

Tohoku University students' access to technology: A survey report

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要約：本稿では、東北大学学部2年生における教育テクノロジーへのアクセスおよびその所有に関する量的研究から得られた知見について論ずる。本研究は、6学期間以上の調査期間を通じ、629名の参加者からのデータを得た。調査結果から、学生は早い段階から様々なタイプのテクノロジーにアクセスしていることが明らかとなった。本研究結果は、教育者に対しては今後さらに取り組みべき研究分野を提示するものであり、また大学管理運営者にとっては、新しいテクノロジーの継続的な開発が、キャンパスにおけるインフラ整備に影響を及ぼすであろうことを示すものである。

Abstract: This report presents findings from a quantitative survey of Tohoku University second year undergraduate students about their access to and ownership of technology. The survey collects information from 629 participants over six academic terms. The responses reveal that students have access to various types of technology from an earlier age. This report presents the data for the benefits of educators and administrators. The survey findings provide educators with areas for further research and administrators may notice that the constant development of new technology affects infrastructure implementation on campus.

Introduction

Research investigating the benefits of Computer Assisted Language Learning (CALL) in Japan is extensive. Ranging from blogs and podcasts to cell phone-based education and video production, students are being exposed to various affordances that technology provides them. However, few studies provide evidence of students' access to technology outside class time. Reporting on a blog project, Pinkman (2005) explains that after receiving in class training, students completed their blog projects at home. Pinkman provides no data concerning her students' access to technology outside class. Such information is important since it indicates the constraints that these students may face when attempting to complete the project on their own time. Another research project reported that some of the participants "did not have Internet access at home" (Mebed, 2007; p.102). Mebed became aware of students' lack of access to the Internet once the project was completed.

Before teachers can embark on CALL-based teaching methods, this author argues that it is imperative for CALL researchers to investigate their students' access to technology. Therefore the purpose of this article is twofold. First, it reports on the development of a survey that collected evidence

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about students' access to technology. Second, it discusses the results generated through the survey.

The survey was conducted at Tohoku University over a three year period. A description of the participants and the data collection methods defines the parameters of the survey. The data gathered from the students' responses are organized as quantitative evidence. The data analysis aims to extrapolate some general data to reveal the extent to which students have access to technology prior to their university studies. Based on the findings generated, the report concludes that it is useful for teachers to conduct surveys designed to collect information about students' access to and their general abilities with using various types of technology. Such information facilitates university technology planning and helps teachers to train students working and living in an information technology-centered society.

The literature concurs that Japanese students have six years of English learning prior to entering a university (Hinkleman & Gross, 2005; Hirata & Hirata, 2007). However very little evidence exists concerning students' computer skills prior to beginning their academic endeavors. The information available about junior high school students indicates that this group of learners is not accustomed to using technology. This fact is significant as Nakata (2008) explains that limited exposure to technology can affect comparative research outcomes.

The limited information available from the literature does not provide a clear view of students' access to technology. Instead it reports on random student questioning which does not assist the academic community in learning about the technological accessibility, needs and abilities of Japanese students. Therefore the purpose of this

report is to provide statistical evidence from English as a Foreign Language (EFL) learners at Tohoku University regarding their experience with and access to technology.

Participants

Second year undergraduate students at Tohoku University participated in this research project. This group of students was selected because they were observed to possess enough English language ability to provide reliable responses.

The participants were from various faculties, including Agriculture, Education, English, Engineering, Economics and Medicine faculties. The students were informed about the purpose of the research project and its structure. Students were given the opportunity to indicate their consent to have their responses included in this research paper (Creswell, 2009).

Methodology

Structured as a descriptive survey, the aim was to collect information concerning second year undergraduate students' access to and use of technology outside of class time. Students completed the survey at the beginning of each term.

Ozok (2008) explains that sometimes little research is available to construct a survey. Survey items must therefore be generated either from evidence reported in the literature or by observing participants. The literature review conducted by Gromik (forthcoming) reveal that Japan-based CALL researchers seldom conduct student-centered surveys. Therefore the survey was designed based on the lack of information available in the literature. In addition, survey feedback was necessary for this researcher to understand his students' access to technology before implementing CALL centered project-based learning.

