0299 Is there a Net generation coming to university?

Authors

Chris Jones, Simon Cross

The Institute for Educational Technology, The Open University, Milton Keynes MK7 6AA

c.r.jones@open.ac.uk, s.j.cross@open.ac.uk

Abstract

This paper reports the first phase of an ESRC funded research project to investigate first year students' use of technology in relation to the idea of young people born after 1983 forming a distinct age cohort described variously as the Net generation or Digital Natives. The research took place in five English universities in the spring of 2008. The research found a far more complex picture than that suggested by the rhetoric with student use of new technologies varying between different universities and courses. Some of the more discussed new technologies such as blogs, wikis and virtual worlds were shown to be less used by students than might have been expected. The Net generation appears if anything to be a collection of minorities with a small number of technophobic students and larger numbers of others making use of new technologies but in ways that did not fully correspond with many of the expectations built into the Net generation and Digital Natives theses.

Introduction

The Net Generation is one of several terms used to identify a distinct generational group in ways that have relevance for teaching and learning. This new generation is identified with young people born after 1983. At the time of writing this makes the oldest Net generation members 26. Some recent reports suggest that there is a further generational shift following the Net generation beginning in the year 1993 (JISC-Ciber 2008). For our purposes we accept this ten year period between 1983 and 1993 as the boundaries of our research. It is claimed that the Net generation prefer active to passive learning, have distinct information searching patterns and a low tolerance for delays. From these characteristics there are derived particular issues that might affect teaching and learning, for example the kinds of attention spans that are exhibited by students such as working in 'bursts'. This new generation has been entering UK higher education since 2001 and on their arrival they encounter an increasingly extensive use of e-learning. Currently it is still not clear what the characteristics of this emerging student body are. Nor is it clear what the most important influences might be on student engagement with networked and digital technologies during their studies.

The term Net generation is most commonly associated with the work of Tapscott (1998 and 2008) and he argues that these young people are different to previous cohorts because of their experience of networked and digital technologies. He writes, for example, that:

> Today's youth are different from any generation before them. They are exposed to digital technology in virtually all facets of their day-to-day existence, and it is not difficult to see that this is having a profound impact on their personalities, including their attitudes and approach to learning. Tapscott (1998 a)

We are interested in how these changes might affect learning and Tapscott suggests that the changes in technology have some 'inevitable' consequences for learning. Tapscott argues that that the ultimate interactive environment is the internet itself and that education will need to move from a teacher-centered approach to learning to learner centered approaches. "But as we make this inevitable transition we may best turn to the generation raised on and immersed in new technologies." (Tapscott 1999 p11).

Another key source for arguments about the Net generation comes from articles written by Prensky using the term Digital Natives (Prensky 2001 and 2001a). In a similar way to Tapscott he argues that digital natives are part of a step change in attitudes and styles:

> .. not just changed incrementally from those of the past, nor simply changed their slang, clothes, body adornments, or styles, as has happened between generations previously. A really big discontinuity has taken place. One might even call it a "singularity" – an event which changes things so fundamentally that there is absolutely no going back. (Prensky 2001 p 1)

Presnky's comments were made about the entire generation in schools and colleges and they are not limited to students in universities. Prensky suggests the new generation thinks differently and he goes on to make the claim that the brains of the new generation are different to previous generations (Prensky 2001a). A similar argument has recently been advanced, without

substantiation, by Baroness Greenfield the Director of the Royal Institution in the United Kingdom. She told the House of Lords that children's experiences on social networking sites:

"are devoid of cohesive narrative and long-term significance. As a consequence, the mid-21st century mind might almost be infantilised, characterised by short attention spans, sensationalism, inability to empathise and a shaky sense of identity".

24th of February 2009 (www.guardian.co.uk/uk/2009/feb/24/social-networking-site-changing-childrens-brains)

Lady Greenfield echoed Prensky in suggesting that exposure to new technologies and web services was likely to fundamentally change children's and young adult's brains. Prensky argued that in education there is a disconnect between the 'digital native' students and the 'digital immigrant' staff who retain the 'accent' of the pre-digital era even when they become socialized into a digital environment. This suggests that being a digital native or a digital immigrant is not a learned skill and in Prensky's view it is a fixed product of early development. In a recent article Prensky has suggested that the distinction between digital natives and immigrants will become less important and developed a new set of distinctions around the term digital wisdom (Prensky 2009). However it is clear that both Prensky and Tapscott still suggest that the changes in technology lead to determinate outcomes. Indeed Tapscott advances the technologically determinist argument that changes to pedagogy flow in an 'inevitable' way from changes in technology.

Diana Oblinger of EduCause uses the term Millenials for the generation born after 1982 and her work is supported by large scale annual surveys of students in the USA. However her argument continues to describe a whole generation and she claims to have identified a trend towards an internet age mindset. Oblinger also identifies what she describes as a disconnection between the new Millenial students and the institutions that they are enrolled in. Unlike Prensky, Oblinger and Oblinger (2005) suggest exposure to technology might be more important than age group, allowing older students to develop different approaches. "Although these trends are described in generational terms, age may be less important than exposure to technology." (2.9).

