Technology-based learning: problematising VET students' preferences and readiness

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Abstract

This paper conducts a literature survey to seek evidence that supports assumptions that vocational education and training (VET) learners have a preference for, and the readiness skills to be successful students in technology-based learning.

Australian studies show that VET students value the flexibility of online learning. However, these studies assume online learning as a given rather than questioning the learners' preference for that approach. In the USA, a survey of full-time college students in the USA suggests a moderate rather than high level of preference for technology-based learning. It is shown that there is a lack of substantial evidence to sustain the assumption that contemporary learners prefer technology-based learning and argued that this claim is often overstated.

Research into the design of surveys consistently identifies learner self-management and learner self-directedness as important in learner readiness for online learning. When juxtaposed with Australian research which shows that VET learners generally lack these skills the assumption that VET learners have the readiness skills for technology-based learning is placed in question.

It is noted that research related to VET learner characteristics was reported in 2000. Given the claimed rapid change in generational preferences the paper proposes that this research should be repeated.

Introduction

It would be difficult to find disagreement with the proposal that computer technology has significantly influenced the ways that we communicate, access and store information, and develop a wide range of document types in the forms of text, numerical data and graphics. Technology has also changed the ways that we entertain ourselves. The 1980s saw the emergence of personal computers, the 1990s the Internet and 2000s mobile technologies. We have seen the convergence of technologies into single units and a shift from fixed to wireless and mobile systems.

Australians have a reputation for adopting these technologies with great enthusiasm. For example, over the last week or so I have seen people using: mobile phones for oral and SMS conversation, capturing images and listening to FM radio; MP3 players to listen to music; handheld devices as personal organisers and to play games individually or to compete against each other using devices communicating through wireless technology; and, personal computers to watch digital movies, to read/write text documents or complete spreadsheets.

The use of technology in education is certainly not a new phenomenon and it is not necessary to limit discussion to the last quarter of a century to demonstrate the transfer of technology for private and commercial use to education.

> *Educational television and teaching machines, with the backing of commercial interests and foundation grants, have aroused a renewed interest in educational reform*. (Clark Trow, 1963, p.v)

And

> *The children of the 1970s will grow up used to men on the moon, to life in orbit, to pocket-sized computers, but will be taught by some teachers who will have grown up in a world without television or radio. The rate of change makes each generation old-fashioned to the next and reduces the authority of the adult as a transmitter of culture, because that culture, in its technological aspects, is antiquated*. (Shipman, 1975, p.19)

Over time, a number of terms have emerged to describe the use of computers and other digital technologies in education. These include computer managed learning, computer aided instruction, flexible learning, online learning, e-learning and m-learning. To avoid confusion, the current paper uses the term technology-based learning to represent goal-directed learning that is conducted from an educational institution that incorporates information and communications technology of a contemporary nature.

The transition of an innovation from idea to institutional norm is not linear and unproblematic. Aldrich (2005) identifies a six step process for the introduction of an innovation. Innovators work to turn an idea into outcomes that can be used by others. Often, the development ceases at this point. In other cases development companies and vendors adopt the innovation which is then enthusiastically promoted. In many cases over-inflated promises and expectations are not met. Disenchantment rises before more conservative evaluations of the innovation are conducted Only those innovations that are commercially viable proceed to become part of institutionalised infrastructure (Aldrich, 2005).

For example, during the 1980s, the Apple II series of computers were popularised. With their user-friendly interface they were soon promoted for educational uses and were found to be located in schools throughout Australia. Software programs such as Logo, which allowed students to use simple programming language and other computer based games for language and mathematics were soon available. However, the positive impact of computers in the education sector is not a given, immediate or progressive.

In reviewing whether computers in schools in the USA had been worth the investment, Cuban (2001) observed that computers were ubiquitous in schools but that the contribution that school courses and experiences had made to computer literacy and competitiveness in the workplace were at best, murky. and there had been no advances in

the enhanced efficiency in learning and teaching that could be attributed to broader access to computers. This conclusion may be the result of introduction of e-learning into educational institutions before practitioners were clear about how to use the innovation in a productive way (Zemsky & Massy, 2004).

