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Preparing Japanese students' digital literacy for study abroad: Is more training needed?

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Regular Paper

Study abroad programs provide an excellent opportunity for students to accelerate their language learning and acquire cultural capital (Byram & Feng, 2006). Research into returnees from a variety of study abroad programs, however, has revealed that this is not always the case (e.g., Kinginger, 2011; Sato & Hodge, 2015; Yoshimitsu, 2009). To promote a more positive academic and culturally-inclusive study abroad experience, one recommendation is for language teachers to focus on students' digital literacy (Kinginger, 2011). Given the reported poor levels of digital literacy among Japanese freshman students (see Lockley 2011; Murray & Blyth, 2011), the researchers in this current study were attempting to determine if this wider trend also applied to students at their private university in Tokyo. The authors surveyed first-year College of Tourism and Hospitality (CTH) students preparing for a year-long study abroad program. This paper will report on student responses to two sections of a computer literacy questionnaire created by Son, Robb and Charismadjiri (2011). The first section considers students responses to the digital self-assessment items, and in the second section, student results in a 10-item digital skills knowledge test will be reported on.

Keywords: Digital literacy, study abroad, Japanese university, ICT

1. Introduction

This paper reports on the second phase of the researchers' investigation into how they can prepare their Japanese students in the College of Tourism and Hospitality (CTH) for a one-year study abroad program in Australia. In the initial phase, returnees

from the first student cohort of the study abroad program were surveyed. Key findings from this investigation were that students appear to be very interested in improving their digital literacy; they recognize the necessity of digital literacy in higher educational settings and beyond; many believed that their digital skills were inferior to their non-Japanese classmates while studying in Australia; and, they reported using their computer more in their Australian university classes than in Japanese university classrooms.

In this second phase of the study, 112 students from the 2016 freshman cohort were surveyed on issues relating to ownership and accessibility of computers, ability to perform tasks both on mobile devices and personal computers, and their personal and professional use of computers. In this paper, the authors report on student responses to two sections of the questionnaire: a) self-assessment of digital skills, and b) digital literacy quiz results.

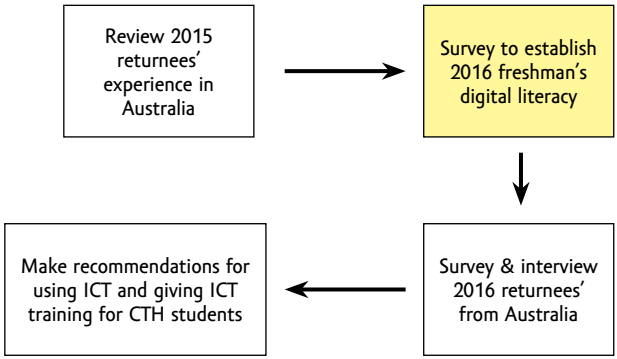

Figure 1. Summary of the ICT (information and communications technology) skills review for CTH students.

2. Literature review

2.1 Digital literacy

Learning how to use digital technology has become a crucial step in developing literacy in the twenty-first century (Goodwin-Jones, 2000). As well, teachers are being asked to consider how they can effectively prepare students first to develop, and then exercise, their digital literacy because it can lead to better job prospects, increased interaction in society and wider entertainment options (Corbel & Gruba, 2004). Corbel and Gruba argued that students need computer skills as much as language skills to prosper in the today's world. The authors (p. 5) noted that students need computer skills to:

- communicate effectively in society
- interact with family and friends
- function effectively in the workplace
- learn new ideas and for fun and pleasure

Literacy has traditionally been defined as the ability to read and write. Digital literacy appears to be a much harder term to define as succinctly. The United States Department

of Education (1996) defined digital literacy as having computer skills and the ability to use computers and other technology to improve learning, productivity and performance. Barrette (2000), along with Corbel & Gruba (2004), observe that digital literacy contains two core components: a) the ability to control basic computer operations, and b) using one's understanding of computers for problem-solving and critical thinking. More recently, Dudeney, Hockly and Pegrum (2014) identified digital literacy as being able to make use of technologies at one's disposal and understanding the social practices that surround the use of new media.

