

Internet use among first-year university students: computer versus mobile phone activities across home, school and community contexts

Uso da Internet entre os alunos do primeiro ano da Universidade: Computador contra atividades de telemóveis em contextos casa, escola e comunidade

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Abstract: Forty-eight first-year university students responded to an online survey regarding their use of internet applications on computers and mobile phones at home, school and in the community. Results suggest that university students are not unanimously connected; five of 48 students who completed the survey indicated that they did not use the internet at home and six reported that they did not use the internet at university. Across all environments, accessing the internet via computer or mobile phone was most commonly reported for purposes of communication. Students used a limited range of specific internet applications. Approximately one-third of students used their mobile phones for school work. When considering instructional applications of internet technology, mobile phones appear useful to some learners. Student access to learning opportunities and instructional resources may be the most beneficial aspect of the internet and mobile phones.

The use of emerging technologies by undergraduate university students is well-documented for two reasons. First, “college students have been at the forefront of social change since the end of World War II” (JONES & MADDEN, 2002, p. 5). They were among the first to use the internet for communication, file sharing and playing games and to have regular broadband access. In this regard, university students provide a metric of pending social trends (JOHNSON, 2007). Second, universities develop and apply technological innovation (DEDE, 2005; NAGLER & EBNER, 2009). Currently, the implementation of instructional applications of digital technologies is fundamental in all universities and online

university courses are increasing exponentially (MARGARYAN, LITTLEJOHN, & VOJT, 2011). However, description of patterns of internet use among undergraduate university students often lacks the comprehensive approach necessary given the ubiquitous nature of young people’s use of technology. Internet technology includes a wide variety of devices and applications, used across a range of contexts (i.e., home, school and community), for a variety of reasons (e.g., information, communication, recreation). Further, individuals vary with respect to their orientation to the internet as useful for accomplishing tasks, socializing or as a source of amusement and recreation (JOHNSON & KUPLA, 2007).

Approximately 96% of Australian first-year university students report owning a mobile phone, 89.5% report owning a desktop computer and 63.2% a laptop computer (KENNEDY, JUDD, CHURCHWARD, GRAY, & KRAUSE, 2008). Nagler and Ebner (2009) reported ubiquitous use of Wikipedia, YouTube and social networking sites among undergraduate university students. Dede (2005) described the learning style of digital natives (individuals born after 1989, the digital revolution) as characterized by "fluency in multiple media, valuing each for the types of communication, activities, experiences, and expressions it empowers; learning based on collectively seeking, sieving, and synthesizing experiences rather than individually locating and absorbing information from a single best source; active learning based on experience that includes frequent opportunities for reflection; expression through non-linear associational webs of representations rather than linear stories; and co-design of learning experiences personalized to individual needs and preferences" (p. 10). In 2011, all students enrolled in the first-year Adelaide University undergraduate science program received a free Apple iPad (KIDMAN, 2010). Melbourne University recently launched a pilot program to foster creativity and critical thinking in which participating students received an iPad to be used for their studies (GEDDA, 2010). Salaway, Caruso and Nelson (2008) reported that up to 82% of American university students were registered with one or more social networking sites, with Facebook and MySpace being the most frequently cited. Reportedly, students spent up to five hours per week on these sites with the majority of students logging in on a daily basis.

In less than 20 years (from 1995 to 2004), mobile phone ownership increased from 7% to nearly 100% (WRAY, 2010). "Younger generations of students are trending away from computer use because desktops, and even laptops, are too unwieldy, location-centric, and thus inconvenient" (PURSELL, 2009, p. 1219). Recently, ubiquitous connectivity has resulted in the next generation of e-learning, often referred to as *mobile learning* or *m-learning* (COCHRANE & BATEMAN, 2010). M-learning is defined as "the provision of education and training on PDAs/palmtops/handhelds,

smartphones and mobile phones" (RISMARK, SØLVBÆRG, STRØMME, & HOKSTAD 2007, p. 1). Increasingly, wireless portable technology is impacting on teaching and learning (PATTEN, SANCHEZ & TANGNEY, 2006). Learners from a wide variety of backgrounds benefit from mobile technologies because they emphasize activity and interactivity as well as oral communication (LITCHFIELD, DYSON, LAWRENCE, & ZMIJEWSKA, 2007). Bethell (2010) summarized the first-year university student as an individual who uses a mobile phone for voicecalls and text messages but not videocalls or to access emails, for taking photos and videos and downloading them to a computer and to go online, mainly to access news and information but also to receive advertising and marketing messages.