Surveys of faculty and administrators over a 15 month period at Pennsylvania University concluded that overoptimistic claims about e-learning were troubling. Assumptions that: 'if we build it they will come'; 'kids will take to e-learning like ducks to water'; and, 'e-learning will force a change in the ways we teach' (Zemsky & Massy, 2004, p.iii) are questioned. The last point is reflected in the conclusion about the state of e-learning drawn from a survey of 19 tertiary education institutions from 13 countries located in the Asia-Pacific, Europe, Latin America and North America regions.

> *Growing disenchantment with e-learning has replaced over-enthusiasm. Failures of e-learning operations have, at least temporarily, overshadowed the prospects of widened and flexible access to tertiary education, pedagogic innovation, decreased cost etc., that e-learning once embodied.* (Organisation for Economic Co-operation and Development, 2005, p.11)

The generation that has grown up with and never known life without information technology is popularly referred to as Generation Y, the NET Generation (Oblinger & Oblinger, 2005) or digital natives (Prensky, 2001). The promotion of technology in education, particularly as it relates to this generation, appears to be underpinned by the two related assumptions. Firstly, that Generation Y has a preference for the use of technology for educational purposes. Secondly, that Generation Y has the skill set required to productively use technology for educational purposes.

Using a literature survey into recent research from Australia and the USA, the current paper seeks evidence and problematises these assumptions.

Literature Review

Generational Change and Technology-based Learning: Student Preferences

The most extensive quantitative research into the technology preferences of learners that I have been able to find involved a survey of 4374 college students across 13 institutions and five states in the USA (Kvavik, 2005).

The cohort surveyed in this research is limited to full-time, campus-based learners in the USA. Therefore, it cannot be assumed that these findings would be replicated in the Australian VET system which is dominated by part-time study where the student demographics may be significantly different. However, the work of Kvavik (2005) is significant in that the researchers had an expectation of a greater level of support than they found. Their intuitive understandings were not realised in quantitative terms.

> *We expected to find that Net Generation students would demand greater use of technology in teaching and learning in the classroom. They did not. What we found was a moderate preference for technology*. (Kvavik, 2005, p.7.17)

Anecdotal evidence related to the use of MP3 technology also suggests that, although students may use a technology for personal purposes, the use of that technology for learning may not be automatically transferred. The Apple iPod was released in 2001 and since that time the exponential rise in the use of MP3 players for personal use has been remarkable. Music is available for download, podcasts from a wide range of sources including radio stations are freely available. Amongst some, the popularity of MP3 technology is associated with the idea that podcasts are able to be used in education.

In the context of English language majors in Japan who had been issued with Apple iPods, Thomas (2006) asserted 'iPod therefore I learn'. One student responded 'iPod therefore *I* listen to music' (Thomas, 2006, p.4, authors emphasis). This statement demonstrates the danger in assuming that the popular use of a technology is easily transferred to education. Thomas (2006) states

> *With iPod education, educational technologists are, perhaps, still at a similar stage to that which guided the enthusiasm to get computers into all high schools in the mid 1990s. Just having computers in the classroom, educational policy makers and politicians argued, will increase students' motivation to learn, as well as enhance learning outcomes. The same philosophy emerged with the advent of the Internet*. (Thomas, 2006, p.5)

In another example involving MP3 technology, Duke University in the USA distributed Apple iPods to students entering first year studies. The range of purposes to which Duke University used iPods included: dissemination of course content; recording of lectures, discussions and verbal feedback; field recording of notes, interviews, environmental sounds; as a study tool for repetitive listening to lectures and other audio; catching up on missed lectures; and, for file storage and transfer, particularly of large multimedia files. Students were enrolled in language and music courses, theatre studies and information sciences courses (Belanger, 2005).

