

E-portfolios and first year students – do we assume too much?

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***Abstract:** This paper explores the literacy, comfort and access levels that first year engineering students have with computers, internet and e-portfolios and whether the assumptions frequently made about these by course teaching staff are realistic. It examines the results of a survey about these issues administered to a large first year engineering course in a university with an equity mission. Results indicated that the majority of students were reasonably comfortable with e-portfolios and computers in general. However, some differences were noted in the results for mature age and non-Australian born students. Student comments also indicated issues that need to be considered by staff when using e-portfolio's as major assessment pieces within courses.*

Introduction

The use of electronic portfolios as an assessment component is gaining popularity in engineering programs, particularly in those courses targeted towards the development of professional, non-technical skills such as communication and teamwork. It is frequently assumed that today's generation of students is more familiar with working with computers and more comfortable working in an online environment than ever before. As discussed by Duffy & Bruns (2006), most students are highly socially active in internet based environments such as facebook, myspace.com, flickr.com and the blogging space blogger.com. In these online spaces they are already writing reflectively and commenting on their friends' writings.

However, is this always the case for all students - particularly for international students from countries where computer access is low or for mature age students returning to study? At the University of South Australia an e-portfolio is used as a major assessment component in the first year, first semester course Sustainable Engineering Practice. The course is taken by all engineering degree students (civil, electrical and mechanical degrees) as well as students undertaking an Associate Degree pathway program. The student body is diverse with a significant number of international, recognised equity group and mature age students. The e-portfolio is now in its second year. It was evident when it was introduced that not all students were familiar and comfortable with the on-line medium. To determine the breadth of the spectrum of computer literacy amongst the students, and what factors affect it, a survey was conducted of students undertaking the course in 2009. The survey looked at factors such as age, cultural background, previous education, previous exposure to computers and online communication such as blogs and how these factors influenced students' comfort levels with the e-portfolio assessment. The paper will discuss findings from the survey and the strategies implemented to assist first year students to adapt to this online environment.

The University of South Australia (UniSA) was established in 1991 through the merger of several antecedent institutions including an Institute of Technology and former Teachers Colleges. The University's founding act and subsequent mission has always stated that it should provide education to a range of people from educationally, socially and culturally disadvantaged backgrounds and hence it has a range of access pathways and programs to support this. The most recent statistics indicate that 44% of its domestic undergraduate students fall into one or more of the recognised DEST equity groups, with 25.4% from a low socio-economic status. Equity statistics available for the three engineering schools for 2008 indicate that, 26.7% of the students of engineering students are also identified as low socio-economic status according to DEST reporting requirements. (UniSA, 2009) Exact statistics for the student cohort enrolled in the course examined in this paper and responding to the survey are not available but they are likely to be similar.

E-Portfolios in SEP

The aim of the Sustainable Engineering Practice (SEP) course is to introduce students to the profession of engineering and how it is practiced within a sustainable context. The course also helps students to develop some of the core working skills of an engineer, *viz.* locating and using information, critical analysis and reflective practice, effective teamwork, engineering report writing and effective presentations. These skills are developed by working on real engineering problems in an international context as well as meeting with engineers from industry. A major assessment task, representing 45% of the final SEP course grade, requires students to use an online e-portfolio program to reflect on industry interactions, SEP course content, self awareness exercises and reflection/evaluation of individual contributions to the group project.

When the course was run in 2008, both wiki and blog online programs were selected for students to compile their e-portfolio. The wiki was used to compile a portfolio to help in the transition from student to professional. The blog was used to help develop reflective thinking, and assist with learning interaction. Wikis have been successfully used in teaching since 2000 (Molyneaux & Brumley, 2007), with a comprehensive discussion of the pedagogy provided by Renee Fountain (2005). Since the university did not have its own wiki or blog software, public domain software was used. PbWiki (www.pbwiki.com) and blogger (www.blogger.com) were selected. Blogs and wikis were regularly checked by tutors to check on student progress and provide formative feedback. However, the use of the two online environments was inefficient and an alternative program was selected when the course was taught again in 2009. The University invested in an e-portfolio program called PebblePad (www.pebblepad.com), which included both a blog and wiki type environment. This new program was easier for teaching staff to access and mark.

Student Computer Literacy

To help understand the computer literacy background of the UniSA first year engineering cohort a survey of students in the Sustainable Engineering Practice course was performed. 136 students of the total of 199 enrolled responded to the survey, which was distributed as a hard copy in tutorial classes and collected at the end of class via a drop box. Students were advised that survey completion was voluntary and anonymous. The characteristics of the survey respondents are shown in Table 1, where it can be seen that the majority of students are male, school leavers, studying full time, born in Australia and under the age of 20.

Comparing the survey respondents' characteristics to statistics available for those students enrolled in the course is slightly difficult as the enrolment statistics only distinguish between students who are currently international students vs domestic students, without indicating which students might be domestic now but were originally born overseas. However, of the total enrolment of 199 students in Adelaide and the regional campus at Whyalla, 22 were international students (11.1%) and 19 were part-time (9.5%), Hence the survey respondents would appear to include at least a representative proportion of the international students.

Table 1: Characteristics of the survey respondents (n = 136)

Survey Response					
Gender	Male: 88.6%		Female: 11.4%		
Student Status	Full Time: 85.9%		Part Time: 12.1%		
Study Location	Adelaide: 87.3%		Whyalla: 12.7%		
Birth Place	Australia: 75.6%		Overseas: 24.4%		
Age	<20	20-24	25-29	30-34	≥ 35
	70.7%	18.0%	6.0%	3.8%	1.5%
Discipline	Assoc	Civil	Mech	Elec	
	15.9%	34.1%	25.4%	24.6%	
Last Education Setting	TAFE	HSchool	Uni		
	6.7%	78.4%	14.9%		

Students were asked to identify what they believed their English language proficiency to be, in regards to reading, writing and speaking. Students could select from “very well”, “well” and “not well”. Out of the students surveyed 81% said they could speak and read English very well, with slightly less confidence in written English. Less than 7% responded “not well” for all aspects. Equity statistics for domestic undergraduate students across the three engineering schools indicate that 5% of them identify as being from non-English speaking backgrounds (UniSA, 2009), so this combined with the relatively low number of international students in the course would seem to support this response.