Undergraduate university students are, for the most part, well-established digital natives (PRENSKY, 2001). However, Hargittai (2010) found "considerable variation ... even among fully wired college students when it comes to understanding various aspects of Internet use" and suggested that "differentiated contexts of uses and experiences may explain these variations" (p. 108). Based on semi-structured focus group interviews with undergraduate students, Bullen, Morgan, Belfer and Qayyum (2008) observed that student use of the internet at university was the consequence of "the student and instructor dynamic within a course or program, the technical requirements of the discipline, and the affordances that a tool provided within a given context" (p. 10). Margaryan and colleagues (2011) concluded that university students use a limited range of relatively well-established internet applications. Use of collaborative knowledge creation tools, virtual worlds and social networking sites was uncommon. Jones and Cross (2009) concluded that the majority of surveyed undergraduate students attached the greatest importance to activities such as accessing content and using the internet to communicate rather than to create and share content. Johnson (2007) reported that only three of the 406 college students surveyed expressed the perception that the internet was a waste of time; 3.2% claimed that the internet was best described as frustrating. "Overwhelmingly (i.e., 77.8%), college students conceptualized the

internet as a convenience, although 17.8% considered the internet a source of fun" (p. 141). Jones, Ramanau, Cross and Healing (2010) concluded that while there were strong age-related variations, it was simplistic to describe first-year university students as a single generation. "The generation is not homogenous in its use and appreciation of new technologies and there are significant variations amongst students that lie within the Net generation age band" (p. 773).

STATEMENT OF THE RESEARCH QUESTIONS

Undergraduate university students are the first generation of true digital natives, that is, they have not experienced life without the internet and most have observed their parents online. Twenty-five years after the birth of the internet and the mobile phone, to what extent and in what ways do first-year university students use the internet? Do their online activities vary across contexts of use (i.e., home, school and community)? Do their online activities vary in terms of access via computers versus mobile phones?

METHODS

A survey, developed specifically for this study, queried respondents regarding demographics necessary to describe the sample and use of internet activities (e.g., instant messaging) based

upon the list generated by Kennedy and colleagues (2008). Students were instructed to select all internet activities in which they had ever engaged. At the end of the school year, all students enrolled in an introductory educational psychology course ($n=123$) at a university in Western Australia were invited, via email, to complete the survey using Qualtrics an anonymous online application. Forty-eight students responded to the survey. Of these respondents, 56.3% were 18-19 years old, 37.5% were 20-39 years old and 6.3% were aged 40-59 years. One respondent indicated part-time university enrolment status while the remainder indicated full-time enrolment status. Thirty-six respondents were female which is consistent with the gender distribution trends in the participating university. The proportion of students reporting each internet activity across each context and for each device was tallied.

RESULTS

Figure 1 illustrates the proportion of students indicating access to the internet via computers and handheld devices across home, university and community (i.e., at work or a friend's house). Approximately 90% of participants reported computer internet access at home and university; 72.9% reported community access. Far fewer students reported accessing online applications with their handheld devices; 47.9% at home and 37.5% at university or in the community.