Although some empirical research agrees that: "Students are 'digital natives'—having grown up with ICT and expect to use their own equipment at university."(JISC 2008 p7) most recent empirical studies are less clear about the nature of new young learners. In the UK Margaryan and Littlejohn (2009) have reported that students use a limited range of established technologies for both learning and for recreational and social use. They also found that there were low levels of use and familiarity with virtual worlds and personal web publishing. In addition they reported that students' attitudes to learning appeared to conform to fairly traditional pedagogies. Kennedy, Judd, Churchward, Kay & Krause's (2009) found that first year Australian students use of new technologies displayed considerable diversity in both patterns of access to technology and the ways students used these technologies. They argued that first year students possessed a core set of technology based skills but, that outside of these core technologies, students exhibited a range and diversity of skills (Kennedy et al. 2009 p117). Selwyn's study of UK students (2008) agreed that the new generation of learners were no more homogenous than were previous generations and pointed to the continued existence of gender differences. However ECAR studies of US students report that in terms of skills with the core applications used for studying that there were few gender differences (Salaway, Caruso & Nelson 2008 p11). Work in South Africa reported that, whilst almost all students were exposed to ICTs, there was a low use of these technologies for teaching and learning (Brown and Czerniewicz 2008). Overall there is growing empirical evidence that suggests caution in defining a new generation of young people in relation to their lifelong exposure to digital and networked technologies.

The survey

This research is the first phase of a two year study funded by the Economic and Social Science Research Council. The overall aim of the research is to provide an empirically based understanding of the Net generation as they first engage with e-learning in UK tertiary education. The research uses a mixed method approach including interviews and the Day Experience Method, a form of cultural probe, to supplement the survey work (Riddle and Arnold 2007). Five universities were selected to represent the main 'types' of university in England. Fourteen courses were surveyed representing a range of subject and disciplinary areas in both pure and applied branches of learning (see Table 1 for a more detailed description). A survey was chosen as the main intervention in the first phase of the research to provide a single snap-shot of student use of technology and to provide a background for further research including a range of methods in the second phase of research which has taken place during the 2008/9 academic year.

A questionnaire exploring first-year experiences of e-learning was developed by the research team and tested with a small number of students for timing and comprehension. Survey instruments developed by researchers in the USA and Australia were considered and informed the design of some questions but they were not considered to be directly transferable to a UK context. The instrument sought to collect baseline information about some of the key aspects of the students' use of technology in their studies. It was mainly composed of closed questions but included a number of open text responses. The instrument contained four sections: demographic characteristics of the respondents, access to technology, use of technology in university studies in general and finally course-specific uses of technology.

Table 1: University types (Jones and Ramanau 2009a)

	University A	University B	University C	University D	University E
Founded	Founded 19th Century	Founded 1970s (Polytechnic) university status in 1992	Founded 1970s	Founded 1970s	Founded 21st Century from university college
Location	Large urban metropolitan	Large urban metropolitan	Large scale distance	Mid size campus outside small city	Mid size with multi-site campuses in small towns
Course units	English	Sociology	Science	Modern Languages	Journalism
	Bio-science	Information and Communication	Health and Social Care	Computing	Psychology
	Veterinary science		The Arts	Accounting and Finance	Social Work

A maximum of 1809 students nearing the end of their first year study at university were available to participate in the survey. A total of 596 first-year students completed the survey yielding a response rate of approximately 33%. A further 62 responses had to be excluded because students had either failed to finish the survey form or had not signed the consent sheet. This purposive sample provides a robust basis for presenting a descriptive account of first year students use of technology.

The specific method of delivery used for each course was determined on a case by case basis. Students were invited to participate during a short presentation by a member of the project team or university teaching staff and, in the case of distance students, an email and letter were sent in place of the introductory presentation. Following this initial contact, follow-up emails were sent to all students on each course. Some verbal reminders were also given by teaching staff in subsequent lectures. Three versions of the survey were produced: an online version accessible via the internet; a

paper version for distribution and collection within a teaching session; and, for distance learners, a paper version that could be mailed to their home and returned in a prepaid envelope. Of the fifteen courses surveyed: nine courses used only online surveys; five offered a combination of online and paper; and one used paper only.

Findings

The demographic profile of our sample is shown in Table 2. Two features are worth noting in our sample. The gender distribution is skewed towards female students and the sample from University C (the distance university), is disproportionately over 25. Both these proportions are beyond what might have been expected as the course recruitments were not as skewed as our respondents. The Net generation age group in the distance university shows a skew that exaggerates the current recruitment patterns at this university as under 25s could be expected to be approximately 20% of the intake for first level courses.

