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E-YEARNING: An examination of the use and preferences of students using online learning materials.

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Abstract: This paper reports on the second phase of an ongoing project being carried out at Edith Cowan University (ECU) in Western Australia examining ECU Education students' ownership and use of information and communication technologies (ICT). In particular the study gathered information concerning students' self-perceived software skills and frequency of use, hardware ownership and frequency of use, access to and location of Internet use, preference for various types of online learning materials, and access and use of university email and the Blackboard virtual learning environment. It is critical that modern universities understand their students' ICT capabilities in terms of hardware ownership, software facility, and preferences in order that online course and content delivery may be tailored to deliver effective, usable and engaging learning resources.

Keywords: E-learning, Educational technology, ICT readiness, online learning

Introduction

In 2007 the researchers undertook an online survey to try and determine the skills, ownership and use of ICT by ECU education students [3]. This survey showed that in 2007 students were not early adopters of new technologies, nor were they making use of its potential in their studies. In 2010 and modified but related survey was used to determine what had changed, and it is this survey that is the subject of this paper.

ICT use by education students is of particular importance, as it is these students who form next-generation of classroom teachers. Other research undertaken by the authors has shown that in Western Australia at least, the vast majority of classroom teachers are not using ICT effectively within their classrooms. Thus if student teachers are reticent to use ICT to support their own learning the authors believe that it is unlikely that they will see it as a tool to support the learning of others. Edith Cowan University (ECU), situated in the metropolitan area of Perth Western Australia, is a large university with 24,241 students (18,678 equivalent full-time student load) in 2010. These students are spread over four campuses and about 20% of all students are international full fee paying students. Historically, ECU has its foundations in teacher education and training and its Faculty of Education and the Arts is the largest in Western Australia, with 7298 students (6074 equivalent full-time student load) and 268 academic staff.

Previous research has shown that whereas new teachers may be competent users of information and communication technology (ICT), they do not necessarily utilise them in their own classrooms [4]. It is also known that students' own pedagogical beliefs and values that are generated during their education (including tertiary) play an important part in whether or not they choose to implement technology for their own students [2]. This suggests that, if students do not have positive experiences with ICT and its applications to education while at university, they are unlikely to employ ICT in their own teaching. We are also mindful that web technologies (including those touted as 'web 2.0') are developing at a rapid pace [1] and that the 'online' aspect of ICT use is likely to become of greater importance in education in the future [5]. Additionally, and significantly, in 2011 the

Faculty of the Education and the Arts at ECU began work on a project funded by the Australian Department of Education, Employment, and Workplace Relations called the *Teaching Teachers for the Future* (TTF) project. This project is a nationwide initiative to ensure that "... pre-service teachers achieve and demonstrate (upon graduation) competence in the effective and innovative use of ICT in education to improve student learning". The results of the current investigation into students' ICT use and preferences will inform the TTF project in terms of the most effective ways to engage ECU Education students with online learning resources.

The Investigation

The investigation was undertaken via an online survey developed and delivered via Filemaker Pro 8.5 and housed on a university web-server. Education students were informed of the survey via a link placed on Blackboard. Data entry was via drop down menus and radio buttons to ensure an uncluttered layout and accurate data entry. Finally, a progress bar indicated how far participants were through the survey to encourage them to continue through to the end. Further an iPod Nano was offered as a prize to a random student that completed the survey. It is acknowledged that this method of recruiting students for the survey skewed the sample towards the more ICT capable members of the target group as they were required to use the online learning management system to access the survey. It is therefore reasonable to assume that the sample represented the middle to upper end of Education students in terms of ICT ability.

The survey contained the following sections:-

- *About you – demographics*
- *Your Skills – perceived software skills and frequency of use*
- *Your Stuff – hardware ownership and frequency of use*
- *Your Access – type of internet access, location of internet access*
- *Your Learning – Preferences for various formats of online materials (Word, PDF etc), frequency of access to university email and Blackboard, frequency of saving, printing online learning materials*

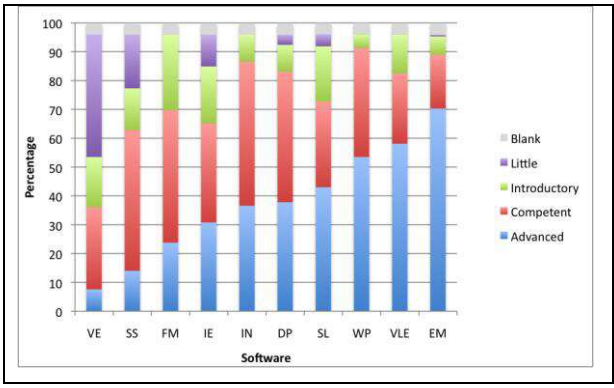
In all 158 undergraduate, 3 postgraduate, and 11 unidentified students from the School of Education completed the survey. Twenty one percent of the respondents were male and the remainder female. This ratio of male to female students fairly accurately reflects the actual ratio mong Education students at ECU. Overall the sample is a reasonable representation of the ECU Education student population under examination.

