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Re-examining students' perception of E-learning: An Australian perspective

Introduction and background

The higher education sector in the global marketplace is continuously striving for innovation in teaching and learning. Such innovation is often driven by students' changing needs for learning resulting from their own learning, as well as their present and prospective employers' workplace needs (Heidt and Quazi, 2013). Educational providers are aware of such developments and continuously strive to adjust offerings to students in line with the dynamic nature of demand for higher education. One such prevalent adjustment made by educational providers includes alternative modes of delivery, such as technology enhanced e-learning. E-learning is considered as a viable alternative to conventional face-to-face mode of delivery and has generated a great deal of attention from students, educational designers and researchers, policy makers and education providers. The past two decades have witnessed a rapid growth of e-learning, 'the third generation of distance education' mostly in the economically advanced countries, and limited growth in developing nations (Garrison and Anderson, 2003). One of the main reasons leading to the popularity of e-learning is attributed to demand for courses and programs offered through face-to-face mode greatly exceeding provider capacity resulting in limited places for potential students aiming to pursue their education. Typically, increasing globalisation and growing wealth generation in developing countries such as India and China has led to increased demand for additional places at international institutions. This has created opportunities for e-learning educational providers to offer courses and programs across national boundaries but this is also contingent upon the propensity of students to use the chosen technologies in their learning. According to Bijker

(2012) members of a social group (i.e. students in learning environment) also play a crucial role in technological development. The inference we draw here is that there is an intricate relationship between the need to use new e-learning technologies for educational purposes and the capability of its adoption to drive change in the way students want to, and are willing to, learn. Given this link and the market opportunities such pioneering educational practices afford, this has prompted further innovation in the mode of delivery of education for maximum reach at a minimum operational cost. Tremendous development of information technology in recent years has provided the right platform for such a transformation of learning. Being able to offer an ever widening variety of student services through offline to online modes has been instrumental in advancing and facilitating the e-learning approach as a viable mode of educational delivery. The online mode as a sophisticated pedagogical teaching and learning tool continues to evolve with the application of advance information technology in the growing education sector within Australia and beyond. For example, commonplace in many contemporary e-learning platforms is the use of virtual learning environments (VLEs) such as BlackboardTM and MoodleTM, and these are increasingly being integrated with other Web 2.0 tools such as ElluminateTM, RSS feeds via podcasts, and social media tools, including FacebookTM (Allen and Seaman, 2008; McLoughlin and Lee, 2008).

An increasing number of educational institutions operating in international education markets are using e-learning as a cost effective alternative to conventional face-to-face learning systems (Tony, 2005). Clearly, there has been tremendous development of virtual systems in other spheres of our daily lives, so naturally the Australian higher education system has

already been affected by the tide of virtual systems. These are being widely adopted in Australian tertiary institutions and rapidly becoming a dominant mode of educational delivery at both course and program levels. However, one critical question remains unanswered in the extant literature is to what extent e-learning is satisfying student learning need relative to other types of education that students and other stakeholders expect from tertiary providers. Given the paucity of literature to support the above question, especially in terms of empirical evidence in favour of adoption of e-learning in relation to its pedagogical benefits, the objective of this research is to explore the above propositions in a little more detail within an Australian setting.

Relevant Literature

E-learning has undergone continual evolution over the last two decades and has reached a crucial stage in its advancement (e.g. dubbed 'E-learning 2.0') (see for example, Ehlers, 2009). Currently, E-learning is attracting considerable scholarly attention within national and international spheres thus generating a large body of academic literature. We conceptualize e-learning as the use of online tools designed to help and/or enhance student learning, such as downloadable materials, lectures and other resources relevant to the learning experience. A review of the extant literature reveals two broad streams of research, namely: (1) the benefits this approach provide to education delivery brings educators from a 'workman' perspective, and, (2) value it provides to university administrators from a strategic perspective. An overall summary of the two streams are highlighted in table 1, followed by a brief discussion of each.