Table 2: Key demographic characteristics (% of the total) (Jones and Ramanau 2009b)

	University A	University B	University C	University D	University E	Overall
Male	22.3	27.3	36.1	43.2	16.3	**27.8**
Female	77.7	72.7	63.9	56.8	83.7	**72.2**
UK Students	96.6	95.3	93.3	80.8	98.0	**93.9**
International Students	3.4	4.6	6.7	19.2	2.0	**6.1**
18–25 years of age	96.0	89.1	12.6	95.9	84.4	**75.8**
Older than 25	4.0	10.9	87.4	4.1	15.6	**24.2**
Full-time student	99.4	96.9	5.1	100.00	99.0	**80.3**
Part-time student	0.6	3.1	94.9	0	1.0	**19.7**
Total number	**176**	**128**	**119**	**74**	**99**	**596**

Computer and network access

Just over three quarters (77.4%) of the respondents had access to a laptop and over a third (38.1% where n=554) owned a desktop computer. Only two (0.4%) had no access to a desktop computer and eight (1.4%) no access to a laptop. Over half (55.4%) used a desktop computer in a public place but this suggests that a large minority of students only make use of private access to computing which could have implications for university provision. Around two thirds (70.1%) of those asked felt that their access to computers was sufficient to meet their computing needs whilst a further 26.4% said that it mostly met their needs. Only 3.3% of students said it 'partially' meet their needs and only one student said that their access did not meet their needs at all. A supplementary question (Q2.3) asked this minority to explain why their needs were only partially met or not met at all and 14 gave as their reason 'cannot afford the necessary software/hardware', 11 that 'the computer is too old' and 11 that 'the place of access is inconvenient. Other open text comments included one student citing 'excessive port blocking' by university systems and another complaining about limited access in halls of residence.

Over half of the respondents had a broadband connection (55.6%) and 39.5% had access via a broadband wireless hub /router. Around an eighth (13.4%) of students reported that they had a wireless mobile connection. We were surprised by the number claiming to have mobile broadband access but this was supported by open text answers. For example one student said: '[I have] no land line where I am: [so] using mobile phone as modem (GPRS). Speed of 460.8 Kbps appropriate for text, but way too slow for media

content' and another student said 'mobile computing is becoming a priority'. In another question we asked students where they accessed the internet and included the option of 'anywhere, mobile internet'. Whilst this isn't directly comparable with a question specifically identifying mobile broadband access, it gives further confirmation of the rough size of the minority of students because 11.1% of respondents reported using mobile internet. This latter figure is similar to the proportion of students claiming to have a wireless mobile connection (13.4%) but cross-tabulation reveals that 9% of students responded positively to both question and this would suggest that caution needs to be exercised in interpreting these results.

Student access to other devices was in some ways predictable. Almost all students owned a mobile phone (97.8%) and these phones generally came with a camera (91.9%); music player (77.25); and internet access (75.7%). Less common were wifi (14.2%) and plain phones with none of these features (6.4%). This still meant that 35 of the students only had a basic phone and 6 of our respondents reported that they did not have any access at all to a mobile phone. Memory sticks were the second most commonly reported device (87.9%) but once again there were a small minority who did not own or have access to one (7.9%). An MP3 device or other digital music player was also a commonly owned device with 82.4% reporting ownership. Other devices were less common such as a games console 38.4%, although this was one case that showed a significant amount of shared use (21.5%), and a large minority who reported no access at all (39.5%). A further question about the kinds of games players that were owned, included hand held as well as console players. Around half of students (50.2%) reported that they owned a games player of one kind or another and most who owned a handheld games player also owned a console. Personal Digital Assistants (PDA) were used by very few with PDAs with wifi owned by 5.7% and PDAs without wifi by 4.6%. Fifteen individuals reported both owning a PDA with and without wifi and we cannot be sure if this implied two separate devices or was a double reporting of the same device. When we asked which of these devices they would miss the most if they did not have access to it 83.2% chose their mobile phone. In open text answers it appears that this was because the phones had several functions (i.e. the phone function was not the only, or indeed the primary, benefit).

Student use of technology

Students reported spending a considerable amount of time working on computers and using the internet. The majority of students use their computers for up to four hours a day and the internet for up to three hours. However there are a small number of outliers that use the computer for over 10 hours a day and a handful of extreme users who access the internet for over 10 hours a day.

