Information and Knowledge Management
ISSN 2224-5758 (Paper) ISSN 2224-896X (Online)
Vol.3, No.8, 2013

Utilising Web 2.0 Technologies In An Australian Higher Educational Setting: A Case Analysis of Griffith University, Gold Coast, Australia

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ABSTRACT
On a national (Australia) scale, there is limited rigorous research investigating and comparing the types of Web 2.0 technologies Australian university students and their lecturers are interacting with and using to communicate, collaborate, deliver, and retrieve course content. This is surprising, given that academic institutions charged with equipping graduates to compete in today's knowledge economy, the potential for utilising Web 2.0 tools for learning and teaching is great. From such an identified research gap, this study sought to determine the level and type of Web 2.0 applications from Australian university students and their lecturers use throughout the higher education landscape for heightening pedagogical practices, knowledge management, and course delivery. Given that technology, pedagogy, knowledge management and social capital are becoming increasingly entwined, further empirical research associated with the usage of Web 2.0 within higher education is warranted.
Keywords Web 2.0, Social Media, Higher Education, Social Capital, Knowledge Management, Pedagogy

Pedagogy and Web 2.0 Technologies in Higher Education
As universities increasingly move toward an environment of instant and infinite information, it becomes less important for students to know, memorise, or recall information. Al-Daihani (2010) suggests that instructional paradigms will have to shift, with less focus on the memorisation of material by students and more focus on the application of knowledge to particular problems (p.12). Students in the 21st century need to move from being simply knowledgeable, to being knowledge able; to examine, question, and even recreate the increasingly digital and communication structures that shape our world (The New York Times, 2010). An important aspect of communication technologies are their potential to empower by putting more control in the hands of the user, as compared with other media (Arrington, 2005; Fox & Rainie 2006). This heightened ability for the learner to individually retrieve information/knowledge is changing the traditional ideologies behind past learning and teaching practices, and as such, is having resounding repercussions for current/future learning and teaching models; demanding a re-think as to their practicality into the early 21st century.
Modern communication technologies are transforming, or some may suggest challenging, traditional pedagogical practices - none more so than the introduction of Web 2.0 technologies. Since their introduction, Web 2.0 technologies such as MySpace, Facebook, Twitter, and Flickr have attracted millions of users' worldwide, many of whom have integrated these sites into their daily practices (Boyd & Ellison, 2007, p. 9). Boyd and Ellison (2007) comment:

> While their key technological features are fairly consistent, the cultures that emerge around Social Networking Sites (Web 2.0) are varied. Most sites support the maintenance of pre-existing social networks, but others help strangers connect based on shared interests, political views, or activities. Some sites cater to diverse audiences, while others attract people based on common language or shared racial, sexual, religious, or nationality-based identities (p. 12).

The phenomenon of Web 2.0 technologies has been extensively researched throughout the world, especially in the United States and in European countries (American College Health Association, 2007; Steptoe et al., 2002). With international literature recognising that 3 out of 4 Americans use Web 2.0 (Forrester, 2008), and that 93% of users believe that organisations/companies/academic institutions should have a Web 2.0 presence (Cone Communications, 2008), it is warranted that further studies should be undertaken to uncover user trends associated with Web 2.0 by Australian university students and their lecturers. Interestingly, Australia leads in average time per person spent, (nearly seven hours per week) on Web 2.0 sites in December 2009, ahead of the United States and the United Kingdom (Nielsenwire, 2009). Furthermore, current literature suggests that further studies into the area of human–computer interactions must investigate sustainable action plans and strategies that will create and encourage reform among academic institutions when it comes to adopting technology innovations (Nahm et al., 2008; Weinert, Cudney & Hill, 2008). From a national (Australian) perspective, it has been forecasted that:

> Web 2.0 will affect how universities go about the business of education, from learning, teaching and assessment, through contact with school communities, widening participation, interfacing with industry, and maintaining contact with alumni (Queensland University of Technology, 2011).