First, a pilot study was conducted to test the language difficulty of the survey items and to address any ambiguity. The pilot study was timed to ensure that it was within the students' reach. Feedback received during the pilot study was used to improve question coherence (Burns, 2000).

The data was collected over six academic terms, thus generating evidence from six different groups of participants. This approach helped increase the validity and reliability of the evidence outlined in this paper (Burns, 2000).

In line with descriptive survey structure, both closed and multiple choice questions were utilized to collect information from the participants. Closed questions collected data to construct an overview of the students' background and their access to technology. Such questions revealed whether or not students own iPods, for example. Multiple choice questions targeted information that reflects students' preferences. For example, some students may prefer to have Microsoft Windows rather than Apple Macintosh computers. The collection of responses was analyzed to provide a statistical overview of students' access to technology and its services. Open-ended questions were not considered since students may not have been able to provide sufficient information in English to extract reliable data. Jonson and Marsden (2006) explain that some students might prefer yes/no to open-ended questions and this may affect the validity of the data collected.

The survey is divided into five sections: demographics, computers, cell phones, Internet access, and mp3 players. The demographic section inquires about students' age and gender. The computer section inquires about students' earliest access to and familiarity with computers. This section

requires that students rate their computer ability in terms of beginner, intermediate or advanced. The cell phone section investigates whether or not students own a cell phone and inquires about their text messaging habits. The Internet section includes a question concerning access at home and a multiple choice question to assess students' reasons for using the Internet at home. It also reports on their Internet emailing habits. The mp3 section is similar to the other sections. It is a multiple choice question which asks students to indicate whether they have access to an iPod or other brand of mp3 player. It also reports on students' willingness to study with an mp3 player.

Data Analysis

Quantitative data analysis was used to process the feedback provided by participants. The data was collected at the beginning of each term. The data was organized and tabulated with the OpenOffice Calc software. The overall data was then added to the general database of student responses. This information was then calculated to generate a statistical overview of students' responses concerning their access to and use of various technologies. By the end of six academic terms, the evidence generated a general and reliable perception of respondents' access to technology.

Findings

The findings were collected over six academic terms and are described in two different periods. These periods include data collected in 2006 and data collected from 2007-2008. These periods are separated because of the appearance of new technological devices on the consumer market. As more research became available, the survey needed to be redesigned to include questions targeting access to specific technology. Therefore the overall data for 2006 to 2008 is outlined first. The second set

of data collected between 2007 and 2008 reports on students' access to mp3 players and it is outlined last.

The data is reported either according to each academic term or as overall evidence. The label S1 06, for example, refers to the data generated from participants in the first semester of the year 2006 (see Figure 1). The findings are categorized as: gender ratio per class, total number of participants, access to computer technology, length of computer ownership, exposure to computer training and self-perceived computer skills, ownership of cell phones, and access to an Internet connection. The next set of data concerns students' cell phone text messaging habits compared to computer-based emailing habits. The evidence gathered about access to iPod technology is discussed at the end of the findings.

Data from 2006 onwards

Participants

629 participants (476 male, 153 female) completed the survey. Over six academic terms, 16 students did not consent to have their answers included in this research. The high consent rate (n= 613) reflects the participants' willingness to provide information that would be of benefit to the research community.

Access to technology

The figures in Table 1 refer to the type of computers students use. Two general sets of data are

visible. First, the figures highlight a preference for Microsoft Windows computers (n=575), as opposed to Apple Macintosh computers (n=12). Second, the data discloses the fact that while 26 students did not own a computer, 587 students did. These figures challenge evidence by Thornton and Houser (2005) who found that only 17% of their participants owned a computer at home. Such information is important since it can assist universities in providing better technological infrastructures for future students who will have more regular access to computers at home and consequently will be more conversant with using such technology.

Windows Vista became available on the market from 2007 onward and the presence of this operating system becomes apparent in the 2008 data. In the previous terms, Windows XP was the preferred operating system by default. Furthermore, students seem to prefer laptops (n=434) over desktop computers (n=153). This report hypothesizes that students appreciate the mobility that laptops afford them.

