Native or Novice?: An Exploratory Study of the Access to and Use of Digital Technologies among Pathway Students

Velliaris, D.M. and Breen, P.

Handbook of Research on Engaging Digital Natives in Higher Education Settings

Margarida M. Pinheiro
University of Aveiro, Portugal

Dora Simões
University of Aveiro, Portugal

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Chapter 1

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Donna M. Velliaris
Eynesbury Institute of Business & Technology, Australia

Paul Breen
University of Westminster, UK

ABSTRACT

Access to and use of technology by students deemed to be 'Digital Natives' studying in the Higher Education (HE) sector has been an area of much interest, speculation and publication. This chapter reports on a small-scale exploratory study that aimed to uncover the digital technology access and practices in both everyday life and academic study of 'new' international first-year 'pathway' students at the Eynesbury Institute of Business and Technology (EIBT). The purpose of this study was to contribute to the debate on digital natives by providing a 'piece of evidence' on the access to and use of digital technologies by a group of pre-university pathway students. This exploratory study stemmed from the realisation that EIBT lecturers could better meet the needs of the current generation and cohort of 20+ ethnically diverse students, and help them acculturate and transition as lifelong learners who are able to adapt to an evolving information landscape in Australian HE and upon their return home.

INTRODUCTION

So-called 'Digital Natives' who have grown-up surrounded by technology are characterised by their dependence on technology to maintain social contact, their openness to share content, and their ability to adopt new technologies (Oblinger & Oblinger, 2005; Prensky, 2001). Increasingly

however, studies suggest that the homogeneity of this generation cannot be assumed and that in reality the technological characteristics of Digital Natives are significantly diverse in nature, especially in relation to their technology use as part of formal academic studies. Beetham and Sharpe (2007) for example, recognised the dangers in an 'often uncritical attitude to Internet-based

information, and the cut-and-paste mentality of a generation raised on editing tools rather than pen and paper' (p. 5). Similarly, Lea and Jones (2011) raised concerns about 'undergraduates being so immersed in Web-based technologies in their broader lives that they have difficulties engaging in more conventional study practices such as academic reading and writing essays' (p. 377). Variance in technological experience and ability, therefore, challenges many of the assumptions that form the basis of technological implementation strategies in the context of Higher Education (HE).

Herein, 'technology/technologies' will refer to artefacts and tools of the Web 2.0 era and beyond (Conole, de Laat, Dillon, & Darby, 2008, p. 511). The 'Information Age' is characterised by the diffusion of Information and Communications Technologies (ICTs) and an increased demand for educational approaches that foster 'lifelong learning' (Fischer & Konomi, 2007). The term 'international students' or 'students' is specific to individuals enrolled on temporary Australian student visas at EIBT and who are almost exclusively Non-English Speaking Background (NESB). This chapter uses the term 'Digital Natives' coined by Prensky (2001) and is directly linked to digital technologies of the 1990s with which this generation of students was raised. For the purpose of this chapter, there is scant literature on pre-university 'pathway' international students. Hence, this work contributes to bridging that gap as pathway institutions offer valuable partnerships for the HE sector and it is beneficial to conduct research into this division in order to strengthen the overall 'international student' experience.

BACKGROUND

Founded in 1998, the Eynesbury Institute of Business and Technology (EIBT) in South Australia, offers pre-university pathways that attract students early in their education lifecycle and secure their tertiary destination prior to them meeting university entrance requirements (Bode, 2013; Fiocco, 2006; Navitas, 2014; Velliaris & Willis, 2014; Velliaris, Willis, & Breen, 2015a). Specific to this research are the international students who enter EIBT to undertake a Diploma in: Business; Information Technology; or Engineering packaged with *The University of Adelaide* or the *University of South Australia*.

Though accessible to local students, student recruitment is predominantly directed towards full fee-paying international students who: (a) have completed Year 11 high school in Australia and would prefer to continue their studies in a different academic context; (b) have completed Year 12 high school in Australia, but did not obtain an ATAR [Australian Tertiary Admission Rank] sufficient for direct entry into university; (c) have graduated from high school abroad, but whose English language proficiency did not meet the minimum requirement for direct entry into university; or (d) are 20+ years of age with a relevant employment history (Velliaris & Breen, 2014; Velliaris & Coleman-George, 2014, 2015a, 2015b; Velliaris & Willis, 2014; Velliaris, Willis, & Breen, 2015b).

Approximately 40 'sessional' lecturers ranging in age from their 20s (i.e., PhD candidates and early career researchers) to their 60s (i.e., experienced academics and/or business professionals), deliver 40+ courses across three back-to-back trimesters). EIBT diplomas comprise the same—or deemed equivalent—eight courses that constitute the 'first-year' of a bachelor degree at the partner university. The partner university moderates diploma program delivery and grants advanced standing, equivalent to first-year, for courses if students achieve a specified entry-level Grade Point Average (GPA) upon graduation. With reference to Table 1, EIBT students are generally young, between 17-27 years, and throughout 2014 -2015 represented more than 20 different nationalities/ethnicities.

