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# A survey of Japanese university students' computer literacy levels

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*Despite most Japanese university students having access to computers and the internet, there are antecdotal reports of these students having very low levels of computer and internet literacy. In order to gather empirical evidence to either confirm or refute these reports, a computer literacy questionnaire was administered to 103 Japanese university students at three universities in the first month of the 2011 academic year. This article reports on the respondents' perceived levels of computer and internet literacy, software use, skills, and knowledge.*

## Introduction

An old adage "*you can tell if there is a teenager in the house by if the* ***VCR*** *has the clock set right*" might no longer be true. Many English language teachers in Japan, and perhaps the rest of the world, are finding that their young adult students are not as tech-savvy as expected. For example, some teachers have observed that their students are unaccustomed to typing on computer keyboards and are "hunt and peck" typists (Foss, 2011). Corbel and Gruba (2004) remind us that the developers of **CALL** programs along with language teachers assume that the students have adequate computer skills.This lack of computer skills is an issue which can hold back many of the pedagogical opportunities that students can exploit to assist in their language learning. For anyone, regardless of being a teacher or student, confidence and competence in using computers affect their abilities to use the devices (Lam, 2000). Having confidence and competence should assist the technology user to not deal with the technology, but deal with the task instead. That is to say, a language

student should be able to focus on the language, and not be distracted with trying to make the technology do what the teacher claims can be done. Stockwell (2010) stated that the focus of **CALL** systems should not be on the **CALL** system, but on the language acquisition that ought to be made more efficient with the use of technology. There have been cases claiming that language acquisition has been made more achievable or more efficient for students (Al-Haq & Al-Sobh, 2010; Lin, 2009). In order to make language learning achievable and efficient, the technology should seem invisible in learning; however, to achieve this students need a minimum skill and knowledge set. As a consequence, this skill and knowledge set needs to be defined. Having defined the gaps in skills and knowledge then teachers can be aware of the capabilities of their students, and provide support where appropriate, or use technology that is already familiar.

Since common technology uses include in-computer programs (like Microsoft Word), peer-to-peer programs (like Skype), and social networking programs (like Twitter), we agree with Son, Robb, and Charismiadji (2011) on what computer literacy is. Son et al. (2011) say "*computer literacy is ... the ability to use computers at an adequate level for creation, communication and collaboration in a literate society*" (p. 27). We assume that this can encompass language learning specific programs (such as Rosetta Stone), and of course generalist programs that aid in language use, practice, and learning (such as writing tasks on **MS** Word), and systems to send and receive communication (such as e-mail). However, this fails to encompass internet literacy. The difference being that internet literacy is more often for social interaction and leisure utilizing services such as Twitter and Google+. Thus requiring the user to competently and safely navigate the virtual ecosphere to enjoy all that a person might wish from the internet. We see internet literacy not just including use, but also two aspects of safety on the internet, an awareness of possible repurcussions of certain online interactions (see Blyth, 2011), and an awareness of and avoidance of unscrupulous others (avoiding phishing and identity theft).

Lockley (2011) conducted a study on Japanese students' abilities to use information and communication technology (**ICT**) with 105 first year Japanese university students. This study focused on pre-university use of technologies such as computers, mobile phones, and consumer electronics. He reported that 89% had used computers at least once a week. Additionally, he reported that 11% had not received computer training at high school despite **ICT** courses being mandated by the Japanese Ministry of Education and Technology (Mext 2006, cited in Lockley, 2011). Lockley concludes that students seem to lack **ICT** knowledge, even though most have computers in the home and have received instruction at school. He also says that many students in high school have learnt how to use programs like Microsoft Word, but have not needed to actually use them in practical situations.

Instead of covering a range of technologies like Lockley's study, we decided to hone in on the use of computers. In particular, we wanted to know the students' experiences with computers, their perceived levels of computer and internet literacy, their skills, and their level of computer knowledge. The purpose of the study is to gather empirical evidence to either confirm or refute antecdotal reports of low levels of computer and internet literacy.

## Methodology

### *Participants*

A convenience sample of 103 students from three universities participated in the study. These participants were all first year students in the first few weeks of the first semester. Subsequently, it can be described that the results represent high school graduates, rather than 'first year university students'.