2.2 Japanese student literacy

Although Japan is recognized as a very digitally-connected country (Gobel & Kano, 2014) and national mandates from the Japanese Ministry of Education, Sports, Science and Technology (MEXT) declare that ICT be included in high school curriculums (MEXT, 2011), it is well documented that Japanese youths' digital literacy is falling behind other developed (and developing) countries. In a report by MEXT in 2011, they recognised that ICT utilization in Japanese schools has not been advancing at a rate similar to other industrialized nations. More recently in 2015, the OECD released a critical report on the literacy of Japanese, noting that 25% of Japanese youth (aged 16–29) lack basic computer skills. One explanation for these shortcomings is that schools are not responding to the aforementioned mandates by MEXT to carry out ICT training. Reviews of recent Japanese high-school graduates revealed that many students had not used ICT in high school (Gobel & Kano, 2014; Lockley, 2011; Lockley & Promnitz-Hayashi, 2012; Murray & Blyth, 2011).

There have been some reviews of Japanese university freshmen's digital literacy in recent years. In 2014, Gobel and Kano reported that despite having exposure to a greater range of ICT in their lives, it did not seem to guarantee students' skill and confidence using this technology. The authors found that computer use appears to be secondary to phone use. Students are unable to manipulate data beyond the basic creation phase. The authors concluded that it would be a mistake for teachers and curriculum developers to embrace digital learning or online learning, and they recommended that a blended approach to teaching would better serve students. In light of their finding concerning students' comfort using mobile devices, Gobel and Kano recommended that teachers consider the use of mobile devices more.

Focusing on university students' computer skills, Murray and Blyth (2011) surveyed 103 freshmen university students from three Japanese universities. The authors reported that students were not very proficient at using basic online services and managing online accounts (e.g. Facebook, Google+ and Twitter) and they appeared to be somewhat behind developments in Internet phenomena. Respondents displayed limited levels of proficiency relating to efficiency using computers, and a fifth of respondents displayed limited knowledge of the Internet. The most alarming finding from this study was students' lack of experience using productivity software. In fact, half of respondents reported having never used word processing software, 85% never used spreadsheet software and 78% never used presentation software.

Lockley (2011) surveyed 105 freshmen students at a private Japanese University in Tokyo. The study reported that despite students having access to digital devices at home and school, and almost 90% of respondents receiving ICT instruction at junior high and high school, most had forgotten how to use it or lacked confidence using it by the time they started

university. Although his study did not investigate why students lacked confidence or forgot ICT skills by the time they reached university, Lockley posited that outside of instruction on how to use ICT, students did not have an opportunity to put what they learned into practice. For example, students may learn about PowerPoint and how to create slides, but they never get the chance to make presentations using PowerPoint. With this point in mind, Lockley urged teachers to embrace ICT in the university classroom and that teachers design tasks that allow students to further develop competence and build confidence using the skills they already possess.

2.3 Digital literacy and study abroad

To adequately prepare CTH students for study in Australia, poor digital literacy may be limiting students' language learning opportunities (Murray & Blyth, 2011), their chances to deeply engage with Australian culture (Kinginger, 2011), and their ability to function in the foreign society (Brine, Kaneko, Heo, Vazhenin & Bateson, 2015). Recognizing that at many points during the study abroad experience students have to work independently to solve personal and academic-related problems, Jarman-Walsh (2015) argued for the development of ICT skills which support independent learning. He also highlighted how using multimedia and social networking programs, such as Facebook, are ways in which students can access resources and strengthen relationships within their new university community. Similar to Jarman-Walsh, Kinginger (2011) advocated using computer-mediated communicative tools to practice informal communication with peers at institutions abroad. Kinginger argued that they provide a protected context for communication, they offer an opportunity for students to develop their foreign-language speaking identity, and during this process students can explore the linguistic choices or communicative norms used by local students. To prepare their Japanese students for studying abroad, Brine et al., (2015) incorporated a video interview project into their preparatory program and these authors argued that along with the development of language skills, the project develops technical and digital collaborative skills. Although a large body of study abroad research centers around the development of cultural awareness and language proficiency (e.g. English, 2012; Sato & Hodge, 2015), the examples listed above illustrate the role ICT training can play in pre-embarkation programs.

