

Digital Apprehension® and First Year University Students.

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Abstract: The mere presence of global connections creates the need for higher education to be internationally competitive—economically, culturally, and academically. The ‘latest’ digital tools can be heralded from the ‘best’ institutions enticing local and international students to come to their particular university. However, with the combination of global connection, the diversity of the contemporary university population, and technology, a new concern is appearing. While learning technologies are being increasingly utilised in the delivery of university programs, students may not use the technology to the full advantage. The aim of this study was to identify and characterise *Digital Apprehension*® among first year university students ($N = 30$). This was achieved by thematic analyses of data gathered from focus group interviews, and development of a 12-item questionnaire. Findings revealed that one in three first year university students were frustrated with the learning technology.

Introduction

University students need support at the critical time of their first year as the transition from high school to university can be very difficult for some students. For example, many living away from the support of family and friends for the first time, which may involve things such as dealing with large chunks of unstructured time, therefore learning how to discipline themselves (Briggs, Clark, & Hall, 2012; Chester, Burton, Xenos, & Elgar, 2013; Lizzio & Wilson, 2013). The current project is part of a larger project that focuses on aspects of student adjustment during their first year of higher education. The new concept of *Digital Apprehension*® (DA) is introduced and examined as the condition of apprehension experienced by students during the first year transition (Blume, Baldwin, & Ryan, 2013) when it occurs during the use of digital technology (Burger & Blignaut, 2004; Embi, 2007; Powell, 2013). Digital Apprehension in this project is described as a motive leading to a reluctance to use technology, whether this motive is fear, non-compliance, frustration, or just lack of knowledge with technology, or a mixture of some or all of these reasons. The major study (a three-part study) provides a foundation for an instrument to measure first year higher education students’ perceptions of their interaction with technology (Part 1), how students appraise their problem-solving abilities for learning in the digital age and subsequently, students’ expected transition experience (Part 2 & 3).

Research shows that digital tools are beneficial for first year students (Burton, Lawrence, Summers, Gibbings, & Noble, 2013), but how students react to such tools remains to be thoroughly considered to understand how these tools can help and support students. Previous research investigating technology, problem-solving, and transition has included adaptation to technology (Corrin, Lockyer, & Bennet, 2010; Embi, 2007; Kennedy & Fox, 2013), digital fluency (Wang, Myers, & Sundaram, 2013), problem-solving appraisal (Beccaria & Machin, 2011; Smith & Burton, 2013), the first year experience (James, Krause, & Jennings, 2010), and the transition experience (Box, Callan, Geddes, Kemp, & Wojcieszek, 2012; McMillan, 2008). Nevertheless, there seems to be a dearth of information about the effects on students from the technological advances in higher education. To counter this gap this project involves the development of a measure to assess the nature and substance of digital apprehension, by creating an instrument to measure the concept. If higher education continues to utilise emerging technologies to enhance learning, this concept may be important, especially in the changing landscape of university, the context in which the first year higher education students find themselves.

The Changing Landscape of Australian Higher Education

Higher education is growing and changing with increasing numbers of lower socio-economic, international, multi-cultural, and distance students (ABS Australian Social Trends, 2013), comprising populations that are quite different from 30 years ago (DIISRTE, 2012; McIntyre, Todd, Huijser, & Tehan, 2012). Monitoring changes in the student experience involves the investigation of the first year journey (Ertl & Wright, 2008). This has been shown in previous research, for example, examination of problem-solving appraisal (Geytenbeek, 2011), learning and technology (Buckley, Pitt, Norton & Owens, 2010; Entwistle, McCune, & Tait, 2013), students' learning experience (Ertl & Wright, 2008; Harvey, Drew, & Smith, 2006), and student transition (Lizzio & Wilson, 2006). Worldwide connection through the internet occurring in the digital age, has added to the increasingly diverse community structures, and change has paradoxically become the new 'constant' (Kennedy, Judd, Churchward, Gray, & Krause, 2008; Prensky, 2001a). As a result, ongoing review is necessary to assess the Australian position to ensure quality education maintains pace with the needs of this new wider cohort. Accordingly, the Australian government recommended reviews of Australian higher education.