Table 1. Citizenship of EIBT students over the past eight trimesters

Country	2013-02	2013-03	2014-01	2014-02	2014-03	2015-01	2015-02
Australia	5	2	4	3	5	5	3
China	139	137	205	202	256	304	246
Hong Kong	51	50	51	29	30	27	25
India	8	9	12	10	10	10	5
Indonesia	4	6	4	1	4	3	2
Kenya	1	3	5	5	5	6	3
Malaysia	12	9	16	17	17	20	18
Pakistan	-	1	2	3	5	6	4
South Korea	5	3	3	3	2	2	2
Vietnam	12	11	19	24	26	23	15
Other	12	14	20	18	14	17	14
Total	**249**	**245**	**341**	**315**	**374**	**423**	**337**

Notes: -01 = Trimester 1 commencing February; -02 = Trimester 2 commencing June; and -03 Trimester 3 commencing October. Each trimester is approximately 12 teaching weeks, 1 week revision, 1 week examinations, and 2 weeks for vacation.

In part, the impetus for this research was the recognition that as a pathway provider, EIBT lecturers face many cultural challenges e.g., social, cultural, linguistic, religious, and of course 'academic' issues stemming from its international student demographic. With this in mind, the purpose of this study was to contribute to the debate on Digital Natives by providing a 'piece of evidence' on the *access to* and *use of* digital technologies by a group of international pathway students. This exploratory study stemmed from the realisation that EIBT lecturers need to adapt assignments, delivery, and methods to the expectations, preferences, needs, and characteristics of each new generation that enters the classroom. Learning about each generation and being open to new ideas for teaching them will help educators better engage and connect with their students (Bracy, Bevill, & Roach, 2010, p. 24).

LITERATURE REVIEW

The 'Information Age' is characterised by the diffusion of Information and Communications Technologies (ICTs) and an increased demand for educational approaches that foster 'lifelong learning' (Fischer & Konomi, 2007). Slaouti, Motteram and Onat-Stelma (2013, p. 78) referred to this phenomenon as the 'technologification' of [adult] learning. As early as Laurillard (1993), there was a desire to make greater use of the affordances of new technologies, which has since expanded exponentially as the physical terrain of study itself has become increasingly digital. In the present landscape of Higher Education (HE) and technological change, significant transformations are underway in terms of *how* students study.

Generations of Students

Generations of students have been described as fundamentally dissimilar. Scholars have identified generations of learners, albeit slightly differently, as: GI Generation (1900-1924); Silent Generation (1925-1945); Baby Boomers/Matures (1946-1964); Generation X (1965-1979); Generation Y/Net Generation/Millennial (1980-2000); Generation Z (2001-present); and the Homeland Generation (2005-2025) (e.g., Bennett & Maton,

2010; Elam, Stratton, & Gibson, 2007; Howe & Strauss, 2000, 2007, 2009; Jonas-Dwyer & Pospisil, 2004).

Tapscott (1998) put forward the notion of the 'Net Generation', while social commentators Howe and Strauss (2000) coined the term 'Millennials' as a generational label. The following year, Prensky (2001) suggested that students could be characterised as 'Digital Natives' (i.e., young, fast, technologically avid, into graphics, texting and gaming, experiment with trial and error) due to their exposure to digital technologies while growing-up. Young adults born between 1983-1990—currently between 18-25 years old—are considered the First-Generation of Digital Natives, and the current generation of teenagers born after 1990—currently 18 years or younger—is identified as Second-Generation Digital Natives.

In technological terms, the following quotation encapsulates some of tools indicative of these generations (Hartman, Moskal, & Dziuban, 2005):

Matures (born 1946-1964) were exposed to large vacuum-tube radios, mechanical calculators, 78 rpm records, dial telephones, and party lines. Baby Boomers grew up with transistor radios, mainframe computers… and 45 rpm records, and the touchtone telephone. Gen-Xers matured in the era of CDs, personal computers, and electronic mail. For the Net Generation, the prevailing technologies are MP3s, cell phones, and PDAs; they communicate via instant messaging, text messaging, and blogs. (p. 6.2)

Arguably, the rise of Web 2.0 applications may have greatly contributed to a distinct Second-Generation, due to their familiarity and immersion in '...adopting new systems for communicating (instant messaging), sharing (blogs), buying and selling (eBay), exchanging (peer-to-peer technology), creating (Flash), meeting (3D worlds)... socializing (chat rooms), and even learning (Web surfing)' (Prensky, 2005c, p. 2). Conversely, in the line of thought espoused again by Prensky (2001,

2005a, 2005b, 2005c) mature educators/lecturers were characterised as 'digital immigrants' (i.e., older, less familiar and somewhat uncomfortable with technology, preferring to carefully read hardcopies offline).

There is a body of research questioning the validity of the generational interpretation of the 'Digital Native' concept and Table 1 elucidates the proliferation of less widely used monikers, each attempting to capture the essence of the same phenomenon (e.g., Bennett, Maton, & Kervin, 2008; Brown & Czerniewicz, 2010; Coombes, 2009a; Helsper & Eynon, 2010; Jones, 2011; Jones, Ramanau, Cross, & Healing, 2010; Jones & Shao, 2011; Kennedy, Judd, Churchward, Gray, & Krause, 2008; Kolikant, 2010).

A Generation of Digital Natives

Regardless of the expression used, a common characteristic is the fact of having been born into a digitalised world. In agreement with Scanlon (2009), however, 'those writing about digital natives confuse the ability to navigate around ready-made online environments or download content from the net for a general ease with technology'. With this in mind, society and more specifically 'educational' environments, may be creating digital refugees; students who are technologically 'lost' because nobody actually showed them *how* to use technology and/or *how* to use it effectively. If educators hope to graduate lifelong learners who are able to adapt to an evolving Information Age/landscape, then 'yes' they need to be taught how to properly navigate technology rather than being left to learn their information-seeking skills independently by a process of experimentation.

