given for owning a Smartphone. The most popular reason amongst both male and female respondents who wrote reasons in the 'Other' category (m-1/48, f-7/39) was that this was the cheapest option when upgrading/purchasing a new model of phone.

However, the answers in this survey are unclear as to whether the increase in Smartphone sales around the world is in response to pressure from the consumer, or the sales direction of mobile phone operators and manufacturers. Whatever the reasons may be, the sales of Smartphones are continuing to increase rapidly. The global mobile phone statistics website, Mobi Thinking shows that in 2010 there were 302.6 million units sold worldwide, a massive increase of 74.4% on 2009. The figures for Smartphone sales in Japan for 2010 saw a 370% increase in Smartphone units sold. By 2013 the forecast is for another 20 million units to be sold in Japan alone, which will result in Smartphone sales overtaking Feature phone sales for the first time. Whatever preference current students have, the future of mobile phone devices will not be Feature phones.

The final part of the survey asked what students used their mobile phones for. It was very clear, and not unexpected, that respondents used their Smartphone mobile devices mostly for 'Emailing' (85/87), 'Phone Calls' (85/87) and Internet Access (84/87). Playing games (58/87), Dictionary use (54/87) and Calendar (46/87) also showed a significant usage. The lowest category chosen was 'Study' (26/87). Perhaps most surprising was that this survey showed two respondents who did not use their Smartphones for either emailing or phone calls.

Respondents were also asked if they used their Smartphones in class to help with their studying. The results showed that 57.5% did not use their phones (50/87) in this way. The final question asked Smartphone users if they believed that Smartphones made it easier to study English, this result showed 77% of respondents in favour (67/87).

Amongst students who owned a Feature phone, the results for the most popular reasons mirrored those of Smartphone owners with Emailing' (194/198), 'Phone Calls' (192/198) and Internet Access (151/198) again showing the most use. Where the results differed was in the choice of the next most frequent categories, 'Calendar' (88/198) and Dictionary (76/198). 'Study' also replicated Smartphone users and showed low results (22/198). Video/TV (19/198) was the lowest category chosen with only a response rate of 9.6%. This was not unexpected as mobile phones have small screen sizes and low screen resolution which reduces the quality of video files.

The two final questions asked about Internet usage in class and whether respondents felt Smartphone usage would make studying English easier. Surprisingly these results also

mirrored the responses of Smartphone users. Of the 198 students who did own a Feature phone, 68.5% (135/198) responded that they did not use their Feature phone to access the Internet in class. The response of Smartphone users who believed that Smartphones would make studying English easier in the future (123/198), was also high with 62.5%.

Similar to results found in other surveys (see Wang & Higgins, 2006; Thornton & Houser, 2005; Mills, D & White J, 2011), this survey reported that mobile phone devices are still mostly used for voice communication and personal information exchange. However, the forecasted increase in Smartphone ownership in Japan in the next two years (Reitsma, 2011) does suggest that there is a desire by students to expand the ways in which they utilise their mobile devices.

The Survey Results

Box A

Do you owned a mobile phone?		
Male:	Yes: 149	No: 3
Female:	Yes: 129	No: 4
No Data:	Yes: 5	No: 0

Box B

If NO, do you want to buy a Smartphone in the future? Why?			
Females (95):	**Yes: 58**	**No: 38**	
Reasons: YES		Reasons: NO	
Internet Access/Apps:	19	Expensive:	9
Cool / Fashionable:	12	Don't Need:	17
Convenient:	19	Don't Like:	2
No Reason:	8	Difficult to Use:	8
		No Reason:	2

Box C

If NO, do you want to buy a Smartphone in the future? Why?			
Males (103)	**Yes: 63**	**No: 40**	
Reasons: YES		Reasons: NO	
Internet Access/Apps:	10	Expensive:	5
Cool / Fashionable:	12	Don't Need:	4
Convenient:	37	Don't Like:	12
No Reason:	4	Difficult to Use:	7
Other	0	No Reason:	10
		Other:	2

Box D

If YES, why did you buy a Smartphone?

Females	**(39)**	**Males**	**(48)**
Study:	2	Study:	2
Internet:	7	Internet:	6
Convenient:	13	Convenient:	23
Cool/Fashionable:	7	Cool/Fashionable:	13
Others:	7	Others:	1
No Reason:	3	No Reason:	3

Box E

You have a Smartphone, what do you use it for?

