

# ONLINE LEARNING MATERIALS: HOW ARE THEY BEING USED?

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## ABSTRACT

Most universities are embracing Computer Managed Learning (CML) systems such as WebCT and Blackboard as their preferred mode of distance education and, in many cases, their preferred mode of distributing course materials to on-campus students. Thus, paperless modes of document and content delivery such as Microsoft Word documents, podcasts, and video lectures are becoming the norm. The authors wondered how students made use of these materials. Are they being used in the ways that the providers imagined and are they the resources that the students want to use? This paper reports on a study that examined how and where some students at Edith Cowan University use the electronic documents distributed to them through the university CML system.

## KEYWORDS

Computer managed learning, Teacher education, Online learning

## INTRODUCTION

This paper reports on a project carried out at Edith Cowan University (ECU) in Western Australia examining how and where Education students use electronic learning materials. In most universities paperless modes of document and content delivery are now the new norm so it is important for content providers to understand how these documents are being utilised. The investigation was undertaken through an online survey of Education Students at ECU and sought answers to the following questions:

- What software do students use in their studies?
- How do students perceive their ICT competence?
- What hardware do students own and use in their studies?
- How are students using online materials?
- What types of online materials do students prefer to study with?
- Where do students access the internet?
- What type of internet connection (dialup, broadband, mobile, etc) do students use?

It was anticipated that the answers to these questions would be useful to administrators, course coordinators, and lecturers in tailoring resources to student preferences and thus in delivering greater student engagement and satisfaction.

## BACKGROUND

Edith Cowan University (ECU), situated in the metropolitan area of Perth Western Australia, is a large university with 20,605 students (15,730 equivalent full-time student load) in 2007. These students are spread over four campuses and about 21% of all students are international full fee paying students with approximately two-thirds of all students in undergraduate programs. 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 7,764 students (5,920 equivalent full-time student load) and 311 staff.

Over the past decade ECU, like most universities, has been implementing online facilities and learning resources. As of 2008 there were few remaining traditional distance education resources and both on and off-campus students participated in online learning through Blackboard, the university's chosen computer managed learning (CML) system. ECU claims to use best contemporary practice in its online learning and in its strategic plan, Strategy 2.3.2 (Edith Cowan University, 2007), they state:

*... enhance the provision of online learning resources via Blackboard, streaming and pod casting; and improve audio-visual facilities in lecture theatres to allow for recording of lectures, multiple screens and video streams (p. 7).*

Furthermore, ECU strives "To enhance the overall 'student experience' at ECU" (2.4) through "Better capture of student feedback and improved communication with students" (Strategy 2.4.3). It is probably fair to say that ECU's goals are similar to those of other Australian universities (Calvert, 2001) and of most universities around the world.

The authors are colleagues in ECU's School of Education. We believe that education students are unique in that they have the added incentive when learning technology that they will be applying their skills & knowledge of these technologies, albeit for a younger age group, when they begin their profession. 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 (Russell et al., 2003). It is assumed 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 (Cox et al., 2004; Minaidi and Hlpanis, 2005). 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 (Anderson, 2007) and that the 'online' aspect of ICT use is likely to become of greater importance in education in the future (Salaway et al., 2007).

Taking the above into account, the researchers saw the importance of investigating how ECU Education students utilised and responded to the online materials that were delivered to them through their courses. Also of interest were the technologies owned by the students and the modes and places of internet access.

## METHOD AND PARTICIPANTS

To address the above research questions, a survey was conducted using Filemaker Pro 8.5 and delivered via Blackboard. Figure 1 shows a screen capture from the survey and illustrates how the instrument was broken down into screen-sized chunks avoiding the need for the participant to scroll. 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. There were 40 questions that were grouped according to the following categories:

- Demographics
  - Course, year of course, gender, first language, and campus.
- Digital lifestyle: your skills
  - List of software and students rated themselves on a scale containing *do not use*, *very unskilled*, *unskilled*, *skilled*, and *very skilled*. They also indicated whether they used the software in their studies and whether they would like to learn more about the software.
- Digital lifestyle: ownership and access
  - List of hardware and internet services and students indicated whether they owned the device or had access to the service. They also indicated whether it was used in study.
- Digital lifestyle: file formats
  - Students indicated their preferences for file formats by rating them as *do not use*, *dislike*, *neutral*, *like*, and *like a lot*.
- Digital lifestyle: Blackboard
  - Students indicated whether or not they found digital resources useful and also what they did with the resources in terms of printing, saving, and/or editing.