Reform and Knowledge Management via Web 2.0

It is common knowledge that in recent years Web 2.0 tools, such as Facebook, Myspace, Messenger, Blogs, and Youtube have become popular, particularly with university students.Web 2.0 tools have become part of the students' lives and help to build their connections with others and are based on related interests, work, interactions, and personal relationships. Consequently, academic institutions have realised the importance of Web 2.0 and a growing number of academic communities are creating accounts and joining groups through these sites (Al-Daihani, 2010). Similarly, numerous efforts have been made to understand the use of Web 2.0 in education and how it can elevate the quality of learning in higher learning institutions (Shafique, Anwar & Bushra, 2010).

Hemsley-Brown and Oplatka (2006) comment that higher education institutions have accepted the fact that they must formulate strategies and adopt pedagogical reforms (based on Web 2.0 technology) that will allow them to successfully compete in national and global markets. Similarly, a number of scholars (Frederickson, Reed & Clifford, 2005; McLoughlin & Lee, 2010) suggest that there is an increasing student expectation for blended and online learning and teaching activities supported by Web 2.0 tools. More so, learning and teaching activities now take place both in physical and virtual spaces with a range of tools, including learning management systems, other university-supported applications and tools, and an increasing variety of public Web 2.0 domains (Facebook, Twitter, blogs, wikis, messenger, video-sharing sites, etc.) (Queensland University of Technology, 2011).

Web 2.0 tools are shedding new light and equipping individuals with a heightened ability to manage knowledge, or more collectively termed ‘knowledge management’. Knowledge management is defined as:

> The generation, representation, organization, storage, dissemination, transformation, and protection of both tacit and explicit knowledge. Knowledge management also supports and enhances the establishment of an environment and a culture in which knowledge can be shared and can evolve (Kibum, Phillip, Isenhour, Carroll, Rosson, & Dunlap 2003, pp. 1 - 2).

For the sake of this study, knowledge management can be viewed as a process of learning and teaching practices (course content retrieval and delivery) that engage the student and lecturer in the co-construction of meaning, value, and knowledge and should be central to the mission of developing future pedagogical models in higher education. Web 2.0 technologies are increasingly becoming pivotal in the processes associated with knowledge management into the 21st century, primarily being used by universities to deliver courses to geographically diverse student cohorts (Glenn, 2008; Rossi, 2010) and university lecturers who are striving to enhance the learning experience (Rossi, 2009; Tabata & Johnsrud, 2008). Moreover, Wilcox, Winn and Fyvie-Gauld (2005) identified a range of Web 2.0 features which have a direct impact on the university students’ and academics’ experiences, indicating that they enhance the: 1) learning, teaching and assessment strategies; 2) quality of staff student relationships; and 3) collaborative approaches to student learning.

What is more, literature indicates that Web 2.0 tools promote many educational outcomes which heighten engagement processes necessary for encouraging critical thinking amongst university students, these being: 1) dialogue for group work and discussions/forums; 2) sharing resources; 3) critically reading and responding in a constructive and public way to others’ work; 4) learning how to add complexity to concepts in a given field through systematic engagement and analysis with work produced by more advanced students, specialists and experts; and 5) learning via Web 2.0 technologies which enable and heighten learning environments through multimodalities, networkability, message-tailoring capabilities, and temporary flexibility (Usher, 2009).

Social Capital and Web 2.0

Social capital is an elastic construct used to describe the benefits one receives from one's relationships with other people (Lin, 1999).Among young adults, relationships with peers are important both for generating offline benefits and for psychosocial development. Moreover, Web2.0 tools appear to offer important communication technologies, especially for those who otherwise face difficulties in forming and maintaining the large and heterogeneous networks of contacts that are sources of social capital (Steinfield, Ellison & Lampe, 2008). Given that the concept of social capital is a precursor for developing future successful pedagogical reform, it is paramount for Australian universities to develop or refine Web 2.0 tools that could heighten communication strategies; effectively reaching students and providing them with better access to peers, course information and delivery.