INSERT TABLE 1 HERE

Stream 1: Research literature benefiting teachers from a ‘workman’ perspective:

This trajectory of research is concerned with issues relating to pedagogical techniques, and shows how to best deal with the way of learning espoused by ‘digital natives’ (Prensky, 2009). For example, studies devoted to the use of social media, and its impact on learning (e.g., English and Duncan-Howell, 2008; McLoughlin and Lee, 2008; 2010), and, research exploring how other technological tools such as wikis or podcasts may be utilized both within and outside the classroom (e.g., Elgort *et al.*, 2008; Hmelo-Silver *et al.*, 2007; Jones, 2011; Lee *et al.*, 2008). Summarily, these studies address student engagement, applying the principles of learning through social constructivism (see for example, Barab *et al.*, 2007; Willey and Burke, 2011) and constructionism (see for example, Kim, 2005); and how they may be directly applied in the context of e-learning. To illustrate our point, social constructivism is present where student groups construct knowledge for one another, collaboratively creating a small culture of shared resources (e.g., using scaffold activities in a wiki); and in constructionism, students construct their knowledge and understanding through a set of experiences based on solving set problems (e.g., virtual reality learning through Second Life, see for example, Halvorson *et al.*, 2011).

Stream 2: Research benefiting university administrators from a strategic perspective:

This literature deals with issues relating to (1) constructing policies governing the use of social media within tertiary institutes (Keats, 2009), (2) the pitfalls of incorporating Web 2.0 technologies in teaching (Mazer *et al.*, 2007), and (3) the role of technology usage in the

professional skills development in graduates (McIlveen and Pensiero, 2008). Other topics that may concern universities strategically include research on quality assurance (e.g., Ehlers, 2009), selecting the ‘right’ students (Harrison-Walker, 2010), and value creation in the context of e-learning (Wong, 2012). This stream of research related to technological development and adoption within the learning domain is consistent with the earlier view of Pinch and Bijker (1984, p.403) who draw upon the literature and note that “most technological growth came from mission-orientated projects”. From that vantage, clearly, the precise nature of current e-learning technology is going to be a function of the specific need of students at any given point in time, which implies both technology (at a particular point in time) and changing student needs require constant examination.

On this point, while it seems those research topics pertaining to e-learning have thus evolved and moved on with the change in e-learning technology currently in fashion, there have been few studies updating how students feel about e-learning 2.X (irrespective of the version) now. This is important to understand because like any service consumer, student preferences and perceived value of the service offering is not static. Marketers need to constantly adjust the offering to suit customer needs and preferences, which is critical in highly competitive international education market contexts. Despite e-learning being generally perceived as one of the most expensive alternative educational tools (Salinas, 2008), it offers many benefits. One such benefit pertains to flexibility (Malhotra, 2002) whereby institutes are not limited by geographical or temporal constraints. However, research also reveals that alongside this flexibility there are some issues that may limit student benefits that the apparent flexibility

e-learning provides. For example, the issue of loss of face-to-face interaction between students and instructors has received research attention over a decade ago (Kriger, 2001; Clark, 2000). Other relevant issues include, among others students' feeling of isolation and unsupported during the learning process (Cereijo, 2006). Given, instructions are not always 'available' to help the students the e-learner needs to be self-disciplined working independently without real assistance from instructors (Thornbory, 2003). The absence of human interaction has been identified as a source of major concern in online teaching and learning (So and Brush, 2008). In spite of the importance of these issues, research addressing the attitudes of students towards the dynamic changes in e-learning technologies is somewhat scant.

Therefore, there is an urgent necessity to continue to map these changes in student perceptions as new technological advancements are being deployed in e-learning from time to time. For example, typical questions that constantly need addressing include among others: (1) Do students still consider flexibility as the key benefit of e-learning? (2) Does the use of current social media play any role in overcoming the criticism of lack of interactivity in e-learning? (3) Do tools such as wikis help group processes and dynamics is helping to complete and perform better with group assessments? Research shows the effectiveness of e-learning is enhanced when the blended learning environment is created in e-learning mode through better quality online learning environments. Blended learning environments are conceptualized in this paper as those settings that involve, to varying degrees, both face-to-face interactions and the use of e-learning tools in the process of student learning. This are attained through

building more effective learning communities, attainable if they enhance student self-motivation and the professional development of educators and administrators (Yee, 2011). Central is the ability of educational institutions to ensure the student benefits from the current e-learning tools in relation to how they perceive the tools help enhance their learning experiences. Keeping this specifically in mind, the main purpose of this study is to address the punctuated gap in attitudinal research and examine students' perceptions of e-learning. We adopt the view that such continuation in research is important to map changes in student perceptions of e-learning through time. On that basis we revisit the basics of how students feel about the current offerings of e-learning. The specific objective of this study therefore is to empirically examine the effects of use of Web 2.0 teaching tools on student learning at the tertiary level within Australia. Key aspects of what was examined include among others, degree of self-paced learning, flexibility of study, travel time and costs, nature of collaboration, and various perceived negative aspects of e-learning. These are reflected in more detail in tables 2 and 3.