One of the founding assumptions of claims for a generation of Digital Natives is that young people today live entirely immersed in technology and are 'fluent in the digital language of computers, video games and the Internet' (Prensky, 2005c, p. 8). Frand (2000) claimed that this immersion is so complete that young people do not consider com-

puters to be a form of 'technology'. With reference to Table 2, social commentators have assigned a range of skill-based attributes underpinning the premise that constant exposure to technology from birth somehow equates to these youth being able to use technology 'intuitively', because they have never known/experienced a world without the it (e.g., Bennett & Maton, 2010; Bennett, et al., 2008; Brown & Czerniewicz, 2010; Coombes, 2009b; Jones, et al., 2010; Kennedy, Judd, et al., 2008; Prensky, 2005a).

As the discussion of Digital Native characteristics has developed over time, studies that have attempted to measure—usually by questionnaire methods—students' general activities of use of technolog(ies) have proliferated. Prensky (2001) expanded on the disparity among young people and the older generations by introducing the concept of 'digital immigrants'; those who were not born into the digital world and who do not think technology is 'fun' and will be unlikely to master the use of technology to support education. This has remained a central notion in Prensky's work, despite later concessions about the variance of technological experiences of Digital Natives. This 'divide' among academics and '... these young people [who] are said to have been immersed in technology all their lives, imbuing

them with sophisticated technical skills and learning preferences for which traditional education is unprepared' (Bennett, et al., 2008, p. 775), has prompted a call for bridging the gap (Oblinger & Oblinger, 2005) or in the context of this chapter, bridging the 'pathway'.

Changes to the Higher Education Landscape

In terms of HE, there has been a shift in the view(s) of the purpose of education. There is growing emphasis on the need to enable and support not only the acquisition of knowledge, but also to develop the skills and resources necessary for students to engage with technologies (Owen, Grant, Sayers, &

Table 3. Perceived technological behaviours and preferences of 'Digital Natives'

Adept at processing information rapidly	Chooses typing over handwriting
Choose teamwork	Over-reliant on ICTs
Completely immersed in technology	Playful experimentation
Constant connectivity/ engagement	Pre-conditioned by their use of technology
Crave rewards and accolades	Prefers active over passive learning
Discerning users of information	Preoccupied with free expression
Egocentric	
Electronic friends	Purveyors of information
Embrace diversity	Quick-payoff
Emotionally open	Random-accessing
Enthusiastic for educational games	Relies on search engines
Explore and actively test ideas	Responds quickly
Expressive	Risk takers
Favour discovery-based learning	Scan digital headlines
Fluency in multiple media	Seek instant gratification
Frustrated at the rate of response	Sense of entitlement
Generous, practical and achieving	Share a common language
Impatient	Short attention span
Information overloaded	Socially inclusive outlook
Integrate virtual and physical worlds	Speak a different language
Intuitive visual communicators	Striving to be independent
Learn at high speed	Strong views
Less fear of failure	Stunted interpersonal skills
Love 'mashing'	Surface-oriented
Low tolerance for lectures	Trial and error
Make random connections	Twitch-speed
Multimedia oriented	Visually literate
Multi-tasker	Visual-spatial skills
	Web-based

Table 2. Monikers for digital natives

Clickerati	Gen Wii
Cyber Elite	Google Generation
Cyber Kids	Generation O
Cyber-Digital-Net- Generation	Generation Y Homo Sapien Digitalensis
Digital Aboriginals	Homo Zappiens
Digital Digerati	i-Generation
Digital Generation	Instant Message (IM) Generation
Digital Teens	Millennials/Millennial Generation
Digitizen	
Dot.Com Generation	Net Gen/Netgen/Net Geners
Echo Boomers	Nexters
E-Generation	Nintendo Generation
First Digitals	Post Gen
Gamer Generation	Screenagers
Gen Next	Trophy Generation/Trophy Kids
Gen Tech	Generation 9/11

Facer, 2006). Essentially, technologies of the past were: (a) *specific*; (b) *stable*; and (c) *transparent*, whilst new technologies are: (a) *protean*; (b) *unstable*; and (c) *opaque* (Koehler & Mishra, 2009, p. 60; Velliaris, et al., 2015b, p. 133). Relatedly, Hooper and Rieber (1995, p. 161) outlined the critical difference between 'educational technology' and mere 'technology in education' with the argument that 'guidance for designing effective technology-based classrooms should be grounded in the literature on effective pedagogy in general'.

As already alluded to, there is often an assumption that Digital Natives are predominantly—if not exclusively—technically proficient. Indeed, students of today have more opportunities to engage with technologies than their pre-1990s counterparts and are, generally speaking, comfortable and intuitive in handling technologies. This is not to say that pre-1990s individuals are not capable of using technology comfortably and intuitively since anyone willing to invest time and effort to explore technologies would be able to learn to use them effectively. The ability of persons to embrace ICTs, means that they possess a certain level of digital 'literacy'. They are able to use desktop computers, laptops and mobile technologies (e.g., mobile/smart phones, iPods, MP3/4 players and tablets) for texting, capturing information, researching on the Internet, and downloading music and video files. They are part of online communities and are able to use social media networks to communicate with friends and families as well as access services (e.g., banking, bill paying and shopping) on the Internet.

Kennedy et al., (2008) argued that research was needed to identify the technologies students were choosing to use in their everyday lives and how these technologies overlapped with 'learning technologies'. It may be assumed that the overlap between the two i.e., (a) *Personal*—how students use ICTs outside formal academic settings; and (b) *Educational*—how students use ICTs in formal academic settings, is considerable. This has been interestingly referred to as the technologies used for 'living' and 'learning' (Kennedy, Judd, et al., 2008). Selwyn (2009) stressed that educationalists should approach the Digital Native literature with 'caution' and that adults should not feel threatened by younger generations' engagement with such technologies.