Web 2.0 technologies such as Facebook are associated with distinct measures of social capital (Steinfield et al., 2008), which are critical for self-dependence, career orientation, and relationship maintenance (Arrington, 2005), with such elements essential for ensuring successful pedagogical reform, profitable student outcomes, and maintaining student retention rates (Steinfield, Ellison & Lampe, 2008). Many social scientists (Rossi, 2010; Stagno, 2010; Virkus, 2008) identify that a Web 2.0 tool, such as Facebook, has been responsible for bridging and bonding social capital, which emphasises emotional benefits from developing and maintaining strong ties to friends. What is more, social constructivist theorists (Frederickson, Reed, & Clifford, 2005) agree that as a central precept, knowledge is created by learners in the context of, and as a result of, social interaction. Social constructivist approaches are particularly aided by Web 2.0 tools as mediating mechanisms between collaborating students, and between students and lecturers, particularly between students who might sometimes be working in different places and at different times (Franklin & Van Harmelen, 2007). Moreover, understanding how future students use the Web 2.0 as part of their daily life, and as a means for retrieving information, forms the basis for the development of effective reforms based on these applications (Stagno, 2010). There are a growing number of contemporary researchers (Frederickson, Reed & Clifford, 2005; Kawka & Larkin, 2011; McLoughlin & Lee, 2010) and theorists (Frederickson, Reed, & Clifford, 2005) who have directed their attention towards investigating the potential and pitfalls of Web 2.0 technologies for knowledge management and for initiating and supporting social capital actions throughout contemporary higher education settings. Although a great majority of research is directed towards identifying the positives of Web 2.0 tools, there seems to be a limited supply of literature that has investigated the pitfalls of Web 2.0 and its implementation in higher education. It is frequently noted in research that a key challenge incumbent in a Web 2.0 mediated learning environment is the management of the increasingly complex social relationships, which form as a result of the use of such technologies (Wilcox, Winn & Fyvie-Gauld, 2005). Because Web 2.0 is a relatively 'young' technology (Pew Internet & American Life Project, 2010), there are many unresolved problems and issues in its use in universities (Stagno, 2010).

Method

The survey was developed using the Lime Survey on-line tool supported by the Griffith University Survey Research Centre. The survey was designed to collect both quantitative and qualitative empirical data and was hosted on the Griffith University website (Gold Coast campus, Australia). The survey was promoted via Facebook (snowballing) and two broadcast emails to students' email accounts who were attending Griffith University, Gold Coast, Australia (Arts, Education & Law). Both quantitative and qualitative questions were developed to achieve the research aims of the project.

Participants

Participants were required to record their general user trends (top 3), types, and reasons for and for not adopting Web 2.0 technology. Participants were required to give elaborations for specific quantitative responses, allowing for more descriptive data collection. There were no predetermined prompts offered to participants concerning the types of Web 2.0 technologies. The main criteria to be included in the analysis were that participants needed to be an Australian citizen and a University student (either full or part-time). There were approximately 1,500 students enrolled at the time of survey activation, with a total of 365 responses initially collected. Only 251 responses were included for analysis, with 114 responses excluded due to not meeting the selection criteria or limited responses. Ethics approval for the research was obtained through the Griffith University Office of Ethics (GU Ref No: EDN/18/11/HREC).

Data Analysis

Data analysis was undertaken using Statistical Package for the Social Sciences (SPSS) (PASW18). Initial data preparation involved the development of one integrated SPSS file to incorporating all responses from the pilot and final survey. Initial data analysis used Frequencies to provide a profile of respondents by demographic characteristics (e.g. gender, age, course major, geographic state) with questions related to investigating participants' and their lecturers' usage trends pertaining to Web 2.0 within their courses. Qualitative data were classified into groups/themes and analysed and presented using Frequencies. Chi-square tests were undertaken to assess factors that may differentiate female and male university students. Statistically significant differences were reported using $p. < 0.05$

Results

Demographics of Participants

Table 1 summarises the demographics of the participants. Among a total of 251 responses; 81.3% were completed by female and 18.7% by male participants. The average age of participants was 24.65 years (SD

= 8.43). The participants were enrolled in a wide range of course programs, including Education (41.0%), Law/Criminology (12.7%) and Business (13.9%).