When using digital information for your studies, which of the following do you find useful?

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**WebPages (.html)**  
 Don't know  Do Not Use  Dislike  Like  Like a Lot

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**Pdf files (.pdf, Adobe Acrobat)**  
 Don't know  Do Not Use  Dislike  Like  Like a Lot

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**Microsoft Word (.doc)**  
 Don't know  Do Not Use  Dislike  Like  Like a Lot

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**Audio files (.mp3, etc)**  
 Don't know  Do Not Use  Dislike  Like  Like a Lot

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**Video files (.wmv, .mov, etc)**  
 Don't know  Do Not Use  Dislike  Like  Like a Lot

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**PowerPoint files (.ppt)**  
 Don't know  Do Not Use  Dislike  Like  Like a Lot

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**Other file formats**  
 Don't know  Do Not Use  Dislike  Like  Like a Lot

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**Next** 

Figure 1. Example screen from the online survey illustrating layout design

ECU Education lecturers were requested to invite students to participate in the survey on their unit's Blackboard home page. An incentive for students to participate was offered in the form of an iPod Nano to be randomly awarded to one participant (students had the option to leave an email address, although this identifier was not linked to the data collected). In all, 197 students from a variety of courses and years of study participated in the survey (see Figures 2 and 3). This method of recruiting students for the survey probably skewed the sample towards the more tech-savvy of the target group as they were required to use the online learning management system. It is therefore reasonable to assume that the sample represented the middle to upper end of Education students in terms of ICT ability.