METHOD AND METHODOLOGY

The role of EIBT is an important contextual factor in influencing how international learners develop digital literacies and other technology-assisted practices to be effective in a Western HE context. There is little doubt that learners are experienced in using a wide range of ICTs as they enter post-compulsory education. Accordingly, in order to contribute to what is a significant lack of available data concerning the 'pathway' context, 'new' EIBT students (n=89) were required to complete a mandatory online questionnaire designed and administered by the author via EIBT's Learning Management System (LMS)—Moodle. In Trimester 1 of 2015 (2015-01), new EIBT students were required to respond anonymously to 25 questions of their personal view(s) and practices.

The online questionnaire asked them about their access to, use of, skills with, and preferences for an array of established and emerging technologies and technology-based tools. The five objectives of this study were: (1) to *collect* and analyse data, interpret results and communicate findings in order to improve organisational practices and the quality of 'new' EIBT students' learning with technologies; (2) to *offer* 'new' EIBT international students a voice about how they approach learning and living in their everyday lives with digital technologies i.e., the challenges they face in learning and their aspirations for how schools can be improved; (3) to *determine* what professional learning EIBT staff—not just those designated as having technological responsibilities—require in

order to (re)conceptualise pedagogical practices that meaningfully include technolog(ies); (4) to *(re)visit* expectations and understandings of learning in light of the educational possibilities now afforded by complex software and to move on from simply expecting students to use Word/PowerPoint software for the presentation of assignments; and (5) to *find* ways in which formal in-school learning and informal out-of-school learning by EIBT international students can be aggregated into meaningful ways of learning, as well as building their innovation capabilities with technologies.

The design of the questionnaire was informed by the technologies and activities identified in previous Digital Native studies (e.g., Corrin, Bennett, & Lockyer, 2010; Kennedy et al., 2008; Kennedy, Judd, et al., 2008; Williams, Crittenden, Keo, & McCarty, 2012). For this exploratory study, the questionnaire included the following features in order:

1. **Time Spent on Mobile Phone (4 Items):** Single tick box.
2. **Access to Hardware and the Internet (13 Items):** Multiple tick box.
3. **Weekly Usage of Technology Based Tools (13 Items):** Multiple tick box.
4. **Reference to Social Media (23 Items):** Multiple tick box.
5. **Technology Used for Study Purposes:** Open-ended narrative.
6. **Perceived Personal Technological Skill Level (4 Items):** Single tick box.

This was an 'exploratory' study (Neuman, 2004, p. 15) that involved becoming familiar with a new setting and its particular features, gathering a range of data from a small community, and creating a preliminary picture of 'new' EIBT students' *access to* and *use of* digital technologies to be able to generate ideas for future research. Oftentimes, lecturers have limited opportunity to dedicate time,

energy and funds to designing and then conducting elaborate research projects. Fortunately, this chapter was able to utilise existing data, which cannot only be collected relatively quickly, but it would appear to have higher credibility because it was independent of any specific research activit(ies) (Altrichter, Posch, & Somekh, 2000, p. 82).

RESULTS AND DISCUSSION

Despite the small number of students involved, the cohort who contributed to this study was considered to be representative of EIBT. The participant group was restricted to 'new' EIBT students who are most commonly identified in the literature as being the generation likely to be Digital Natives. The results as presented below, however, should be conceived as a subjective process realised in a specific historical context. Importantly, they do not disclose any information that may prejudice participants as they are unidentifiable either by name or description. The focus of this study and the contents were considered non-controversial and no apparent consequences for the participants could arise.

1. Time Spent on Mobile Phone

One of the founding assumptions of claims for a generation of Digital Natives is that these youth spend their lives entirely immersed in technology. Question 1 as delivered in the online questionnaire asked: *On average, how many hours each day do you spend on your mobile phone?* The data indicated that a proportion of new EIBT students are well-connected and relied on their phone for much of the day. There were, however, 11% of the sample who may have possessed a mobile phone, but who did not access their mobile as frequently. Such generalisations about a whole generation, may therefore, be a gross exaggeration.

Table 4. Perceived time spent on mobile phone per day

Response	Average	Total
Between 1-3 hours	58%	52
Half the day	24%	21
Less than 1 hour	11%	10
On and off all day	7%	6

2. Access to Hardware and the Internet

A longstanding focus of research has been the extent of students' access to technology, because it would seem—whether true or not—a natural precursor to technology use. And, the mobility enabled by wireless communication, combined with an expanding class of wireless-equipped portable computers and Personal Digital Assistants (PDAs), is leading to new instructional and social patterns. No longer do students need to be seated to use a computer. An array of multifunctional PDAs capable of wireless communication is allowing such devices to follow their users. A challenge for EIBT, is the gap between the institutional IT environment and the technology environments our students may have created for themselves.