3. Research methods

3.1 Research questions

To better prepare CTH students for university study in Australia, poor digital literacy may be limiting students' language learning opportunities, their chances to engage with Australian culture, and their ability to function in Australian society. With these issues in mind, this study set out to answer the following research questions:

1. What is freshman students' level of digital literacy?
2. Where should additional ICT training be focused?

3.2 Participants

115 students were accepted into the College of Tourism and Hospitality (CTH) in the spring semester of 2016. CTH students attend an English for Academic Purposes (EAP) class three days per/week, an independent English study session one day per/week, and a fifth class which focuses primarily on preparation for the TOEIC test. As was mentioned in the introduction, the CTH students have an opportunity to study abroad in Australia for one year, and that has largely driven the unique design of this "intensive," five-day English program.

All English teachers are instructed to focus on academic skills and TOEIC training, and although not strictly prescribed, teachers were encouraged to employ computers in the classroom and provide opportunities for students to use computers for learning purposes. Furthermore, and arguably central to this current study, all first-year students who join the CTH are required by the College to purchase a personal computer. The tourism curriculum necessitates that all students enroll in a semester-long statistics course and a large portion of their computer activities revolve around creating Excel spreadsheets and learning how to apply functions to sets of data. In addition, the students use their PC in other classes to conduct Internet searches on Japanese tourism-related companies and for writing various expository and analytical essays.

3.3 The questionnaire

At the beginning of the academic year, the new 2016 freshmen cohort was asked to complete a digital literacy questionnaire to appraise digital literacy levels. This survey instrument was adapted from a seminal questionnaire created by Son, Robb and Charismiadji (2011) to evaluate Indonesian English teachers' digital literacy. Although the original questionnaire was designed specifically for English teachers, it has also been successfully adapted for students, such as the aforementioned Murray and Blyth (2011) article. Before administering the survey, permission from the copyright holder, J. B. Son, was granted for the questionnaire to be used in this evaluation. Some items were modified to reflect the local learning context of the students, such as providing examples of applications and programs that Japanese students are more familiar with (e.g. the instant messaging app Line). Moreover, additional items were added to the survey to reflect recent developments in computer technology, such as cloud computing and file sharing services. The survey was translated into Japanese and converted into an electronic format using SurveyMonkey. The entire survey contained 28 items in total. However, only two sections were focused on for this report. A total of 112 student responses (29 male & 83 female) were analysed for this study.

3.4 Results

3.4.1 Self-assessment of digital skills. When students were asked to self-assess their level of digital skills, responses revealed very limited ability. Listed in order of most proficient to least proficient, in Table 1 below, the only applications where students reported having either intermediate or advanced skills included: social networking, smartphone or cell phone mail, and the Internet. To the dismay of the researchers, many students reported having no skills with numerous digital applications and program functions.

Table 1. Student's self-assessment of digital skills

Answer options	Nothing	Beginner	Intermediate	Advanced
Social networking	9	6	43	54
Smartphone/cellphone email	8	11	54	39
Internet	5	9	75	22
E-mail	24	42	40	6
Wiki	28	37	36	10
Multimedia (audio & film)	40	34	23	15
Word processing	21	65	26	0
Spreadsheet	27	62	21	0
Graphic & photo editing	52	32	18	9
Presentation software	38	56	18	0
Computer games	50	40	19	2
Download & install programs	55	33	21	2
Text chatting	66	28	15	3
Security software	58	41	12	0
Video conferencing	67	30	10	3
Online discussions or forums	70	25	11	1
File sharing services	72	27	12	0
Database	74	31	7	0
Cloud computing	78	25	9	0
Blogging	78	26	5	2
Website design	86	23	2	0

Student responses to items asking about their ability to complete digital tasks suggest a somewhat different picture of their level of digital literacy. That is to say; some students appear capable of utilizing basic digital skills to complete a variety of tasks (see Table 2 below). The questions in Table 2 (opposite, in *italics*) reflect those tasks where more than 50% of the respondents noted that they were unable to execute the function successfully.

Table 3 (opposite) illustrates that most students can complete a variety of Internet-related tasks. This result represents an improvement upon those reported earlier by Murray and Blyth (2011) who noted that freshman students were not very proficient using online services. It appears that most respondents in this study can create user accounts, download files, use Internet bookmarks and connect their device to the Internet. One item, 'successfully conducting online video meetings', was the only task which did not garner an affirmative self-assessment result in excess of 86%. In fact, only 18 students (16%) noted that they could manage this task.

