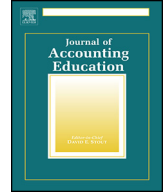




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Contents lists available at ScienceDirect

J. of Acc. Ed.

journal homepage: www.elsevier.com/locate/jaccedu

Main article

Innovators or inhibitors? Accounting faculty resistance to new educational technologies in higher education

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ARTICLE INFO

Article history:

Received 21 August 2015

Revised 20 March 2016

Accepted 21 March 2016

Available online

Keywords:

Technology acceptance model

Technology adoption

Higher education

Faculty resistance

Barriers to technology use

Accounting education

ABSTRACT

While technology affords new opportunities and benefits for educators in their teaching practice, a significant number of faculty are resistant to adopting new technologies. Unprompted, 93% of faculty interviewed in the Australian study to be discussed in this paper pointed to accounting educator resistance as a key barrier to technology adoption and use. Adopting the Technology Acceptance Model (TAM) as a framework, this paper argues that one of the greatest challenges facing business schools and Higher Education Institutions (HEIs) in the 21st century is not new technologies themselves, but the ability of educators to embrace educational technologies. Drawing on the qualitative data to emerge from interviews with accounting educators recognised as exemplary in their use of innovative technologies, this paper explores the reasons for lack of faculty uptake and argues for academics to become innovators rather than inhibitors. The findings offer a timely insight into a twenty-first century issue affecting HEIs and, specifically, accounting academics. While carried out in the Accounting discipline, the findings may be relatable and applicable to all disciplines. A suite of recommendations are proposed for institutions, business schools and academics to consider.

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<http://dx.doi.org/10.1016/j.jaccedu.2016.03.003>

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1. Introduction

Since the 1980s, research into higher education has explored the digital shift taking place in universities around the world (CarringtonCrisp, 2014; Ernst & Young, 2013; Kinzie, Delcourt, & Powers, 1994; Tynan, Ryan, Hinton, & Lamont Mills, 2012; NMC, 2014). Countless reports are emerging from all corners of the globe suggesting that if institutions wish to remain competitive and relevant in the twenty-first century, they will need to embrace the opportunities afforded by technology, particularly in relation to teaching and learning practices (Edmunds, Thorpe, & Conole, 2012). Higher education has been seen as slow, by some, to embrace the opportunities for innovation and transformation that technology affords, with change tending to occur on the fringe, often steered by individual champions (Broad, Matthews, & McDonald, 2004).

In a higher education environment where technological innovation is having a transformational impact on teaching and learning, the increased technological literacy among faculty is of central importance (Mayberry et al., 2012; Zarei, Kheiri, & Yazdgerdi, 2014). In the last decade, academics have been encouraged to implement new and innovative technologies in their classrooms and curricula (Barnes, Marateo, & Ferris, 2007; Kennedy et al., 2008; Kennedy, Judd, Churchward, Gray, & Krause, 2008), and more studies are emerging which stress the “sound educational reasons” (Kennedy et al., 2008, p. 490) for integrating these new technologies into teaching and learning activities (Holtzblatt & Tschakert, 2011; McLoughlin & Lee, 2008).

Despite sound reasons, many faculty are found to be resistant to adopting new technologies in their teaching practice (Blin & Munro, 2008; Keller, 2005; Kirkup & Kirkwood, 2005; Selwyn, 2007; Senik & Broad, 2011; Zarei et al., 2014). Writing about the Accounting discipline specifically, Albrecht and Sack (2000) explain that while technology has and will continue to radically change the way that information is provided and used in higher education, “many educators have still not caught the vision of what this means” (p. 57). Hodgson (2005, p. 200) similarly contends, “Despite the growing importance of integrating learning technologies into higher education, the speed of learning for many academic teachers has not kept up with the pace of change. Resistance is still being experienced.” Although most higher education institutions now employ faculty dedicated to the support of eLearning, Blin and Munro (2008), among others (Keller, 2005; Kirkup & Kirkwood, 2005; Marshall, 2010; Selwyn, 2007), posit that the impact of technology on teaching practice remains limited. Of course, this is not to suggest that there are not those educators readily embracing new technologies into their teaching practice (Bain & McNaught, 2006); just that the numbers of these faculty are limited, particularly in certain disciplines, for example, Accounting (Roberts, Kelley, & Medlin, 2007; Senik & Broad, 2011; Zarei et al., 2014). Dreher, Reiners, and Dreher (2011) refer to the situation as a ‘sub-optimal utilisation’ of new technologies by faculty. Expressing a popular view, Russell (2009) purports that the inadequate changes to teaching practices have surprised and disappointed many (also see Harvey & Beards, 2004; Oliver, 2005).

Drawing on the findings from a recent Australian study (Watty, McKay, & Ngo, 2014), this paper stresses the need for business schools and accounting faculty to embrace the opportunity to harness new and emerging technologies that provide a tailored, anywhere, anytime experience for students. It argues that educators need to reimagine how curricula (and especially assessment) are designed and focus on how students – those often referred to as ‘digital natives’ – may be better engaged. While some educators are using technology to enhance their ability to do this, the literature suggests it is a minority, and at the margins (Chang, 2007; Roberts et al., 2007; Zarei et al., 2014), and the exemplar accounting academics interviewed in our study overwhelmingly supported this view.