Table 1: A summary of participants (n = 103)

| | | |
|---|---|---|
| Tokai University<br>– Marine Science and Technology | Male: 38 (79%)<br>Female: 10 (21%) | Total: 48 |
| Nagoya University of Foreign Studies<br>– Global Business | Male: 10 (34%)<br>Female: 19 (66%) | Total: 29 |
| Meijo University<br>– Pharmacy | Male: 4 (15%)<br>Female: 22 (85%) | Total: 26 |

It was judged that since the questionnaire was anonymous and did not ask for identifiable information, written consent was not required. However, the introductory information on the questionnaire did state that participants were not obliged to complete some or all of the questions if they preferred not to, thus providing an opt-out option.

## Data collection

The 103 participants responded to a computer literacy questionnaire which consisted of 20 questions. The questionnaire consisted of five sections: demographic information, use of computer applications, ability related questions, a knowledge test, and affective factors. A previously published instrument, used by Son, Robb, and Charismiadji (2011) in a study of 73 in-service Indonesian EFL teachers, covered many of the topics that were of interest. Consequently, permission from Son (the copyright holder) to use and adapt his questionnaire was sought and granted. A number of adaptions were made. In the demographic information section, work related questions such as place of employment and subject(s) taught were replaced with a question about area of study. Similarly, in the use of applications section, references to concordancers and language software were removed. References to cellphones, webpage design, social networking, and filesharing were added. To help ensure that the questions were understood by the respondents, examples were used. For example, when referring to word processing software, Microsoft Word and JustSystems' Ichitaro were given. In the skills section, questions were added about emerging technologies such as cloud services, syndication services, and smart phones. In the knowledge test, the question about output devices was replaced with a question about Twitter. Finally, the questionnaire was translated into Japanese.

After students completed the questionaires, all were analysed, even if there were some questions and sections that were not completed. In all, results for 103 questionnaires were analysed.

## Results

Unfortunately, due to the quantity of data, and the scope available in this article, what is to be reported is a selection of the most prominent and pertinent data gleaned from this study. The results from four of the sections are reported in the same order as the questionnaire.

### *Demographic information*

The first section of the questionnaire consisted of 12 questions covering demographic information, computer ownership or access, training, and overall computer skills.

Table 1 shows how much computer experience the respondents have. The majority of the respondents, approximately two-thirds, have between 2 and 8 years of experience. Surprisingly, 8 respondents claimed to have no computer experience at all.

Table 1: Years of computer experience (n=91)

| Time | Number of respondents | Frequency (%) |
|---|---|---|
| 0 | 8 | 9.1 |
| 1 year or less | 5 | 4.5 |
| 2 to 3 years | 18 | 20.5 |
| 4 to 5 years | 18 | 20.5 |
| 6 to 8 years | 24 | 26.1 |
| 9 to 11 years | 12 | 13.6 |
| 12 to 14 years | 4 | 3.4 |
| 15 years or more | 2 | 2.3 |

Note: 12 participants did not reply to this question

Table 2 shows how many respondents have regular access to a computer. Most of the respondents (84%) have access. In a follow-up open-ended question, the respondents were asked to identify the location. Almost all of the respondents have computers in their home, either a machine shared by the family or their own personal machine. In addition, a few identified access to school computers.

Table 2: Access to a computer (n=95)

| Access | Number of respondents | Frequency (%) |
|---|---|---|
| Yes | 80 | 84 |
| No | 15 | 16 |

Note: Participants with no experience did not reply to this question

Table 3 shows the sources of computer training. The most common sources are family, teacher, and self-taught. Overwhelmingly, they prefer face-to-face sources over self-instructional materials such as books and magazines.

Table 3: Sources of computer training (n=95)

| Source | Number of respondents |
|---|---|
| Family | 66 |
| Teacher | 57 |
| Self | 51 |
| Friends | 39 |
| Classmates | 21 |
| Internet | 10 |
| Books | 6 |
| Magazines | 3 |
| Videos | 0 |

Note: Participants with no experience did not reply to this question

Table 4 shows the respondents' self-reported level of computer literacy. On a five-point scale, profiency ranged from low (1) to high (5). The mean level of profiency was 2.51 with a standard deviation of 1.09. This suggests that the respondents perceive themselves as having below average proficiency.