Table 2. Students' self-assessment of their ability to complete the following digital tasks

Answer options	**Yes**	**No**
Can you properly turn on and shut down a computer?	106	5
Can you create a basic Microsoft Word Document?	105	7
Can you minimise, maximise and move windows on the desktop?	104	8
Can you start and exit a computer program?	100	11
Can you print a document using a printer?	99	12
Can you copy, cut and paste inside a document?	97	15
Can you change the font style and size in a document?	92	20
Can you create a basic Excel spreadsheet?	87	25
Can you perform file management including deleting & renaming files, etc.?	83	28
Can you send and receive attachments through email messages?	81	30
Can you change monitor brightness and contrast?	80	32
Can you create a simple presentation using PowerPoint?	74	37
Can you resize a photograph?	56	56
Can you install a software program?	*52*	*59*
Can you move a file from a hard drive to a USB drive?	*39*	*72*
Can you write files onto a CD?	*37*	*74*
Can you install a printer?	*36*	*76*
Can you scan a disk or file for viruses?	*28*	*84*
Can you record and edit sounds?	*19*	*93*
Can you convert a Microsoft Word file to a PDF?	*17*	*92*
Can you create a simple web page?	*17*	*95*
Are you able to create a simple database (e.g. using Access)	*10*	*102*
Are you able to use Input Method Editor (IME) effectively?	*5*	*106*

Table 3. Students' self-assessment of their ability to fulfill the following Internet-related tasks

Answer options	**Yes**	**No**
Are you able to connect your computer to the Internet?	87	25
Are you able to correctly enter a URL in the address bar?	100	12
Are you able to download a file from the Internet and save it appropriately? (e.g. JPEG or PDF)	86	26
Are you able to conduct video meetings online?	18	94
Are you able to create an account on websites that require a username and password? (e.g. Twitter, Gmail or Facebook)	100	12
Are you able to add a webpage to your list of bookmarks?	91	21

The second round of questioning (Table 4 below) concerning Internet-related tasks revealed a much lower level of competency. While a majority of students reported that they could use social networking applications and smartphones, in most cases students reported not knowing about the other applications listed. Of particular note to teachers is the lack of knowledge about cloud computing, podcasting, and online composition software. This

result also echoes the findings of Murray and Blyth (2011), who highlighted Japanese university students' lack of skill using productivity applications.

Table 4. Students' self-assessment of their ability to fulfill the following Internet-related tasks

Answer options	I know about it	I don't know	I can use it	I cannot use it
Social networks (e.g. Twitter, Mixi, or Facebook)	36	3	70	3
Cloud computing (e.g. Dropbox or Google Drive)	28	54	19	10
Social bookmarking	11	81	8	11
Podcasting	11	83	4	11
Online composition software (e.g. Open Office, Google Documents and Microsoft office)	29	59	12	11
Operating systems (e.g. Ubunto, Gentoo, BSD and Unix)	5	96	1	10
Smartphone	30	5	71	3

3.4.2 General computer knowledge. At the end of the questionnaire, students were asked to answer ten multiple-choice questions focusing on general computer knowledge (see Table 5 below). In only four out of the ten questions, more than 50% of the responses were correct. In six out of the ten items, "I don't know" was selected by more than 50% of the respondents.

Table 5. General computer knowledge results

Question	Correct response %	I don't know %
What is a folder?	77%	13%
How many characters are allowed for a tweet?	69%	21%
What is a URL?	63%	12%
Which of the following is not a search engine?	55%	35%
What is the main brain of the computer?	32%	52%
What is the main function of a server in a networked environment?	31%	54%
What kind of program is used to edit a GIF file or a JPEG file?	28%	56%
How much information fits on a CD and a DVD?	16%	67%
Which of the following is considered poor email etiquette?	6%	39%
What are WAV and AIFF examples of?	7%	82%

4. Discussion

This investigation revealed that the subjects of this study lack a certain level of digital literacy in a number of key areas. Similar to the findings of Murray and Blyth (2011), respondents lack experience and skills for using productivity software. Very few students are experienced with blogging, website design, online discussions, computer games, file sharing, cloud software and presentation software. Moreover, as only 26 students (23%)

noted they had beginner level skills for word processing (no student cited expert level), and as most cannot convert a Word document to a PDF, it appears that students are only able to use these software tools in very basic capacities.