The vast majority of 'new' EIBT students have arrived from overseas and been in Australia for a period of several days to one month, while a small percentage have attended high school, studied intensive English in an English Academy, or transferred from another pathway institution. Question 2 sought answers to: *[You may tick more than one] Which of the following technological devices do you own/possess here in Adelaide?* Students were presented with a list of 13 common technologies and asked to indicate their level of access to that technology. Due to the fact the study looked specifically at first-year students it was decided to measure access rather than ownership as it is possible that some students may not be able to afford to purchase some of this equipment

outright but can still access it. Indeed, there are differing degrees and types of access (Chen & Wellman, 2004). People without access at home may use the Internet at libraries, cafes and/or family or friends' houses. Moreover, those who have access to the Internet at home do so under widely varying social and technical conditions. 'People, social groups and nations on the wrong side of the digital divide may be increasingly excluded from knowledge-based societies and economies' (Chen & Wellman, 2004, p. 25).

This list of technologies included those most commonly associated with use in academic contexts, such as desktop/laptop computers, memory sticks and media devices, along with technologies generally associated with everyday life activities such as digital cameras and game consoles. Despite the fact that many of these students had just arrived in Australia, surprisingly, they possessed some form of digital technology. It is important to note that there is the potential for incompatibilities between/among the technologies adopted by students and their school campus; the 'reality of

Table 5. Access to common technological devices

Response	Average	Total
Mobile Phone (Only one personal phone)	22%	75
Laptop/Notebook Computer	22%	74
iPad/iPad Mini/Tablet	13%	43
Memory Stick (Flash Drive, USB Stick)	13%	43
Portable Music Player (iPod, MP3)	8%	26
Broadband Internet Access	5%	16
Digital Camera (not Mobile Phone)	4%	15
Mobile Phone (More than one phone)	4%	14
Desktop Computer	4%	12
Video Game Console (PlayStation, Nintendo, Wii)	3%	11
GPS Navigation	1%	5
Electronic Organiser (PDA, Palm, Pocket PC)	1%	4
Dial-Up Internet Access	1%	3

infrastructure' (Camas, Bueno, Mengalli, Ribeiro, & Mandaji, 2015, p. 163). The findings here, however, demonstrated a high-level of access to two primary technologies: a *Mobile Phone* (n=75 students); and (2) *Laptop/Notebook Computer* (n=74 students), whilst other technologies showed significantly lower access rates at this early time of transitioning to Australia.

3. Weekly Usage of Technology Based Tools

In asking questions concentrated more on activities rather than access, researchers have tried to move the focus away from particular technologies towards the 'types' of activities those technologies support e.g., communication, information access and/or content creation. The extent and the nature of technology uptake, as well as the cognitive transformations that technologies bring about especially amongst HE students, is far from clear. The next question asked students to indicate *how* often they undertook certain technology-related activities over the past seven-days. Question 3 inquired: *[You may tick more than one] In the PAST WEEK, how many of the following technological activities have you done?* In descending order, the results are presented in Table 6, with mobile phone use being the most prevalent weekly activity.

4. Reference to Social Media

Along with mobile technologies, social networking sites have unequivocally been increasing in popularity with young people and have engendered fundamentally new ways of interacting (Benson & Morgan, 2015; Williams, et al., 2012). Understanding *why* students use online social networking sites may be important for the academic community as this communication platform can impact on students' motivation to learn. Social media has the potential to create online social spaces where HE students can build and maintain social capi-

tal with others. As there are hundreds of social media platforms, to prompt student thinking, 23 were offered to students as examples (Table 7). Question 4 probed: *[You may tick more than one] Have you EVER used any of the following social media sites?*

The social media that were not listed in Table 7 included: Care2; del.icio.us; digg; Last. fm; MeetMe; Meetup; StumpleUpon; Tagged; Travellerspoint; and Xanga (Benson & Morgan, 2015; Velliaris, et al., 2015b). Notably, some sample bias may be evident in the results as *Sina Weibo* is a Chinese social networking site. Indeed, this particular group of students does access the popular Facebook, Instagram and Twitter. These findings appear to support the argument by Lea and Jones (2011) that many students do see a distinction between technology's usage in social and curricular spheres.

Table 6. The nature of technology uptake by students

Response	Average	Total
Use a mobile phone to make and/or receive calls	13%	72
Send and/or receive emails	13%	70
Use a mobile phone to send text (SMS) messages	12%	68
Use social networking websites (MySpace, Facebook)	10%	56
Share photos online	9%	51
Read other people's blogs	8%	44
Use instant messaging or chat (MSN, Yahoo Messenger)	8%	43
Use a computer/game console to play games	7%	40
Use a computer/mobile phone/PDA as a personal organiser	7%	37
Download and listen to podcasts	6%	31
Write a blog	4%	20
Create presentations (Publisher, PowerPoint)	3%	19
Build or maintain a website	1%	6

Table 7. Experience with social media sites

Response	Average	Total
Facebook	23%	68
Google+	20%	57
Instagram	12%	34
Sina Weibo	11%	31
Twitter	9%	27
Tumblr	3%	10
Ask.fm	3%	9
Classmates	3%	9
Renren	3%	8
Pinterest	2%	6
Friendster	2%	5
MySpace	2%	5
Flickr	1%	4
Linkedin	1%	4
MyLife	1%	3
Cyworld	1%	2
Habbo	1%	2
LiveJournal	1%	2
Ozone	1%	2
Hi5	0%	1
Ning	0%	1
Orkut	0%	1
Vkontakte	0%	1

5. Technology Used for Study Purposes

Much of the discussion around Digital Natives implies that high-levels of technology use in a young person's everyday life should [somewhat] translate directly into their use of technology for academic purposes. Everyday technology-based activities, however, may *not* prepare students well for academic practices (Benson & Morgan, 2015; Camas, et al., 2015). General information-seeking strategies may have limited application to tasks requiring synthesis and critical evaluation e.g., updating one's Facebook status while travelling abroad may not equip students with the skill-level required to use the same technology to develop a

reflective journal as part of their studies; the nature and the form of the task are dissimilar.