The need to harness digital technologies in accounting education is bolstered by the fact that graduates emerging from business schools in the 21st century are entering technology-rich workplaces. Employers are reportedly demanding that graduates have the digital literacy skills to equip them to operate successfully in workplaces (Leong & Kavanagh, 2013; Watty et al., 2015). There is thus a responsibility on behalf of institutions and educators to ensure students experience this technology-rich world before graduating and entering the workforce. Furthermore, the literature testifies to the overwhelming benefits of technology in teaching and learning; benefits which cannot be overlooked (Barnes et al., 2007; Doherty, 2005; Johnson et al., 2013; Lundin, Lymer, Holmquist, & Brown, 2010; Rodley, 2005; Selwyn & Husen, 2010). The benefits of digital technologies have been identified as:

student engagement, greater efficiency for both faculty and students, creating work ready graduates and helping students grasp complex concepts. The ability to personalise learning through technology are also seen as critical to teaching and assessment (see [Watty et al., 2014](#)). Another benefit is the accessibility and inclusivity of technology. Traditional modes of learning have worked for millions, yet it has also marginalised those who did not fit the profile of a traditional university student. There is thus an increasing number of lives that could be changed by access to education.

2. Literature overview

The question to arise for educators in the face of the digital turn is whether academics are responsible for driving change and innovation using technology, or are they the inhibitors? Despite the digital turn, many faculty remain wedded to traditional teaching methods and approaches ([Blin & Munro, 2008](#); [Conole, 2004](#); [Keller, 2005](#); [Kirkup & Kirkwood, 2005](#); [Selwyn, 2007](#)). Exploring the issue in higher education, [Van Dusen \(1997\)](#) found that “instructors have largely ignored this mandate for change and continue to employ the lecture mode as the predominant method of instruction” (p. 2) (also see [Prensky, 2001a, 2001b, 2007](#)). According to [Prensky \(2001a\)](#), lecturers in higher education tend to be ‘digital immigrants’ and there is reason to be concerned at the “apparent lack of technological literacy among educators” (p. 109). More recently, ([Lewis, Fretwell, Ryan, and Parham, 2013](#), pp. 21–22) suggest:

Given the intensity of use of technology by students and the potential gap in technical expertise between students and professors, an even greater move toward interactive learning is needed in the higher education classroom in order to engage this techno-savvy generation in the instruction-learning process.

More recent studies, do however, counter [Prensky’s \(2001a\)](#) argument, finding that the alleged ‘digital divide between students and faculty is not nearly as significant as suggested by some ([Kennedy et al., 2008](#)). Indeed, in their research to investigate differences between faculty and students’ use of technology in higher education, [Kennedy, Dalgarno, Bennett, Judd, Gray & Chang, 2008](#), found limited differences between student and faculty use of Web 2.0 technologies on the basis of age. In considering [Prensky’s \(2001a\)](#) claims, [Kennedy, Dalgarno, Bennett, Judd, Gray & Chang, 2008](#) find that there is “very little empirical evidence of generational differences with which to test these claims” (p. 485). They ultimately conclude that “age may be a poor predictor...of important types of technology-related experience” and further, that it is “entirely possible that lecturers might be more frequent and adept users of some technologies than their students” ([Kennedy et al., 2008](#), p. 485). [Schneckenberg \(2009\)](#) provides a particularly insightful commentary on the important role academics play:

Academic staff play a key role in the underdeveloped state of eLearning in higher education...Academic staff are nowadays facing new pedagogical challenges; they have to design learning environments which respond to the changing needs of technology-savvy students; and they have to integrate ICT into their courses to extend the flexibility of educational services in universities. But does faculty have the competences to respond to these challenges? (p.413)

[Prensky \(2001a\)](#), among others ([Doherty, 2005](#); [Rodley, 2005](#)), claims that educators “need to adjust their pedagogical models to suit the new kind of learner they are encountering in this new generation of students” (p. 109). While many educators are embracing the opportunity to enhance teaching and learning through technology, others remain less willing ([Blin & Munro, 2008](#); [Conole, 2004](#); [Keller, 2005](#); [Kirkup & Kirkwood, 2005](#); [Paver, Walker, & Hung, 2014](#); [Selwyn, 2007](#)). [Hauptman \(2015, p. 3\)](#) explored the views of 28 faculty members in the US and found “that faculty perceive mobile technology as potentially useful but are unsure of how to implement it, want to see empirical results of efficacy, don’t have the time to invest in adoption, and lack access to expert advice and devices.”