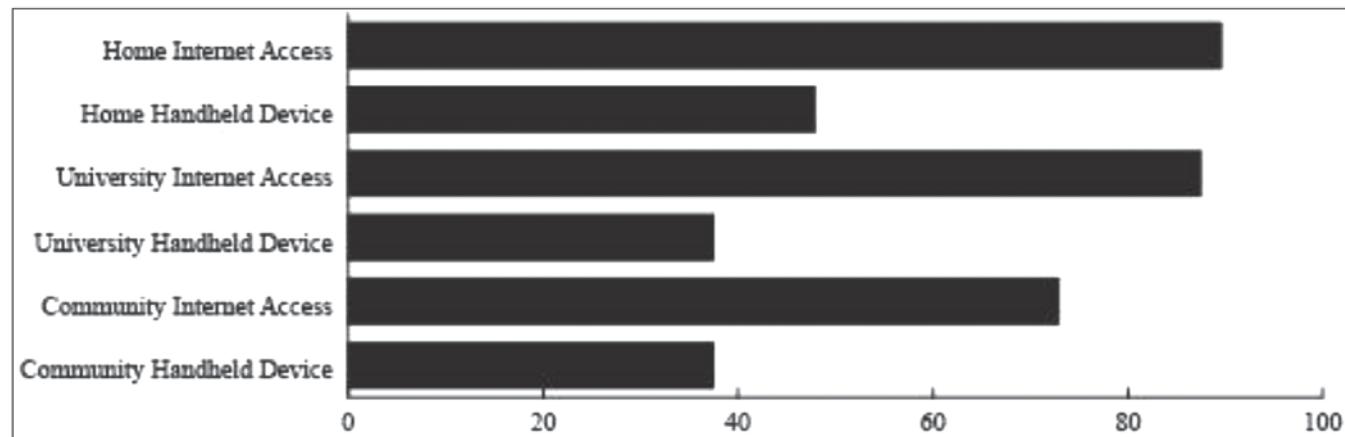


Figure 1: Percentage of First-Year University Students Reporting Connectivity across Contexts and Devices

Table 1 presents the proportion of students indicating that they engaged in each of the computer activities listed in the survey. Variation across students and across contexts was apparent. For example, only 30% of students indicated that they read or contributed to blogs at home. Downloading/streaming music from the internet was common at home (75.0%) but rare at university (4.2%). One-quarter of students reported web conferencing from home while none reported the same online activity at university. Using the internet to conduct personal business was common at home (72.9%) but rare at university (8.3%) and relatively rare in the community (18.8%). No students reported watching television online at university, although 10.4% reported downloading and watching videos while at university. Blackboard, the course management system used at the participating university, was a common online activity among participating first-year university students both at home (89.6%) and at university (81.3 %). A significant proportion (33.3%) also reported using Blackboard in the community. Approximately one-third of participating students reported

downloading and playing games online at home, 16.7% reported the same activity in the community, only 2.1% reported playing online games while at university.

Table 2 presents the proportion of students indicating that they engaged in each of the mobile internet activities listed in the survey. Variation across students and across contexts was apparent but considerably less than with computer activities. For example, students were much more likely to use their mobile phones at home or while in the community than at university to access maps, conduct personal business and watch videos. Participating students were much more likely to use their phone at home or while at university to access Blackboard than while they were in the community. Students were more likely to use their phones than their computers to text and Twitter in all contexts. Students rarely used their phones to blog, although blogging on their home computer was reported in 30.4% of the cases. Students frequently reported using a computer to check information (e.g., news, weather, sports scores); at home 93.5%, at university 70.5% and in the community 68.3%. Phones were also often

Table 1: Percentage of First-Year University Students Reporting Computer Activity across Contexts

Computer Activity	Home	University	Community
Instant message	71.7%	27.1%	35.4%
Email	93.5%	79.2%	60.4%
Use Twitter or similar application	8.3%	4.2%	8.3%
Use social networking sites (Facebook, Myspace etc.)	81.3%	62.5%	70.8%
Check information (news, weather, sports, facts etc.)	87.5%	64.6%	56.3%
Read or contribute to blogs	29.2%	8.3%	14.6%
Use maps (find places, get directions, plan routes)	85.4%	10.4%	45.8%
Conduct personal business (e.g., shopping, banking)	72.9%	8.3%	18.8%
Use internet photo sites	41.7%	8.3%	10.4%
Watch TV	55.8%	0.0%	22.9%
Download/stream music	75.0%	4.2%	31.3%
Download or watch videos online	60.4%	10.4%	39.6%
Download or play games online	31.3%	2.1%	16.7%
Use the internet for accessing Blackboard	89.6%	81.3%	33.3%
Use the internet for accessing reference information for study	89.6%	75.0%	18.8%
Use the internet for making phone calls (e.g., VOIP using Skype)	37.5%	0.0%	4.2%
Use the internet for web conferencing (e.g., Elluminate or Skype)	25.0%	0.0%	6.3%

