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First Year University Students' Access, Usage and Expectations of Technology: An Australian Pilot Study

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Abstract: In recent years, reports in the popular press have highlighted the rapid take-up of Web 2.0 type tools that support social networking, collaboration and information access. Also, there have been calls for universities to be more innovative in their use of these emerging technologies for learning and not just for the distribution of resources and the management of grades. Unfortunately, there is little empirical evidence documenting the technology-related uses, experience, expectations, skill levels and training needs of the broad range of students that are currently entering Australian Universities. This paper reports on a pilot survey of a sample of first year students entering a regional Australian University. Contrary to expectations, this research indicates that the youngest students had the lowest desire to use the technologies in their studies. These findings have implications for program development and delivery particular at first year level.

Introduction

Early this year Swain (2009), writing in the UK Guardian newspaper, reported that the Open University's new iTunes U site (<http://www.open.ac.uk/itunes/>) had recorded over 2 million downloads in a single week. She went on to discuss and quote various academics on how Web 2.0 tools were transforming higher education and creating a challenge for universities.

For Australian regional universities with diverse and often disadvantaged student cohorts (e.g. low income and poor Internet connectivity), anticipating the technology related needs of their first year students is a particular challenge. There is a sector-wide need to design and administer surveys that capture empirical, institution-specific data about students' technology access and usage, and technology related skills. The aim of this project was to pilot a survey instrument in a small Australian regional university with significant mature aged and distance learning first year enrolments. This paper outlines the preliminary findings from the pilot survey administered in Semester 1/2008 to 1,065 first year students enrolled in three units. Units equate to courses in US universities and it usual requires 24 units to be completed for a student to graduate with an undergraduate degree.

It is intended that this pilot instrument will inform the development of regular institution-wide surveys for both first year and third year students. This process will ensure that there is improved understanding of students' access to all relevant technologies to develop relevant students' technology support and to plan the curriculum, from entry to completion, to build both generic and discipline specific technology related graduate capabilities.

There have been discussions overseas (Conole et al 2004; Trinder et al 2008) and in Australia about the claims made about 'digital natives' or the 'net generation' and their abilities to use technologies and the need to change curriculum design and delivery (Boud 2007; Boud & Falchikov 2007) to reflect their skills and expectations. Some findings from recent empirical studies in Australia have challenged some of these assumptions. For example, from a study of first year students (under 25 years old) at a large metropolitan university, 'there is little empirical support for the stereotypical depiction of the digital native – wired and wireless 24/7' (Kennedy et al 2006, p. 13). Their later

study across three Australian Universities concluded that: 'the use of collaborative and self-publishing 'Web 2.0' technologies (O'Reilly 2004) that have often been associated with this generation is quite low' (Kennedy et al 2007).

A complexity of factors influencing first year students' use and expectations of technologies has also been found in studies in other countries. The UK's Joint Information Systems Committee (JISC) (2008) investigated school students' (16-18 years old) expectations of Information and Communications Technology (ICT) provision in higher education institutions and the experiences of ICT use by first year university students (17-19 years old). They found that while the school students had an expectation that ICT would be used at university, they did not know what this role would be. After completing one semester, the first year university students felt that some technologies were easy to assimilate into their learning while other technologies (including social networking sites, blogs and wikis) were difficult to view in terms of supporting their learning. This was both a factor of unfamiliarity with use and not associating technology use with learning (JISC 2008, p.7).

These research findings and the need for the University to find out more about their students' use of technologies led to the aims of the study, which were:

1. To provide a snap shot of first year students' access, use and expectations of a range of technologies
2. To gain an understanding of the gaps in students' skills to inform training requirements to enable students to fully participate in flexible learning opportunities, and
3. To develop a pilot questionnaire to assist in the development of a long term University wide student experience survey instrument to assist in University planning and student support.

Context of the Study

Southern Cross University (<http://www/scu.edu.au>) is one of Australia's 38 publicly funded universities and is located in northern New South Wales. Published surveys of first year students' use of technologies tend to focus on younger students who fit the 'digital native' profile, that is, aged 25 years old or younger. The demographics of the current Southern Cross student population are older. In 2008, there were 15,560 students at the University: 16 percent under 20 years old, 32.5 percent 20 to 24 years old and 32.4 percent were 25 years old or older. About half of the students study as distance learning students. To understand our students' use of technologies, this study included an analysis of all respondents to the questionnaire, regardless of age or study mode.