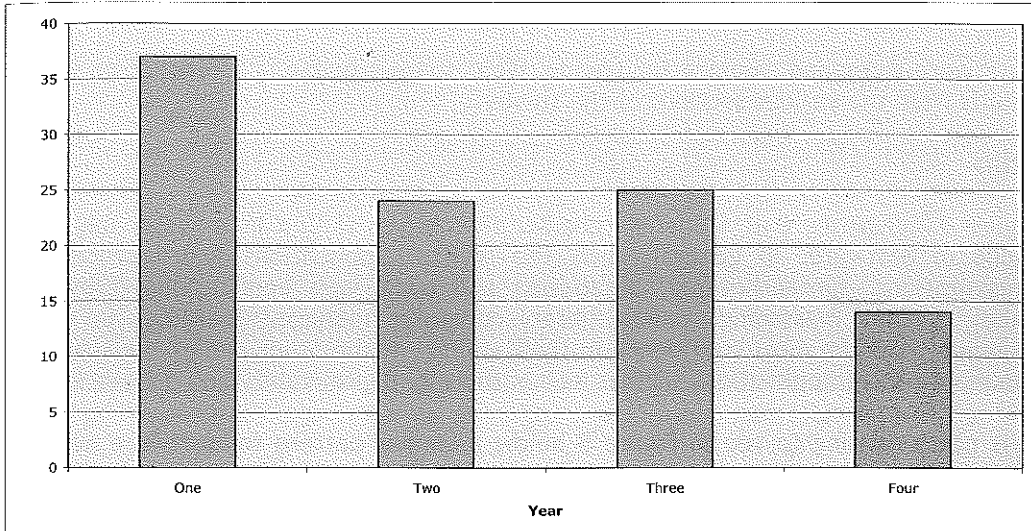


Figure 2. Student sample by Year Group

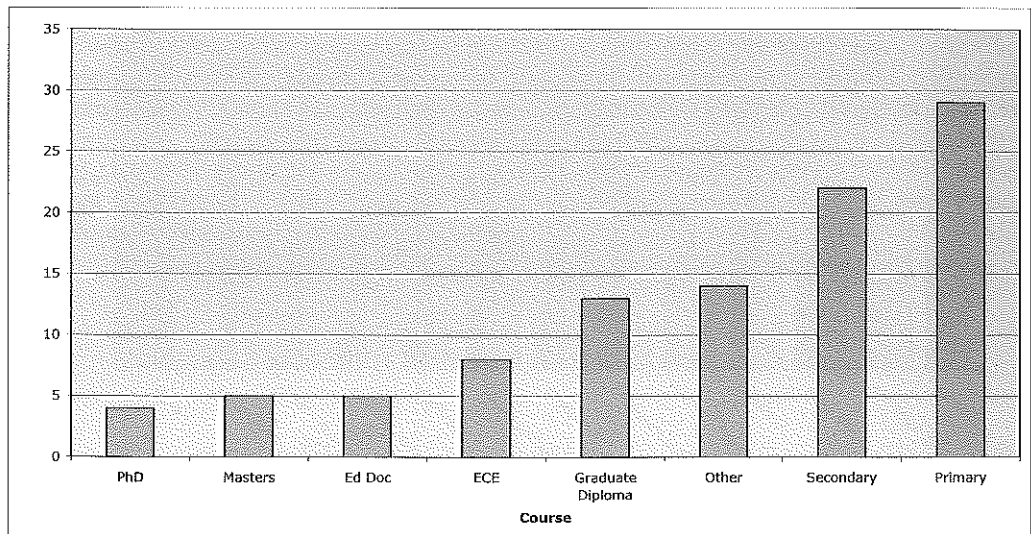


Figure 3. Student sample by Education Course

The sample consisted mostly of first (37%), second (24%) and third year (25%) undergraduate students. Sixty percent of them were in the Early Childhood (ECE), Primary, and Secondary Education Programs with the largest other identifiable group being those undertaking a Graduate Diploma in Education (a one-year course to become a teacher for those who already have an undergraduate degree). The gender breakdown from the sample was females 73% and males 27% which, although appearing biased, matches the actual distribution of gender of students studying Education at ECU. Overall the sample is a reasonable representation of the ECU Education population under examination.

## RESULTS AND DISCUSSION

Data were examined, looking for trends. What follows below is a breakdown of the results from the various sections of the survey.

### Skills

Figure 4 illustrates that students consider themselves skilled in a reasonably wide range of software. In general, it is the 'office' applications (word processing, presentations, spreadsheeting, databases) and basic web applications (browsing, email, instant messaging, online library/computer managed learning) in which students show the most confidence in their ability. At the other end of the scale are the more recent applications such as web authoring, digital video, and podcasting.

It is not surprising to see in Figure 5 below a similar pattern for software actually used in studies. There may be a kind of chicken and egg scenario going on here – do students develop software skills by using applications in their studies or do the students choose which applications to use based on existing skills? Naturally the answer is likely to be somewhere in between but one suspects that skill level may be more the determining factor in a student's busy life.