A web-based questionnaire of approximately 1650 students at Duke University achieved an overall response rate of 28% supported by 27 telephone interviews with non respondents (Belanger, 2005). The survey showed that 75% of first year students reported using at least one iPod feature in a class or for independent support of their studies. Whilst positive, the finding that three quarter of students reported a single use of one iPod feature over the period of 12 months is hardly representative of institutionalised adoption and use of the technology.

What these anecdotes suggest is that the popularity of the technology is alone insufficient to guarantee its transfer into educational use. There is a need for both teachers and learners to recognise its usefulness and to have the skills to use the technology productively in an educational setting. Whilst commercial and policy interests may

promote the use of technology in education, both teachers and learners can act as gatekeepers in this regard. Teachers are more likely to adopt the technology if it is easy to use and compatible with existing practices and needs (Errington, 2001, 2004; John, 2002, 2005; Robertson, 2005a, 2005b). Further, it cannot be assumed that learners will automatically perceive that a technology they regularly use for non-educational purposes will be useful to support their learning. This is particularly the case where there are few examples of teachers modeling the use of the technology in ways that appeal to the learners (Roberts, 2005).

Other recent examples of mobile technology promoted for use in education include mobile telephones and personal handheld devices. It is claimed that mobile technologies can improve learning, student support and course administration. Identified possibilities for use include independent investigations, practical fieldwork, professional updating and on-the-spot knowledge (Kukulska-Hulme & Traxler, 2005); learning that is just-in-time, just enough and just for me, situated and contextualized (Peters, 2005). In the case of mobile technologies, it may be intuitive to assume that learners will prefer to use popular and possibly ubiquitous technologies in educational settings, this assumption is yet to be tested.

In a more general sense, research in Australia found evidence that flexible delivery is an important and valued option for particular segments of the VET student population. In particular, career changers, skill improvers and the self-employed (Ho, 2003). In a more specific sense, researching what counts as quality in online learning (Cashion & Palmieri, 2003) and learner expectations and experiences of online learning (Choy, McNickle, & Clayton, 2003) find that vocational education and training (VET) students value the flexibility of online learning (Cashion & Palmieri, 2003; Choy et al., 2003). Whilst these studies support the findings of Ho (2003), in both cases, online learning was assumed. Neither researched learners' preference for online learning.

The research surveyed is inadequate to substantiate the assumption that learners have a preference for technology-based learning. Quantitative evidence related to full-time college students in the USA suggests a moderate rather than strong preference. Evidence associated with MP3 usage is less than entirely positive and at best inconclusive. In Australia, what research has been conducted suggests a preference for flexibility in a generic sense and also in relation to online learning. However, a preference for the use of technology is not specifically addressed.

If technology is adopted and used in non-educational settings that use may not be transferred to educational settings. In non-educational settings, individuals are consumers of technology. For the most part this consumption is for purposes of entertainment or infotainment rather than goal-directed learning. Where such technology is consciously applied to learning in an educational setting the role of the individual is changed from consumer to learner and the application of the technology may not be directly transferable. In addition to the role of learners, teachers may also act as gatekeepers to the introduction of technology.

Generational change and technology-based learning: Student readiness

There have been several attempts to develop surveys that assess learner readiness for online learning and some have been tested for reliability.

A 13 item survey proposed by McVay Lynch (McVay Lynch, 2002) has been shown to demonstrate an acceptable level of reliability for university students but less than acceptable reliability for technical level (TAFE) learners (Smith & Sadler-Smith, 2003). It has been concluded that whilst there is a need for 'more work on the validity of the instrument, in order to establish its value as a predictor of online learning success [the survey] has shown very adequate reliability for the Australian sample [demonstrating that it] may have useful applicability to research and practice in the area of student dispositions and preferences associated with online learning' (Smith, 2005, p.10). A criticism of these studies is that they did not survey actual online learners such that the 'question remains as to whether this instrument, or any instrument, can predict online learning success' (Bernard, Brauer, Abrami, & Surkes, 2004, p.32).