The survey collected data on students' self-perceived skill with a variety of software. The survey was constructed such that for each piece of software a number of descriptors were developed indicating the respondent level of skills with the software. Table 1 illustrates two examples from the survey for Word processing and Spreadsheeting (e.g. Microsoft Excel). The student selected the rightmost category in which they could complete all listed skills.

Table 1: Sample from the survey where students indicated self-perceived skill level

	Little	Introductory	Competent	Advanced
Word processor	I can't do much	I can print a document, change fonts, spell check, insert a footer and page numbers.	I can insert images, create tables, change Page Setup, change margins.	I can use columns and sections, set up styles, use mail merge for labels or letters.
Spreadsheets (e.g. Excel)	I can't do much	I can enter data, use Sort, create charts [graphs] and modify them.	I can insert some calculations, format cells, insert and delete rows and columns.	I can use complex formulae, use absolute and relative cell references.

As a result of this the students indicated competency in all categories excepting video editing. Looking at the advanced category in Figure 1 the greatest self-perceived skill with software was in email, the virtual learning environment (Blackboard), word processing, and slideshows (e.g. Powerpoint). This is consistent with the types of software they are most likely to be using in their Education course.



VE – Video Editing
SS - Spreadsheeting
FM – File management
IE – Image Editing
IN – Internet Browsing
DP – Digital Photography
SL – Slideshows
WP – Word Processing
VLE – Virtual Learning Environment
EM - Email

Figure 1: Student self-perceived skills with a variety of software.

In the 2007 survey students were asked to rate themselves as either very skilled, skilled, unskilled, or very unskilled. Although a less satisfactory measure than the current descriptor-based method the types of software that students ranked themselves as skilful in remained approximately the same with minor changes in rankings probably due to the variation in question technique adopted by the different surveys.

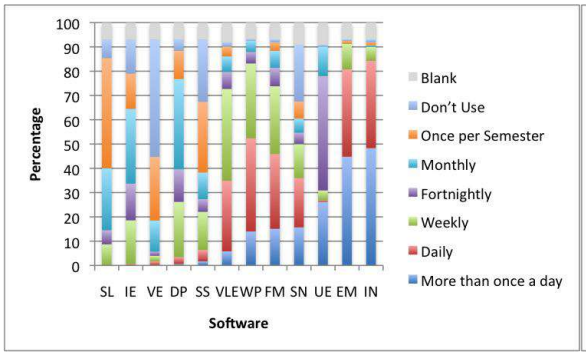


Figure 2: Software frequency of use

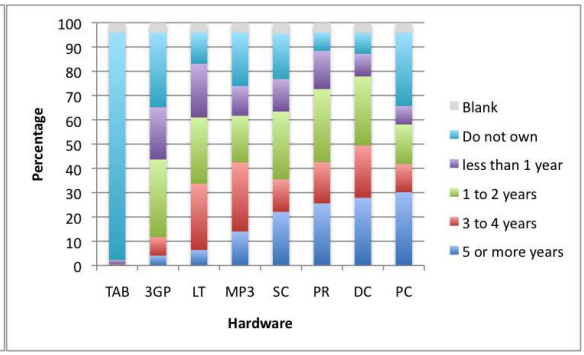


Figure 3: Student hardware ownership

Figure 2 illustrates the frequency of use indicated by the students for the various software types. Interestingly the only software indicated to be used on at least a daily basis by the majority of students was Internet browsing, email, and word processing. The survey asked students to identify what hardware they owned, how old it was, and how frequently the hardware was utilised. In terms of computers over 83% of students owned a laptop with 22% of these obtaining it in the last year whereas 66% owned a desktop PC with 8% obtaining this in the last year (Figure 3). In the previous study from 2007 less than 65% owned a laptop and just over 70% owned a desktop PC. The greatest change however occurred in the smart phone (3G phone) area with less than 10% owning such a device in 2007 and over 65% of students indicating ownership in the current survey with over 50% of students purchasing one in the last 2 years. This data shows a very significant move toward mobile technologies both in terms of current ownership and purchasing pattern. It can safely be assumed that the student population of the future will be armed with laptops and 3G enabled mobile devices. The current study occurred too early for the trend toward tablets such as the iPad to be observed in the statistics but this may well be an important

factor in future surveys. Figure 4 shows the reported frequency of use of each of the hardware types. Again the mobile devices (laptops and G3 phones) are the most frequently used followed by desktop PCs and mp3 players. Over 70% of students responding to the survey use a laptop at least daily.

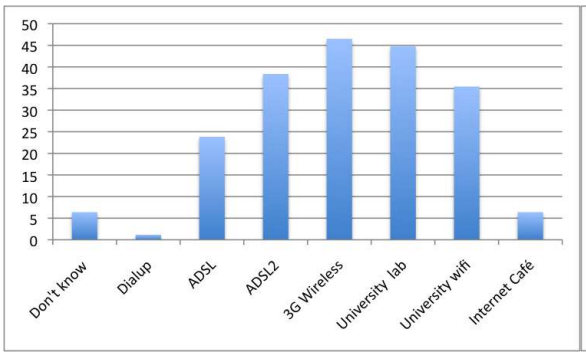


Figure 4: Hardware frequency of use.

