Socio-economic status and students' experiences of technologies: Is there a digital divide?

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With the widening participation agenda in Australia, more students from low socio-economic backgrounds are being encouraged to undertake university degrees, and will be expected to use digital technologies and demonstrate digital literacies. This paper used data from a 2013 survey of students across three universities, to examine whether there were socio-economic differences in students' access to and use of technologies. There were few differences in access to equipment. There were also no differences in the most common uses of technologies, such as accessing course materials from the LMS, and few differences between students from low, medium and high socio-economic status suburbs. However students who received government support benefits less frequently used technologies that related to disciplinary skills or to creating rather than receiving content. There may be a subtle digital divide, where financially disadvantaged students are engaging less with technologies that will most benefit their future employment.

Keywords: students, technology access, learning technology use, socio-economic status

Introduction

The Bradley review of higher education (2008) argued for widening participation in Australian higher education, to increase the number of Australians with higher educational qualifications. The review noted that there should be a particular focus on increasing participation from groups that were traditionally under-represented: people from low socio-economic status (SES) backgrounds, Indigenous people and those from rural and remote areas. These groups are also those who are most likely to be on the disadvantaged side of the 'digital divide' (ABS, 2011) with financially disadvantaged people having lower access to home broadband, mobile internet and smartphones (Wise, 2013).

Digital technologies and online and blended learning strategies are embedded in most university courses and the use of mobile technologies is growing rapidly. Students require digital literacies in order to learn, and for graduate employability (Oliver, 2011). The digital divide is complex (Selwyn, 2010) and needs to be considered not just in terms of access to and use of technologies, but in terms of whether the use leads to desired learning and graduate outcomes for the students concerned.

This paper seeks to provide some insight into whether there is a digital divide in Australian higher education, through comparing the access to and use of common technologies of low, medium and high socio-economic status background university students from three Australian universities.

Methodology

The study used data from the Student Expectations and Experiences of Technologies survey, developed in 2010 by three Sydney-based universities (Gosper, Malfroy & McKenzie, 2013). It was revised and repeated in September-October 2013 by two of the original partners based in Sydney, and a further partner with a number of campuses. The survey[1] included questions about students' access to, current use and preferred use of computers, smartphones, tablets and other digital devices, location of learning and hours spent. Five point likert scales were used to ask about frequency of use of: technologies in everyday life; current and preferred technologies used for university coursework, communicating with teachers and other students; current and preferred uses of the LMS. The scale was from never/rarely (1) to one or more times per day (5). Students were also asked to rate their satisfaction with services and support and their overall satisfaction, and there were four open-ended questions.

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[1] Survey available at http://www.mq.edu.au/ltc/altc/student_it_experience

The survey also included a range of demographic questions including gender, age group, enrolment full-time or part-time, undergrad vs postgrad, local vs international and year of course. Questions that were used to provide indicators of socio-economic disadvantage were:

- Home postcode in Australia, which was recoded into a low, medium and high socio-economic status suburb indicator, based on Australian government codes used by universities;
- Receipt of financial support, including Centrelink (Australian government) benefits or a scholarship;
- Whether students had entered through an access pathway for students with educational disadvantages.

The analyses for this paper compared responses across SES (low, medium, high), Centrelink benefits (yes, no) and access pathways (yes, no) for undergraduate students. Students' access to and use of equipment were compared using crosstabs and chi-square tests. Current and preferred frequencies of use were compared using one-way ANOVA followed by Tukey Alpha (for SES) and independent samples T-Tests (for Centrelink and access pathways). As the sample and number of comparisons was large, a significance level of 0.01 was used.

A total of 3436 students responded to the survey, and approximately 75% of respondents provided some demographic data. Of the 1794 local undergraduates who provided this data, 876 were from high SES suburbs, 734 from medium SES and 184 from low SES, with 491 reporting receipt of Centrelink benefits and 263 reporting entry through an access pathway.

Respondent description

Of the survey respondents who provided demographic data, more than 60% were female, 66% were aged 25 or under, 68% were undergraduates, 88% were enrolled on-campus and 79% (but 88% of undergraduates) were full time. Table 1 shows undergraduate respondent characteristics by SES background, receipt of Centrelink benefits and entry by an access pathway. As would be expected, there was a relationship between Centrelink and SES, with 44.6% of low SES, 29.7% of medium SES and 18% of high SES respondents receiving Centrelink benefits.