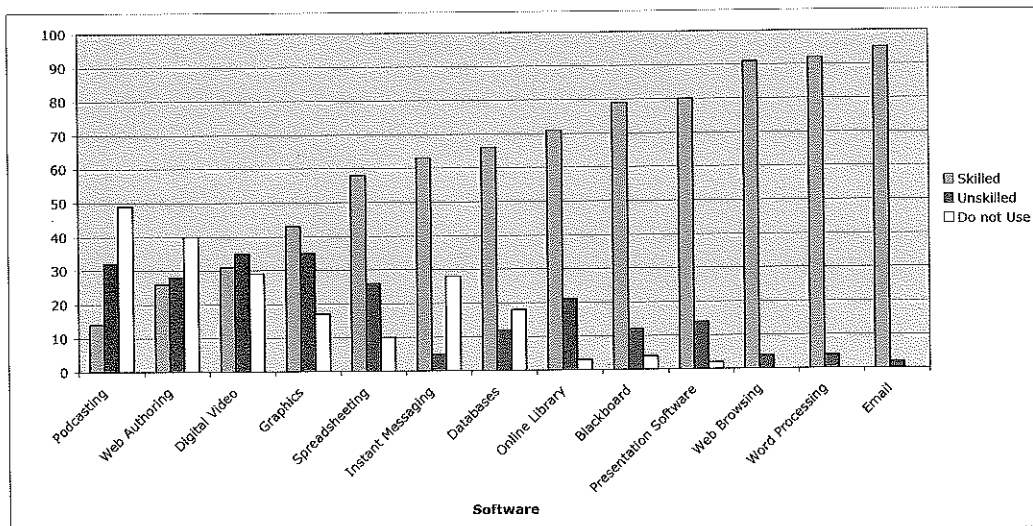


Figure 4. Student perceived software skill-level

A particularly interesting result is the outcome for podcasting. A podcast is a digital media file, which is distributed over the Internet using syndication feeds for playback on portable media players or personal computers. Podcasts can be audio or video or a combination of the two. Podcasts are seen as a bridge that spans both e- and m-learning and many educators, the researchers included, are driven towards supplying content in this format based upon the high number of mp3 players such as iPods in use by the community (see Figure 7 which illustrates that almost the entire ECU Education student population owns an mp3 player, 30% *other mp3 player* and 70% *iPod*). However, it seems that for ECU education students at least, these devices are regarded as music players and not valuable study tools. If students are to make better use of this technology, they may need some training and education.

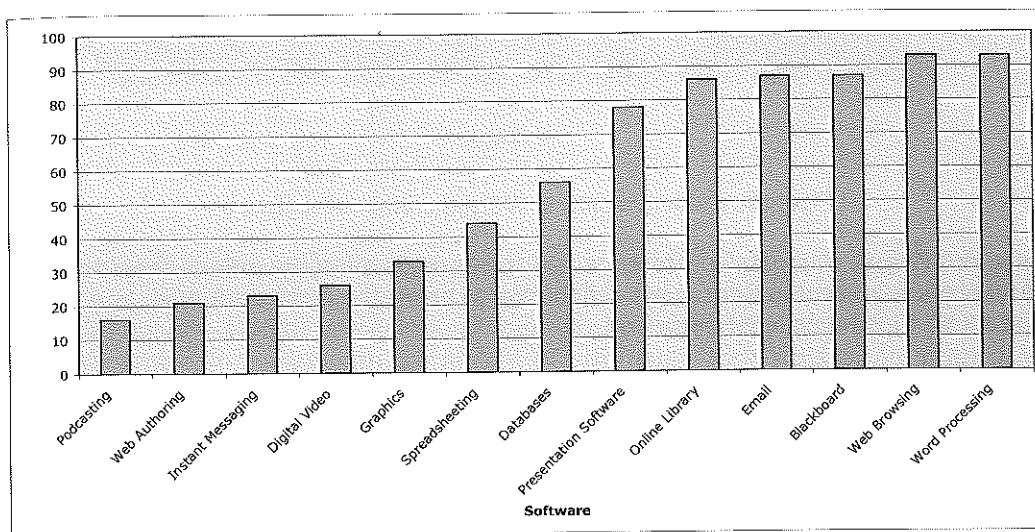


Figure 5. Software used for study purposes

The picture regarding students and software is completed by examining Figure 6 below which is basically a reversal of both the 'skills' and 'software used' graphs. It is evident here that students perceive the need to learn more about the newer technologies of podcasting, digital video and graphics. Perhaps, however, the key software (that course developers should take note of) is more toward the centre of all the charts in Figures 4 to 6- applications that students already use fairly heavily but still feel there is more to learn about. These are spreadsheets, presentations and use of online library and CML facilities.