Respondents were asked how important internet access was for a variety of activities. The activities rated most important were accessing materials and communicating rather than downloading and uploading materials. This suggests that the idea that the Net generation are more likely to be inclined to

Table 3: Hours spent using a computer and the internet

Number of hours (average)	On a computer	On the internet
0 and over	1.9%	11.2%
1 and over	11.4%	31.2%
2 and over	19.5%	25.3%
3 and over	20.7%	14.8%
4 and over	15.8%	7.9%
5 and over	10.4%	4.8%
6 and over	5.6%	1.5%
7 and over	6.6%	1.4%
8 and over	2.7%	0.9%
9 and over	0.7%	0
10 and over	4.8%	1.0%

Table 4: The importance of internet activities

	Important	Not very important	Unimportant
Accessing course information	93.6%	5.2%	1.2%
Accessing study material	89.9%	8.2%	1.9%
Download/stream written material	70.7%	21.2%	8.1%
Download/stream audio material	38.8%	43.6%	17.6%
Download/stream TV and video	40.1%	39.8%	20.1%
Uploading materials (audio/images/video)	44.8%	37.6%	17.6%
Keeping in touch with other students and friends	81.5%	13.0%	5.6%

participation might be somewhat exaggerated. However there appeared at first sight to be a minority who reported that uploading and downloading audio and video was important. On inspecting the data it is not clear whether this apparent minority really does cohere and further analysis is required to establish whether downloading and uploading audio and video materials are an indicator of a coherent minority of students.

We also asked respondents about the frequency of use of twelve types of technology. The horizontal bar charts below show the cumulative percentage of student responses:

Students were asked specifically about their use of particular technologies that have received significant attention in recent educational technology literature, blogs, wikis and virtual worlds. Perhaps surprisingly there is no evidence of a significant uptake of any of these technologies amongst the first year students and of virtual worlds in particular. These figures are consistent with those shown in Figure 1 when students were asked if they used a blog and a majority of students report never having used one. The percentages for wiki use are not directly comparable as those reported in Figure 1 show the use of Wikis including Wikipedia and those in Table 5 ask if the students had contributed to a wiki. In this case the contrast is sharp with only a small minority of students having contributed to a wiki whilst a majority of students use wikis including Wikipedia at least weekly.

We asked students to report on how confident they felt (defined in relation to skills) using a set of common tools and technologies. Over 80% of students reported slight confidence and basic skills or better in using presentation software (87.5%), online library resources (86.5%) spreadsheets (84.9%), and in computer maintenance (82.3%). However, over a third reported no confidence or minimal skills (not known or not confident) using Virtual Learning Environments (VLEs) (37.7%), writing and commenting on blogs and wikis (40.6%), and graphics software (36.4%); with almost two thirds (60.3%) reporting no confidence or minimal confidence in video/audio editing software (Figure 2).

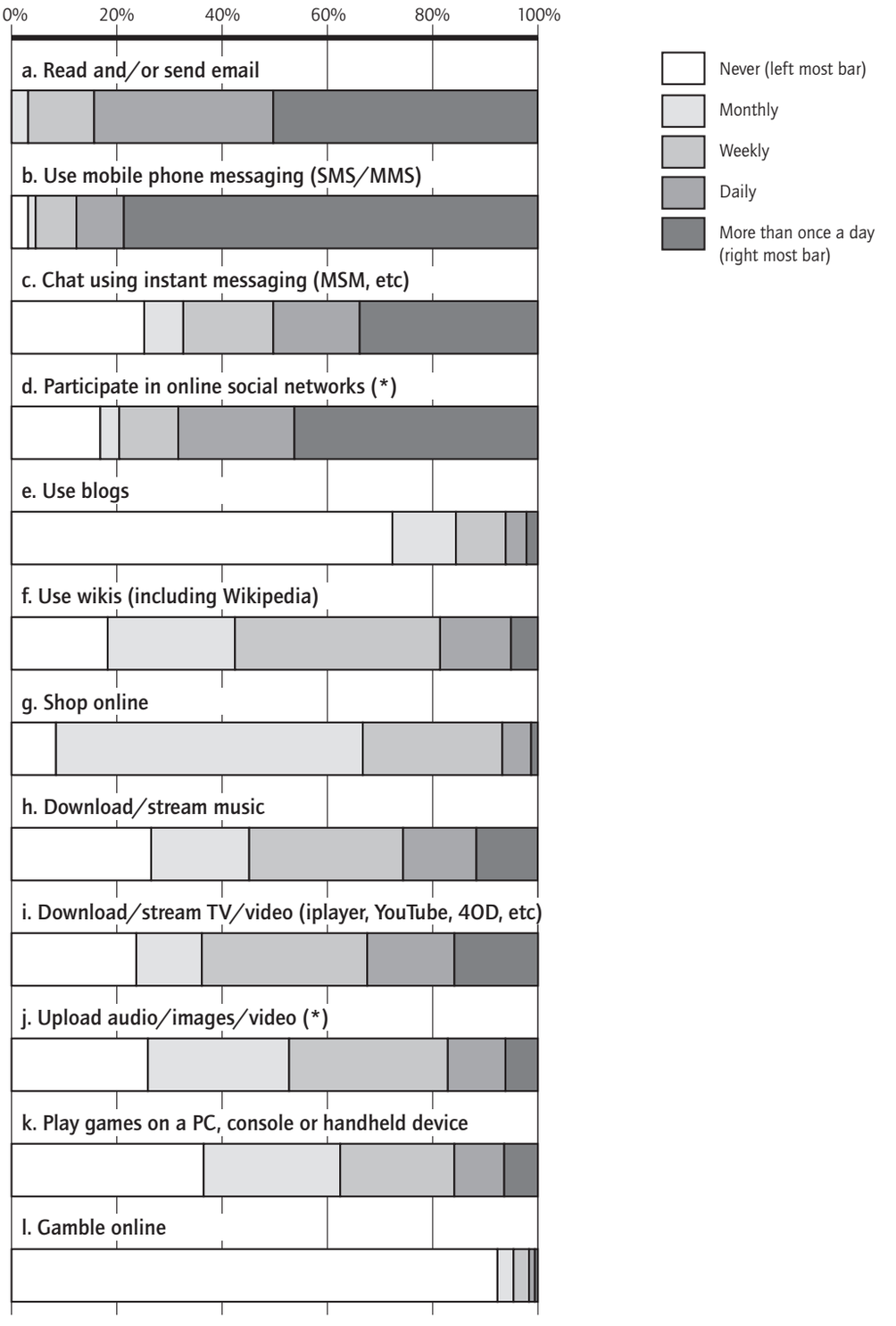
Kennedy et al (2008) have made a distinction between what they called technologies for life and technologies for learning. We explored this distinction and asked two sets of Likert scale questions about the importance students placed on a variety of technologies firstly for study purposes and secondly for their social life and leisure (Figure 3). There are some interesting features to the responses. Firstly there is a small minority of students who never use email for study purposes and a similar small minority who never use email for social purposes. When cross-tabulated only 3 individuals never use email for either study purposes or social life and leisure but a further 42 cases then report low use of either email for study purposes (21 at 0–1 hour a day) or for social and leisure purposes (21 at 0–1 hour a day). It suggests that there are a minority of students for whom email is not heavily used and this might have important implications for routine methods of communication by universities with first year students.