(Respondent numbers out of total of **87)**

Email:	85
Phone Calls:	85
Internet:	84
Games:	58
Dictionary:	54
Study:	26
Music:	47
Video/TV:	31
Calendar:	46
*Others:	24

	Yes	No
Do you use Smartphone Apps?	75	12
Do you have any English study Apps?	27	60
Do you use the Internet in class for study?	37	50
Do you think Smartphones will make it easier to study English?	67	20

*Others included, Maps/Camera/Alarm/Notes

Box F

You don't have a Smartphone, what do you use your Feature phone for?

(Respondent numbers out of total of **198**)

Email:	194
Phone Calls:	192
Internet:	151
Games:	57
Dictionary:	76
Study:	22
Music:	24
Video/TV:	19
Calendar:	88
*Others:	44

	Yes	No
Do you use the Internet in class for study?	63	135
Do you think Smartphones will make it easier to study English?	123	75

*Others included, Maps/Camera/Alarm/Notes

#The survey included students studying Medicine, Economics, Dentistry, Education, Science, Pharmacy, Law, Engineering and Nursing.

Conclusion

Mobile phones, whether Smartphones or Feature phones, clearly have limitations and opportunities for both learner and educator. The total number of mobile phone ownership in Japan, a nation desiring a higher percentage of the population with proficiency in English, shows that there is an opportunity to harness ownership with the convenience of 'anytime, anywhere' learning.

Technical, pedagogical and psychological factors do present limitations. The cost of Smartphone devices, the diversity in mobile OS, as well as smaller memory also provides challenges. Students have not yet become used to learning/studying via a mobile device and there are clear areas where testing, grading, and evaluation present concerns regarding result accuracy. Yet new models of Smartphones have larger screen sizes and memory storages. The high percentage of Japanese people who own mobile phones shows at least a level of comfort with usage.

The results in this survey offer support to the belief that some students believe that Smartphone technology can assist them in their English study. The issue of privacy is a potential hurdle as national privacy laws, such as the 2005 "Act on the Protection of Personal Information" allows students to refuse to provide teachers with mobile phone details such as email addresses and phone numbers. Yet, almost all university students in Japan are provided with university

email addresses, and with many university websites offering a mobile format, these can now be easily accessed via a Smartphone.

The full potential of M-Leaning for both educators and students can only be reached when mobile phone ownership comprises of Smartphones rather than Feature phones. Feature Phones present too many problems that greatly hinder the integration of M-learning mobile devices into the learning process. Further research will be required to understand what additional problems universal Smartphone usage may provide. Currently Smartphones are the best option (Tablet devices are still too few in number to conclude whether they will offer a viable alternative to Smartphones or more as a straight replacement for lap-top computers) to harness M-Learning programmes, but educators will have to develop better materials which can be easily accessed by any mobile phone device.

References

Abdous, M. Camarena M. & Facer BR. (2009). MALL Technology: Use of Academic Podcasting in the Foreign Language Classroom. *ReCALL 21*(1) 76–95.
http://bscw.rediris.es/pub/bscw.cgi/d3978998/Abdous_alii2009_MALLTechnology Podcasting.pdf

Corbeil, JR. & Valdes-Corbeil, ME. (2007). Are You Ready for Mobile Learning? *Educause Quarterly*. 30(2) 51–58
http://net.educause.edu/ir/library/pdf/eqm0726.pdf

Gao, G. Tian, Y. Huang, T. & Yang, Q. (2009). Vlogging: A Survey of Videoblogging Technology on the Web. *ACM Journal Name*. 0(0) 21–63.
http://idm.pku.edu.cn/jiaoxue-MMF/2009/CSUR-2006-0023.pdf

Geddes, S. J. (2004). Mobile Learning in the 21st Century: Benefit for Learners. The Knowledge. *Tree e-journal*. 6.
http://knowledgetree.flexiblelearning.net.au/edition06/download/Geddes.pdf

Japan Guide Website. (2011)
www.japan-guide.com

Kakihara, M. & Sørensen, C. (2002) Mobility: An Extended Perspective. IEEE. *Published in The Proceedings of the Hawai'i International Conference on System Sciences*. January 7-10, 2002, Big Island, Hawaii, USA.