The accounting discipline has been particularly slow to embrace technology ([Roberts et al., 2007](#); [Zarei et al., 2014](#)). Despite increased efforts to strengthen the use of digital technologies in accounting education to enhance teaching and learning (T&L) ([Broad et al., 2004](#); [Collier, Kaye, Spaul, & Williams, 1990](#); [Larres, Ballantine, & Whittington, 2003](#); [Larres & Radcliffe, 2000](#); [Marriott, 1992](#); [Marriott, Selwyn, & Marriott, 1999](#); [Sangster, 1992, 1995a, 1995b](#); [Sangster & Mulligan, 1997](#); [Salleh, 2000](#); [The Pathways](#)

Commission, 2015), the adoption of technology in accounting education remains limited (Ahmed, 2003; Albrecht & Sack, 2000; Chang & Hwang, 2003; Jones & Abraham, 2007; Lin, Xiong, & Liu, 2005; Senik & Broad, 2011; Zarei et al., 2014).

Prior research points to a range of issues and factors affecting the adoption of technology in education (Becta, 2004; Cox, 2003; Mumtaz, 2000; Senik & Broad, 2011; Teo, 2010; Zarei et al., 2014). Extensively canvassing these factors in accounting, Senik and Broad (2011) identify the following as the key barriers to technology adoption: resistance to innovation; demands on faculty time; lack of interest; unacceptable learning methods to students; preference for traditional teaching methods; limited knowledge of technology; reluctance to change teaching approach; age-profile (that is, soon-to-retire academics reluctant to change); lack of resources; problems with technology itself (for example, accessibility issues); lack of technical support (also see Aisbitt & Sangster, 2005; Gazely & Pybus, 1997); lack of institutional support; and, a culture of change resistance. Others have also identified a failure to see the desirability of technology and unwillingness to experiment (Sangster, 1992) as key factors in lack of adoption. Roberts et al. (2007) posit that there are three overarching factors influencing faculty uptake. These include social factors (for example, peers' attitudes and behaviours, friendship networks), organisational factors (for example, administration/infrastructure provided by the institution), and individual factors (that is, learning of new skills, achieving personal goals).

The study to now be discussed builds on the prior research, and points to a range of reasons why accounting educators are resistant to technology uptake and use. Canvassing the views of accounting academics recognised as exemplars of innovation and technology adoption was a deliberate attempt to garner insight from those individual champions who are driving innovation and educational technology in accounting education in Australia.

3. The study

The Australian study reported here focuses on improving teaching and assessment practice through the use of digital technologies. Funded by CPA Australia, it aims to effect innovation and excellence in teaching practice in accounting education. This study comes at a timely juncture for two key reasons. First, the need for accounting educators to innovate and embrace new digital technologies is ever pressing. And second, accounting education is said to be lagging in terms of the adoption of digital technologies compared to other disciplines (Watty et al., 2014).

3.1. Theoretical framework

The technology acceptance model (TAM) theoretical framework developed by Davis (1986, 1989) is adopted for this study and proposes a way to predict technology usage (see Fig. 1).

For the most part, studies which draw on the TAM model as a theoretical lens, tend to measure usage through intention to use rather than actual usage (Turner, Kitchenham, Brereton, Charters, & Budgen, 2010). Underpinning this theory is the premise that "technology acceptance and use can be

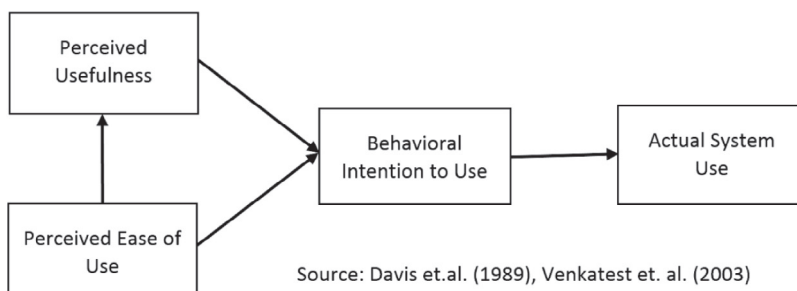


Fig. 1. Davis (1989) technology acceptance model.

explained in terms of a user's internal beliefs, attitudes and intentions" (Turner et al., 2010, p. 464). The key variables relating to the TAM relate to: perceived ease of use, perceived usefulness, attitude towards use and intention to use. Despite many reconfigurations over the years (Adamson & Shine, 2003; Amoako-Gyampah & Salam, 2004; Dishaw & Strong, 1999), the fundamentals of the model remain unchanged (Turner et al., 2010) and, with few exceptions (Legris, Ingham, & Collette, 2003; Turner et al., 2010), it is largely seen as a valid way to evaluate technology usage (Horton, Buck, Waterson, & Clegg, 2001).

Prior research suggests that technology use and adoption in higher education is foremost dependent on the support by and attitude of educators involved (Teo, 2011). Moreover, teacher attitudes to technology are said to affect use of technology in education (Shapka & Ferrari, 2003; Yushau, 2006). They also have been found to impact student views of technology (Teo, 2010, 2011) and difficulties in the use of technology (Demetriadis et al., 2003). Adoption and successful use of technology have not surprisingly been found to be dependent on teacher attitudes and use of technology (Teo, 2011).