Table 1. Demographic Information of Participants

Demographics	*n*	%
Gender		
Female	204	81.3
Male	47	18.7
Course Major		
Education	103	41.0
Law / Criminology	32	12.7
Journalism	7	2.8
Arts / Design	14	5.6
Music	9	3.6
Psychology	6	2.4
Sociology	2	0.8
Media / Communication	17	6.8
Photography	5	2.0
Environmental Science	1	0.4
Language / Linguistics	5	2.0
Business	35	13.9
BA – Unspecified	15	6.0
Resident State		
NSW	6	2.4
QLD	244	97.2
VIC	1	0.4
	M	SD
Age	24.65	8.43

General User Trends of Web 2.0 Tools Amongst Australian University Students

A question was proposed to participants in an attempt to ascertain whether they have ever used any type of Web 2.0 tools. Among the 251 participants, 84.9% of them revealed that they used Web 2.0 tools, whilst 15.1% indicated they did not. For the latter group of participants, 81.6% responded to the question exploring why they did not use Web 2.0 tools. Twenty–six percent (25.8%) of respondents mentioned: 1) privacy concerns (25.8%); and 2) they did not have knowledge about it (16.1%) (Refer Figure 1).

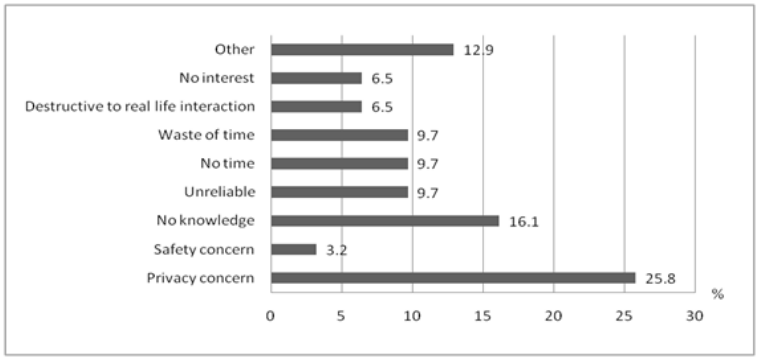

Figure 1. The reasons why university students do not use Web 2.0 tools (n = 31)

For participants (n = 213) who stated they used Web 2.0 tools, they were then asked to reveal the top 3 Web 2.0 tools they most frequently used (Table 2). The top ranked Web 2.0 tools were: 1) Facebook (73.3%); 2) both Blogs and Messenger (12.0% each); and 3) Twitter (13.8%). There was a slight misinterpretation from a few participants who recorded a technology platform (e.g. iPhone, podcast, other mobile), rather than a Web 2.0 technology (e.g. Facebook, YouTube, Twitter). These were included for analysis as responses had limited impact on the data.

Table 2. Top 3 Web 2.0 Tools Used (n for top 1 = 211, top 2 = 150, top 3 = 116).

	1st		2nd		3rd	
	n	%	n	%	n	%
Blog	1	0.5	18	12.0	11	9.5
Facebook	184	73.3	13	8.7	5	4.3
Google	1	0.5	5	3.3	5	4.3
Google Docs	0	0	5	2.0	2	0.8
MySpace	0	0	4	2.7	9	7.8
iPhone	1	0.5	2	1.3	1	0.4
Skype	1	0.5	3	2.0	4	3.4
Twitter	2	0.9	17	11.3	16	13.8
Wiki	1	0.5	6	2.4	5	4.3
Email	5	2.4	15	10.0	9	7.8
Tumblr	3	1.4	10	6.7	6	5.2
Podcasts	0	0	1	0.7	5	4.3
Online forum	1	0.5	2	1.3	2	1.7
Other	9	4.3	14	9.3	16	13.8
Other mobile	0	0	1	0.7	0	0
None	0	0	3	1.2	5	4.3
Yahoo	1	0.5	0	0	0	0
Messenger	0	0	18	12.0	7	2.8
Youtube	1	0.5	13	8.7	8	6.9

Participants who used Web 2.0 tools (n = 251) were then asked how often they would spend time using them. Eighty–three percent (83.3%) of participants responded to this question. Figure 2 indicates that the majority of participants revealed that they used Web 2.0 tools: 1) a few times per day (63.6%); 2) almost every day (26.8%); and 3) few times per week (5.3%).