The figures for 2008 reveal that 127 students owned a Vista operated computer compared to 53 students who owned Windows XP.

The presence of Vista and the new updated Windows Office Suite 2007 is important for Tohoku University administrators to keep in mind.

Table 1 Types of computers students own

	S1 06	S2 06	S1 07	S2 07	S1 08	S2 08	Total
Laptop XP	69	73	77	59	22	12	312
Laptop Mac	4	2	3	0	0	0	9
Desktop XP	25	24	45	23	9	10	136
Desktop Mac	0	0	3	0	0	0	3
No PC	4	5	6	6	3	2	26
Laptop Vista	0	0	0	0	51	62	113
Desktop Vista	0	0	0	0	5	9	14

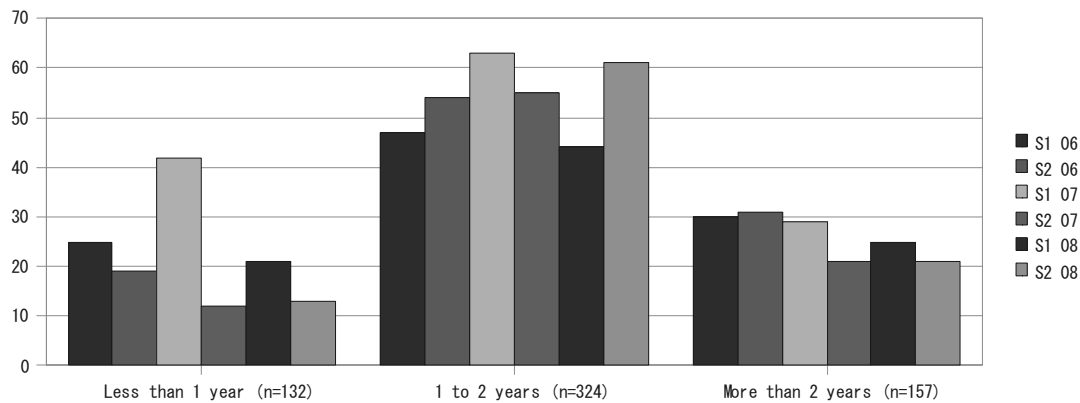


Figure 1 Length of Computer Ownership

The CALL facilities at the Kawauchi campus have Windows XP computers. The Windows Office Suite for these computers is not compatible with the Windows Vista Office Suite. An upgrade for these computers is imminent if educators want to make the most of these facilities.

In terms of length of computer ownership, Figure 1 charts students' average length of computer ownership. Many students reported that they owned a computer for more than a year but less than two years.

Since the data is collected from second year undergraduate students, one could conclude that they purchased their computers at the beginning of their academic studies.

According to Table 2, the majority of students indicated that they had been exposed to computer

technology since junior high school (n= 238). A small number of participants (n=7) indicated never using a computer during their pre-university education.

The survey also collected information to gauge students' perceptions of their computer skills. Students were provided with three categories. The "beginner" category defined users who would mainly use their computers to view movies, listen to music and type their academic papers using Microsoft Word. The "intermediate" category was chosen by students who were able to use all of the software in the Microsoft Office Suite as well as other software. They were also comfortable with surfing the Internet for information. The last category, "advanced" was defined as "the ability to surf the Internet to download and install software, participate in chat groups, manage a blog, and email friends overseas".

Table 2 First exposure to computers

	Since JHS	Since SHS	Since Uni	Never
S1 06	11	31	56	2
S2 06	38	20	46	0
S1 07	50	50	34	3
S2 07	47	24	16	0
S1 08	40	24	25	1
S2 08	52	21	21	1
Total	238	170	198	7