Table 1: Respondent demographics by SES suburb, Centrelink benefits and Access pathway

	Low SES	Med SES	High SES	Centrelink	Access pathway
Female	67.2	64.2	62.0	65.0	61.7
Male	32.2	35.3	37.7	34.8	38.3
Age					
18 or under	16.8	12.4	6.5	10.6	10.2
19-20	34.8	34.1	34.7	32.2	32.5
21-25	29.9	31.2	37.3	37.6	32.5
26-30	6.5	7.2	7.8	9.8	8.5
31-40	4.9	9.8	6.5	6.1	8.1
41+	7.0	5.3	7.2	3.6	8.1
On-campus	86.9	92.6	95.4	94.1	91.9
Full-time	87.4	89.0	87.7	93.9	86.7
Avg hours on campus	16.2	17.2	16.7	17.6	16.6
Avg hours online	15.0	14.6	13.4	14.9	14.2

On average, respondents reported spending 16 hours on campus and 14.2 hours online per week, and there were no differences between undergraduates from low, medium or high SES postcodes. Postgraduates spent significantly less time on campus than undergraduates, but there were no differences in time spent online.

There were also no significant differences in the discipline areas studied by undergraduates from low and medium SES backgrounds, however high SES students were more likely to be studying Business and less likely to be studying Education. Students on Centrelink benefits were slightly more likely to be studying Humanities and Arts and less likely to be studying Business (significant at 0.37). However, there were differences between universities. University A had a significantly higher percentage of high SES and lower medium SES than either University B or University C, and a lower proportion of low SES and slightly lower proportion of Centrelink

recipients than University C. University B had significantly more high and medium SES than University C but was in the middle and did not differ from A and C on proportions of low SES and Centrelink recipients. There were no discipline or university differences based on Access pathway.

Access to and use of equipment for university studies

Overall, there were few differences in access to equipment, with 96% of respondents having access to a desktop or laptop at home, 47% having access to a tablet (iPad, Galaxy or similar), 44% having their own laptop on campus and 81% having a smartphone (iPhone, Android, Blackberry). While 32% overall have access to a laptop or desktop at work, this was significantly less likely for undergraduate low SES students, those on Centrelink benefits and those entering through pathways. Those on Centrelink benefits were less likely to have a tablet, but more likely to have their own laptop on campus and more likely to say they have access to a university computer in computer labs or the library. Students from low and medium SES backgrounds were more likely to have another device, such as a games console, with internet access, with 15.8% of those students having access to such a device compared with 11.9% of high SES students. Postgraduates, who are also older on average and more likely to be part-time, were less likely to have access to a smartphone and also less likely to have access to a laptop or university provided computer on campus.

In terms of actual use and preferred use of equipment for coursework, there were few differences between the undergraduate student groups. Undergraduates from low and medium SES backgrounds were more likely than high SES to report using university computers most often for coursework and preferring to use them most often. However, low SES students also reported more frequently studying anywhere using mobile technologies (3.75 vs 3.45). Undergraduates on Centrelink benefits were less likely to report using their laptop on campus most often for coursework, and used a computer at work less frequently.

Use of technologies in everyday life

Respondents were asked about their frequency of use of 22 different technologies. The most commonly used by all respondents were SMS and email (each used by 92% a few times a week or more), internet search engines (91%) and Facebook (81%) and the least used were virtual worlds (3%), social bookmarking (6%) and audio-video software (7%).

There were few group differences, and those that did occur related to software that was used on average a few times a semester (2 on the 5 point scale) to a few times a month (3). Compared with medium SES respondents, low SES used Twitter more often (mean 2.18 vs 1.83) and other social networking sites more often (2.6 vs 2.25). Students on Centrelink benefits were also likely to use Twitter more frequently (2.09 vs 1.86). Compared with high SES, medium and low SES used data analysis software less often (high mean 2.55, medium 2.28, low 2.32), and low SES used wikis less often (2.97 vs 2.73). Students on Centrelink benefits also used data analysis software less often (2.17 vs 2.53), along with less frequent use of presentation software (2.43 vs 2.62) and e-portfolios (1.45 vs 1.64). All these tools could be seen as more work-related rather than social.