One such review culminated in what is now known as the Bradley report (Bradley, Noonan, Nugent, & Scales, 2008). The Bradley report addressed the current state of Australian higher education, revealing that to compete globally "we must create an outstanding, internationally competitive tertiary education system ... and must act now ... to remain competitive ..." (Bradley et al., 2008; p. ix). The report holds that creation of an outstanding and globally competitive education system entails opening the doors of higher education to a more diverse student population, thereby giving more students the opportunity of a university degree, subsequently raising the educational standard of Australians, and enabling Australia to be globally competitive (Bradley et al., 2008). Previously, higher education in Australia was often perceived as being available only to the privileged or elite (Briggs et al., 2012). Since the release of the Bradley report, strategies have been implemented to specifically support a more diverse range of first year students in contemporary higher education. The combination of diverse student populations and the digital age challenges higher educational institutions to accommodate the diversity and technological change now present in Australian universities.

Diversity and Technology

Contemporary Australian universities are operating in the now established digital age, with diverse groups interacting on a daily basis in diverse modes (ABS, 2013). Such diversity includes those participating through distance education, rural students, online students, minority ethnic students, the mature aged, students from different socio-economic strata, and international students (Briggs et al., 2012; McMillan, 2008; Smith & Burton, 2013). In the digital age there are many people who have grown up not knowing a world before computers (Prensky, 2001a; Stoerger, 2009). Many consider digital interactions such as online relationships, e-conferencing, and e-communication to be an everyday occurrence (Richardson, 2009; Sharpe, Benfield, Roberts, & Francis, 2006). In response, higher education has evolved, incorporating lectures, courses and programs that are recorded and downloaded on to computers, mobile phones, tablets, and MP3 players. Higher education has adopted communications technologies as they become available, leading to innovation in the way that tertiary education is delivered. Where today services such as online tutorials, digital learning, e-learning, u-learning, and virtual learning are commonplace, 30 years ago they were unknown (Hedberg, 2011; Kasraie & Kasraie, 2010; Price & Kadi-Hanifi, 2011). Even though such technologies are often seen as helpful, supportive and economical, especially for students from the digital native cohort, there are concerns about the ability of all students to access their potential benefits. Not all students attending university are digital natives and there are some concerns about the experience of technology during first year of higher education.

Digital Natives and Apprehension

'Digital natives' was a term coined by Prensky (2001a) to describe those who have grown up not knowing a world without technology. Research surrounding technology and education often incorporates how educators and institutions can accommodate and adapt pedagogical platforms to allow quality education for the digital native cohort (Price & Kadi-Hanifi, 2011; Ransdell, Kent, Gaillard-Kenney, & Long, 2011; Sharpe et al., 2006). Currently, a relative level of program-specific technology is required in higher education (Kennedy et al., 2008). Kennedy et al.'s critique of digital natives gives merit to the thinking that, while there are particular cohorts that happily use technology, over half (50.3%) had not used a computer for specialised technology (e.g., creating web pages, using specific program software). Therefore, although digital natives use of technology is an everyday event, in the area of specialised technology, and considering the diversity present among

current student populations, the ‘digital native’ cohort, does not include a “one size fits all” (Kennedy et al., 2008, p. 118) scenario. The current digital native cohort, according to the Australian Bureau of Statistics (ABS) comprises just over half (59%) the students attending university.

Conversely, nearly half of all students (41%) were not considered digital natives (ABS, 2013), and in some instances only a quarter of the students enrolled in first year courses are of the digital native cohort (Edwards & Van Der Brugge, 2012). Additionally, with the current levels of diversity comes the realisation that many students are mature age, or students whose first language is not English, with international student populations now being at their highest, and increasing annually (ABS, 2013). While some students take advantage of the available technology to stay motivated (Price & Kadi-Hanifi, 2011), others may become apprehensive due to unfamiliarity, confusion, or doubt in otherwise familiar areas (Heaton-Shrestha, May, & Burke, 2009; Kennedy & Fox, 2013). Consequently, questions remain about students coping in regard to technology and higher education, and any complacency (e.g., findings by Kennedy et al., 2008) warrants further investigation.