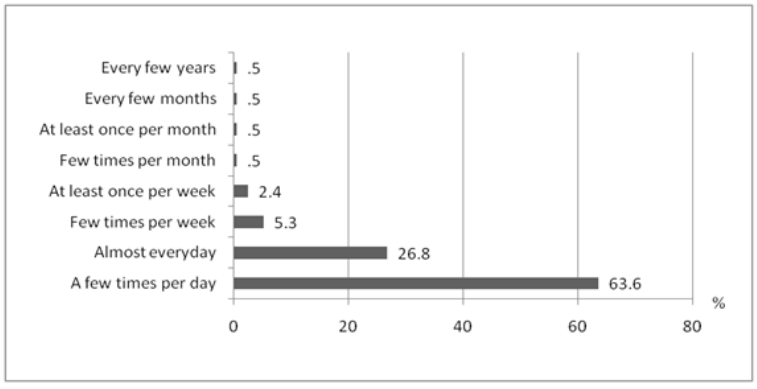

Figure 2. How often participants used Web 2.0 tools (n = 209).

Web 2.0 User Trends Amongst Australian University Students to Retrieve Course Content

Furthermore, participants who revealed that they had used Web 2.0 technologies for their general use were asked whether they would like to use the technology to retrieve course content. Thirty– eight percent (n = 210, 37.6%) of them indicated "yes", while 62.4% of them indicated "no". The initial group of respondents was then

requested to reveal the reasons why they used Web 2.0 to retrieve course content. The top 3 reasons were: 1) it was freely accessible (33.8%); 2) it was fast and easy (26.8%); and 3) for heightened information sharing (23.9%) (Figure 3). In contrast, the latter group was asked to state their reasons for not wanting to use Web 2.0 technology to retrieve course content (Figure 4). The top 3 reasons were: 1) perceived Web 2.0 tools as an unreliable source (54.4%); 2) other reasons such as "do not need it", "no interest", "never thought it" (16.1%); and 3) privacy concerns (14.3%).

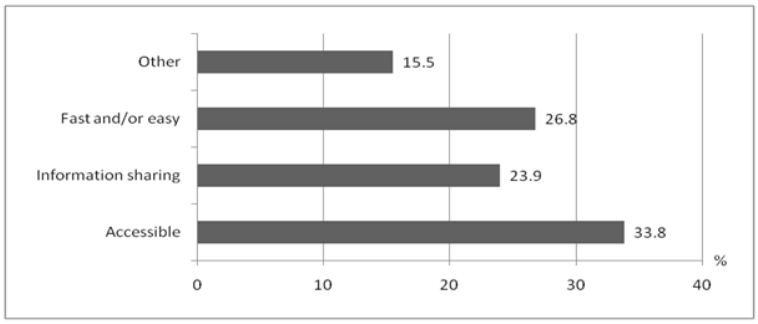

Figure 3. The reasons why participants would like to use Web 2.0 tools to retrieve course content (n = 71).

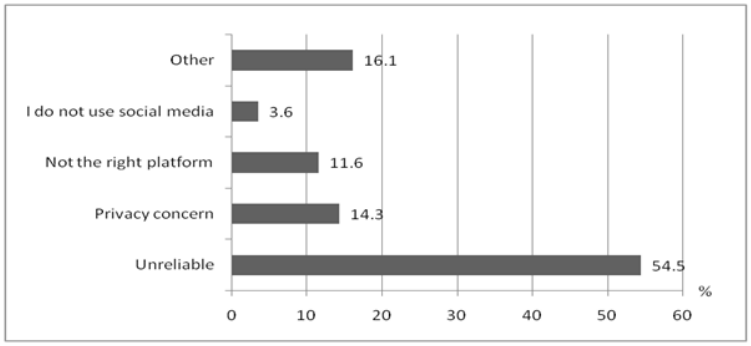

Figure 4. The reasons why participants would not like to use Web 2.0 tools to retrieve course content (n = 112)