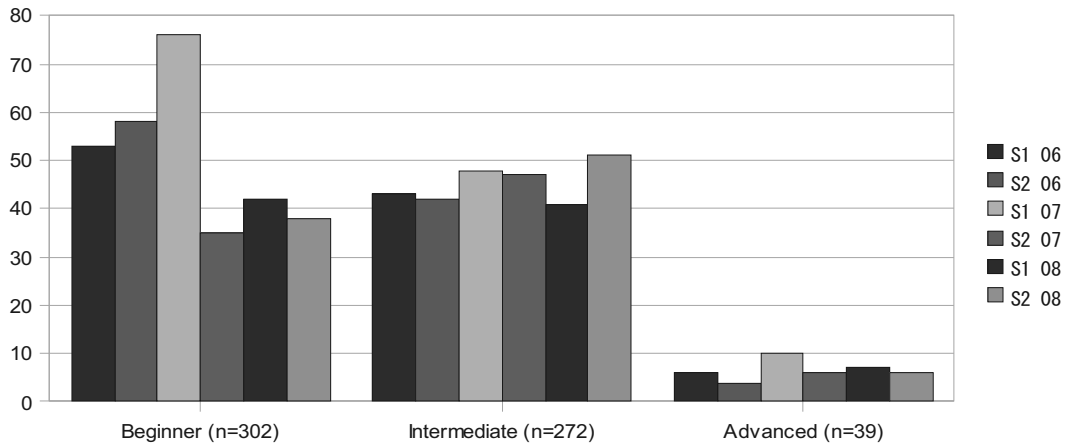


Figure 2 Self-perceived computer skills

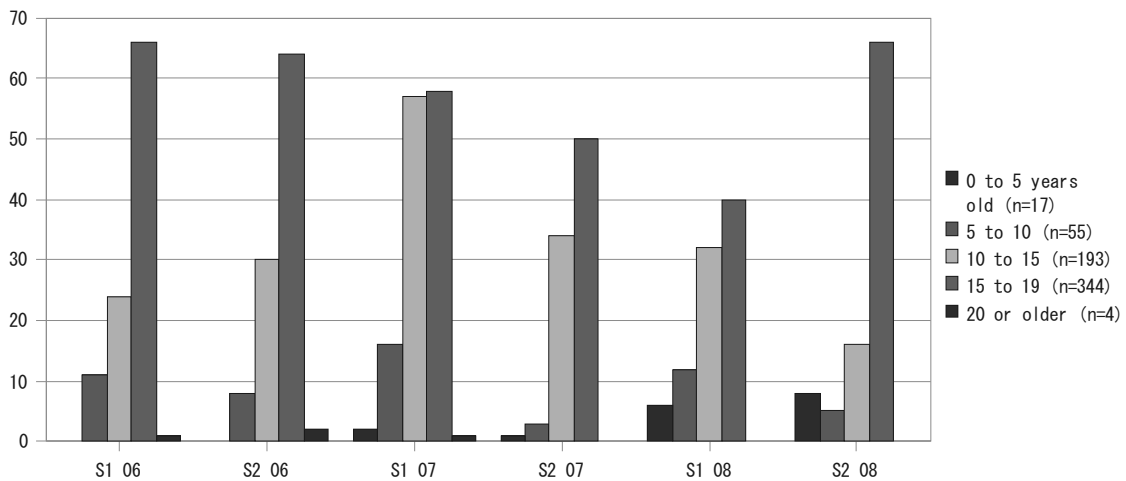


Figure 3 Age of cell phone ownership

Figure 2 reveals that students rated themselves mostly as beginners.

While 49.2% (n=302) of the participants reported that they are beginners, 6.3% (n=39) of the participants perceived themselves as advanced users. The remaining 44.3% of the participants (n=272) perceived themselves as intermediate users.

The next part of the survey collected information regarding access to cell phones. All respondents had access to a cell phone. This data remains constant over the different academic terms.

The majority of respondents acquired their first

cell phone between the age of 15 and 19 years old (n=344) (see Figure 3).

The next major age group to acquire a cell phone was between 10 and 15 years old (n=193). Very few respondents acquired their first cell phone after 20 years of age (n=4) or before 5 years of age (n= 17). Nonetheless, more and more students have access to a cell phone from an early age. 55 respondents indicated receiving a cell phone between the age of 5 and 10.