3.2. Data collection and analysis

We sent emails to Accounting Heads of School (HoS) in all 39 Australian HEIs asking them to nominate accounting academics who they knew to be exemplary in their use of digital technologies. From this, we secured an interview list of 13 business academic names across 10 universities including two Go8 institutions¹ and four Australian Technology Network (ATN)² institutions. Interviewees included two heads of school, one director of teaching, one director of accreditation, four senior lecturers, three lecturers and two T&L fellows, and all are involved in both teaching and research activities.

Using a semi-structured schedule of interview questions (see Appendix A), in-depth interviews were conducted with each accounting academic. Interviews were transcribed and analysed using a qualitative computer software package, NVivo 10, which is appropriate for qualitative researchers where deep levels of analysis of text-based data are required. One researcher carried out the NVivo analysis, developing and identifying themes and categories. All data were recursively reviewed and audited by the senior researcher on the team. The following section presents the findings to emerge from this analysis, as well as the key recommendations for technology adoption in accounting education.

4. Findings

Interviews with the 13 academics revealed that a range of digital educational technologies and accounting-specific technologies to enhance student learning were available for faculty and students. We developed a media rich interactive resource (iResource) as part of this project, and it features six of the thirteen exemplars and their use of educational technologies for enhanced student learning. Further, the iResource provides additional resources to support faculty who are interested in learning more about the technologies presented for implementation. The iResource is freely and publicly available on the web for download and use: <http://tinyurl.com/j752fun>.

The documented types of new technologies (detailed in the iResource) include:

1. *Intelligent Tutoring System* – the Intelligent Cash Flow system (iCFS) is a computerised system that enables students to apply theory of cash flow statement and decision making based on international accounting standards to profile student work by providing varying degrees of assistance and personalised feedback and progress to the individual learner.
2. *Social media technologies* – used for connecting, communicating and collaborating to effectively deliver content, engage with students and ensure the latest news in the discipline are at the fingertips of students using digital mediums that they are familiar with.

¹ The Go8 represent a coalition of 8 research-intensive Australian universities. The Go8 universities are some of the largest, oldest and most respected universities in Australia.

² The ATN is made up of 5 of Australia's most innovative and enterprising universities.

3. *Click technology* – used for engaging students in active learning. Clicker technology is used for polling students and incorporating a screen capture (technology such as Jing) task assignment designed to engage students in active learning.
4. *Video learning resources and social media* – ensuring open access for all. This innovative use of different types of videos are embedded as part of curriculum design. This is important for students limited by their geographic location who cannot attend classes in-person, and where any language barriers exist. A range of technologies to create video learning resources include digital video cameras, portable hand held digital audio recorders, interactive pen and digital drawing mouse pad (Wacom) and software such as CamStudio and SmoothDraw for video and annotation production, and YouTube for wider, open access dissemination on video sharing platforms.
5. *Flipped classroom technologies* – used an integrated and embedded approach to digital technologies which aid in the change from a traditional lecture classroom approach of transmitting one way knowledge transfer to a more dynamic, interactive and collaborative ‘flipped’ classroom approach to the course delivery. Technologies used to support the flipped approach included podcast (to build a step by step visual and narrated concept maps) eReadings and Google Drive to capture student group discussions, providing students with their own space to collaborate in real time.
6. *Instant web response tool* – used to foster critical thinking and reflection to enhance student learning. A web-based student classroom response system tool (GoSoapBox.com) to engage students in active learning.

Table 1 summarises the range of digital technologies organised by educational technologies and accounting-specific technologies. These digital technologies have been adapted from [Watty et al. \(2014\)](#).

While the exemplars interviewed in our study, and featured in our iResource, were keen to embrace these new technologies, in-depth interviews with these faculty members revealed that they were largely operating as individual champions facing notable resistance from other faculty towards new technologies in teaching and learning. The key findings to emerge from these interviews are detailed below.

Table 1

Software available for educational and accounting-specific technologies.