Table 2: Percentage of First-Year University Students Reporting Mobile Phone Activity across Contexts

Mobile Phone Activity	Home	University	Community
Phone people	87.5%	85.4%	89.6%
Text people	89.6%	89.6%	89.6%
Use Twitter or similar application	22.9%	14.6%	25.0%
Check information (news, weather, sports, facts etc.)	58.3%	39.6%	43.8%
Read or contribute to blogs	4.2%	4.2%	2.1%
Use maps (find places, get directions, plan routes)	58.3%	20.8%	39.6%
Conduct personal business (e.g., shopping, banking)	33.3%	6.3%	27.1%
Use internet photo sites	6.3%	2.1%	2.1%
Watch TV	2.1%	0.0%	4.2%
Download/stream music	12.5%	0.0%	4.2%
Download or watch videos online	8.3%	0.0%	8.3%
Download or play games online	10.4%	2.1%	2.1%
Use the internet for accessing Blackboard	35.4%	31.3%	6.3%
Use the internet for accessing reference information for study	6.3%	6.3%	2.1%

used to check information; at home 58.3%, at university 39.6% and in the community 43.8%. Watching television or videos and listening to music via mobile phones rarely occurred while students were in the community and was never reported to occur while at university.

DISCUSSION AND IMPLICATIONS FOR INSTRUCTIONAL PRACTICE

Results of the current investigation suggest that first-year university students are not unanimously connected; five of 48 students who completed the survey indicated that they did not use the internet at home and six reported that they did not use the internet at university. Across all environments, using the internet to communicate was most commonly reported. Among the communication tools listed on the survey, Twitter was the least commonly reported, although text messaging from a computer was commonly reported. Apparently, digital natives enjoy detailed online communication including real-time communication. Students commonly reported using the internet to conduct personal business including using online maps, banking, shopping and checking information. Recreational use of the internet was also common, particularly accessing music and videos. Five of 48 students who

completed the survey reported not accessing Blackboard or study material at home; perhaps the same five students who did not have home internet access. For the most part, first-year university students appeared to use the internet in every aspect of their lives, for communication, commerce, information, recreation and education. Nonetheless, variation across students was apparent. When considering instructional applications of technology, some students may not be as comfortable with internet application as might be expected. Given current trends, first-year university students may not necessarily be recent high school graduates living with their parents (KRAUSE, HARTLEY, JAMES, & MCINNIS, 2005).

For the sample of participating first-year university students, patterns of online activities were both similar and dissimilar across contexts of use (i.e., home, school and community). For example, using Twitter was rarely reported and accessing social networking sites was commonly reported regardless of the context. Correspondingly, using phones for talking and texting were equally pervasive across contexts. Alternatively, instant messaging from a computer was more than twice as common at home than at university. Blogging was reported three times more often at home than at university. Using the internet for

recreational purposes was far more common at home and in the community than at university. Using the internet to learn (i.e., access Blackboard and study material) was twice as likely to occur at home and university as opposed to in the community. Apparently, for most first-year university students, some uses of the internet are so important that they transcend context, particularly communicating with their mobile phones and studying. Nonetheless, variation was apparent with some students engaging in, perhaps, inappropriate use of the internet relative to context. For example, more than one in ten participating university students reported downloading or watching videos at school, although such videos may be instructional in nature (SAEED, YANG, & SINNAPPAN, 2009). First-year university students appeared to have relatively clear views regarding appropriate and inappropriate uses of technology across contexts. Consistent with previous research, digital natives use a limited range of specific internet applications (HARGITTAI, 2010; MARGARYAN et al., 2011).