Methodology

In order to understand the issues associated with perceptions related to the benefits and pitfalls related to e-learning, a mixed methodology (Teddlie and Yu, 2007) was used in this study comprising two stages. Stage 1 involved capturing the richness of data. A series of interviews were administered with university academic staff well versed with e-learning mechanisms (n=9), as well as with students recently completing a fully online course (n=22). This enabled us to concurrently consider both university and student-centric views, which is

critical in capturing a much clearer picture of the constructs of interest that emerged from the data. Following Miles and Huberman (1994), and, Teddlie and Yu (2007), a purposeful sampling technique was used to identify and target the specific individuals representing the spectrum of knowledge and experience relevant to this study (Maxwell, 1997). All respondents in this first stage had completed a fully online marketing course within the past 12 months, were experienced in the use of wikis, had participated in Elluminate™ sessions, and, utilised social media in peer-to-peer and peer-to-instructor communications. Both sets of respondents were asked a series of open-ended questions aimed at assessing their attitudes towards e-learning.

Stage 2 pertained to the quantitative data collection via a structured questionnaire that was constructed to encapsulate the findings from stage 1. The questionnaire was administered to a purposive sample of marketing students within a large Australian university. Items were measured on a seven-point Likert scale (1=Strongly Disagree, 7=Strongly Agree). The criteria to qualify as respondents to the survey were that the student had to have completed an online course incorporating wikis and Elluminate™ sessions (as a minimum) within the last 12 months. Of the 588 students approached, 231 students met the criteria and responded to the survey.

Results

An analysis of respondent demographics reveal the majority of students (69.5%) were aged 21-25 - with the balance (23.5%) being 26-30 year olds. Respondents were predominantly

male (65%) and dominated by international students (86.5%). Descriptive statistics of the main aspects of perceived positive and negative attitudes towards e-learning are outlined in Tables 2 and 3 respectively. The results relating to affirmative attitudes towards e-learning suggest attitudes are highly positive for all five issues examined. However, flexibility issues were found to be the most favorable (P1, P3 and P5), and is consistent with earlier research identifying flexibility as a critical aspect of e-learning (Malhotra, 2002). These issues are followed by perceived cost savings (Elizabeth, *et al.*, 2003) and learning aids (Zhang, *et al.*, 2006). As far as the negative attitude towards e-learning is concerned lack of collective learning opportunities and techno aptitude (N2 and N3) are the most critical issues followed by boredom and demotivation (N1 and N4).

INSERT TABLE 2 HERE

INSERT TABLE 3 HERE

Since the sets of positive and negative attitudes were clearly distinct, separate factor analyses were performed on the items relating to positive attitudes and negative attitudes. It is to be noted that the negative attitudes emerged as a single factor explaining 63.171% of the total variance with a Cronbach alpha coefficient of 0.742 and an eigenvalue of 2.527. Positive attitudes emerged as a two-factor solution. Details of the factor structures are presented in Table 4.

INSERT TABLE 4 HERE

A series of tests of differences were performed with demographic variables, and these are reported in Tables 5 and 6.

INSERT TABLE 5 HERE

INSERT TABLE 6 HERE

Discussion of Results and Conclusion

It is evident from the analysis of students' e-learning experiences that flexibility and better learning outcomes are the most striking perceived benefits of e-learning and teaching. These findings are confirmed by the mean scores of attitudinal variables as well as the results of exploratory factor analysis revealing two dimensions of which the flexibility being the most dominant one followed by better learning outcomes. In regards to the negative perception of e-learning, two main issues were found to be paramount in students' mind. These are lack of collaborative learning opportunities and an inability to access e-learning materials. These negative perceptions are likely to affect students learning especially in terms of effective group work, particularly considering that the face-to-face mode can spark creativity among students (Boland *et al.*, 2008). It appears from evidence shown in Tables 2 and 3, that the flexibility factor in e-learning provides opportunity for self-paced study (P1) and 'anywhere, anytime' learning (P3) was highly rated by students. These findings are consistent with those of prior research conducted a decade ago (Malhotra, 2002). The cost savings (P4) resulting