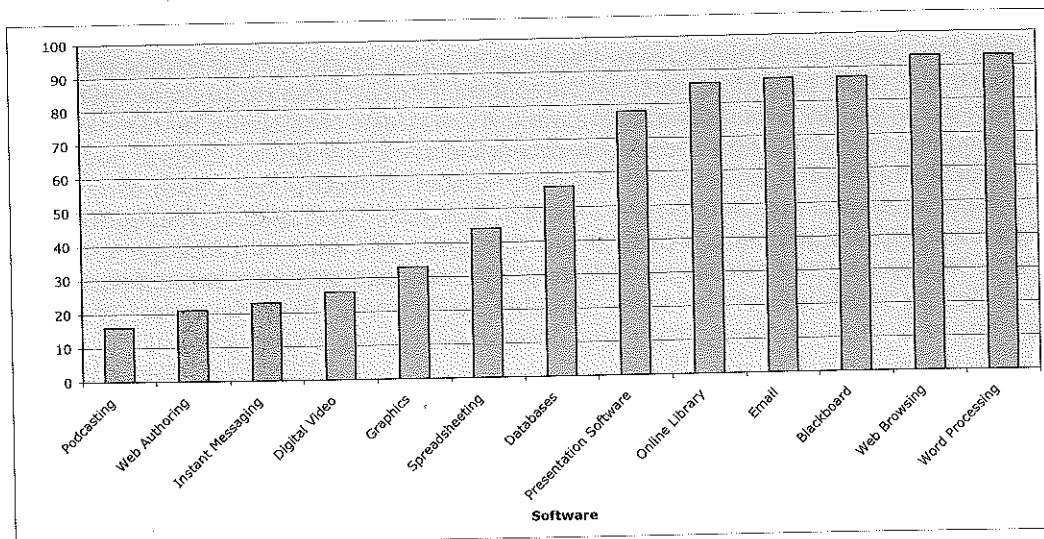


Figure 6. Student desire to learn more about software

Data relating to students' preference for file formats directly reflect the students' software use and competence, with .doc (Word) being the most preferred, and movie and sound files being least preferred.

### Ownership and Access

As Figure 7 shows, most students have access to a computer and for an increasing proportion this is a laptop, allowing them to bring their computer with them on campus should they choose. The rise of cheap all-in-one scanner/copier/printers seems to be reflected in the data too, with a large proportion indicating ownership of a scanner. A large number also own a digital camera though a smaller proportion use them in their study. The biggest surprise is the data relating to ownership of digital audio players, with 100% owning a device but only a small proportion using them for study. Digital video is also poorly used.

The lack of use, and preference for, audio and video learning materials may come as a surprise for many educators as these formats are seen as a method of making content more dynamic and tangible. The low usage may be because of a variety of factors including: the time taken to view these files; poorly edited and chosen material; and/or lack of student ICT skills. A further reason for the lack of use of audio and video formats maybe be related to the findings of Pagram and Rabbitt (2006):

*...some [students] did not possess the prerequisite IT skills or have access to the required infrastructure to study in this mode. The cognitive level of accessing the technology was for some students greater than the assimilation of the knowledge. The how was harder than the what!*

That is, students unfamiliar with the use of audio and video files may simply have decided it was easier not to utilise the files than learn how to use them.