The survey instrument was adapted from the previous research project by Kennedy et al (2006). This study builds on and extends their findings. The questionnaire was expanded to include feedback on anticipated future use of technologies and training requirements.

Students were asked about:

- Their access to a wide range of information and communication technologies and tools (current and planned)
- Their current use of technologies
- Their desire to use the technologies in their studies
- Their perceived need for training, and
- Background demographic information.

The online questionnaire was offered to students who were enrolled in core units across programs in nursing, tourism and hospitality, commerce and management, and arts and social sciences in the first few weeks of the first teaching session in 2008. The University offers 3 teaching sessions per year 1,065 students responded to the questionnaire. The respondents were predominantly from a social science communications unit (809 students) with smaller cohorts of students in another social science communications unit (73 students) and in a biology unit (183 students). The questionnaire was voluntary for the students to complete. It was included in one of the communications unit as a voluntary formative learning task, which improved the response rate for that unit.

The two communications units were first year core (compulsory) units that are taught to on-campus and distance learning students with considerable use made of online learning approaches and assessment tasks. The biology core unit provided a different cohort of primarily on-campus students taught face-to-face.

There are limitations to the survey as it was a pilot and so it can only provide a snapshot of these students at the time of the survey and the extrapolation of the results to the whole of the University cannot be made. As the survey was delivered online and it was optional for the students to complete it, the students who replied may have been more comfortable with the use of online tools.

The understanding of the needs of and difference between, first year students is vital if they are to be given the required support as they start to engage with the University's learning and teaching activities. When these differences in student expectations of technology use become evident, the question for institutions and teaching support staff is how to assist students to engage effectively with the technology based learning opportunities.

Survey Findings

There was a relatively even spread of respondents aged 19 years and under (33.0%) and 20 to 24 years (33.5%) with a large cohort of students over 25 years (23.5%), including 10 percent of respondents over 40 years with a maximum age of 66 years (Figure 1). This spread of ages reflects the diversity and mature age nature of the University's student enrolments, although in this case, there was a relatively a higher percent of younger students than in the overall University student population.

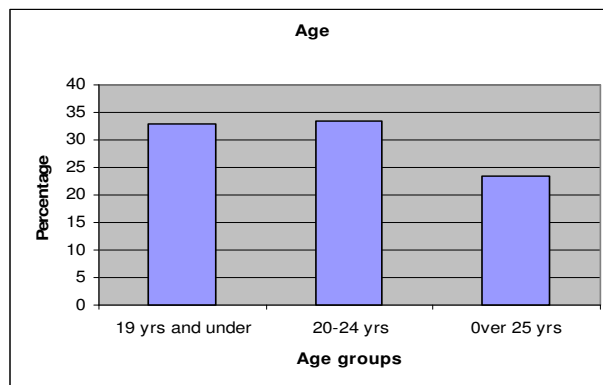


Figure 1: Age groups in the survey (percent of total respondents)

As assumptions about technology use have been a focus in the literature, a cross-tabulation of the variables in the questionnaire with age was undertaken. This analysis found that age is not a clear determinant for which students have access to technologies or who are using them in their everyday life. However, this study did indicate that there were some distinct differences by age in these students' desire ('Want to use in my studies') to use of technologies in their studies.

Access to Technologies

The students were asked about their current access to the Internet and to a range of technology hardware including computers, MP3 players, mobile phones, digital cameras, printers, scanners, video game consoles, and their plans for acquiring these technologies in the future. The type of access was reported by respondents as either 'No access', 'Limited or inconvenient access', 'Access any time but shared with other people', 'Access exclusively for my own use'. Students in the last two categories were expected to have reasonable access to the technologies for their studies.

While the 20-24 year old students had the least access to a desktop computer at home (16% had no access), they had the highest unrestricted access to portable computers of the age groups (71.4%). The lowest level of access to a portable computer was for the over 40 year olds (54.1% had unrestricted access).