All participants in this study own a smartphone and notebook computer, and although somewhat encouraging, it appears that students are vastly more confident using the former device. Similar to the recommendations by Gobel and Kano (2014), perhaps more steps need to be taken to capitalize on students' smartphone skills. In addition, steps could be taken to foster better collaboration between both the smartphone and notebook PC. For example, students could be instructed on how to capitalize on cloud computing services (e.g., Evernote, Google Drive, Dropbox or iCloud) for integrating smartphone generated content (e.g., photos, voice memo, video, notes) with students' PCs. Echoing the advice of Lockley and Promnitz-Hayashi (2012), the researchers also recognize that teachers cannot expect students to quickly transfer their smartphone skills to PC operations, nor should they expect these skills to augment students' work in an academic setting.

One recommendation for teachers is to create opportunities for students to practice self-expression using either a personal blog or website. Along with English language improvement, such activities can develop typing abilities, composition skills, and digital editing. Blog tasks should ask students to call upon a range of competencies to create a blog post (e.g., embedding student-made video and images, checking blog content in MS Word or other software for accuracy and managing an online discussion concerning one's blog post).

The researchers of this current study are planning to investigate the next group of returnee students about which digital skills were required of them in Australia because, as other Japan-based studies and the initial stage of this research project suggest, students need more training and opportunities using basic productivity software. This list of software should include: MS Word, PowerPoint, Excel and/or their Google equivalents. Training in how to use cloud-computing can also create a bridge between the work students do on their smartphone and notebook computers. Collaborative presentation tasks using Google Slides or Apple's iCloud could be a useful way to develop this skill.

4.1 Study Limitations

There are a number of areas that can be identified as limitations in this study. This questionnaire asked students to self-assess their digital skills. Given the reported tendency for Japanese students to provide modest self-assessments of their digital skills (Lockley & Promnitz-Hayashi, 2012; Lockley, 2011), a practical test of digital tasks may have provided a better assessment of students' digital skills. For example, students could be asked to create a basic spreadsheet or presentation slides. However, one can argue that this sample's poor results in the second section analysed in this study, general computer knowledge questions (Table 5), validates respondents' low self-assessment of digital skills.

A second concern is that the digital format for the questionnaire might have influenced the results. A small group of students completed the survey on their smartphones, and given the length and complexity of the questionnaire, these students may have become tired or irritated as they proceeded through the items, and therefore, the quality of their responses may have been compromised. A more concerning factor, however, is that many respondents were being asked to complete their first digital survey on a new computer that they had been using for only a couple of weeks. And although the questionnaire was

translated into Japanese and rigorously tested with native Japanese speakers, the mode adopted for survey instrumentation may have had an influence on the quality of the data.

One final concern is related to the student sample. As the gender ratio was heavily unbalanced (29 male and 83 female) and all participants were from the same academic field, the results may not be representative of Japanese university freshmen and therefore, should be interpreted with discretion.

5.0 Conclusion

To prepare students for their upcoming study-abroad program, this study set out to identify freshman students' level of digital literacy. Results in this study echo some of the findings of other contemporary Japan-based studies, as almost all students in this sample displayed very limited digital literacy. In particular, most participants cannot use productivity applications effectively, which prevents students from being able to complete Corbel and Gruba's (2004) aforementioned second tenet of digital literacy: using computers for problem solving and critical thinking. Although smartphone ownership and personal computer ownership is at 100%, students do not appear to be using these devices outside of accessing social networks, email, Internet surfing and watching videos.

This study has identified that Japanese university freshman need to develop digital skills covering a broad range of areas. How students should be specifically and effectively trained to develop these skills requires further investigation. Nevertheless, students need training in using word processing, spreadsheet programs, cloud computing, blogging and online discussion. In addition to basic training, teachers need to create opportunities for students to use these new skills to complete a variety of learning tasks.

In the third stage of this research study, the researchers will interview the second group of returnees immediately after they return from Australia in September 2016. The goal is to develop a training program to more appropriately equip students with the digital skills which can help them have a more positive study abroad experience.

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