Educational technologies software	Accounting-specific technologies software
<i>Learning management systems</i> , e.g. Moodle, Blackboard, Brightspace, Sakai, Wordpress	<i>Learning management systems</i> (Pearson MyAccountingLab Online Homework systems)
<i>Social Media and Collaborative Technologies</i> , e.g. blogs, Wikis, Twitter, Facebook, YouTube, Scoop.it, LinkedIn, Google Drive, One Drive, Dropbox, BaseCamp, Wiggio, VoiceThread	<i>Simulated learning systems</i> – Institutional customised development, i.e. SCAM, FINESSE, iCFS, Net Present Value and The Normalised Game)
<i>Curating, evidencing and showcasing learning and professional capabilities</i> , e.g. e-portfolios including LinkedIn, Institutional LMS, PebblePad, Mahara, Wordpress, Wix, Weebly	Australian Taxation Office (ATO) eTax https://www.ato.gov.au/
<i>Communication</i> , e.g. asynchronous – online discussion boards and email; synchronous – Skype/Skype for Business, Blackboard Collaborate, Google hangout, Adobe connect	Microsoft® Office 365™, i.e. Access, Excel and Word https://products.office.com
<i>Mobile Apps</i> , i.e. iOS and Android, e.g. Doceri, iMovie, Magisto, Viddy, Splice)	MYOB™ http://myob.com.au/
<i>Assessment and evaluation</i> , e.g. online quiz, test and exams; online/paperless assignment submission; Self/peer review (SparkPLUS, REVIEW, PRAZE, CatMe, CBR); Web-based polling, i.e. polleverywhere.com , mInteract, GoSoapbox.com , socrative.com	Intuit QuickBooks http://www.intuit.com.au/
<i>Presentation and learning resource creation tools</i> , e.g. Articulate Storyline, Adobe Creative suite, Adobe Presenter, Adobe Captivate, SmoothDraw 3, Screen Capture (Camtasia, Camstudio, Jing), HandBrake, AudioByte, Voice Recognition, Prezi, eMaze, Piktochart	SAS® Enterprise Guide® http://support.sas.com/software/products/guide/
<i>Learning objects/resources</i> , e.g. e-books, narrated PowerPoint lecture slides, Podcasts (audio and video), recorded classroom video lectures, instructional videos, short welcome, introductory and concept videos, annotated video drawings	Internet Evidence Finder® (IEF®) https://www.magnetforensics.com/magnet-ief/

4.1. Faculty resistance as a key barrier

The study focuses on innovative digital technologies and how they are being used to enhance student learning outcomes. Interestingly, unprompted, 92% of interviewees (12/13) brought up the issue of accounting educator resistance to technology use in T&L, and the following section presents the key qualitative data.

Echoing prior research (Senik & Broad, 2011), respondents identified faculty uptake and resistance as the greatest barriers hampering technology-enhanced teaching and learning in accounting education. Respondents were categorical in their views³:

Staff engagement, other staff engagement, that's the biggest barrier. [RS_002]

I still think it's a lot of pushing up hill. [RS_006]

I encounter more resistance from staff that I ever do in terms of embracing the technology. [RS_008]

Respondents pointed to an overall negativity and resistance to change amongst accounting academics:

I think sometimes my work colleagues are too negative. Whenever they see new approaches instead of seeing the possibilities they always see the limitations. [Perhaps]...it's the training in accounting. [RS_003]

Others were critical of the outdated approaches adhered to by some of their colleagues:

I've got colleagues in my department who are absolute luddites who have trouble finding the on off switch. [RS_004]

I've got some colleagues who are still back in a talk and chalk type mentality. [RS_004]

These statements point to a potential lack of knowledge or perhaps simply a preference for older teaching approaches, and this finding is supported in the extant research (see Roberts et al., 2007).

4.2. Individual champions pushing uphill

Individual champions are purportedly driving the technological innovation and transformation in higher education and our study substantiates this view. The majority of participants spoke about being the pioneers of innovation, some in the face of intense resistance:

I've been the pioneer. I was the one who went over to Information Technology and went "Here it is and this is what's available". [RS_001]

I got crucified...for what I was doing, and that was quite demotivating. [RS_002]

Respondents were vocal on the difficulty of being early adopters trying to garner interest and uptake in new educational technologies. While some indicated the need to keep pushing, one respondent cautioned against applying 'pressure in any way' or 'pushing' other staff members into embracing new technologies given that it 'is not something we're all comfortable with' [RS_001].

It's been slow to be picked up in other areas and I haven't pushed it ... I'm not sure that it is a technology that everyone wants to use. [RS_001]

Other respondents spoke about their efforts to bring other academics 'on board' new technologies and 'educate staff':

.. it's about maintaining transparency. So I try and [SIC] get sessions to staff, "This is what I'm doing, this is how it's working, this is what's not working, etcetera," to try and bring people on board. [RS_002]

So that's how we've tended to work. We don't get everybody doing it straight away. We get people who are more used to teaching with technology I suppose and then they run it and then we

³ Respondent information was transcribed exactly as provided.

get the learning design people to help us farm it out to others...who perhaps aren't as familiar with technology. [RS_005]

These comments point to seminars and workshops as a potential way to inspire resistant academics to embrace the new. They also point to innovation in accounting education as indeed being driven by individual champions.

4.3. Comfortability and generational attitudes

Another issue raised by respondents was that of comfortability. Many suggested that lack of technology uptake was an issue of faculty being 'uncomfortable' and not fully understanding its potential:

.. some students just love learning technologies and are good at it, others really struggle and...I find that even within the staff. Some people find it very easy to teach and use technologies, others just don't want to adopt it at all.

Colleagues were always concerned that this would allow them to get out their phone and get onto Facebook or whatever and so on. [RS_001]

Another respondent raised the issue of the fear that some faculty have of technology and trying something new:

Some are scared. Some are scared to engage in technology. The others like to do things the way they have been doing for the past number of years. Because there are risks involved with doing new things...So those are the risks that sometimes people don't like to take. [RS-013]

This statement echoes the findings of Roberts et al. (2007) in relation to the fear surrounding new technology uptake. In their extensive study, Roberts et al. (2007) pointed to a range of associated fears including: fear of change, fear of time commitment, fear of appearing incompetent, fear of failure, and fear of the need to backward in order to move forward.