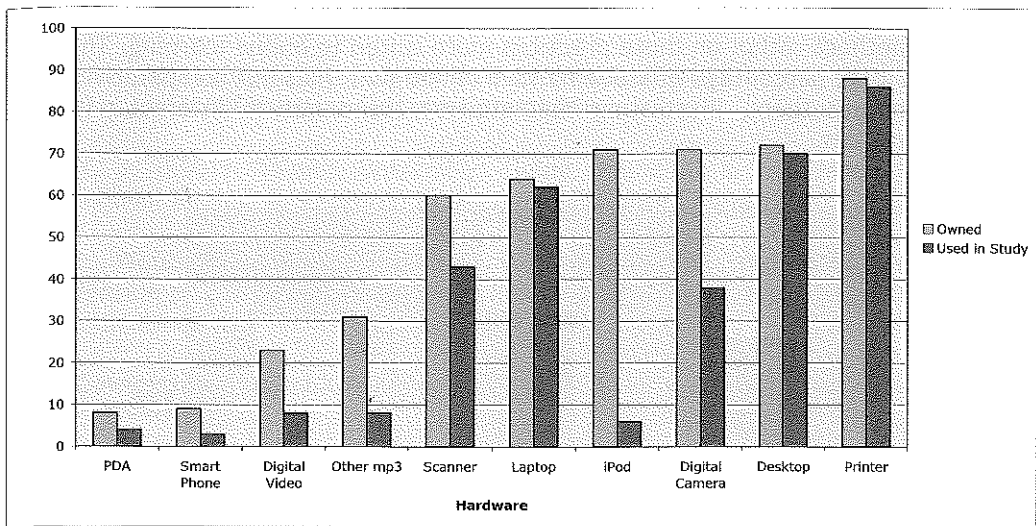


Figure 7. Technology ownership and use in study.

Internet access (Figure 8) is improving for students, with at least 65% having broadband and most using it for study. 3G internet access is increasing but is accessed only by a small percentage of students and not really used at all for study. This will probably change with the advent of affordable access plans. An interesting finding is that whereas over 60% of students have a laptop and use it for study, only 20% of students use ECU wireless on campus. This may indicate that they have difficulty setting up their laptops (installing VPN services, setting proxies, etc) in order to access the internet while on campus.

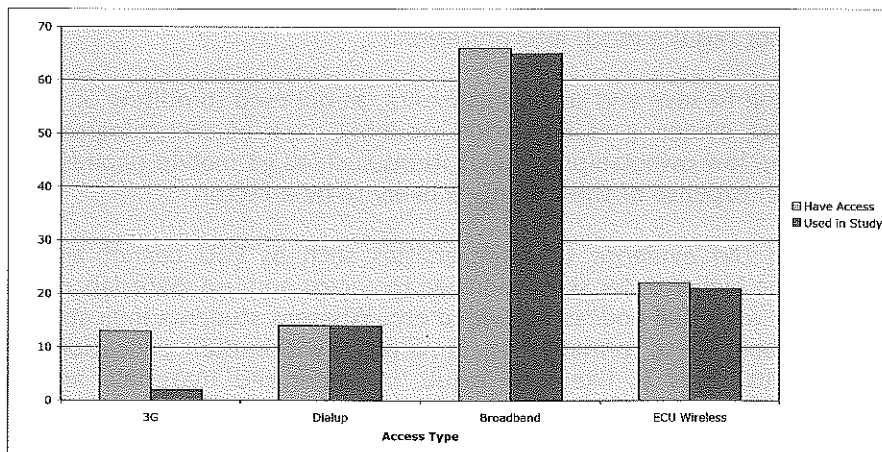


Figure 8. Types of internet access and usage for study purposes

Online access to the Blackboard learning management system was 100% for the sample (not surprising since students were recruited for the survey from there) and almost 70% of students said that blackboard materials were 'often' or 'always' useful.

With regard to the materials provided via Blackboard, the data show that many students still prefer to work with paper-based resources, with 59% often or always printing the materials (Figure 9). This is a concern as universities often claim to have reduced their environmental footprint when moving online; perhaps all they have done is push the printing and paper consumption back onto students. This may also



indicate limitations with the use of procedures that they are based largely on classroom methods rather on those practices more suited to online learning. The data also show a large percentage of students save online materials but comparatively few edit or annotate them, illustrating that students tend not to interact with the learning materials.