In terms of the frequency of use of technologies in relation to their courses, around two thirds of students use computers, the internet and web and

Table 5: The use of new technology forms (Blogs, wikis and virtual worlds)

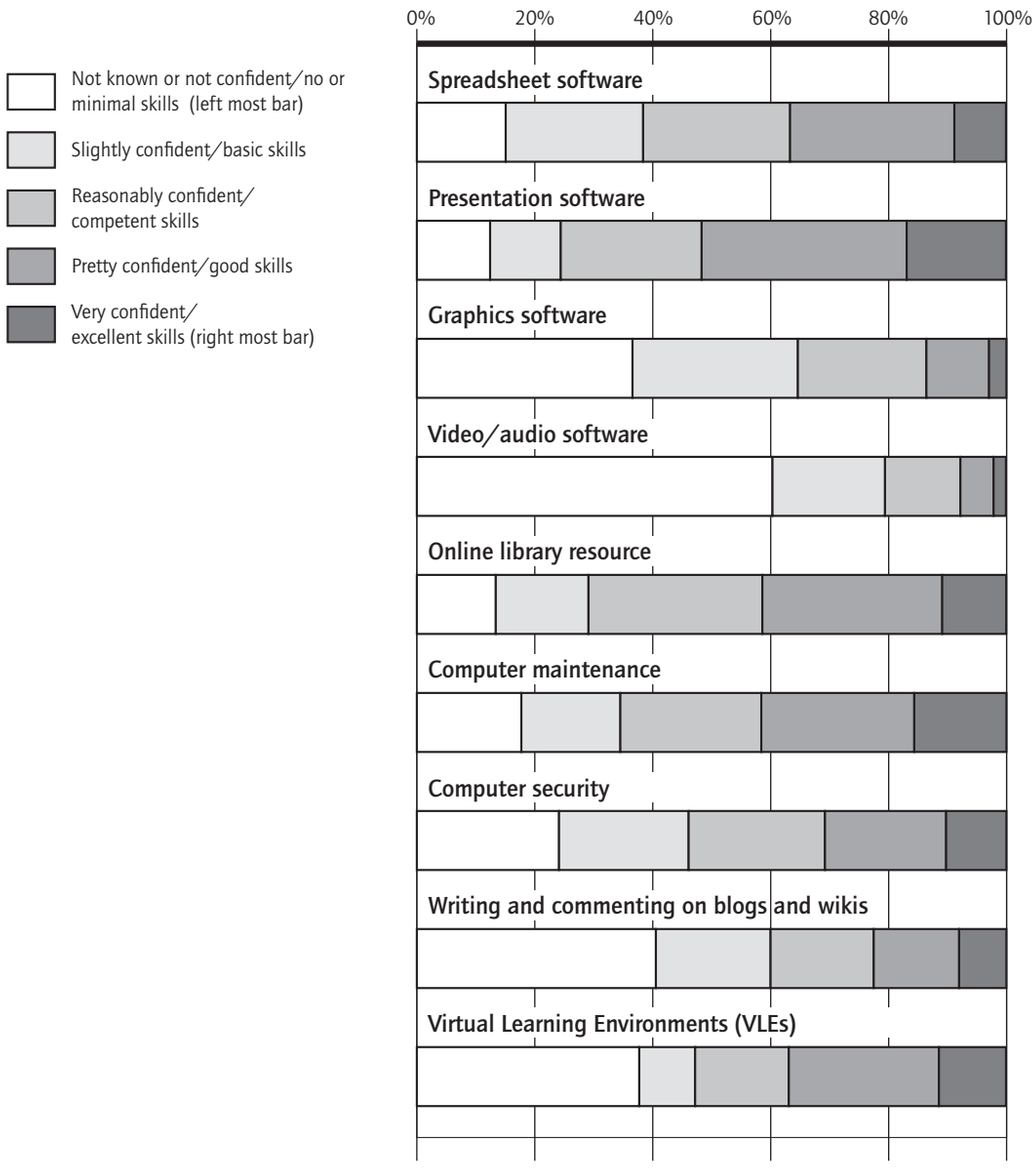
Yes	No	
21.5%	78.2%	Contributed to a blog
12.1%	87.9%	Contributed to a wiki
2%	98%	Used a virtual world