Within the literature there is a discussion surrounding whether technology is more comfortable for those of a certain age; that is, the digital natives versus digital immigrants debate. Some of our respondents countered this view:

It's not necessarily age or anything...They either feel comfortable with technology or they don't. And if they don't feel comfortable with it they struggle to relay that comfort. You've got to feel comfortable if you're going to get the students to feel comfortable. [RS_005]

Others did, however, attribute the lack of uptake to age. One academic, for example, spoke about using Facebook and tweeting students interesting articles from the online news, maintaining:

So I read the paper online, and anything that I think students should know about, it's really easy and quick to press the button to share it, tweet it and it's out there. So I suppose it's more that I was taking how I live my own life on Facebook and all that sort of thing, and then just innovating that into the classroom, and that doesn't work for everybody. So our postgraduate coordinator is closer to retirement age, he still reads a physical paper. [RS_006]

Others similarly pointed to the "aging" academic population [RS_007] and stated:

...there's been more technology used by our more junior staff, they definitely have a greater enthusiasm for it. [RS_006]

I know that from having spoken at a few of the faculty teaching learning with emerging technologies seminars, a lot of people, when I demonstrate to them about how we use Twitter and link it to Blackboard, and link it to Facebook, a lot of people went, oh...I really don't want to be on Facebook. [RS_006]

...you've got staff that have been there for a while and say, "Look, I don't really want to have to learn this or learn something different," which is fair enough. I completely understand where they're coming from and it is trial and error. [RS_007]

Respondents alluded to the digital native/digital immigrant divide, with one astutely commenting:

...students [are] becom[ing] more technologically savvy... than a lot of staff members. I don't know if we can ignore that. [RS_006]

4.4. Faculty capacity and support

The exemplars in our study also alluded to the lack of faculty capacity, training and support as fundamental barriers to adoption of technology. Others raised the issue of faculty capacity in relation to technology use:

I worry about the skill level in the use of technology, so I think a major challenge is professional development of other staff members...I've had to try and encourage people to use technology and it's very difficult. If you're not like me, an early adopter, there is no way that you're going to get people, unless there's a big professional development impetus, to become technology savvy, and so that's a concern of mine. I'm just reflecting on the people that work with me in this particular unit, I get a lot of resistance; a lot of resistance. [RS_009]

One attributed the lack of faculty uptake to resource issues:

It's...actually being...passionate enough to put your time and effort into it...there's [SIC] always resource issues and that is the major challenge. [RS_010]

There was also an allusion to a distrust that faculty had of the "latest fads" while others attributed the lack of uptake to simple laziness, claiming that many are simply "not interested in doing anything out of what they're already doing. I guess they're pretty lazy sometimes...There are people who do a lot of work. But some are just downright lazy" [RS_013]. On a more positive note about faculty capacity, one accounting educator said, "I think a little bit of support goes a long way and it's often just a bit of hand holding at the beginning and then they're off and running" [RS_008]. One respondent stated: "...there is no way that you're going to get people unless there's a big professional development impetus to become technology savvy" [RS_010]. Another pointed to the need for a whole-of-team approach to capacity building in order to ensure sustainability:

..the next systemic problem is that not only is [SIC] there not good rewards but we often also don't have good systems and policies in place to give people support to do stuff in teams, so the whole team can learn rather than that one innovator who moves on and the whole innovation moves – dies. [RS_012]

4.5. Time/workload

Our study finds that the single most important factor recognised by all respondents as inhibiting technology adoption, is time. Asking already busy and overloaded academics to learn about new technology, build capacity and competence and adopt these technologies in their teaching practice was not surprisingly found to meet with resistance. Respondents felt that faculty resistance was strong due to workload issues and the time required to innovate and learn new technologies. One interviewee claimed it was "really onerous, time consuming" [RS_008]. Another stated:

I think it does take a lot of development time getting these things right. Initially a five minute video would take me five hours from start to finish. [RS_007]

I just constantly hear, "I don't have time," and I think maybe financial resources aren't necessarily what's required, at least at the department level, or at least to transition those financial resources into time. As in, let staff go for a semester and their whole sole responsibility in teaching is to redesign a course, rather than physically teach the course. [RS_002]

Respondents suggested that workload models do not support those academics who wish to innovate in their teaching:

It then drills into a bigger question of workload because...the workload models don't necessarily support innovation in that area. I think...the benefits are more likely from the research side of things. That's where I'll spend my time." So I think there's [SIC] incentive structures which push away from that. [RS_007]

..working long hours and doing it all above load and...for no pay. [RS_010]

..academics are totally peeved off with the lack of rewards for teaching, and teaching innovation, that they're unlikely to take the risks with all this because it takes time ... and so they get turned off even trialling something. [RS_012]

If you do good teaching and the department gets good results everybody shares in that glory whereas if you go and write a research paper that gets an A star, you get it. Your name is on that paper. [RS_012]

Another issue raised was that of teaching versus research, and the lack of recognition and credit that faculty receive regardless of the effort they put into innovative technologies in their teaching practice.