Furthermore, literature now confirms that, while digital natives are perhaps the most prolific users of technology, they are not necessarily comfortable using technology in the classrooms (Burton et al., 2013; Kennedy & Fox, 2013; Kennedy et al., 2008). For example, their stated discomfort may be due to the interplay between the privacy needs of their social interactions, or the unfamiliarity of specialty software (Corrin et al., 2010; Heaton-Shrestha et al., 2009). Moreover, while many students are familiar or comfortable with technology in their social life, their transition to the unfamiliar environment of university may still be experienced as challenging and stressful (Ransdell et al., 2011). Apprehension may also be generated from doubt about their abilities, or even non-compliance with utilisation of digital tools and familiar technology in non-familiar settings (Heaton-Shrestha et al., 2009; Kennedy & Fox, 2013). The individual experience then transposes into the notion of digital apprehension and emerges as a new concept reflecting an aspect of the digital age and diversity in higher education. Digital apprehension in this project is described as a motive leading to reluctance to use technology, whether this motive is anxiety, non-compliance, frustration, or lack of knowledge with technology, including navigating the tools involved in studying and course completion. This then affects how students cope with study loads, and problems encountered when first embarking on their academic journey and their interaction with the technology. Therefore, this project will evaluate, analyse and address the issue of digital apprehension in first year higher education students, and proposes that digital apprehension is an important phenomenon present in the current higher educational setting that needs to be quantified.

Methodology

Introduction

This study used a qualitative methodological approach with limited quantitative analyses in regard to the demographic data. Both qualitative and quantitative methods have strengths and limitations, and both can bring a certain complementarity to the other (Lund, 2012). Qualitative approaches incorporate ideas and opinions, and utilise focus groups, case studies, and interviews, whereas, quantitative approaches apply mathematical analysis of surveys and questionnaires. While this study is qualitative in design, the mixed method design was formally recognised around 2000 (Lund, 2012) and brings together a balance of direction and probability, comprehension and explanation, narrative and numeric (Tillman, Clemence, & Stevens, 2011). Importantly, objectivity is enhanced through quantitative methodologies, while added depth is attained through the addition of qualitative methodologies (Lund, 2012). Rather than being at opposite ends, as Karasz (2009) suggests, the two methods ‘dove-tail’ together, merging strengths and minimising limitations, to form a solid holistic position. Regardless of methodology, whether qualitative, quantitative or mixed methodology, consideration must be given to the application, integration and anticipated achievement of the project. Using qualitative methods seeks to understand the personal ground level ‘feelings and thoughts’ of those whose data is analysed, and quantitative endeavours to achieve the statistical implications of the results (Tillman et al., 2011). This study employed qualitative methodology, namely, thematic analysis of information gathered from focus groups.

Thematic Analysis

Thematic analysis is a detailed identification of similar occurrences (patterns/themes) that are grouped together from a larger data set and coded (Braun & Clarke, 2006). Thematic analysis not only enables richness and depth, it also provides basic insights that are stepping-stones to conducting any manner of qualitative analyses (Braun & Clarke, 2006). As with any method, there are advantages and disadvantages to using this type of analysis. Criticism of the qualitative

(thematic) analysis includes claims of insufficient regulation, guidelines, and clear clarification of how analyses were carried out (Braun & Clarke, 2006). Lack of clarification often makes it difficult to retest/appraise for validity. To address these disadvantages, the current study will use the flexibility of the method, while adding other parameters that will guide, without undue rigidity, and clearly detail and clarify how the themes were reached. In line with the above, the themes extracted from the data collected for the present study will be specific to the research questions at hand. The first of those being, does the concept of digital apprehension exist for first year university students at universities in Australia, as represented by participants in this study.