Figure 1: Frequency of use of 12 technologies



the university intranet/portal at least once a day. Around two fifths use the University VLE as least once a day, whilst over half never use a networked device as a course requirement. A fifth of students use the network to access library resources at least once a day and a majority of students access online library resources at least weekly. There are some interesting aspects of the use of technologies connected to course requirements. We asked, for example about course requirements to access online library resources and over 60% reported that there was such a requirement (61.7%). The results reveal that even, within specific courses, opinions do vary. On one course

Figure 2: Confidence and skills in using tools and software



73.7% (14 students) reported that access to online library resources was not a requirement whilst 26.3% reported that it was; and on another course, 65.6% reported that it was (21) whilst another 34.4% reported that it was not. Even on those courses with greatest agreement, not all student responses agree and these findings illustrate the variation within a single age cohort and the way course requirements and instructions only have an indirect effect on student understandings of them.

We also asked about thirteen technological tools in relation to what the students had used for study, and in relation to what the student thought they were required to use. Table 6 shows that in all cases the use of tools exceeded the perceived requirement to use them. However, for some technologies the difference is greater than others. For example, instant messaging, online quizzes, wikis and social networking sites are all used to a much greater extent than they are required to be. Email and the course website are almost universally used, although only three quarters of students believed that use was a course requirement. Wikis (including Wikipedia) were used almost as much as e-journals/e-books and the VLE. Only one in ten students used e-portfolios and simulations while lower numbers used blogs and only a handful used virtual worlds.

Figure 3: Study purposes (left) social life and leisure (right)