Using a narrative inquiry approach (Shields, 2005), the open-ended question requiring a personally-composed reflective response was: *What technological devices and/or special programs/ website links do you use to help you study?* One author-researcher collated and examined all the narrative data. Far from diminishing the process of qualitative research, excerpts were grammatically corrected to enhance students' commentary and present a free-flow of response; a literal record was not warranted given that this was not a linguistic study.

In terms of technological device(s), one-third of the students simply listed 'devices', but did not indicate 'how' that device was used in relation to their studies.

A dictionary pen.

Electronic dictionary.

I normally use my smart phone and tablet PC to search websites to help my studies.

I use an electronic dictionary to check vocabulary words that I am not sure about in my study.

I use my smart phone or my laptop.

I usually use my laptop to help me study.

Laptop.

Mobile phone, USB.

Phone computer.

Another third of the students answered with a simple list of 'sites' that they accessed for assistance with their studies, but did not indicate the device they used to access the site. Examples included:

ESL, it is website. I can practice my English on this website.

Google and Google translate.

Google and Wikipedia.

Google search, online dictionary and Wikipedia.

Google search, Wikipedia and wolframalpha.com.

Google translate.

Google, Wikipedia, dictionary.com.

Google, Yahoo, Wikipedia, YouTube, Scribd and others.

I always use Youdao transfer, Keynote, and Google to help my study English. I use six minutes English to improve my English skill, because that is a very clear and easy to understand English website.

I always use Youdao transfer, Keynote, Google to help my study English.

I usually use Google, Google Scholar, and YouTube to search for information.

Nothing else other than Moodle.

Online dictionary.

Recently, I use some Apps to help me to study my program.

TED, Coursera, Youdao, and USBranslator.

www.adelaide.edu.au.

www.studyonline.edu.au.

www.unisa.edu.com.au.

Youdao translator and NetEase Open Course.

Slightly more detailed answers that combined both technological device(s) and special programs/ website links included:

I often use a laptop and iPad mini for my study, and I always find some resources on the Internet. Searching different links, like Anu's website to find some public notes.

I will use dictionary.com if I do not understand any words and I will save some definitions. I will also save my course program booklets onto my iPad so that I can easily have access to them.

A few more than 20 websites were extracted from all the student responses and predominantly included, but was not limited to [alphabetical order]: Coursera; Dictionary.com; Ebsco; Google Translate; Google Scholar; Google; Khan Academy; Learn & Teach English with ESL.com; Scribd; Study Online; TED; Udemy; Wikipedia; Wolframalpha; Yahoo; Youdao; and YouTube. Overall, a significant proportion of students considered 'Google' to be the most helpful search engine:

Google translation is used to help me study. For example, if I cannot understand what the word means, then I can use Google translation. I think it is very useful to me. Sometimes I will also listen to English music and movies to help me get good listening.

I like to Google everything as Google can always be my best friend. I can find most of the answers by Googling my questions or even topics. For example, I do not know what is the meaning of 'technological' and I can find the meaning by using Google. I do not need to look for a dictionary and it reduces a lot of work. It is good for my learning as it does help a lot whenever I meet any difficulties in my studies.

Technology can make learning pleasurable and captivating. I use my laptop for doing all my assignments and presentations. It's portable so I can take it anywhere and do my work. I use Google to do almost all my work. It's the best search engine according to me and I get the solutions to all my problems here.

There are many websites that help me to get all information about my lessons. Google is a teacher of all answers. By using the Internet, I get support in my studies. Sometimes online dictionary help me to find out the correct answer.

While other students were somewhat skeptical of Google:

I used to use Google translator and Google for my studies, however, I found that there were some disadvantages so I started to use an online dictionary, and I would learn the vocabulary by searching the similar word. It was much useful than a translator.

Several students described the device and the application they used to assist them with their studies. In addition to those already listed above, they mentioned that they accessed sites in their 'home' language to assist them in their academic pursuits.

I usually just Google my problems and then try to find something mostly on YouTube. I also use a Swedish online dictionary, a synonym website and I have also been to the Khan Academy.

I was always using the Google translate to help me finish my work as I have to use huge vocabulary to finish my work. Additionally, I use some Chinese websites as I can get some new ideas and viewpoints. Those Chinese websites must be very professional and specialised.

Online Google translate helps me to translate words I do not understand and a Vietnamese and English dictionary on my phone.

Some students referred to using educational 'Apps' to assist them:

I use dictionaries on my phone very often, but sometimes it is not enough. I have to use the online dictionary instead. I also have some Apps to help me remember new words.

I use laptop for most of my studies. I have bad handwriting so all my homework and paper are done on my laptop. Udemy is an App that I use to learn many subjects that is beneficial to my studies in school.

I usually use Google translate and vi duct box on my mobile phone to help in studying. I use Google translate when I reading an article or reading a book. Some of difficult article, I usually translate the whole sentence because doing this helps me understand what the sentence is talking about, although its translation is not always accurate. I use Vi Dict Box when I write as this App has a lot of examples so that I know how to use it in a sentence.

Only two students referred to downloading e-books:

I usually download e-books and go through them to gather more information, or even in some cases use YouTube (especially for mathematics sessions e.g., Khan Academy) to help me understand more.