Participants

A convenience sample of first year university students ($N = 30$), 18 years and over, participated in semi-structured focus group interviews. The majority of participants (40%) attended face-to-face focus groups or individual interviews, whereas 33% answered focus group questions via email, and 27% were interviewed online via Skype. Participants from the three university campuses were represented with 37% from an inland regional city, 17% from a coastal campus, and 10% from a satellite of a metropolitan city. Participants consisted of 30% studying off-campus, 30% studying on-campus, with 23% online students, and 17% being a mixture/blended mode (see Table 1).

	Skype	Form-filled	Focus Group	Total
Regional city	3	3	5	11
Satellite city	-	1	2	3
Coastal city	-	-	5	5
Ext/Online	5	6	-	11
Total	8	10	12	30

Table 1. Focus Group Interview Dates and Times

Participants were from seven different faculties: Science 33%; Education, 26%; Business, 20%; Health, Arts and Law each having 7%. The majority of participants were female (70%) with 30% being male. Age of participants ranged from 19 to 61 years ($M = 35.17$, $SD = 12.69$). The majority were Australian (93%), with one Canadian/Australian, and one Indigenous Australian participant, and one participant having English as their second language. Over half (63%) of participants were working, and of those who were working, 23.5% were working at least 40 hours per week. Approximately two thirds of participants (63%) were studying full-time, while the remaining 37% were part-time. Almost half (49%) were in their first semester, while another half (50%) were in their second semester, with one participant in their third semester. All participants lived in Australia, with approximately 83% living in Queensland (QLD), 7% living in New South Wales (NSW), and the three remaining participants living in the Australian Capital Territory (ACT), South Australia (SA), and Western Australia (WA), respectively. Three of the participants (10%) had left high school in the last 12 months.

Procedure

Ethics approval was sought and approved by the host university. The first aim involved conducting focus group interviews in a semi-structured format. The relevant permissions were attained to contact first year students for focus groups and interviews. All the first year courses offered were perused and the most suitable courses selected. The lectures covered as many faculties as possible including Business, Education, Law, Arts, Health, Engineering, and Sciences. Methods of contact included an announcement on the students' initial webpage after log-in, and talking to students in the first 15 minutes of first year lectures, at about three to six weeks into the course in order for students to have perceived an initial idea of how they were coping.

As the response was high, limits were put on the number of students accepted for focus groups, and given the time impost of participation in focus groups or individual interviews, the number of students recruited for this study was capped at 30. This was deemed an acceptable number as the literature on qualitative methods reports sufficient validity and reliability with numbers as low as 20 (Onwuegbuzie & Leech, 2007). The selected 30 participants are representative of students based on the university's demographic profile of first year students.

Participants were offered guidance about how to best use the appropriate student support agencies available to them if requested. Focus group meetings and interviews lasted on average, approximately 28 minutes, with individual interviews lasting approximately 10 minutes. Feedback was provided to participants where requested, with the aggregate

data compiled so that participant anonymity was preserved. Course credit was offered where this option was available, or a \$500 bookshop raffle was offered as incentive. Participation was voluntary and students were able to withdraw at any stage without penalty.

Semi-structured focus groups and individual interviews were conducted, with groups ranging from two to six people ($n = 20$) with myself (the researcher) as a participant/observer. Ten participants were either unable to make it to the focus groups and so elected to comprehensively answer the focus group questions, scan them, then email them to the researcher. Participants' mother's maiden name was collected, in the event that re-contact was necessary, or withdrawal of data was requested. All interviews were audio-recorded on a mobile phone to permit accurate transcription.

Data from the focus group questions were transcribed and all data, including demographics, were entered into SPSS. Transcribed data was analysed and then examined to discover key themes and words, then coded accordingly. After the completion of the perusal, coding, thematic analysis, and further analysis to create a 12-item questionnaire, both stages led to generation of a measure of digital apprehension.