Katsumata, Y. (2000). The Impact of Population Decline and Population Ageing in Japan from the Perspective of Social and Labour Policy. **UN/POP/PRA/2000/10**. *EXPERT GROUP MEETING ON POLICY RESPONSES TO POPULATION AGEING AND POPULATION DECLINE*. Population Division, Department of Economic and Social Affairs United Nations Secretariat, New York, 16–18 October 2000.
http://www.un.org/esa/population/publications/popdecline/Katsumata.pdf

Kukulska-Hulme, A. (2009). Will Mobile Learning Change Language Learning? *ReCALL*. 21(2), 157–165.

http://dx.doi.org/doi:10.1017/S0958344009000202
Kukulska-Hume, A. & Shield, L. (2008). Will Mobile Learning Change Language Learning? *ReCALL*. 21(2).
http://dx.doi.org/doi:10.1017/S0958344009000202
Levy, M. & Kennedy, C. (2005). Learning Italian via Mobile SMS. In Kukulska-Hume, A. & Traxler, J. (editors). *Mobile Learning: A Handbook for Educators and Trainers*. London. Routledge. 76–83.
Mills, D. & White, J. (2011). Get Smart!: Smartphones in Japanese Universities. *Short Paper Presentation*. JALT Conference. Tokyo 2011.
Mobi Thinking Statistics Webiste. (2011)
http://mobithinking.com/mobile-marketing-tools/latest-mobile-stats#smartphone-shipments
Reitsma, R. (2011) Forrester Blogs.
http://blogs.forrester.com/reineke_reitsma
Rosenberg, M. (2011). Negative Population Growth: 20 Countries Have Negative or Zero Natural Increase. About.com Website.
http://geography.about.com/od/populationgeography/a/zero.htm
Rosenbloom, A. 2004. The blogosphere. *Communications of the ACM* 47. 12. 31–33.
So, S (2009). The Development of a SMS-Based Teaching and Learning System. *Journal of Educational Technology Development and Exchange*. 2(1). 113–124.
http://www.sicet.org/journals/jetde/jetde09/simon.pdf
Total Telecom Website, (2011).
www.totaltelecom.com
TCA Japan Statistics Bureau Website (2011).
www.sta.go.jp
Thornton, P. & Houser, C. (2005). Using Mobile Phones in English Education in Japan. *Journal of Computer Assisted Learning*. 21(3). 217–228.
DOI: 10.1111/j.1365-2729.2005.00128.x
Wikipedia website, (2011)
http://en.wikipedia.org/wiki/Feature_phone
Wang, S & Higgins, M. (2006). Limitations of Mobile Phone Learning. *The JALT CALL Journal*. 2(1). 3–14.
Zhang, K. (2008) Ubiquitious Technology for Language Learning: The U-Japan Movement in Higher Education. *Journal of Computing in Higher Education*. 20(2). 81–91.

Appendix: The Survey

Gender: _____ Age: _____ Department: _____

1a: Do you have a mobile phone?	YES	NO
1b: Do you have a tablet (iPad/Galaxy etc.)	YES	NO
1c: Do you have a touch screen Media player (iTouch)?	YES	NO

2: What do you use your mobile phone for? (Circle ALL you do)
Email & SMS / Phone calls / Internet / Games / Dictionary / Study / Listening to Music / Watching TV or Video / Calendar / Other: _____

3: When travelling to and from university do you:

Listen to music	YES	NO
Watch TV/Video	YES	NO
Phone Calls	YES	NO
Read Internet	YES	NO
Play Games	YES	NO
Use Dictionary	YES	NO
Study	YES	NO
Other	YES	NO

4a: Do you have a Smartphone (iPhone/Android etc.)	YES	NO

YES: Why did you buy a Smartphone?

_____

NO: Do you want to buy a Smartphone?	YES	NO

Why? / Why Not?

_____

5a: Do you know what a Smartphone App is?	YES	NO
5b: Do you use Smartphone Apps?	YES	NO
5c: Do you have any English study Apps?	YES	NO
5d: Do you use the Internet on your phone in class?	YES	NO
5e: Do you use the internet in class for study?	YES	NO
6: Do you think Smartphones will make English studying easier?	YES	NO

要　約

日本の大学における M-Learning：課題と可能性

Mobile Phones at a Japanese University: Limitations and Opportunities

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本稿は，日本の大学生にとっての M-Learning の将来的な役割について，その長所と短所について分析するものである。世界でも携帯端末の所持率が最も高い日本は，携帯電話を利用した M-Learning を活用できる最適の教育環境であると言える。本稿は，M-Learning に関して先行研究で指摘されてきた有効性と制限について分析を行い，スマートフォンのような新しい携帯端末の急速な普及によって従来の携帯電話では困難であった学習が可能になるという点について考察した。広島大学の学生を対象に実施した調査の分析に基づき，日本の大学生は，所有条件などの環境が整えば，英語学習にスマートフォンを取り入れることに肯定的であることが分かった。