The cell phone text messaging habits indicate that students were most likely to send 1 to 5 messages

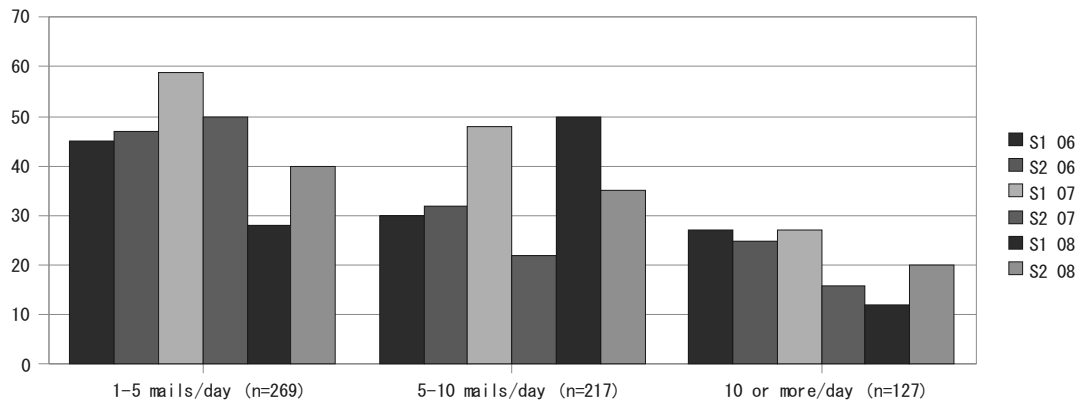


Figure 4 Cell phone text messages sent per day

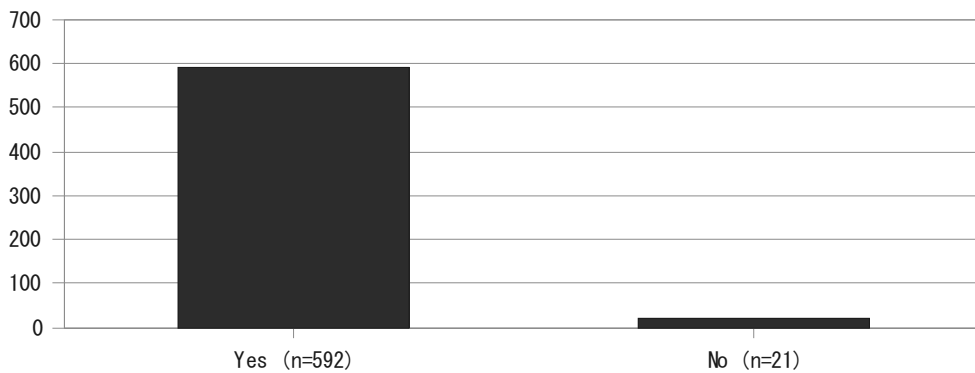


Figure 5 Internet access at home

per day (Figure 4). Out of 613 respondents, 269 sent 1 to 5 messages per day. 217 respondents indicated sending 5 to 10 messages per day. All students reported sending a minimum of one cell phone text message every day.

The remaining 127 respondents sent more than 10 messages per day. Over the period of a week, the minimum number of messages sent was 7, and the maximum was 70 per student.

The number of students sending more than ten text messages per day was consistently very low. This data is relatively small compared to the responses provided by the participants in the Thornton and Houser (2005) experiment, who were

reported to average 200 text messages per week.

Cell phone text messaging can be contrasted against the number of Internet-based emails sent. First the data reports on student access to the Internet at home before drawing some comparisons.

As Figure 7 indicates, a small group of respondents did not have access to the Internet at home (n=21).

The remaining students had an Internet connection at home (n=592). Nonetheless, the data informs university administrators that the high ratio of students who have access to the Internet allows for the possibility of delivering educational content online.