Reflecting the personal nature of the mobile devices, students reported a high level of exclusive access to these technologies. Students reported the highest overall access to mobile phones. Students under 20 years old reported 100 percent access to a mobile phone with a similar rate (99.4%) for the 25 to 29 year olds. Access levels to mobile phones were slightly lower for the older age groups with 4.1 percent of students over 29 years old reporting 'No access' and 85.6 percent reporting 'Exclusive access'. Access to MP3 players was considerably higher for the under 25 year olds (74% unrestricted access) than the 25-39 year olds (60%) and more than double the rate for the over 40 year olds (39% had unrestricted access) (Figure 2).

The majority of the students had reasonable access to the other technologies surveyed: portable DVD viewer, digital camera, video game console, printer, scanner, CD burner, DVD burner. Overall, reported levels of access to the other digital and storage technologies across the age groups were similar. There was a trend for the 25-29 year olds to report a lower unrestricted access to some technologies than the younger and older groups. One of the largest differences in types of access to technologies by age was for printers with older groups reporting about 90 percent unrestricted access the 20-24 year old students reporting 70 percent. While the levels of 'No access' to printers and memory sticks were relatively low they can be essential for students' work. Providing students with information on how to buy reasonably priced laptops, printers and storage devices to back-up their work could be considered.

Use of Technologies

This section of the survey aimed to provide a profile of technologies that students had experience using, their expectations of which technologies they would like to use in their studies and if they required training to use the technologies in their studies. The students were asked about their current use of technologies in any context. As these were early first year students, this response would reflect their use of the technology predominantly in their non-academic life. The types of technology used were divided into three broad categories:

1. Using computers to create and access different content types (e.g. writing documents, and creating graphics, multimedia presentations, audio files)
2. Using the internet for a range of personal activities (e.g. buying and selling) and social networking (e.g. sharing files, Internet phone, Web conferencing), and
3. Using mobile phones (e.g. texting, personal organiser, email).

To focus the adoption of technologies by the students and to identify where they may need assistance in using the technologies in their studies, a comparison was done of the reported current use across the age groups. Analysis of the trends in age and technology use and skill does not necessarily mean that there is a casual relationship as there may be other factors influencing the results (e.g. expectations created by enrolment mode). The consideration of age related use of technologies would be relevant when the 'typical' ages of a unit's cohort are known, such as if mostly school leavers are enrolled in a unit. This comparison revealed some trends for current use of the technologies across the age groups. Figure 2 indicates the percentages of non-use of the technologies within the age groups. Focusing where students do not have experience in using technologies in their non-academic life can assist in developing appropriate support strategies.

There was consistently high current use across the age groups for the following technologies. These can be considered as *established technologies* across the student population:

- Use a computer for writing documents
- Use a computer for general study without accessing the Internet
- Use the internet for looking up reference information on the Internet, and
- Use a mobile phone for text/SMS (except for students aged 40 years and over).

There was a low current use (less than about 50% of the students using) at a nearly consistent level across the age groups for the following technologies. These can be considered as technologies that are *not established* across the student population:

- Use a computer to build or maintain a Web page
- Use a computer for creating and editing audio and video, and

- Using a handheld computer (PDA).
- Using a computer for Web conferencing
- Using the Internet to read RSS feeds, and
- Using the Internet to make phone calls.