Results

The data was checked for errors using Frequencies (with Minimum and Maximum Dispersion) as well as screened, there were no missing or out of range data. There were a couple of spelling mistakes while entering data, which were corrected. For ease of analysis External and Distance (mode of study) were combined into one External category. An approximate age from year-of-birth was calculated and inserted as a variable. One participant who listed Law/Arts was included in Law for ease of interpretation. Assumptions of normality were performed using descriptive statistics (kurtosis, skewness, histogram curve, scatterplot, and boxplot) with no meaningful violations identified. Outliers were retained as they may contain meaningful information in the current data set.

Results indicated that students' initial reaction to university included being anxious, daunted, excited, frustrated, and confused, with most of the participants (90%) feeling overwhelmed, excited, and/or daunted. For example, one student when asked "*Can you recall your initial reaction to uni when you started?*" answered "My initial reaction was a mixture of excitement and nervousness. The excitement was because I felt that I was beginning a new chapter of my life that would be challenging, productive and would present a challenge to me. I was also excited because of the possibilities to advance my career during and after uni". Another response was "It was a little daunting but exciting because I was finally doing it after considering for some time.", and also "Very overwhelming. I was the first in my family so we had no idea what we were doing".

Challenges (or problems) faced when first starting university included being time-poor, personal issues, financial issues and family issues. For example, one student when asked "*When you first started uni, did you have many challenges in other areas of your life to get through before you could get on with study?*" answered "I was initially worried about my writing because I didn't put much time into English at school. I was moving back to Australia from Thailand but in the meantime I lived in Cambodia, and then there was the process of moving and setting up a new house. I was worried about time". Another answered "Yes, I was working nearly fulltime as well as studying four subjects in my first semester. Combine this with nearly no sleep between working nights and driving to and from university from a distance for classes four times a week and the results speak for themselves at the end. So my time table was probably the most trying of all my issues. Also battling depression and anxiety on and off for the past three years really made motivation an issue and as a result of this I always opted for the easiest way of doing things which not surprisingly is not the best for your results at uni.". Another student noted "I am a single mum and have part time care of my son (12) and almost full time care of my daughter (15). I considered how this was going to affect them as I know that the workload can be a little heavy at times", and another student, "I was starting over as a single mum of a 2, 4 and 8 year old, and separating from my husband of 14 years". When asked about the challenges with the question "*If so, how much did those issues affect your ability to get on with study? And how much did those issues affect how easily you adapted to the use of technology at uni?*" one student replied with "My study was placed on the backburner until our youngest child reached school age. I have tried to keep up with technology; however I was very nervous submitting my first assignment via EASE. I had my husband sit with me while I attached the file to make sure I was sending the correct document. Sounds silly now, but I had worked really hard and did not want to blow it at the last hurdle". Another student noted "The lack of sleep and motivation made me not really want to engage in new technology when I started, however having realised later that I really had to adapt or be left behind I soon got into gear. Simply put, I was just not interested in the way it worked when I started. The technology was not what I was used to and came across very intimidating at times. I mean the use of Microsoft office was good, but the use of SPSS and databases felt like it was beyond me at the time".

When asked to rate their experience of technology at university with the question "Can you rate the level of difficulty you faced at the time, where 1 equals 'it was pretty easy' and 10 equals 'I thought it'd never get sorted out'",

70% answered with a 5 or more. It was determined from being a participant/observer in the focus groups, then listening to the recordings, then reading the transcripts of the recordings that responses of 1-4 were generally positive, whereas responses of 5 or more were generally negative responses. Due to this categorisation it was deemed that answers of 5 or more would represent a negative answer. For example, one student answered “2 – it was easy, I just needed to get used to the layout of the online campus”, and another student responded with “4 – it took me a while to learn to navigate Uconnect” implying a positive, but leaning towards the negative. Another student answered “I’d say a 10, I thought I wasn’t going to get it, I thought I might as well drop out now, why am I doing this?” “10, I really did think I would never get it and had lost hope at times about catching on to the use of technology. I found myself looking for ways around its use instead of asking for help.” Some students rated higher than 10, for example “12. It’s affecting my performance because then you watch it and then you go into the labs and try to do it and you’ve been watching with no instructions”.