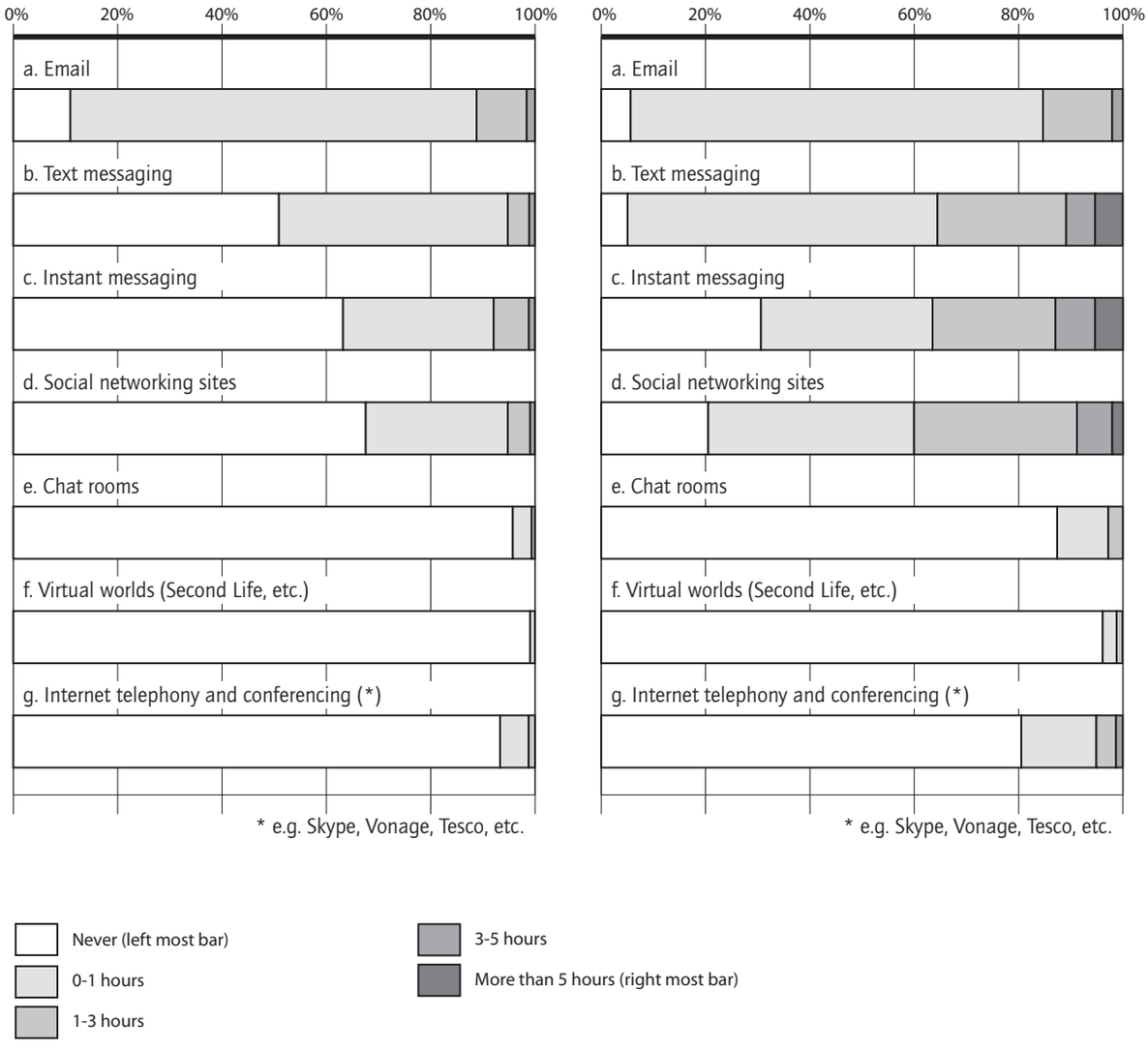


Table 6: Use and requirement to use on course

	Use	Required to use
Email	96.1%	75.7%
Course Web site	91.2%	76.1%
VLE	63.4%	58%
E-journal/e-books	65.6%	48.4%
Instant messaging	30.7%	3.1%
Online quizzes or tests	48.4%	23.5%
E-portfolio	13.8%	10.1%
Simulations/computer models	10.3%	4.9%
Blogs	8.2%	5.6%
Wikis (including Wikipedia)	46.7%	12.3%
Social networking sites	34.8%	4.5%
Virtual worlds	1.4%	0.2%
Discipline specific technology/software	16.7%	14.4%
Other (please specify)	0.8%	1.2%

The figures in Table 6 support the data displayed in Figure 3 and the distinction suggested by Kennedy et al. between technologies for life (used for social life and leisure) and technologies for learning (technologies used for study purposes).

Finally we report a set of questions that explored the use of written materials online. Over two thirds (68.3%) reported that they save/download materials when accessing them online. The majority (56%) report mostly or always reading on screen, although around a third of students still report mostly or always printing out downloaded written materials. Asked about their practices when printing out materials students reported the results shown in table 7.

Table 7: Printing activities

I always cut and paste first	14.7%
I mostly cut and paste first	26.9%
I mostly print the full document	34.5%
I always print the full document	8.2%
I have no preference	15.7%

When asked about their writing activity, around a quarter of students report writing course notes on a computer but this proportion rose to around three quarters when drafting essays or coursework. Almost all students reported writing their final essays or coursework on a computer.

Discussion and conclusion

Our research confirms the complex picture found amongst students in other contexts (Kennedy et al 2008, Salaway et al. 2008, Margaryan and Littlejohn 2008 and Selwyn 2008). The findings also suggest that the kind of academic moral panic identified by Bennett et al (2008) and recently exhibited in the debate about Facebook and the brain sparked by comments by Baroness Greenfield is over exaggerated. The first year students surveyed for this research are a diverse group and it does not seem that they are marked by their exposure to digital technologies from an early age in ways that make them a single and coherent group. This conclusion supports earlier work by Selwyn (2008) who identified gender and subject and disciplinary differences amongst students in the Net generation. This should caution educational policy makers in universities and governments against adopting technological determinist arguments that suggest that universities simply have to adapt to a changing student population who are described as a single group with definite and known characteristics. This research, whilst exploratory, suggests that the picture is complex and our understanding of the characteristics of young students entering their first year is still very limited.

We would point to two results that support this argument. Firstly the limited use by students that is revealed in the survey of blogs, wikis (other than Wikipedia) and virtual worlds. Secondly we would point to the existence of significant minorities, for example those who do not use either email or have access to mobile phones. It is often assumed that these two technologies are now universal and that all students have access to them and the desire to use them. Our survey suggests that this is not true for a small but significant group of students. It should not be assumed from these comments that our results suggest that there is little change taking place. We were genuinely surprised by the apparently rapid uptake of mobile broadband by students who are often in university residences with good broadband access and little apparent incentive to pay for such access. We are also intrigued by what we think is a growing seamless integration of new technologies into everyday life. It would seem to us that technology is not added to a life that exists without technology but rather student life seems to be infused with a variety of more or less universal technologies. We are also interested in the apparent changes to students' reading and writing practices and the large minority that now make use of audio and video materials.