from e-learning in terms of reduced commuting expenses also rated as one of the most relevant issues. These findings are understandable given the disproportionate and persistent increases in fuel costs in Australia in recent years. Perhaps just as important to note, is what is missing from the list of positive and negative perceptions. It is interesting that loss of face-to-face interactions with the teacher and the peers in class rooms which was a notable factor a decade or so ago (Clark, 2000; Kriger, 2001) did not even make it to the list in this study. However, the loss of peer-to-peer interaction can be implied as relevant from feelings of boredom (N1), difficulties in teamwork (N2), and losing motivation (N3) - these being consistent with the feelings of isolation previously noted by (Cereijo, 2006), and the importance of self-discipline to keep oneself motivated (Thornbory, 2003). It is also noted from Table 5 that older students (26-30 years) have significantly greater positive attitudes toward e-learning particularly for items in the Factor 1 in Table 4, which relate largely to 'comfort' factors such as increased flexibility and reduced costs. On the contrary, it is also noteworthy from Table 6 that younger students are more prone to feelings of boredom and loss of motivation suggesting that younger learners see class room teaching and learning as an exciting and rewarding experience which they believe can be better facilitated by face-to-face learning and the physical presence of instructors and learners. Furthermore, younger learners may consider universities as their preferred educational institutions because they come to the campus to learn social behavior from their teachers and senior students, meet interesting people and socialize with them.

Implications of the Study

The above findings suggest important implications for educational management - that is, for faculties and schools to develop new exciting content 'made for online' learning that is topical and has temporal currency. This would help counter potential feelings of boredom with traditional content delivered online, and provide more emotional support for students suffering from loss of motivation and feelings of isolation. The findings of this study clearly implies ongoing research initiatives as suggested by Toncar and Munch (2010) to map attitudes towards e-learning through time; including the use of alternative methods such as experimental designs at various levels of fully online and blended learning. These longitudinal research initiatives can be undertaken by individual institutions towards developing a database for ongoing comparison of shift in the attitudes of students to e- learning. Such monitoring could be used to make modifications and improvement of the existing e-learning strategies in terms of technology used, overall contents and the curriculum, and the various teaching approaches. Similarly, this longitudinal research initiative can be undertaken at the national level towards generating critical information for continued improvement of the quality of e-learning and teaching strategies of the sector as a whole. This is tantamount if the higher education sector is to continue offering high quality programs within an ever increasing competitive global marketplace.

Limitations and Further Research

This research has a number of limitations that are to be noted. First, the data has been collected from one single university and the sample size is also relatively small. Therefore, generalization of the findings of this study at the Australian national level and beyond is to be

made with caution. Future studies should use a broad-based sample drawn from a number of institutions comprising both main stream and regional universities to have a deeper understanding of the issues examined in this study. Second, as mentioned earlier there is an urgent need for the continuation of attitudinal research to continue providing feedback to educational policy makers, academics and student community. This current study is cross-sectional in nature and is not designed to capture changing attitudes of learners. However, some of the findings corroborate earlier studies in relation to attitudes towards e-learning suggesting value in tracking attitudes over time. Future studies should therefore be designed to capture student perceptions of newly introduced features in e-learning as well as continued introduction of advanced technologies into the e-learning packages. Finally, this study only examined student attitudes (positive and negative) towards the aspects of e-learning in the context of a range of demographic variables and this clearly has some limitations. There are likely to be many other variables impacting upon student perceptions of e-learning that need to be modelled to gain a clearer picture of the effectiveness of e-learning as a viable strategy. Future studies could examine variables such as the nature and extent of student motivations, previous learning experiences and mode of study, the type of curricula being taught, and the extent of blended learning being used in courses. These, and other salient variables, should be tracked over time to determine their relevance, per se, and/or their impact upon the effectiveness of e-learning within a tertiary setting in an Australian context.