Student online activities varied in terms of use of a computer versus a mobile phone. In some cases, students were more likely to access the internet via a computer as opposed to a mobile phone. For example, participating first-year university students were far more likely to access instructional resources on a computer, across all contexts, than on a mobile phone. It may not necessarily be the case, as previously reported (PURSELL, 2009), that digital natives prefer mobile technologies. Correspondingly, students reported recreational use of the internet on a computer more often than on a mobile phone; 75% of students reported downloading/streaming music from their computers at home while only 12.5% reported using their mobile phones for the same purpose. Perhaps due to bandwidth limitations, accessing photo sites via a mobile phone was rare at home, university and in the community. Accessing online maps in the community with a

mobile phone, as might be expected, was relatively common, reported in approximately 40% of the cases. Internet access may be more dependable via computer but more convenient via mobile phone. Approximately one-third of students used their mobile phones for school activities. When considering instructional applications of technology, mobile phones may be useful for some, but not necessarily all, university students, as has previously been suggested (BETHELL, 2010; COCHRANE & BATEMAN, 2010; RISMARK et al., 2007).

The argument is frequently made that digital natives will benefit from instructional applications of new media and technologies including, for example, Twitter (JUNCO, HEIBERGERT, & LOKEN, 2011), wikis (NAISMITH, LEET, & PILKINGTON, 2011), blogs, podcasts and social bookmarks (SAEED et al., 2009). It may be that such instructional application motivate students to learn primarily via a novelty effect (Johnson, Howell, & Code, 2005). Adopting recreation and social technologies to education simply because they are popular with students does not bode well for the current condition of instructional science. The pedagogical benefits of popular technologies, beyond student engagement, have not been established. Instructional technologists may be more focused on the technology than sound instructional practice. The objective is not the use of emerging technologies; the objective is enhanced student learning. Among the sample of participating first-year university students, the single most common use of the internet at home and at university was to access Blackboard (i.e., the course management systems used at their university). Texting and talking, irrespective of context, were the most commonly reported use of mobile phones, although approximately one-third of students access Blackboard with their phones at home and at school. Student access to learning opportunities and instructional resources is, arguably, the most beneficial aspect of internet and mobile technologies (BULLEN et al., 2008; LITCHFIELD et al., 2007).

REFERENCES

- BETHELL, P. (2010). Journalism students' experience of mobile phone technology: Implications for journalism education. *Asia Pacific Media Educator*, 20, 103-114. Retrieved from <http://ro.uow.edu.au/apme/vol1/iss20/10>
- BULLEN, M., MORGAN, T., BELFER K., & QAYYUM, A. (2008). The digital learner at BCIT and implications for an e-strategy. *Proceedings of the 2008 Research Workshop of the European Distance Education Network (EDEN) Researching and promoting access to education and training: The role of distance education and e-learning in technology-enhanced environment* Paris, France. Retrieved from <http://www.box.net/shared/fxqyutottt>
- COCHRANE, T., & BATEMAN, R. (2010). Smartphones give you wings: Pedagogical affordances of mobile 2.0. *Australasian Journal of Educational Technology*, 26(1), 1-14.
- DEDE, C. (2005). Planning for neomillennial learning styles, *EDUCAUSE Quarterly* 28(1), 7-12.
- GEDDA, R. (2010). Melbourne Uni begins 50 student iPad pilot. Techworld Australia. Retrieved from http://www.techworld.com.au/article/358389/melbourne_uni_begins_50_student_ipad_pilot/
- HARGITTAI, E. (2010). Digital Na(t)ives? Variation in internet skills and uses among members of the "Net Generation", *Sociological Inquiry* 80(1), 92-113.
- JOHNSON, G. M. (2007). College student internet use: Convenience and amusement. *Canadian Journal of Learning & Technology* 33, 141-157.
- JOHNSON, G. M., & KUPLA, A. (2007). Dimensions of online behavior: Toward a user typology. *CyberPsychology & Behavior*, 10, 773-780.
- JOHNSON, G. M., HOWELL, A. J., & CODE, J. R. (2005). Online discussion and college student learning: Toward a model of influence. *Technology, Pedagogy and Education*, 14, 61-76.
- JONES, C., & CROSS, S. (2009). Is there a net generation coming to university? In *Dreams Begins Responsibility: Choice, Evidence and Change*. Manchester, UK. Retrieved from <http://oro.open.ac.uk/18468/>
- JONES, C., RAMANAU, R., CROSS, S., & HEALING, G. (2010). Net generation or digital natives: Is there a distinct new generation entering university? *Computers & Education*, 54(3), 722-732.
- JONES, S., & MADDEN, M. (2002). *The internet goes to college: How students are living in the future with today's technology*. Washington, DC: Pew Internet and American Life Project. Retrieved from http://www.pewinternet.org/PPF/r/71/report_display.asp
- JUNCO, R., & HEIBERGERT, G., & LOKEN, E. (2011). The effect of Twitter on college student engagement and grades. *Journal of Computer Assisted Learning*, 27(2), 119-132. doi: 10.1111/j.1365-2729.2010.00387.x
- KENNEDY, G. E., JUDD, T. S., CHURCHWARD, A., GRAY, K., & KRAUSE, K-L. (2008). First year students' experiences with technology: Are they really digital natives? *Australasian Journal of Educational Technology*, 24(1), 108-122.
- KIDMAN, A. (2010). Want an iPad and a degree? Gizmodo. Retrieved from <http://www.gizmodo.com.au/2010/09/want-an-ipad-and-a-degree/>
- KRAUSE, K. L., HARTLEY, R., JAMES, R., & MCINNIS, C. (2005). *The first year experience in Australian universities: Findings from a decade of national studies*. Centre for the Study of Higher Education. University of Melbourne. Retrieved from http://www.griffith.edu.au/_data/assets/pdf_file/0006/37491/FYEReport05.pdf
- LITCHFIELD, A., DYSON, L., LAWRENCE, E. & ZMIJEWSKA, A. (2007). Directions for m-learning research to enhance active learning. In *ICT: Providing choices for learners and learning. Proceedings Ascilite Singapore 2007*. Retrieved from <http://www.ascilite.org.au/conferences/singapore07/procs/litchfield.pdf>
- MARGARYAN, A., LITTLEJOHN, A., & VOJT, G. (2011). Are digital natives a myth or reality? University students' use of digital technologies. *Computers & Education*, 56(2), 429-440.
- NAGLER, W., & EBNER, M. (2009). Is your university ready for the Ne(x)t-Generation? In J. Luca & E. Weippl (Eds.), *Proceedings of 21st world*