These areas of research will now be taken forward in a second phase of research that will explore the issues in more detail, making use of interviews, cultural probes and two further surveys of students at the start and end of their first year studies. The second phase of research includes two

further linked surveys of students entering university in the academic year 2008/09. These linked surveys at the start and end of the year will allow for examination of any longitudinal changes during the first year of exposure to university provision of digital and networked technologies. The surveys also provide the basis for recruitment of smaller sub-samples of students for interview and participation in a cultural probe intervention. This second phase should allow the research team to build a richer description of student uses of technology during their first year at university.

Acknowledgements

The research reported in this paper was funded by the UK Economic and Social Science Research Council (Grant RES-062-23-0971). We would also like to acknowledge the assistance of Ruslan Ramanau and our collaborators at the five participating universities, in particular Susan Armitage, Martin Jenkins, Sheila French, Ann Qualter and Tunde Varga-Atkins.

References

Bennett, S., Maton, K. and Kervin, L. (2008) *The 'digital natives' debate: A critical review of the evidence*. British Journal of Educational Technology. Vol 39 No 5 2008 775–786

Brown, C. and Czerniewicz, L. (2008) in student use of ICTs in higher education in South Africa. In: van Brakel, P.A. (Ed.), *Proceedings of the 10th annual conference of world wide web applications*, Cape Peninsula University of Technology, Cape Town, South Africa.

JISC (Joint Information Systems Committee) (2008) *Great Expectations of ICT: How Higher Education Institutions are Measuring Up* (JISC–Ipsos Mori Full Report), London, JISC.

JISC-Ciber (2008) *Information Behaviour of the Researcher of the Future. Ciber briefing report.* www.bl.uk/news/pdf/googlegen.pdf [accessed March 2nd 2009]

Jones, C. and Ramanau, R. (2009a) *Collaboration and the Net generation: The changing characteristics of first year university students*. Proceedings of the 8th International Conference on Computer Supported Collaborative Learning: CSCL2009: CSCL Practices.

Jones, C. and Ramanau, R. (2009b) *The Net Generation enters university: What are the implications for Technology Enhanced Learning?* M-2009: Proceedings of the 23rd ICDE World Conference on Open Learning and Distance Education including the 2009 EADTU Annual Conference, 7–10 June 2009, Maastricht NL.

Kennedy, G., Judd, T.S., Churchward, A., Gray, K. and Krause, K. (2008) *First year students' experiences with technology: Are they really digital natives?* 'Questioning the net generation: A collaborative project in Australian higher education'. Australasian Journal of Educational Technology, 24(1), 108–122. www.ascilite.org.au/ajet/ajet24/kennedy.html [accessed August 8th 2008]

Margaryan, A. and Littlejohn, A. (2009) *Are digital natives a myth or reality?: Students' use of technologies for learning*. www.academy.gcal.ac.uk/anoush/documents/DigitalNativesMythOrReality-MargaryanAndLittlejohn-draft-111208.pdf [accessed May 20th 2009]

Oblinger, D.G. and Oblinger, J.L. (2005) *Educating the net generation*, An Educause e-book publication. www.educause.edu/ir/library/pdf/pub7101.pdf [accessed May 20th 2009]

Prensky, M. (2001) *Digital natives, digital immigrants.* On the Horizon. NCB University Press, Vol 9(5).

Prensky, M. (2001a) *Digital Natives, Digital Immigrants Part II: Do they really think differently?* On the Horizon. NCB University Press, Vol 9 (6).

Prensky, M. (2009) *H. sapiens digital: From digital immigrants and digital natives to digital wisdom*. Innovate 5 (3). www.innovateonline.info/index.php?view=article&id=705 [accessed February 1st 2009]

Riddle, M.D. and Arnold, M.V. (2007) *The Day Experience Method: A Resource Kit*. dtl.unimelb.edu.au/dtl_publish/12/67585.html [accessed November 5th 2008]

Selwyn, N. (2008) *An investigation of differences in undergraduates' academic use of the internet*. Active Learning in Higher Education 2008; 9; 11 pp11–22.

Tapscott, D. (2008) *Grown up digital: How the Net generation is changing your world*. New York: McGraw-Hill.

Tapscott, D. (1998) *Growing up digital: the rise of the Net generation*. New York: McGraw-Hill.

Tapscott, D. (1998 a) *The Net Generation and the School*. Milken Family Foundation. www.mff.org/edtech/article.taf?_function=detail&Content_uid1=109 [accessed Oct 7th 2008]

Tapscott, D. (1999) *Educating the Net generation*. Educational Leadership, 56, 5, 6–11