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Table 1: A summary of contemporary literature review

Author (Year)	Contribution to research	Comments
Prensky (2009).	Found the use of digital technology as the best way to deliver student learning	Stream 1
English and Duncan-Howell (2008); McLoughlin and Lee (2008; 2010).	Measured impact of use of social media on student learning	Stream 1
Elgort <i>et al.</i> , (2008); Hmelo-Silver <i>et al.</i> , (2007); Jones (2011); Lee <i>et al.</i> , (2008).	Found using wikis and podcasts in and out of classrooms to boost student learning	
Keats (2009).	Identified issues affecting policy formulation concerning use of social media in university teaching	Stream 2
Mazer <i>et al.</i> , (2007).	Identified the limitations of integrating Web 2.0 technologies in teaching	Stream 2
McIlveen and Pensiero (2008).	Explored the role of technology usage in teaching in enhancing the development of professional skills of graduates	Stream 2
Ehlers (2009).	Examined the strategic role of quality assurance in university teaching	Stream 2
Harrison-Walker (2010).	Examined issues relating to selecting the 'right' students for teaching	Stream 2
Wong (2012).	Explored value creation issues through e-learning approach	Stream 2
Malhotra (2002).	Found flexibility as the key benefits in using technology in teaching and learning	General
Sun <i>et al.</i> , (2008).	Found course flexibility as an important factor affecting student satisfaction of E-learning	General
Krige (2001); Clark (2000).	Identified loss of interaction between students and instructors as the key limitation of e-learning	General
Cereijo (2006).	Identified the issue of students' perceived isolation and lack of support while learning	General
Thornbory (2003).	Found instructors' unavailability to help students on a continuous basis leading e-learners to be highly disciplined to learn independently without support	General

Table 2: Summary Statistics of Positive Attitudes towards e-learning

	Item	N	Min	Max	Mean
P1	E-Learning is self-paced and gives students a chance to speed up or slow down as necessary	200	3	7	5.24
P2	Students are able to get extra study material from E-learning for their personal development	200	2	7	4.82
P3	E-Learning is more flexible for access anytime, anywhere	200	4	7	5.5
P4	Travel time and associated costs are reduced or eliminated	200	3	7	5.31
P5	E-learning provides learning opportunities that are highly flexible	200	3	7	5.4
P6	Technology tools make collaboration among students much easier	200	3	7	5.01

Note: Negative attitudes formed a single factor explaining 63.171% of the total variance with an eigenvalue of 2.527

Table 3: Summary Statistics of Negative Attitudes towards e-learning

	Item	N	Min	Max	Mean
N1	Self-study in e-learning can make students feel bored	200	2	7	4.67
N2	E-learning can make working in teams more difficult	200	3	7	5.1
N3	E-learning can make students lose motivation in their studies	200	3	7	4.78
N4	E-learning is limited by how comfortable one is with technology	200	2	7	4.94

Table 4: Two-Factor Structure for Positive Attitudes towards e-learning

	Item	Factor loading	Alpha	Mean	Eigen value	% of variance explained
Factor 1: Flexibility in learning	E-Learning is self-paced and gives students a chance to speed up or slow down as necessary	.853	.806	5.36	2.793	41.650
	E-learning provides learning opportunities that are highly flexible	.734				
	E-Learning is more flexible for access anytime, anywhere	.711				
	Travel time and associated costs are reduced or eliminated	.454				
Factor 2: Better learning outcomes	Technology tools make collaboration among students much easier	.737	.743	4.92	1.203	21.691
	Students are able to get extra study material from E-learning for their personal development	.647				
						Total=63.341

Table 5: T-values for Positive Attitudes and Demographics

Demographic	P1	P2	P3	P4	P5	P6
Age (21-25 ¹ vs. 26-30 ²)	2.546*(²)	1.933	2.123*(²)	2.164*(²)	2.213*(²)	0.453
Gender (male ¹ vs. female ²)	0.955	0.770	0.818	1.943	1.287	1.162
International ¹ /Local ²	1.054	1.107	0.745	0.210	1.576	0.906

Notes: * indicates significant at 0.05; (¹ or ²) indicates group with higher mean; P denotes a positive attitude item.

Table 6: T-values for Negative Attitudes and Demographics

Demographic	N1	N2	N3	N4
Age (21-25 ¹ vs. 26-30 ²)	2.134*(¹)	0.958	2.166*(¹)	1.672
Gender (male ¹ vs. female ²)	0.731	1.701	0.768	1.007
International ¹ /Local ²	1.530	0.731	0.659	2.004*(²)

Notes: * indicates significant at 0.05 level; N denotes a negative attitude item.