Further analyses revealed that while some students were not concerned with using the technology, most of the participants were confused with the technology encountered. For example when students were asked “*What were your initial reactions to using the technology associated with the uni and your program/courses*” one student answered with “I was not concerned. I spent some time prior to the beginning of the Tertiary Preparation Program (TPP) program I participated in on the study desk finding my way around”, and another “Very good and compatible. Of course they are hard systems and some of the lectures and tutors struggled a bit but the whole concept is very smart”. However, the general consensus was, “Slightly apprehensive, a bit overwhelmed by all the different things to navigate through, and frustrated. If I was already stressed about getting a particular assignment done and it has to work because this feels like it’s my last resort to get a decent job and that kind of thing and then I can’t find this thing on study desk, oh where is it, it just adds to it and it gets worse.” Some found it more stressful than others and noted “Daunting, I found the use of some technology very exhausting and frustrating, not only because of it been new but because it was such a huge component of some of my subjects and assessments”. Another students answered “I was confused by the layout of the university site, and the study desk. Each course is laid out differently and key components such as study schedules were in different places and called different things. For example, I didn’t find the ‘modules’ for one course for several weeks. This was the actual written component which the lectures and tutorials were based on, so I was very confused. I was engaging with the course extensively but there was so much information I didn’t know what I’d read where”.

Another question asked was “*What would have helped you with your use of technology when you started uni*” the overall response was to attend a workshop or classes to help them understand the technology. Other things that were common were, a better layout, with less options, more organised, as well as the right computer software and hardware. The overall results showed that at least two-thirds of participants (68%) felt apprehension, overwhelmed, and/or frustrated while using the technology associated with the university site and course homepages.

Discussion

This project aimed to discover whether there was any support for the notional concept of digital apprehension and, if it did, to create an instrument to measure the construct. The study’s aims were supported, in that students who reported experiencing digital apprehension were more likely to also have a negative experience at university. The study was conducted to enable an instrument to be created that would measure digital apprehension if it was found to be present in first year higher education students. Results suggest that, considering the technology used by the university, some students were negatively affected by apprehension, and they felt frustration, and even overwhelmed to the point of finding ways around using the digital tools (non-compliance). Another important thing to note is that navigating the university webpages often took a lot of time, and that time was one of their biggest challenges in completing their study. The presence of digital apprehension in this small focus group sample highlights the need for continuing investigation in this area. The next stage of study will investigate the prevalence of digital apprehension, in conjunction with students’ problem-solving appraisal and their expected transition to higher education.

Outcomes and Significance

Universities and other higher education institutions, understand the importance of enabling students and empowering them with relevant digital tools. It is now commonly accepted that the ability to operate and navigate computers and digital tools is essential in higher education (Burton, et al., 2013; James, et al., 2010; Kennedy & Fox, 2013). Factors that generate obstacles and disruption to quality experiences in the first-year experience need further observation and research and, given the diversity of student populations, such research should also include experiences of digital tools.

This project uncovered support for a new concept, digital apprehension, in order to name and raise understanding about why some students have difficulty during their first year of university, despite the digital tools available to them.

The utility of digital tools to support learning is often underpinned by students' desire to interact with these tools. However, as the experience is not equal for all, this project uncovered relevant factors that trigger students to turn away in frustration, and to fail in their use of the tools available to them. This research gathered important information to enable the creation of a new tool enabling recognition of struggling students, for universities to support students during their first year, while giving a more precise understanding of how digital tools can help – and hinder – students in their quest for success.

This research has utility for not only the higher education sector, but also the business sector, and any area that uses technology. Organisations and industry will benefit, perhaps using the instrument for induction screening, change-over maintenance, retention or engagement management, or simply supporting struggling employees. This tool has the ability to reveal areas where people are limited because of the apprehension they experience in their engagement with digital tools. The project aims to contribute to the current body of literature by opening an area with potential for further research, especially considering the number of new digital tools now available and still emerging, not only in the educational sector, but also the workplace or corporate sector—anywhere that employs technology.

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