Web 2.0 User Trends Amongst Australian University Lecturers to Deliver Course Content

Lastly, participants were asked questions about Web 2.0 tools that were being used by their university lecturers to deliver course content. They were asked to indicate whether their lecturer(s) used Web 2.0 to assist/complement the teaching of a particular course. Two-hundred and nine (209) responses were received; with 32.5% indicating "yes", while 67.5% indicating "no". For those who stated "yes", they were then asked to reveal the most frequently used Web 2.0 tools used by their lecturers. From Figure 5, it appears YouTube (50.0%) was the most common Web2.0 technology used to assist/complement the teaching of a particular course.

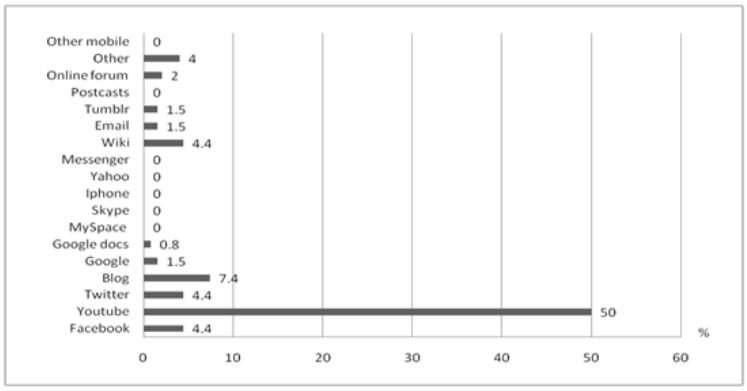

Figure 5. The most common Web 2.0 tool used by lecturers to assist/complement teaching of a course (n = 68).

Next, participants (n = 123) were asked if they would like to see their lecturer use Web 2.0 as a way of delivering course content. The majority of respondents (61.0%) indicated they would not like to see it, whilst 39.0% of respondents indicated they would. Participants were also asked whether they would like to offer their lecturer any advice as to how they may use Web 2.0 as a way delivering course content. Eighty–seven percent (n = 178, 87.1%) stated "no" while 12.9% stated "yes". Nine participants from the latter group suggested using Facebook as a tool for heightening: 1) ongoing communication; 2) discussion and idea sharing; 3) the formation of study groups; 4) reminders for assignment deadline; and 5) notification of lecture cancellations. Further advice included: 6) making lecture videos available online; 7) access to Skype with lecturers; 8) Google Docs to support study group organisation; and 9) using Twitter to connect each other.

Chi square analyses were performed for gender and the question of whether participants used Web2.0 tools. However, no significant difference was demonstrated between female and male university students. Chi square analyses were also undertaken for gender across questions of how often would they spend using Web 2.0, whether they would like to use Web 2.0 to obtain course information, and whether they would like to see their lecturer use Web 2.0 to help deliver course material. Likewise, no significant results were found.

Discussion

Of particular interest to this study is the identified number of Australian university students who indicated that they used Web 2.0 tools for their general use (n = 251, 84.9%), yet were resistant to accessing it for retrieving pedagogical information (n = 210, 37.6%). To a degree, it can be postulated that Australian university students are interacting with Web 2.0 technologies for their personal use but are failing to see how, or do not have admittance to the appropriate avenues, to use such technologies for retrieving course information. The adoption of Web 2.0 in universities is relatively new terrain (Stagno, 2010), and given that many universities are still late adopters of such technologies (Eijkman, 2009), it could be claimed that many academic institutions see Web2.0 tools as problematic (Franklin & Van Harmelen, 2007). Cha (2010) has identified that a major concern which inhibits the adoption of Web 2.0 by corporate, government, and educational institutions is its perceived lack of security and privacy. Interestingly, this study has identified the same findings.