Table 4: Reported level of computer literacy (n=95)

| Proficiency | Number of respondents | Frequency (%) |
|---|---|---|
| 1 low | 16 | 17 |
| 2 | 25 | 26 |
| 3 average | 39 | 41 |
| 4 | 12 | 13 |
| 5 high | 3 | 3 |

Note: Participants with no experience did not reply to this question

Table 5 shows the respondents' reported level of internet literacy. On a five-point scale, proficiency ranged from low (1) to high (5). The mean level of literacy was 2.86 with a standard deviation of 1.09. This suggests that the respondents perceive themselves as having slightly below average internet literacy.

Table 5: Reported level of internet literacy (n=95)

| Proficiency | Number of respondents | Frequency (%) |
|---|---|---|
| 1 low | 8 | 8 |
| 2 | 19 | 20 |
| 3 average | 41 | 43 |
| 4 | 23 | 24 |
| 5 high | 4 | 4 |

Note: Participants with no experience did not reply to this question

### *Software*

The second section of the questionnaire focuses on the types of software used by the respondents. Table 6 shows how frequently each type of software is used. The top five uses are: cellphone mail, internet, multimedia, social media, and blog. Conversely, the least used are: forums, video chat, database, filesharing, and chat.

Table 6: Types of software used

| | Never | Almost Never | 1–2 times a month | 1–2 times a week | 3–4 times a week | Almost every day |
|---|---|---|---|---|---|---|
| Cellphone mail | 5.1 | 2.0 | 0 | 5.1 | 9.2 | **78.6** |
| Internet | 3.1 | 2.0 | 6.1 | 16.3 | 16.3 | **56.1** |
| Multimedia | 8.2 | 7.2 | 16.5 | 21.6 | 13.4 | **33.0** |
| Social media | 31.6 | 18.4 | 9.2 | 8.2 | 6.1 | **26.5** |
| Blog | 33.7 | 26.5 | 7.1 | 9.2 | 9.2 | **14.3** |
| Chat | **50.0** | 30.6 | 6.1 | 4.1 | 2.0 | 7.0 |
| PC mail | 17.5 | 37.1 | 16.4 | 12.4 | 11.3 | 5.2 |
| Video chat | **55.1** | 32.7 | 1.0 | 3.1 | 3.1 | 5.1 |
| Games | 31.6 | 30.6 | 17.3 | 7.1 | 8.2 | 5.1 |
| File sharing | **51.0** | 27.6 | 6.1 | 6.1 | 4.1 | 5.1 |
| Graphics | 35.7 | 37.8 | 11.2 | 9.2 | 2.0 | 4.1 |
| Wiki | 13.4 | 11.3 | 32.0 | 28.9 | 10.3 | 4.1 |
| Word processing | 13.3 | 41.8 | 19.4 | 15.3 | 6.1 | 4.1 |
| Database | **54.1** | 32.7 | 7.1 | 1.0 | 2.0 | 3.1 |
| Presentation | 21.4 | 57.1 | 9.2 | 6.1 | 3.1 | 3.1 |
| Forums | **59.8** | 29.9 | 3.1 | 1.0 | 3.1 | 3.1 |
| Spreadsheet | 30.6 | 55.1 | 9.2 | 2.0 | 2.0 | 1.0 |
| Website design | 48.0 | 46.9 | 4.1 | 1.0 | 0 | 0 |

Note: Participants with no experience did not reply to this question

Figure 1 shows the respondents' use of cellphone mail. An overwhelming majority of students (78.6%) send or receive mail with their cellphone almost every day. Nearly 93% of all students use cellphone mail at least once a week. Only 5.1% of the students never use cellphone mail.

Figure 2 shows how often the respondents use the internet. Just over half (56.1%) of the students use the internet almost every day. Approximately 90% of all students use the internet at least once a month.

Figure 3 shows how often the respondents use multimedia software. A third (33%) use multimedia software almost everyday. Approximately 85% of the students use multimedia software at least once a month.