conference on educational multimedia, hypermedia and telecommunications (pp. 4344–4351). Honolulu, Hawaii, USA.

NAISMITH, L., LEET, B. H., & PILKINGTON, R. M. (2011). Collaborative learning with a wiki: Differences in perceived usefulness in two contexts of use. *Journal of Computer Assisted Learning*, 27(3), 228-242. doi: 10.1111/j.1365-2729.2010.00393.x

PATTEN, B., SANCHEZ, I. A., & TANGNEY, B. (2006). Designing collaborative, constructionist and contextual applications for handheld devices. *Computers & Education*, 46, 294-308.

PRENSKY, M. (2001). Digital natives, digital immigrants: Do they really think differently? *On the Horizon* 9(6), 1-6.

PURSELL, D. P. (2009). Adapting to student learning styles: Engaging students with cell phone technology in organic chemistry instruction. *Journal of Chemical Education*, 86(10), 1219-1222.

RISMARK, M., SØLVBÆRG, A. M., STRØMME, A., & HOKSTAD, L. M. (2007). Using mobile phones to

prepare for university lectures: Student's experiences *The Turkish Online Journal of Educational Technology*, 6(4), Article 9. Retrieved from <http://www.tojet.net/articles/649.pdf>

SAEED, N., YANG, Y., & SINNAPPAN, S. (2009). Emerging web technologies in higher education: A case of incorporating blogs, podcasts and social bookmarks in a web programming course based on students' learning styles and technology preference. *Educational Technology & Society*, 12(2), 98-109.

SALAWAY, G., CARUSO, J. B., & NELSON, M. R. (2008). *The ECAR study of undergraduate students and information technology*, (Research Study, Vol. 8). Boulder, CO: EDUCAUSE Center for Applied Research. Retreived from <http://www.educause.edu/ECAR/TheECARStudyofUndergraduateStu/163283>

WRAY, R. (2010). In just 25 years, the mobile phone has transformed the way we communicate. *The Guardian*. UK. Retreived from <http://www.guardian.co.uk/business/2010/jan/01/25-years-phones-transform-communication>.