Technology Uses	Under 20 yrs	20-24 yrs	25 yrs & over
Not currently using a computer to:	%	%	%
write documents (eg Word)	0.0	0.3	0.6
create graphics or manipulate digital images	12.8	12.0	21.4
creating Web pages	55.0	51.5	66.8
creating multimedia presentations	4.6	6.2	25.1
creating, editing audio and video	41.3	42.3	54.8
general study without accessing the Internet	5.1	6.4	5.9
play digital music files	2.6	5.6	17.5
play games without accessing the Internet	14.0	24.4	42.4
game console to play games	27.1	37.0	55.4
handheld computer (eg a PDA)	70.1	64.7	77.9
Not currently using the internet to:			
look up reference information for study purposes	1.1	0.3	1.1
play networked games	42.2	47.3	70.9
listen to sound recordings	11.1	12.0	28.5
other pastimes (i.e. for leisure activities)	2.8	3.4	8.9
buy or sell things	30.2	18.8	21.8
other services (eg banking, paying bills) check	24.8	11.2	13.2
instant messaging	4.3	10.4	36.9
build or maintain a website	65.5	57.7	71.3
social network software on the internet (eg Myspace, Facebook)	10.3	13.4	46.5
download mp3 files	11.7	8.7	30.1
upload and share mp3 files	27.1	25.2	49.6
share photographs or other digital material	21.9	20.4	38.8
internet to make phone calls	67.0	52.7	64.5
Web conferencing (eg using a Web cam)	61.0	54.6	67.2
read RSS	48.1	36.7	51.2
read other people's blogs or vlogs	26.8	28.9	49.6
keep your own blog or vlogs	57.0	48.7	76.5
contribute to the development of a wiki	73.5	63.3	82.1
Not currently use a mobile phone to:			
text/SMS people	0.6	1.1	3.6
take digital photos or movies -	4.6	8.7	20.0
send pictures or movies to other people	14.0	14.8	30.9
a personal organiser (PDA)	11.7	16.0	28.4
access information services on the Internet	51.0	44.3	60.6
send or receive email	63.5	57.4	73.7

Figure 2: Not currently using technologies by age groups - percent within age group (highest non-use highlighted)

There was a general progressive decrease in use of many of the technologies across the age groups surveyed. This result suggests that the younger students are adopting the technologies at a faster rate than the older students are but this is not generally a spike, rather there is a gradual decrease in use from the younger to the older age groups. These

could be considered *emerging technologies*. The relative 'slope' of the percentage use by age group can be viewed as providing an insight into how the technologies are being adopted by the student population. This is a preliminary way to explore the statistics, which may be followed through later in further studies and statistical testing.

There were two types of uptake noted from this comparison:

1. Technologies that are being gradually adopted across the age groups, and
2. Technologies that are being used predominantly by the youngest students.

For example, there was about double reported usage percentages reported by the youngest students (under 20 year olds) compared to the oldest students (over 25 year olds) for the following technologies:

- Use a computer to create graphics or manipulate digital images
- Use the Internet to play networked games
- Use the Internet to read other people's blogs
- Use the Internet to share photos or other digital materials, and
- Use the Internet to play networked games.

In contrast, there was more than triple usage percentages reported by youngest students than by oldest students for the following technologies:

- Use a computer for creating multimedia presentations
- Use a computer to play digital music files
- Use the Internet for other pastimes
- Use the Internet for instant messaging
- Use the Internet social network software (e.g. MySpace)
- Use a mobile phone to text/SMS, and
- Use a mobile phone to take digital pictures or movies.

For instant messaging and playing digital music, the youngest students were using them at about ten times the level of the oldest students. These results indicate the youngest students' had preferences for social networking, particularly synchronous communication, using their mobile phones and retrieving online content. Interestingly for some technologies, the 20-24 year old students were using the technologies at a higher level than the students under 20 years old. These activities could be considered more 'mature' uses of emerging technologies, in particular using internet services and the creation of online content, for example:

- Use a handheld computer (PDA)
- Use the Internet to buy and sell things
- Use the Internet to build or maintain a Web site
- Use the Internet to make a phone call
- Use the Internet for web conferencing
- Use the Internet to keep your own blog, and
- Use the Internet to contribute to a wiki.

Planned Use of Technologies in Study

The students were also asked if they wanted to be able to use the technologies in their study (i.e. a response to 'Want to use my studies' – 'Yes', 'No', 'Don't know'). Comparison of planned use of technologies in the study across the age groups revealed an unexpected trend (Fig. 3). While the school-leaver aged students indicated that overall they were using many of the technologies more than the older students were, they indicated a lower desire to use most of them in their studies than the older students did. This was the case for all of the surveyed technologies, except the mobile phone technologies. In some cases, the oldest students (25 years and over) showed the highest desire to use technologies in their studies, for example, using emails, PDA's and a computer for study. The highest percentages of response by age group for 'Want to use in University study' for each technology are highlighted in Figure 3.