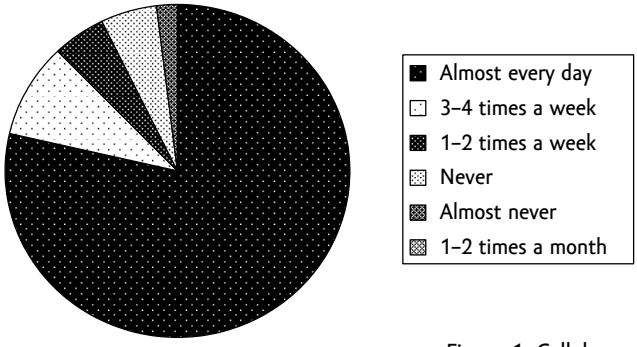


Figure 1. Cellphone mail usage

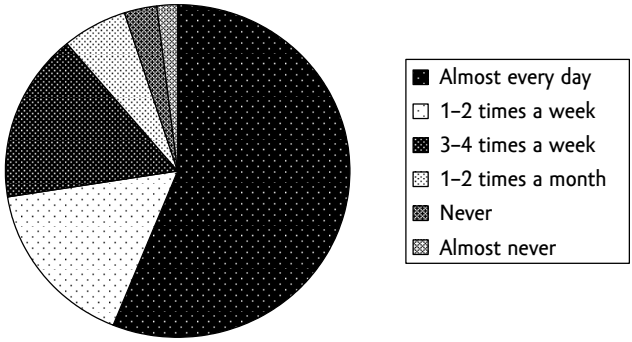


Figure 2. Internet usage

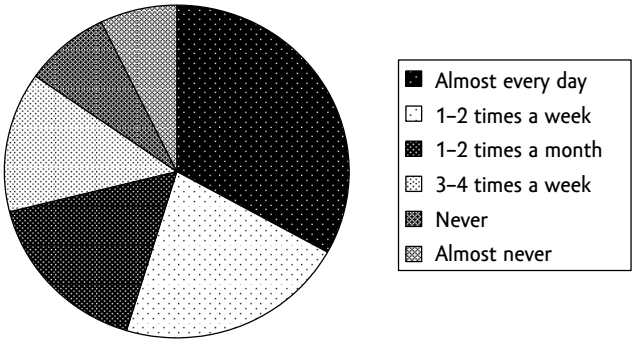


Figure 3. Multimedia usage

### *Skills*

This section included 3 questions, but only data from one question will be provided here for brevity; other data will be published later. In this question ten "Do you have" and "Do you use" questions in Yes-No answer format were asked.

Table 7: Results for computer usage

| | n | % |
|---|---|---|
| Do you have a computer connected to the internet at home? | 95 | 77 |
| Do you use a computer connected to the internet at university? | 95 | 76 |
| Do you have a non-university and non-mobile phone email account? | 95 | 63 |
| Do you find it easy to learn something by reading it from a computer screen? | 95 | 62 |
| Do you understand the basic functions of computer hardware components? | 95 | 51 |
| Do you use a computer for studying? | 95 | 51 |
| Do you use an online mail service like hotmail, gmail, or similar? | 94 | 48 |
| Do you use keyboard shortcuts? (eg: ctrl + v) | 94 | 33 |
| Do you have a personal homepage on the internet? | 95 | 23 |
| Do you use email software like Windows Live, Thunderbird, or similar? | 94 | 13 |

Note: Participants with no experience did not reply to this question

### *General knowledge*

The general knowledge section consisted of 10 multiple-choice questions about a variety of topics such as folders, file formats, and the internet. The mean score for the general knowledge section is 5. Table 8 shows the questions and the percentage of correct responses. The majority of the students knew basic concepts such as folders (86%), **URL**s (81.3%), file formats such as .gif and .jpg (71.6%), servers (62.1%), and **CPU**s (61.2%). However, only 23.7% could correctly answer the question about email etiquette.