Students’ computer and internet access is summarised in Table 2. Out of the students surveyed 97.7% had access to a computer at home, with 72.8% having had access for more than 10 years. A majority of students had access to the internet at home, but there were still 12.2% of students without access. It can be assumed that a majority of students are used to communicating via email as 98.5% indicated that they had email access prior to starting at the University, with 85.8% of students having had an email account for more than 5 years.

Table 2: Computer Background, % of all survey respondents

Survey Response					
Home access to computer	Yes: 97.7%		No: 2.3%		
Home internet access	Yes: 87.8%		No: 12.1%		
Email access prior to uni	Yes: 98.5%		No: 1.5%		
Previously kept a blog	Yes: 11.1%		No: 88.9%		
Comfort level in using computers	Not Comfortable	Fairly Comfortable	Comfortable	Very Comfortable	
	0.7%	12.5%	32.4%	54.4%	
How many years access to a computer	1	2	3 to 4	5 to 9	≥ 10
	0.8%	0.8%	0.8%	24.8%	72.8%
How many years since first email account	1	2	3 to 4	5 to 9	≥ 10
	1.6%	0.8%	11.8%	60.6%	25.2%
How often email checked	Hourly	Daily	Weekly	Monthly	
	12.6%	65.9%	18.5%	3.0%	
How often internet accessed	Hourly	Daily	Weekly	Monthly	
	35.6%	55.6%	8.9%	0.0%	
Have an account with...	MySpace	Twitter	Facebook	Flickr	YouTube
	41.2%	5.2%	74.3%	2.2%	40.4%

Communication between teaching staff and students, outside of face to face class contact time, occurs mainly through email, and it is assumed or at least hoped that students check their email on a daily basis. This was confirmed with 79% of students indicating that they check their email daily with only 3% checking their email monthly.

As expected, students were highly active in online social networking websites, with 75% of students having a Facebook account. This response rate corresponds to a survey performed by McCarthy (2009) who has used Facebook as an assessment method with first year Architecture students.

There were very few differences in access to computer and internet, usage of facebook, prior blogs and comfort level between students in the 20-24 and <20 age groups, which made up 88% of the survey respondents. However for those over 25, considerably less had active accounts such as facebook or had previously kept a blog. Whilst they had computers at home they were less likely to have internet access at home. Interestingly the older age group reported higher comfort levels with computer usage, with 67% saying they were very comfortable, compared with around 50% for the younger age groups.

Indication of computer literacy based on location of birth is presented in the Table 3. Students born in Australia indicated greater activity in social networking websites MySpace and Facebook, with a higher percentage of students born outside of Australia keeping a blog prior to the SEP course. A slightly higher percentage of students born in Australia have access to a computer at home, but a lower percentage has access to the internet.

The computer comfort level between Australian born and overseas born is comparable, with at least 85% of students responding they feel at least comfortable when using computers. However, a greater percentage of Australian born students indicated they felt very comfortable and a small percentage of students born overseas indicated they were not comfortable with using computers.

On the whole similar percentages of Australian born and not checked their emails and accessed the internet on either an hourly or daily basis, although a small percentage (8.8%) of overseas born students only checked their emails monthly.

Table 3: Indication of Computer literacy, % Response by location of birth

Location of Birth:	Aust	Overseas
MySpace Account	48.0%	20.6%
Facebook Account	77.5%	64.7%
Kept a blog prior to course	8.9%	17.7%
Access to computer at home	98.0%	96.8%
Access to internet at home	86%	93.8%
Computer Comfort level		
Not Comfortable	0.0%	2.9%
Fairly Comfortable	12.8%	11.8%
Comfortable	27.5%	47.1%
Very Comfortable	59.8%	38.2%

Student Feedback

The survey results suggest that a majority of students have access to the internet, with 12% having no access. What the survey did not ask was the quality of the internet access. With online tools, often a high speed broadband connection is required to provide optimum use. Slower connections can cause drop outs, freezes, and numerous other frustrations for the students. As one male student 20-24 stated:

“Online sucks unless you have good internet”

Using online tools for assessment can sometimes be more time consuming than standard submission methods. Some students found submitting assessment tasks via the e-portfolio frustrating and too dependent on level of computer literacy, as commented by this under 20 year old male:

“The Webfolio thing is annoying and a confusing way to hand something up as well as being difficult for people with lesser computer skills.”

Although some students found the online environment frustrating, it was seen by others as being a good alternative to standard assessment tasks as discussed by this male student:

“The Wikis and blogs however tedious at times are a fresh alternative to traditional forms of assessment like exams and essays.”

Conclusion

The assumptions on students' computer literacy levels were justified, in that the vast majority of students were comfortable with computer use and had ready access to computers and internet. It is interesting to note that the proportion with computer and internet access at home is higher than might be expected from the equity statistics for engineering and the university discussed previously. However, it is important to make provision for those that do not have such ready access or have poor internet speeds available to them, particularly some more mature age students and some international students.

It is also clear that for any course using such online methods, success is dependent on the quality of training provided to the students. Regular help desk sessions are required to get students established in this environment so that it becomes a useful tool, rather than a burden.

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