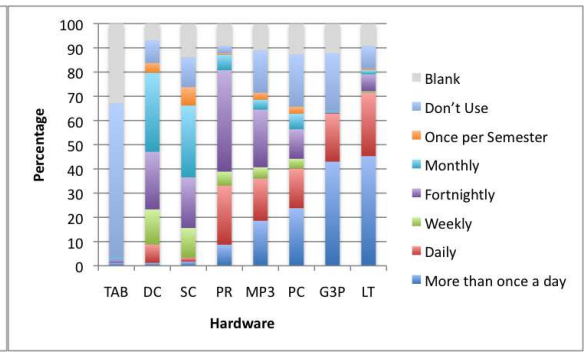


Figure 5: Type of Internet access

Figure 5 illustrates the variety of ways that students access the Internet. This pattern is drastically different to the distribution from the 2007 survey with regard to both university wireless and 3G phone access to the internet. In 2007 just over 20% indicated using university wireless and just over 10% indicated using 3G devices to access the internet. By 2010 this has changed to 35% accessing the internet using university wireless and over 45% indicating the use of 3G devices. Once again this indicates a huge shift toward mobile devices for student use.

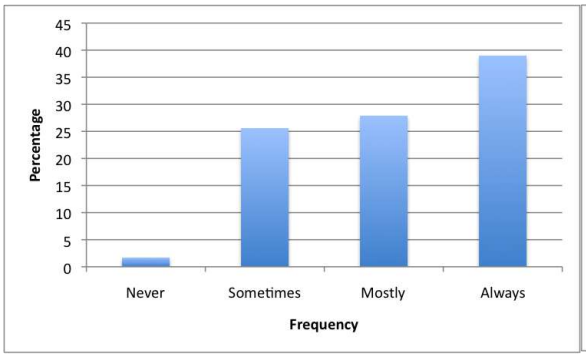


Figure 7: Frequency of saving materials.

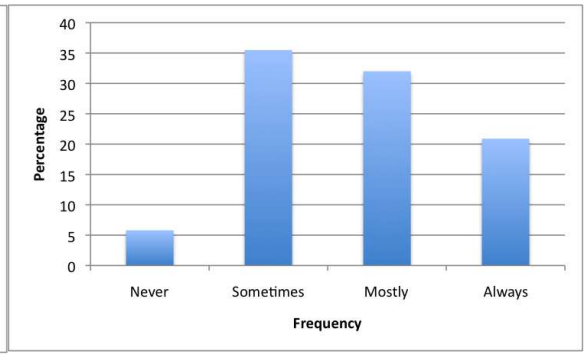


Figure 8: Frequency of printing Materials

The authors were also interested in how frequently students access online learning materials and this is shown in Figure 9 with the majority of students indicating fortnightly access. This would seem to be a worrying statistic when more and more of course materials are being presented online. This picture is worsened by the fact that many students still print or save online learning materials (Figures 6 and 7) which suggests that these materials are of a traditional printable form and do not require any interaction beyond reading. This would not be the case if they were, for example, simulations or materials that were not primarily information-based and that required interaction on the part of the student.

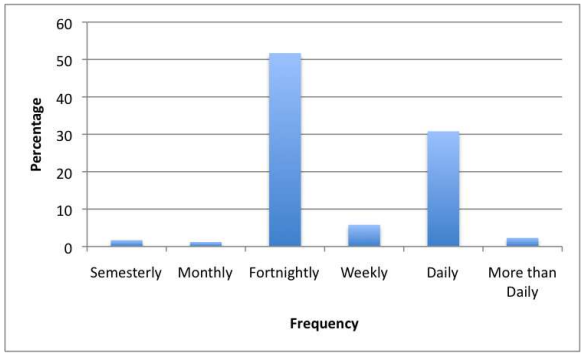


Figure 9: Frequency of accessing online learning materials.

Conclusions

Overall, the outcomes from the 2010 survey are far more positive than those obtained in 2007. Increases in technology ownership by education students have been quite dramatic particularly the ownership of laptop computers and 3G mobile phones. Generally the trends are in a positive direction towards students who not only own technology are comfortable using it for the tasks of life and students are making more use of technology in their learning.

However, the survey also reveals, as it did in 2007, another large group of students who technology adverse. For while universities, ECU included, have steamed headlong into the production of digital content online lessons and/or communications in a digital form it would appear that many students still prefer printed materials (as they did in 2007), Perhaps more worrying (for university educators in particular) is that there are a significant group of students for whom online technologies are not being used. Those students who rarely or never make use of their University e-mail address and/or make little use of the University learning management system, present a particular challenge.

The authors believe that these students are unlikely to make use of technology when they graduate, for they do not value it in their own education. Currently such students are able to flourish at University as we are in a transition period between digital and analogue world's. The authors believe that as the transition closes such students' will either decide tertiary education is not for them or embrace the digital world.

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