Technology Uses	Under 20 yrs	20-24 yrs	25 yrs & over
	%	%	%
Use a computer:			
for general study	87.5	86.0	91.0
to create documents	86.9	84.9	91.6
to create graphics or manipulate digital images	50.1	61.9	56.3
to create web pages	25.6	39.5	38.7
to create multimedia presentations	79.2	79.3	75.8
to create or edit audio and video	35.6	47.6	41.6
to play games	19.4	26.6	12.9
handheld computer (e.g. a PDA)	15.1	21.6	21.8
Use the internet:			
to send or receive email	78.3	79.0	81.1
for instant messaging/chat	55.8	56.0	43.9
to build and maintain a website	21.9	36.1	33.0
to use social networking software	48.1	48.5	26.9
to download MP3 files	51.0	60.8	51.7
to upload and share MP3 files (e.g. podcasts)	35.9	47.3	41.3
to share photographs or other digital files	37.6	47.3	42.7
to make phone calls	16.0	34.5	34.0
for Web conferencing (e.g. using a webcam)	28.5	43.1	43.0
to read RSS feeds	37.0	51.5	43.6
to read and/or comment on other peoples blogs or vlogs	26.2	39.5	26.6
to keep my own blog or vlog	18.2	31.7	19.0
to contribute to the development of a wiki	16.8	26.3	15.4
Use a mobile phone:			
to call people or take calls	71.8	69.7	74.0
to send or receive text messages (SMS)	72.6	67.2	71.7
to take digital photos or movies	50.4	49.9	45.3
to send and/or receive pictures or movies	46.2	47.1	42.3
as a personal organiser	55.6	55.2	50.87
access web-based information or services	29.3	38.7	34.8
to send or receive email	27.4	38.9	32.9

Figure 3: Response to ‘Want to use in my studies’ by age group (highest ‘Yes’ response highlighted)

These findings indicate that there are likely to be other factors apart from the higher use of new technologies by the younger students influencing expectations of technology use at university. For example, in this study, there was a cohort of nursing students who were studying predominantly on-campus and were the youngest group of students in the units surveyed (38.3% aged 19 years and under). These students may not necessarily expect to use technologies in their learning activities. Alternatively, there was a large cohort of older students in the COM00207 communications unit with more distance learning students than on-campus students. These more mature aged students may see the advantages of using technologies for learning, particularly for distance learning. As these students were surveyed in the first few weeks of their university career, how their expectations are managed to support their engagement and success in University learning activities needs to be considered.

Conclusions

The findings of this survey have supported other research that indicates diversity in the technological experiences and expectations within first year university student cohorts. This study informs the development of empirical research into the students’ access, usage and expectations of technology use and provided additional insights into the

wide range of students entering Australian regional universities, particularly mature aged students. The Australian Government has recently highlighted that there is a relatively lower participation rate of 25 to 34 year olds in Australian higher education compared with other OECD countries. The Government is supporting an increase in the enrolment of mature aged students and students from lower socio-economic backgrounds, particularly in regional universities (Australia. Department of Education, Employment and Workplace Relations, 2008). To support this policy, further investigations into how to effectively support students from a variety of backgrounds is going to be required. This study suggests that further research is required into how technology usage in various contexts (e.g. school, workplace, social) is transferred to university learning contexts. That is, rather than focusing on age groups as an indicator of technology skills and expectations, the focus can shift to the enabling the transfer of new students' existing skills and experiences to using technologies effectively within formal and informal tertiary learning contexts.

While students' experiences and expectations do not necessarily limit the use of technologies in learning activities, the development of appropriate learning strategies is assisted by exploring these factors. Strategies are required to assist incoming university students in their transition to use technologies for engaging in learning opportunities provided within the curriculum. Incorporating computer literacy skills and encouraging students to build up their skills to participate and interact, and to create and share content using technologies is essential. Where boundaries between internal and externally enrolled students are blurring through the use of communication technologies, all students need equitable access to learning opportunities. Enabling students to explore and develop skills to use the vast array of technology tools that assist social networking, collaboration and information access can encourage creativity and success in lifelong learning.

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