Use of technologies for learning and communicating at university

Respondents were asked about their frequency of current and preferred use of 25 technologies for learning in their course. These ranged from those used primarily to access information (including library databases, internet search engines, wikipedia and lecture recordings), to those used for collaborative work (eg Facebook groups, wikis, document sharing) to those primarily for content creation (creating blogs, audio-video materials, e-portfolios). The most frequently used was internet search engines, with 79% of respondents using them a few times a week or more. Fourteen technologies, including all of those used for content creation, were used a few times a week or more by less than 10% of respondents.

There were only three differences in frequency of use between SES groups, with low SES using library tools to find resources less often than medium or high (low 3.02, med 3.22, high 3.18), using wikipedia less often than high SES (3.02 vs 3.18), and using discipline-specific software less often (low 1.60, med 1.84, high 1.91). There were more differences between students on Centrelink benefits and others, with Centrelink recipients less frequently: using RSS feeds, creating audio/video materials, developing a private blog, creating wikis collaboratively, using social networking sites other than Facebook for groupwork, developing an e-portfolio, using web conferencing, creating websites, using discipline-specific software or discipline-specific apps (differences ranging from 0.12 to 0.21). There were no significant differences between groups in preferred use, with all groups expressing a preference for more frequent use of almost all technologies.

Respondents were asked separately about how often they used and would prefer to use features of the LMS. The most frequent use for all students was for accessing online readings and course materials, with 63% using these a few times a week or one or more times per day. There were few differences across SES groups, with Low SES groups using Turnitin to check assignments before submission more frequently than Medium SES (Low 2.58, Medium 2.33) and expressing a greater preference than high SES for more frequent access to lecture recordings (3.87 vs 3.62). Centrelink recipients were less likely than others to: post comments in discussions, get assignment feedback online, use group areas for assignments, use Turnitin for checking assignments, contribute to a blog or wiki. Again, although differences were significant, they were small (0.16-0.24).

In relation to communicating with teaching staff, students most often used, and preferred to use email, communication tools in the LMS and face-to-face meetings. There were no differences between SES groups on either current or preferred method. Students on Centrelink benefits had lower preferences than others for the generally less preferred methods of instant messaging, phone calls, collaborative technologies and social media other than Facebook or Twitter (differences 0.16 to 0.22).

In relation to communicating with other students, the most often used and preferred methods were SMS, Facebook, face-to-face and email. Low SES students used SMS more often than others (low 3.34, medium 3.19, high 3.06) and preferred it even more often (low 3.50, medium 3.33, high 3.21). Similar to their communication with teachers, students receiving Centrelink benefits less frequently used or preferred to use phone calls and social media other than Facebook or Twitter, and less frequently communicated through the LMS.

Discussion

The results pointed to a pattern of substantial similarity in the use of technologies by all student groups. Students had similar access to equipment, with the exception of tablets, and there were no differences in use of common technologies, such as internet search engines and Facebook, either for learning or in everyday life.

As the use of technologies and the LMS within a course is substantially influenced by the course's learning and assessment requirements and the technologies provided by academic staff, relatively few differences were expected. While there were no differences in use of technologies that enabled access to information, it was notable that the technologies that were used less frequently by Centrelink benefit recipients involved content creation, contribution to discussions, blogs or wikis or seeking feedback online. Both low SES students and Centrelink recipients were less likely to use discipline-specific software or apps, and Centrelink recipients also less frequently used work-related technologies in everyday life. These differences in use, while small, might have consequences for the digital literacies that these students develop and potentially for their employability skills in professions where disciplinary software capabilities are assumed.

Selwyn (2010) points to the subtle forms of exclusion inherent in class-based choices of applications by individuals, and also by the differing discipline and course-based choices made in university courses. Universities may provide access to computers, mobile technologies, and applications but how courses are designed to facilitate digital learning outcomes, and how students make course choices, may determine whether students' experiences reduce or replicate digital inequalities. Further research is needed to ascertain whether subtle differences in technology use might influence later outcomes for students.

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