Table 8: General knowledge

| **Question** | **Correct Responses (%)** |
|---|---|
| What is a folder? | 86 |
| What is a **URL**? | 81.3 |
| What kind of program can edit a .gif or .jpg? | 71.6 |
| What is the function of a server? | 62.1 |
| What is a **CPU**? | 61.2 |
| How many characters long is a tweet? | 54.9 |
| What is the capacity of **CD**s and **DVD**s? | 47.9 |
| What are .wav and .aiff files? | 30.8 |
| Which of the following is not a search engine? | 25.8 |
| Which of the following is poor email etiquette? | 23.7 |

## Discussion

### *Overall proficiency*

Like the teachers in the Son et al. study, the students seemed to self-rate their competencies lower than their actual knowledge would suggest. This may be due to being able to perform tasks on computer, but without knowing the vocabulary for it. For instance, the question about **CD** and **DVD** capacities may possibly give a false result, as some software programs show a progress bar to indicate quantity of content being progressively added, prior to burning. Consequently, not knowing the capacity of a **CD** may not be indicative of an inability to use this facility.

### *Communication*

As can be seen in Table 7, 77% of students have a computer connected to the internet at home, whilst 13% of students claim to use specialised email software like Windows Live, Thunderbird, and others. Interestingly, 63% of students have an email account that is both not a mobile phone and not a university address, whilst 48% claim to use an email account provided by a major online service. It can be assumed that this difference could be that students are sharing their family's email address that might be included with their home internet provider's package, where for instance a Sonet or **CTY** internet package includes an email address which they may choose to utilize. It should be interpreted that these are low numbers for university students, as these same people are likely to be expected to be proficient in using basic online services that require email addresses to set up and maintain accounts (Facebook and Google+, for instance). Additionally, regarding the email ettiquette question of the knowledge test, 24% correct responses were selected. However, there may be a caveat, where the correct answer was that the use of a lot of capital letters is considered poor etiquette. Students may not have selected this, especially as the use of capital letters appears to be entirely appropriate for roman alphabet use in Japanese society for names of music groups and companies like "**SMAP**", "**ARASHI**", "**SONY**", and "**TOYOTA**".

It appears that some students do not seem to keep up with some recent internet phenomena. Whilst Twitter is not considered an essential part of professional and academic communication, 55% of students selected the correct answer that a tweet uses a maximum of 140 characters per message broadcast. Some might assume that Twitter is a phenomenon that is taken up especially by young people, however, the above result would suggest otherwise. Also note that knowledge of twitter restrictions does not equate to actual use and that there are perhaps non-users who know the correct answer, so Twitter users will surely be less than 55%. In addition to this, in the four-option multiple-choice question about search engines, only 25% of students correctly chose Firefox as being the only item that is not a search engine. Despite the apparent success of both Chrome and Firefox web browsers, the 25% response appears almost randomly chosen.

### *Efficiency*

Regarding keyboard shortcuts, which is an indication of students' proficiency and efficiency in carrying out basic operations, only 33% of students claim to use these. This might suggest that students have not had sufficient time to use computers to become more efficient

users, or students were not taught these. However, it should be noted that the authors first learnt to use computers in the era where all commands were done by keyboard shortcuts before graphical user interfaces with mouse clicks. Consequently, it can be questioned if this generational difference in aquiring efficient computing skills is so imperative at the first year level of university.

### *Internet knowledge*

It is interesting that in the knowledge test 81% of the participants correctly chose the answer for "What is a **URL**?". The remaining 19% might not have known what the term '**URL**' refers to, or do not understand the web-address concept. Both of the authors have seen students typing **URL**s into the Google search bar to find a specific website. However, some of these students often clicked on the first search result, which was not always the intended destination. This means that up to 20% of students need a demonstration from their teachers in how to perform some basic web surfing. For instance, if a teacher wishes his or her students to practice their English on websites like EnglishCentral.Com, then the teacher should consider including a brief demonstration on how to efficiently arrive at the intended website. In addition, since not all students have created their own email accounts with major providers like Hotmail, Gmail, etc. (see Table 7), it can be questioned if students are indeed familiar with website registration proceedures. Unfortunately, this information cannot be extracted from the data, and requires further study.