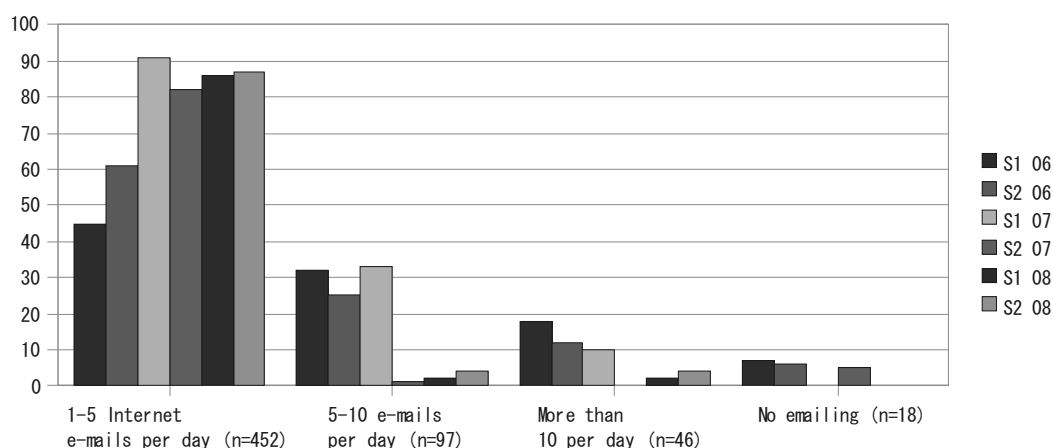


Figure 6 Computer-based emails sent per day

Similar to cell phone-based text messaging habits, it appears that the majority of students sent an average of 1 to 5 computer-based emails per day (see Figure 6). While this data provides some information about students' computer-based emailing, it does not explore the types of websites students access via their home Internet connection.

Summary

Most students had prior experience with using computers since junior high school. The majority had access to a cell phone since they were between 10 and 19 years old, and most acquired a computer prior to commencing their undergraduate studies. Technology is a part of their lives and as the next set of data indicates, it is no longer just computers and cell phones that students have access to, but a greater and more mobile range of technology.

mp3 data, 2007 onwards

Nascent in 2001, the iPod is a tool that has revolutionized the availability of audio-visual resources. Students have been reported to use this device to store information to undertake their studies, leading to a potential ban at some American schools (Boone, 2007). This has not stopped educators in Japan from considering iPod technology

as a language learning device (see McCarthy, 2006 and Valance & Shibata, 2008 for examples).

In 2007, 222 second year Japanese undergraduate students responded to the following two questions: "Do you own an iPod?" and "Would you agree with using an iPod to study English?". Data collected revealed that 72 respondents had access to an iPod player only. But the data also indicates that many students did not utilize this device (n=150). Some students stated that they used other mp3 players such as Sony or iriver, to name a few.

To include all the major mp3 player brand names was beyond the scope of the survey. Therefore in 2008, the survey item "mp3 player" was added. 185 participants responded to the revised survey. While 81 participants responded that they owned an iPod, 41 indicated that they owned another brand of mp3 player. A few selected respondents were approached to investigate their decision for selecting other brands. The majority responded that iPods were too costly for their particular needs. Such information is of some importance because students have financial constraints that dictate their choice of technology.