...there was some opposition to some extent because they were saying "Where are our teaching credits if we were [SIC] to prepare this podcast and all that?" [RS_003]

..a number of colleagues were concerned that this was another administrative thing that they'd be required to do. [RS_001]

The big one for me is sometimes the overwhelming amount of data that I get from it and the amount of time it takes me to go back and figure out what data is meaningful and useful for me to tailor my lectures to. [RS_011]

5. Discussion and recommendations

Prior research reports a variety of reasons for the lack of faculty uptake of technology in higher education, and in specific disciplines like Accounting, where adoption of educative technologies is said to be slow. These factors range from workload, time, lack of interest, support, resources, to preference for traditional teaching methods. Our study finds that the single most important factor recognised by all respondents as inhibiting technology adoption is time. Asking already busy and overloaded academics to learn about new technology, build capacity and competence and adopt these technologies in their teaching practice, not surprisingly meets with resistance. Technology adoption is certainly exciting and comfortable for many; but others do not share these experiences or feelings. The challenge as we see it, is to create greater awareness of the benefits of technology, the types of technology and the specific ways it can enhance T&L. However, this must be done with the understanding of the context in which many academics are operating. They are often busy, time-poor, lacking support and not surprisingly resistant to change.

Given the lack of uptake by faculty identified by interviewees in our study, clear themes surrounding faculty reluctance and resistance to adopt new technologies have emerged. They relate to faculty resistance as a key barrier; individual champions pushing uphill; comfortability and generational attitudes; faculty capacity and support; and, time/workload. The Technology Acceptance Model (TAM) provides a particularly useful lens through which to view these findings. If use of technology is dependent on *perceived ease of use* and *perceived usefulness* as suggested by Davis (1986, 1989), then it is not surprising many academics appear disinclined to innovate or adopt technology in their practice. To change this, we need to foster greater understanding of the technologies available to academics and develop their capacity in using these technologies to ensure the perceived ease of use is suitable. Further, more information needs to be provided to faculty so that they understand the usefulness, potential and benefits of technology and its role in enhancing T&L.

Creating innovators from inhibitors requires that the appropriate implementation processes, support and procedures are in place. Based on the Davis model, it is hypothesised that with the appropriate processes and conditions in place to positively affect perceived ease of use and perceived usefulness, the overall usage of technology will be improved. To create these processes, we provide the following suite of recommendations to emerge from our national study (see Watty et al., 2014).

5.1. Key recommendations

- **Garner interest.** Our findings indicate that many faculty lack interest in technology and innovation through technology. According to [Senik and Broad \(2011\)](#), this relates to a “lack of personal interest among the academic staff in changing their teaching approaches, including using IT” (p. 107). We argue that using educational technologies to enhance student learning in business education is no longer an optional extra in curriculum design. Our business graduates enter an environment where technology is ubiquitous and is the platform for lifelong learning. This is the nature of discussions that are necessary if faculty, who are hesitant to engage with educational technologies, show no interest. Conversations that may be difficult and challenging, are a necessary precursor to raising awareness and understanding. Garnering interest requires that seminars, workshops, disseminating activities are regularly held to inform faculty of the possibilities and potential of technology-enhanced learning. These activities may include: ‘speed-dating with digital technologies’ that provides an introduction to various digital technologies; forums inviting internal and external speakers on a range of digital technologies topics; and, regular newsletters highlighting new and emerging technologies with practical case studies of current practice.
- **Raising awareness/understanding.** Studies have indicated faculty have a lack of knowledge about which skills they need to develop and which technologies best suit their T&L needs ([Senik & Broad, 2011](#)). They have also suggested that faculty do not know where to go to access more information about the technologies available to them. As a result of this lack of understanding and knowledge, many faculty do not understand how technology can enhance T&L. As evidenced in our study, those who are unfamiliar with technology and lack understanding are less likely to adopt it in their teaching practice. Academics need to be informed about the range of options available to them and the overall benefits, as well as shown examples of how new technologies can address specific T&L needs (see [Kennedy et al., 2008](#)). Establishing a community of practice (learning circles) where there are experienced innovators, early adopters who share their experiences with rotating topics of mutual interest, may prove beneficial.
- **Build capacity.** Prior research suggests that faculty do not have the competencies required to utilise new technologies ([Schneckenberg, 2009, 2010](#)), and this was supported in our study. Without the capacity, faculty are often uncomfortable using technology ([Roberts et al., 2007; Senik & Broad, 2011](#)). Encouraging innovation requires that competency and capacity be built to ensure faculty are comfortable and empowered to embrace technology. Faculty need to be provided with formal technical training ([Salmon, 2004](#)), as well as involved in workshops and seminars where new technologies are actually demonstrated. Building faculty capacity also requires resources to ensure success. There is a financial cost involved that must be recognised and acknowledged.
- **Provide appropriate support.** Many faculty are disinclined to adopt technology because they lack either institutional or technical support. Research shows that faculty need to be supported every step of the way in their engagement with new technologies. In a study that looked at faculty development, [Lefoe, Olney, Wright, and Herrington \(2009\)](#) found ‘corridor conversations’ and ‘at elbow’ support were invaluable in the early stages of adopting and learning new technologies (also see [Sorcinelli, Gray, & Birch, 2011](#)). The appropriate support mechanisms must be in place to ensure faculty have recourse to support at all times when new to adopt technology or adopting new technologies. Support should be aimed at providing faculty with greater confidence and capability in creating and using digital technologies for learning. A team of locally situated and dedicated support faculty could provide support reassurance for academics considering new technologies for the first time. Local T&L support teams have the benefit of their networks across cross-faculty groups, and cross-educational institutions to draw upon. Further, a local T&L support team can provide the added benefit of providing support where and when academics require it by providing just-in-time, in-person, phone, email and real-time virtual support to help troubleshoot a range of queries.
- **Resources – time and funding.** One of the key factors influencing faculty adoption of technology is resources. Faculty often have to divide their time up across a range of tasks, including research, teaching and administration. [Lefoe et al. \(2009\)](#) explain, “teachers indicate they are overwhelmed by heavy workloads and administrative requirements leaving them little time to engage with new technologies, let alone spend time planning for their integration in learning activities or