### *Software proficiency*

Although approximately 67% of the students have between 2 and 8 years of experience using computers, there are crucial applications that students have little experience with. For educators and future employers, the lack of experience with productivity software is alarming. In particular, students have little experience with wordprocessing, spreadsheet, and presentation software. For instance, most (approximately 85%) students never or almost never use spreadsheet software. Likewise, a majority of the students (approximately 78%) rarely use presentation software. More than half (approximately 55%) never or almost never use wordprocessing software. Consequently, educators need to keep this lack of experience with productivity software in mind. When an assignment needs to typed, it may be necessary to dedicate some class time to cover fundamental features such as document formatting and spell-checking.

The data in this survey shows much similarity with Lockley's (2011) results. Lockley found that 89% of students had not used **ICT** in senior high school, similarly, this study found that 8% of students never had used a computer ever before in their lives. Interestingly, despite it being mandatory that all students in senior high school do an **ICT** course, it was found that only 57% of students have claimed to have learnt how to use a computer from a high school teacher. However, this might be open to interpretation causing an under-reporting of this item. Some respondents might not have remembered they had done an **ICT** course, or because multiple answers were suggested (including learning from a classmate), might have assumed that the real instruction that they had received in an **ICT** class was from the person sitting next to them rather than the teacher faciliting the learning, and there of course may be other explanations.

## Conclusion

As a preliminary study, it does have various shortcomings that will need to be addressed in further research. One shortcoming is that the study only utilized paper-based questionnaires. Although some open-ended questions were used, the data collected pale in comparison to the rich data that interviews would provide. For example, interviews would give the participants opportunities to explain their responses instead of forcing the researchers to speculate. Also, some of the questions on the questionnaire need refinement. For example, an improved question about years of computer experience would ask the respondents to specify the number of years and months. Similarly, the question about the location of their computer should be multiple-choice rather than open-ended to avoid vague responses and to aid with coding. The questionnaire could be improved with additional questions in the knowledge test. Finally, while planning our study, the decision was made to use a paper-based questionnaire because we did not want the results to be affected by the form of delivery. However, this decision limited our sample of participants. To overcome this, an online questionnaire may be useful in future research.

The above results and discussion is merely a summary of the most pertinent points to emerge from the data. The data itself continues to reveal more about the students surveyed, more than what can be included in such an article as this. Additionally, many 'why' questions can be asked, such as "Why don't more students make use of free email services like Hotmail, Gmail, and others?", additionally "What computer and internet skills do will students actually need in their workplace?", which will require additional follow up research.

Despite the shortcomings of this study, it makes a contribution by providing empirical evidence about computer and internet literacy of first year Japanese university students. This study also confirms that the topics of computer and internet literacy deserve the attention of researchers.

## References

Al-Haq, F. A-A, & Al-Sobh, M. A. (2010). The effect of a web-based writing instructional EFL program on enhancing the performance of Jordanian secondary students. *The JALT CALL Journal*, *6*(3), 189–218.

Blyth, A. (2011). Cookies and breadcrumbs: Ethics in CALL. *ELT Journal*, *65*(4), 470–472.

Corbel, C., & Gruba, P. (2004). *Teaching computer literacy*. Macquarie University, National Centre for English Language Teaching and Research.

Foss, P. (2011). Developing a blogwriting program at a Japanese university. In J. Macalister, & I. S. P. Nation (Eds.), *Case studies in language curriculum design: Concepts and approaches in action around the world*. (pp. 195–198). New York, NY: Routledge.

Lam, Y. (2000). Technophilia vs. technophobia: A preliminary look at why second-language teachers do or do not use technology in their classrooms. *Canadian Modern Language Review*, *56*(3), 389–420.

Lin, C.-C. (2009). Learning action verbs with animation. *The JALT CALL Journal*, *6*(3), 23–40.

Lockley, T. (2011). Japanese students' experience of ICT and other technology prior to university: A survey. *The JALT CALL Journal*, *7*(1), 93–102.

Son, J., Robb, T., & Charismiadji, I. (2011). Computer literacy and competency: A survey of Indonesian teachers of English as a foreign language. *CALL Electronic Journal*, *12*(1), 26–42.

Stockwell, G. (2010). From the editor. *The JALT CALL Journal*, *6*(3), 151.

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