After investigating students' access to mp3

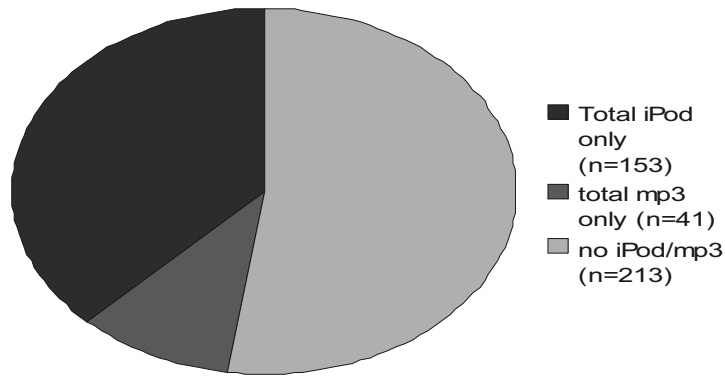


Figure 7 Total access to mp3 player ownership

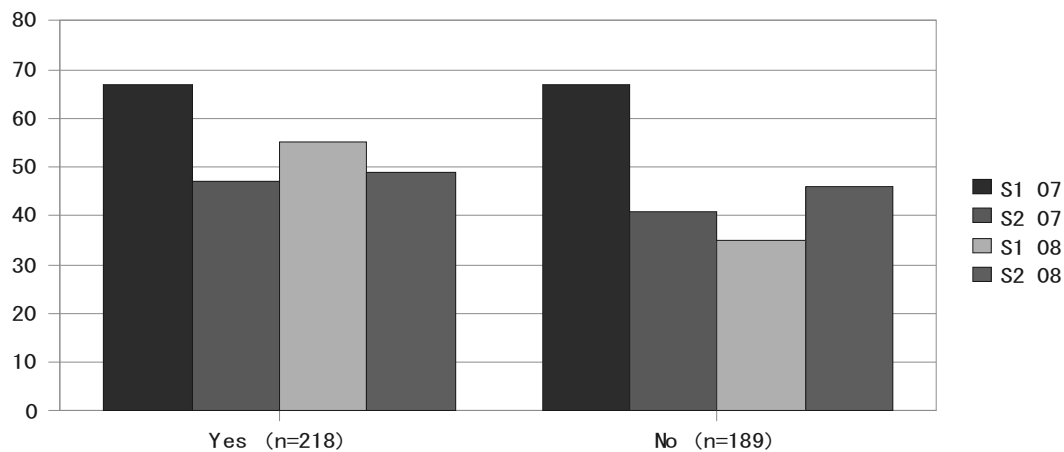


Figure 8 Interest in studying with mp3 players

players over four semesters between 2007 and 2008, this article concludes that students are investing in this technology.

Out of 407 students, 194 owned an mp3 player (47.6%), compared to 213 who did not own or have access to such a device (52.3%) (See Figure 7). Updating the survey to include the general term “mp3 player” generated statistical evidence more reflective of the types of devices owned by this student cohort.

During 2007 and 2008, students were asked if they would consider studying English with their mp3 player. Some respondents indicated that they would

like to study English with an mp3 player (n=218), while others were not interested in learning via this device (n=189) (see Figure 8).

There is no major difference between semesters that would reveal a clear understanding of students’ preferences with regard to learning with an mp3 player. It may be the case that once students are exposed to learning with an mp3 player, they would see some educational benefits with this learning approach (see Gromik, 2008 for an example).

Limitations

Due to respondents’ limited ability to respond promptly and thoroughly to open-ended questions

in English, this survey was unable to delve into qualitative data. For example, attempting to seek out students' reasoning behind issues such as their preference for Microsoft over Apple computers may have impeded them in answering all questions within the time allocated to complete in the survey.

In terms of survey design, a limiting factor is the constant technology upgrades and developments available to consumers. For researchers to keep track of students' access to technology, surveys need to be frequently updated. This survey report exemplified the research constraints that technological development imposed when reporting on students' ownership of mp3 devices.

Implications

Given the limitations outlined above, this survey report also provides information that has implications for future research. For example, it might be feasible to conduct a correlation study between computer requirements at university and students' familiarity with various types of software. This could be an area for further investigation to determine how and if computer usage increases as universities and teachers begin to assign more computer-based tasks.

For CALL infrastructure administrators, this report offers some indications not only about students' access to technology but also the constant technological changes that emerge. This is important because Microsoft first furnished selected computers with a Windows XP operating system. This operating system was upgraded in 2007 with Windows Vista. Microsoft is currently upgrading its operating systems again and is due to release Windows 7 (Microsoft, 2009).

Constant technological development could guide CALL infrastructure administrators to consider

various types of services to provide on the university CALL computers. For example, Gromik (2008) reported on the benefits of learning with iTunes, an Apple audio-visual delivery website. Providing this service on campus may benefit students and educators alike with authentic learning resources in various languages.

Conclusion

This paper reported on a survey conducted over six academic terms at Tohoku University. 613 students from various departments consented to provide evidence concerning their prior experience with technology. The data reported on students' access to and use of technology outside of class. The information revealed that students have increasing access to computers, cell phones and mp3 players. Students' familiarity with these devices varies depending on their length of exposure and training. This survey report also indicated that due to rapid technology developments, it is essential to update survey questions and keep track of recent trends and updates. New developments also affect students' familiarity with technology and their use of it on a daily basis. This author concludes that it may be time for educators and administrators to consider investigating further the effect of integrating technology on a wider scale.

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