Using McVay's survey questions as part of a larger 38 item survey Bernard et al (2004) report on the development and predictive validation of a survey designed to assess the achievement outcomes of distance education (DE)/online learning success. This survey was administered to 167 Canadian students who were about to embark on an online course. In addition to the factors of readiness of online skills (i.e. student comfort with online learning) and self-management of learning (and learning initiative) as represented in McVay's survey, Bernard et al (2004) added the factors of general beliefs about DE/online learning and desire for interaction with an instructor and other students. They found that the best predictor of course grade was grade point average (GPA) suggesting that the prior opinions of students as to their self-management, self-direction and initiative as learners are the best set of items for predicting academic success in an online course.

A further study of success factors in web-based courses developed a 42 item survey to find that student self-motivation towards web-based learning was the most important success factor and that if motivation is lacking, then learning outcomes and satisfaction will be adversely affected. The authors raise doubts on the importance of student personality and learning style where an online student has sufficient motivation to learn (Eom, Ketcherside, Lee, Rodgers, & Starrett, 2004).

Using a grounded approach based on open–ended survey questions of students, lecturers, help-desk staff and other literature sources, which did not include McVay Lynch (2002), an Australian study developed a 20 item survey covering technical skills, self-efficacy, learner preferences and learner attitudes. The reliability of the first two is described as good and the latter two moderate (Pillay, Irving, & McCrindle, 2006).

This overview of research identifies a range of criteria as influential in shaping learner readiness, outcomes and success in online learning. They can be classified as relating to: learner self-efficacy (Pillay et al., 2006), self-management and self-directedness (Bernard

et al., 2004; Guglielmino & Guglielmino, 2003; Smith, Murphy, & Mahoney, 2003); comfort with online learning (Smith et al., 2003); self-motivation towards online learning (Eom et al., 2004); technical skills (Guglielmino & Guglielmino, 2003; Pillay et al., 2006); previous success in learning (Bernard et al., 2004). Learner preferences and attitudes are identified as moderate predictors by some (Pillay et al., 2006) where others raise doubts about their influence in the presence of sufficient motivation (Bernard et al., 2004; Eom et al., 2004).

When these factors are considered, it is reasonable to expect that recent generations of learners are likely to have well developed technical skills and a level of comfort with the use of technology. Importantly, a person's ability to be self-managed and self-directed is consistently identified as important in learner readiness for online learning. Warner, Christie and Choy (1998) generally characterise Australian VET students as having: poor levels of readiness for self-directed learning; little confidence or experience in using electronic technologies for learning; and low levels of confidence in themselves as autonomous learners. Other research into the learning preferences support these findings suggesting that both university and TAFE students are inclined towards learning that is teacher-directed (Choy & Delahaye, 2000; Smith, 2000a, 2000b).

In specific regard to Australian VET students, a survey of 542 respondents, and semi-structured interviews found that slightly more than one quarter of the respondents 'possessed both disposition and skill, including technology skills, for self-directed learning' (Warner, Christie, & Choy, 1998, p.9).

Together, the literature reviewed suggests that there is a cohort of VET students who have the dispositional and learning skills required to be successful technology-based learners. If this group is distributed throughout the general student population rather than being condensed into particular locations and courses then almost three-quarters of a cohort lacks the disposition and skills required to be successful technology-based learners. When this evidence is juxtaposed with the importance of these skills then the online learning readiness of VET learners is placed in question.

Given the claimed rapid pace of generational change in learner preference and readiness for technology-based learning we should however be cautious in assuming that data reported in 1998 and 2000 is still current today. Given that the data was reported as much as one-half of a generation ago it may be time to repeat the research.

Conclusion

This paper has examined the assumptions that VET learners have a preference for and readiness skills to be successful in technology-based learning. Neither assumption appears to be solidly substantiated by the evidence provided.

The paper raises questions rather than providing answers. The discussion flags the need for further research into the transferability of technology from non-educational to educational settings, learner preference for and readiness to participate in technology-

based learning. Use of information derived from such research would assist in making more considered decisions about the introduction of new technologies into education thus reducing the financial and other costs associated with the zealous promotion of new technologies that fail to achieve the overoptimistic expectations of manufacturers and early adopters.

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