The technology devices that help me study would be the e-books that can be downloaded to your personal electronic device. The use of Matlabs to solve difficult problems where calculators cannot perform the equations. The use of AutoCAD

system to draw pictures of different shapes and lines to meet the subject requirements. YouTube is a great source of videos for not only entertainment purposes, but also for educational purposes as well because they have plenty of useful videos.

Educational use of technologies and tools need to be (more fully) supported by EIBT's learning infrastructures and educational design. Several international students provided great insight into their EIBT aspirations on their pathway to mainstream Australian HE.

I think that the number one way for me to get great results in my diploma and go to the University of Adelaide, is to make my English the best it can be. I have my mobile phone with me each day, sometimes my iPad in my backpack, and a desk top computer in my apartment. I am trying to use technology to improve my English as related to my courses. I think my 'everyday' English is quite good. I can easily do the shopping, ask questions, and have deep conversations, but the language I need to pass my degree is much higher and harder. Already in my first week at EIBT, I feel that my English needs great attention. I think I need to start recording my lectures so that I can listen to them over and over. And I thought my IT skills were OK until I came to Adelaide. Now I realise that I am average.

I thought that when I arrived in Australia, my English would automatically become fluent, but I have realised that I must check the online dictionary on my mobile phone or iPad all the time. I try to make a list of new words I am learning, especially the example sentences, so that I don't use the words the wrong way. During my diploma program, I hope that my teachers will help me to find excellent websites to help me with my courses and my results. I am expecting to learn technical words related to 'business'. Even if I understand the business concepts, I need to show my understanding in my exams in English. I think I need to

get some popular educational Apps for my phone and iPad. Recently, I have heard of Phrasal Verb Machine, BrainPOP, and Evernote. I have not used them yet, but I am excited to give them a try.

6. Perceived Personal Technological Skill Level

In the pre-diploma program questionnaire, the final question 6 asked: *[Choose one only] Overall, how do you assess your own technological skill level?* Students could rate themselves as either *Poor, Average, Above Average* or *Excellent*. The majority of students in this study classified their technological ability as *Average* (n=51 or 57%). This calls into question the popular assertion that students in this generation age bracket all have a high-level of digital literacy because of their exposure to technology (Oblinger & Oblinger, 2005; Prensky, 2001). In short, institutions need to provide ample opportunity for ICT training of students as it cannot be assumed that they will/ do enter HEIs prepared to use advanced software applications.

IMPLICATIONS, LIMITATIONS, AND FUTURE RECOMMENDATIONS

The diversity of EIBT's international student cohort suggests that a 'one size fits all' approach would be inappropriate when integrating ICT into diploma curricula. Any pedagogical and/ or curriculum changes proposed to accommo-

Table 8. Students' self-evaluation of technological ability level

Response	Average	Total
Average	57%	51
Above Average	22%	20
Excellent	11%	10
Poor	9%	8

date the needs of the new generation of learners should be both evidence-based and empirically informed, rather than making predictions based on sweeping generalisations that all international students transitioning to EIBT have a collective digital upbringing.

The analysis of the responses from the questionnaire indicated that, for these EIBT students, access to and use of technology does not neatly fit into the stereotype of the Digital Native. The wide variance of use, especially between everyday and academic contexts, suggest that first-year university students do not form a 'homogenous' group in relation to experience, ability and adoption of technology. This highlights the 'mismatch' that is reported in the literature between how institutions perceive students' use of technology and their actual use, and reinforces the need to avoid the assumption that fluency in social or entertainment based technologies necessarily equates to a similar fluency in the use of technology for academic purposes.

This study of first-year university students' access to, and use of, a range of technologies has significant implications for EIBT. At a time of growing interest in the attributes of the so-called Digital Natives, it is important for EIBT to ensure that decision-making about how to enhance the first-year experience of incoming international students through the use of technology is evidence-based and empirically-informed. As always, faced with choices about how to advance the educative process, it is imperative to be informed about the kinds of students who are entering our institution.

As expressed in the literature review, EIBT cannot assume that being a so-called Digital Native is synonymous with knowing how to employ technology-based tools strategically to optimise learning experiences in HE. Low-level interactivity in a LMS, such as EIBT's Moodle, is unlikely to measure a student's digital nativeness, as emerging, browser-based collaborative tools incorporating synchronous audio, video, chat and data display, are (more) likely to offer great(er) engagement. While the majority of incoming EIBT students possess a *core* set of technology-based skills, a diverse range of skill-sets *does* exist across the population.

Given that the sample was limited to EIBT respondents, the resulting limitations, implications and future recommendations as presented below, may apply specifically to this population. The findings of this questionnaire highlight the differences in students' access to and usage rates of technology. As expressed in the literature, research into this area should also examine student perspectives of *how* and *why* they use technology in the way they do. Given the diversity within a single cohort of first-year EIBT students, however, the challenge is how to cater for the broad range in students' levels of access to, familiarity with, and preference for different technologies and technology-based tools. When further analysis of trimesterly data is undertaken, it is anticipated that the findings will provide a deeper understanding of EIBT students' use of technology to support learning such that EIBT academics will be better placed to make effective decisions about technology implementation throughout the school and within the classrooms. Staff development seminars—possibly sponsored by emerging technology providers—are one way of having staff explore emerging mobile devices and issues surrounding digital literacies. Such sessions could include pedagogical input and sharing of ideas, between/among staff and students, as to how emerging tools and particularly the interactivity/engagement that they allow may be used to enhance and advance EIBT's teaching and learning environment.