Web 2.0 has become very popular among undergraduates with usage rates upwards of 90% at most campuses (Stutzman, 2006). Steinfield et al. (2008) suggests that more research on the role of social network sites among young adults is needed, since maintaining friendships through Web2.0 technologies like Facebook may play an important role in psychological development (p. 67). Findings from this study correlate with similar international studies which claim that the use of Web 2.0 is rapidly increasing among young adults and students (Pew Internet & American Life Project 2009, 2010; Tech Crunchies, 2008, Virkus, 2008), yet little is known about young people's activities on these sites (Subrahmanyam, Reich, Waechter & Espinoza, 2008). More precisely, qualitative data from this study generated nine (9) recommendations pertaining to the usage and implementation of Web 2.0 tools throughout the academic environment. Supporting such recommendations is Hewitt and Forte (2006) who identify that there has been a great deal of recent

research activity directed towards various aspects of Facebook use, such as the use of Facebook in academic settings. Additionally, Stagno (2010) indicates that universities will need to adopt new teaching and communication platforms if they are to compete in the 21st century knowledge economy.

Despite huge efforts to position information and communication technology (ICT) as a central tenet of university teaching and learning (Selwyn, 2007), the fact remains that many universities make only limited formal academic use of Web 2.0 tools. Whilst this is usually attributed to a variety of operational deficits on the part of students, academics, and universities (Cha 2010), it is still widely acknowledged that further research is warranted to explore the wider social relations underpinning the relatively modest use of Web 2.0 technology in higher education. Further findings from Cha's (2010) study suggest that more research on the role of Web 2.0 technologies among young adults is needed since maintaining open communication, building peer engagement, and academic organisation is central to minimising student emotional stress.

Among young adults, relationships with peers and their academic supervisors are important, both for generating offline benefits (peer engagement) and for psychosocial development (Steinfield et al., 2008). With this concept in mind, a number of participant responses to open ended questions were included and examined, resulting in common responses associated with: 1) Web 2.0 tools are becoming a more prominent facet for communicating students' concerns (n = 13); 2) Academics should be provided with proper training for use of Web 2.0 technologies (n = 15) and 3) Lecturers should play a more active role in the implementation and usage of Web 2.0 for course content delivery and administration (n = 5). Given that a result from this study has indicated that lecturers mainly use YouTube (50.0%) to deliver course content, a further exploratory study should be undertaken to explore what mechanisms could be employed to encourage lectures to adopt a variety of Web 2.0 technologies for the future delivery of course content and communication (YouTube is only a one way information presentation - online video content).

Another important consideration necessary for interpreting results from this study is the disproportional gender ratio of participants (female n = 204 - 81.3% and male n = 47 - 18.7%), whereby it could be assumed that the results obtained from this study is gender specific. As male and females typically display differing user trends and habits concerning Web 2.0 technology (Stagno, 2010; Tech Crunchies, 2008), a recommendation from this study is for further research to be undertaken that would determine male university students' Web 2.0 usage trends.

Future Directions

Findings from this study may help guide future research and policy design which would assist Australian universities to develop the necessary infrastructure and platforms for delivering effective learning and teaching into the 21st century. Supporting such a claim is Levy's (2011) prediction, where he forecasted that "as new technology enables – and even forces - the 21st century learner to learn in a very different way and at a very different pace from any other time in history, the need arises for new learning structures, networks, and tools - Massive Online Open Course (MOOC) is one such learning structure" (p. 33). DeWaard et al. (2011) similarly states that the MOOC is creating a new 'educational order' and a transformative educational landscape to which will necessitate higher education to embrace the use of Web 2.0, Cloud Computing, and mobile technology to heighten pedagogical reform.

The following ten (10) recommendations are made on the basis of contemporary literature (Queensland University of Technology, 2011; Subrahmanyam et al., 2008; Al-Daihani, 2010; Zakaria, Watson & Edwards, 2010), supported by findings from this study and are based on addressing such identified directional and paradigm shifts in higher education. It is identified that there are ten (10) universal future recommendations that should be considered, these being:

1. Undertake larger ethnographic/cross-cultural and university-wide studies in an attempt to better understanding questions such as, "who is, and who is not, using these sites - why, and for what purposes?"