reflection on new pedagogies” (pp. 15–16). Every respondent in our study alluded to the issue of time as a barrier to technology adoption and usage. We argue that time is always faculty’s worst enemy. Various it is presented as a barrier to research, community engagement, providing meaningful feedback to students, embracing new technologies to enhance learning, and the list goes on. Embedding appropriate technologies in curriculum design for 21st century graduates is a part of the role of faculty. It is about updating our curriculum to satisfy the needs of new generations of students (and graduate employers). However, for many this may be a new skill and it is incumbent upon the university executive to ensure that appropriate funding is made available to achieve this development. Such funding is not forever, as new (often younger) faculty appointments enter the Academy with knowledge of new technologies and are aware of their possibilities as part of curriculum design. Further, budgetary constraints can hamper the willingness and ability of faculty to introduce new technologies into their classrooms. There thus needs to be adequate funding and resources directed towards educational technology development (Lefoe et al., 2009). Funding could also be in the form of strategic T&L funding schemes/grants to develop and build scholarship of teaching and learning (SoTL) and provide academics with the opportunity to be creative in a supported environment. In addition to funding, there needs to be recognition for staff who do invest the time to pioneer the use of new digital technologies. This should also include allowances for poor teaching evaluations if problems are encountered in the first use of such technologies.

6. Conclusion

Despite the resistance of some educators, it is unlikely that 21st century accounting education can constrain indefinitely the radical implications of the digital turn. For real change in business curriculum – and there is undoubtedly a need for change – technology can play a key role in reimagining how business education can be remodelled; remodelled to deliver 21st century education that enhances the learning outcomes for *all* students. It is time to consider how technologies have already changed the game in the ways that we interact and learn – Internet, email, Facebook, Wikipedia – all are part of our unique personal learning environment. While each person’s environment may be different, technologies enable all to tailor the technological environment to our learning needs.

This paper posits that the technological shifts sweeping through society and higher education institutions necessitate and demand that accounting educators reimagine what the future might hold for accounting education and an increasingly diverse student population. Technologies provide a window for reimagining institutional and discipline vision, and different models of learning. We need to consider a model that reflects a vision that is firmly planted in innovative use of technology to provide anywhere, anytime, for anybody, education. Business schools cannot afford to ignore the fact that this is where teaching and learning are heading. The technologies exist – our challenge is to reimagine business education that embraces the technologies of today, tomorrow, next year, and next century.

Appendix A

1. How do you define digital technology?
2. How does digital technology impact accounting education?
3. What are the types of digital technologies that you use in your teaching?
4. What prompted you to use technology in your curriculum design?
5. Do you have diversity in your student cohort? And, if so, does technology have a different role in educating these students?
6. When using technologies, what were you trying to achieve in terms of learning outcomes?
7. How do you measure the student learning outcomes of the innovative technologies you use in your practice? (e.g. student evaluations). Can you provide 2–3 themes that have emerged from student evaluations of your use of technologies? If not, how could you envisage measuring the student learning outcomes of the innovative technologies you use in your practice?
8. What level of support was provided when you introduced technology and from where?
9. What makes your use of the technology effective?

10. Would you describe your use of technology in teaching as a) simple; b) practical; or c) innovative? And why?
11. What do you see as the 2–3 major benefits of using innovative digital technologies in your (1) teaching, and (2) assessment?
12. What do you see as the 2–3 major challenges of using innovative digital technologies in your (1) teaching, and (2) assessment?
13. If you had access to unlimited funds how would you use them to innovate your practice using technologies?

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