Future Recommendations

- More funding may be needed to better integrate IT/ICT into the EIBT classroom environment. Relatedly, education technology budgets should reflect the importance of professional development. A portion of EIBT's budget should be reserved for school staff to become proficient in using and integrating technology into their teaching methodology. Educators themselves should be involved in decisions on planning, purchasing, and deploying education technology.
- To circumvent waiting for a whole-of-institution response to adopting new technologies, EIBT educators can encourage the use of student-owned devices and student-used modes of communication/learning where they can enhance students' engagement, where access to technologies is equitable for students, and where the use of online applications poses little risk to EIBT. Further empirical exploration could thereafter take a multidimensional approach to seek out the relationship between/among technology (a) access, (b) use and (c) skill-level.
- While technology may be embedded in their daily lives, EIBT students' use and skills are *not* uniform. Indeed, encounters with students from varied ethnic, geographic, linguistic, and/or religious upbringings, together with backgrounds such as age, gender, generation, lifestyle, sexual orientation, and/or social class, invites critical awareness of commonalties and points of difference. Further research should endeavour to account for national effects so as to see if there are 'country' differences (e.g., Cambodia, India, Kenya) in the use of particular platforms and providers and in the creation and dissemination of content.

Significantly, this study and related findings make a contribution to the debate that the incorporation of technology into students' lives does not so much call for a total break with tradition, but rather a continuance of traditional principles to make the most of technology's affordances (Koehler & Mishra, 2009; McGrath, Karabas, & Willis, 2011; Mishra & Koehler, 2006).

CONCLUSION

As scholars increasingly critique the 'Digital Native' myth, a key lesson is that this generation cannot translate the language of digital fluency into academic practices until—as with preceding generations—they learn *how* to do so. This process varies in important ways; explaining such variation is critical if educators are to understand how today's adolescents are choosing for example, to go online, and where over time these choices can take them. The findings reported in this chapter show that not all students meet the reported criteria as 'Digital Natives' in terms of *access to* and *usage of* technologies. Rather, there is a 'wide variance' of experiences and ownership, and a significant proportion of non-adoption.

In comparing the use of technology between the contexts of everyday life and academic study, it was seen that students who participated in this study were less likely to use technology to support their schoolwork. This is an important consideration for educators implementing ICTs within their coursework and in the development of policies for teaching and learning in HE. The overall intent of this exploratory research was to lay the ground work for future research within the context of EIBT into *how* and *why* students adopt or not technolog(ies) to support their academic studies. Additionally, steps are and will continue to be taken to examine implications for the use of ICTs in HE and more specifically, pre-university diploma pathways.

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KEY TERMS AND DEFINITIONS

Computer Literacy: Understanding the basic processes of computers and technology and being able to use those processes.

Digital Literacy: The knowledge, skills, and behaviours used in a broad range of digital devices such as smart phones, tablets, laptops and desktop PCs, all of which are seen as 'network' rather stand-alone. Computer literacy preceded digital literacy, and refers to knowledge and skills in using traditional computers (such as desktop PCs and laptops) with a focus on practical skills in using software application packages, whereas digital literacy is a more 'contemporary' term focused on one's practical abilities in using digital devices.

Digital Native: The term 'digital native' applies it to a new group of students enrolling in educational establishments referring to the young generation as 'native speakers' of the digital language of computers, videos, video games, social media and other sites on the Internet. That is, those born into societies in which information technology permeates all aspects of everyday life, thus influencing socialisation patterns. The reception and application of digital information is often second-nature to digital natives.

Diploma: In Australia, an undergraduate diploma refers to an advanced level program completed in the vocational education and training sector or university. This is academically equivalent to first-year and, depending on students' results, may lead straight into the second year of a bachelor degree, with full credit for the first-year of the degree.

EIBT: The *Eynesbury Institute of Business and Technology* offers full fee-paying pre-university pathways for predominantly international students entering one of two South Australian higher education institutions: *The University of Adelaide*; or *The University of South Australia.* EIBT is located in a modern, five level building in the centre of the city of Adelaide opposite the Central Market and China Town.

Formal Learning: Learning provided by an education or training institution, structured in terms of learning aims and objectives, involving the presence of a teacher or trainer, and leading to certification or an award of qualification or credit.

ICT: Information and Communications Technology (ICT) is often used as an extended synonym for Information Technology (IT), but is a more specific term that stresses the role of unified communication i.e., any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form. For example: radio, television, cellular phones, computer and network hardware and software, and satellite systems, as well as the services and applications associated with them, such as videoconferencing and distance learning.

Informal Learning: Learning which is not provided by a formal educational or training institution and oftentimes does not lead to certification. Informal learning results from daily, social life activities related to education, work, and socialising as examples.

International Students: Individuals enrolled in the *Eynesbury Institute of Business and Technology* on temporary student visas and who are almost exclusively Non-English Speaking Background (NESB).

Pathway Provider: Educational institutions that offer students alternative forms of entry into university degree programs. Applicants may include: early school leavers; those that have not achieved the academic and/or English requirements to obtain direct entry; or students looking to return to study after a period of absence.

Pedagogy: The art and science of teaching, and not in its narrower sense of teaching the 'young'. Its common usage is now sufficiently broad that there is no need to import the word 'andragogy', a term which has only limited currency in the mainstreams of higher education practice.

Technologies: This includes much more than computers and digital technologies used for information, communication and entertainment. Technologies are the diverse range of products that make up the designed world. These products extend beyond artefacts designed and developed by people and include processes, systems, services and environments.

Web 2.0: The term given to describe a second generation of the World Wide Web that is focused on people collaborating and sharing information online.