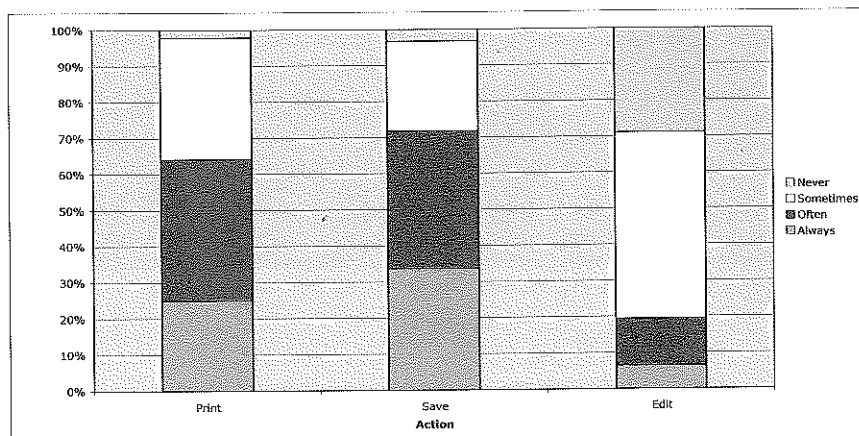


Figure 9. Student use of online materials

## CONCLUSION

Overall, the results indicate that for the most part Education students at ECU are not embracing “cutting edge” technologies. Whereas computer ownership, including laptops, is high, students’ desire to use technologies such as Podcasting and video is low, preferring more traditional file formats, such as .doc and .pdf, which can be printed and do not require much interpretation.

Students also tend to save and store documents, as opposed to editing or interacting with them. Other evidence of Education students’ lack of technological savvy, is illustrated by the low ownership levels of items such as g3 mobile phones and pda’s although the high expense of these items is likely to be a factor.

It is clear from the evidence that universities such as ECU cannot assume that students have the higher order skills required to access and use materials deployed in more innovative ways like podcasting/video etc. Whereas students indicated a desire to learn more about these formats there is no place within their education course to learn these skills. This is likely to result in underused materials and student frustration in being unable to optimally access and use them. The authors are convinced that when new ways (technologies, file-formats) for distributing learning materials are introduced, student support/training is essential if students are to optimally utilise these new methods to enhance their learning.

These findings are interesting in the context of training the next generation of teachers. Previous studies have shown (Russell et al., 2003) that teachers are not big users of technology in their classrooms. The current study compounds this problem in that it shows that ECU Education students exhibit a comparatively low uptake of new technologies. Overall the study has shown a need for ongoing monitoring of student use of ICT at ECU and how this is related to the materials provided. Over time, these variables constantly change and it is incumbent upon a university of the 21<sup>st</sup> century to monitor students’ technology ownership and use and have an adaptive approach to both technology and pedagogy.

## REFERENCES

- Anderson, P. (2007) *What is Web 2.0? Ideas, Technologies, and Implications for Education*, Joint Information Systems Committee.
- Calvert, J. (2001) "Deakin University: Going Online at a Dual Mode University", *International Review of Research in Open and Distance Learning*, 1(2), 1-20.
- Cox, M., Webb, M., Abbott, C., Blakely, B., Beauchamp, T. and Rhodes, V. (2004) *An Investigation of the Research Evidence Relating to ICT Pedagogy*, British Educational Communications and Technology Agency.
- Edith Cowan University (2007) *Engaging Minds; Engaging Communities. Towards 2020*.
- Minaidi, A. and Hlpanis, G.H. (2005) "Pedagogical Obstacles in Teacher Training in Information and Communication Technology", *Technology, Pedagogy and Education*, 14(2), 241-254.
- Pagram, J. and Rabbitt, E. (2006) "How do You Like it? What Our Students can Tell Us about Online Learning", *Educom 2006*, Thailand.
- Russell, M., Bebell, D., O'Dwyer, L. and O'Connor, K. (2003) "Examining Teacher Technology Use: Implications for Preservice and Teacher Preparation", *Journal of Teacher Education*, 54(4), 297-310.
- Salaway, G., Caruso, J.B. and Nelson, M. (2007) *The ECAR Study of Undergraduate Students and Information Technology*, EDUCAUSE Centre for Applied Research.