2. Expand samples and case studies from other universities (both national and international) with the objective to examine the impact of diverse demographic characteristics and Web 2.0 implementation.

3. Web 2.0 tools should be integrated together with other blended learning modes throughout university course delivery.

4. Current and future academics should enhance their skills in the use of Web 2.0, so they can keep pace with emerging global trends.

5. Online privacy and security is paramount for successful adoption and that university IT platforms need development to cater for Web 2.0 tools.

6. Explore the potential of Web 2.0 for enhancing remote and distant learning.

7. Use Web 2.0 in an attempt to maximize student engagement via peer-to-peer and student-lecturer interactions.

8. Establish Web 2.0 tools that provide avenues which support the university's real world learning agendas.

9. Provide scope for innovation in learning and teaching approaches.

10. Web 2.0 tools need to complement student-focused learning environments that support the achievement of identified learning outcomes.

Importantly, it would be a mistake to consider that Web 2.0 could be the sole driver and saviour to contemporary learning and teaching; in reality Web 2.0 is just one part of the higher education landscape. Franklin and Van Harmelen, (2007) posit that considerations need to be given to other drives, for example: 1) pressures to develop greater efficiency; 2) changes in student population; and 3) ongoing emphasis on better learning and teaching methods. Similarly, in a more recent study by Kawaka and Larkin (2011) it was suggested that Web 2.0 technologies by themselves will not result in improved outcomes for students in relation to student learning, nor social support [social capital]. They further proclaim that:

> Lecturers need to develop a pedagogic practice which meets the varied needs of the students as well as establishing a context where connections can be made between the various elements of the educational enterprise – lecturer, students, learning resources, assessment tasks and Web 2.0 technologies (p. 27).

The university environment is complex (Rossi, 2009) and requires the lecturer to engage in a continual and sustained process of planning, action, observation, and reflection (Kawaka and Larkin, 2011). More so, based on early evidence, a structured approach is critical for the success of Web 2.0 and pedagogical reform in higher education. Educators need to carefully select Web 2.0 applications which fit to their learning objectives, their learners' experiences, attitudes, and interaction patterns, as well as the considering the overall framework in which Web 2.0 is employed.

Limitations

This study had some limitations associated with the survey instrument, with the major limitation being the initial online data collection method (LimeSurvey). There was an inability (due to an unbiased e-mail alert) to collect/identify equal sample sizes from male and female participants, resulting in a higher participation rate from Australian female university students. However, it was an expectation that given the nature of many of the university programs (i.e. Bachelor of Primary Education) a higher female participation rate was expected. Secondly, the identified participation rates were only achieved via an e-mail broadcast to Griffith

University students (Arts, Education and Law). Due to regulations and privacy restrictions, only 2 e-mails were sent.

Concluding Comments

This study investigated Australian university students' and their lecturers' Web 2.0 usage trends for course retrieval / delivery practices, knowledge management, and social capital. While students in this survey overwhelmingly rejected the educational use of the Web 2.0 technology they frequent, perhaps the skills they have at updating statuses, remixing memes, and sharing their opinion can work in a more intentional educational context. A possible solution could be for educational faculties to build a course that pulls in the technology and easy use of popular Web 2.0 sites, thus allowing the students to devote more energy to the learning environment. Correspondingly, it is further concluded that future reform, underpinned by Web 2.0 technology, could provide a potential framework that legitimises university students' participation in retrieving and receiving course content material and social capital building. But currently evidence is lacking to show under what conditions this proposition development might facilitate change or otherwise, thus warranting further research. Specifically, there is a need to conduct additional research which investigates evidence of differential use between demographic groups (Jones, Johnson-Yale, Millermaier & Seoane Perez, 2009). In particular, scholars (Head & Eisenberg, 2011; Horgan & Sweeney, 2010) have examined race and ethnicity, as well as gender, as predictors of Web 2.0 use, and identified points of contrast. Similarly, these aforementioned issues may have an indirect impact on this study's data, suggesting that not all Australian households have access to Web 2.0 applications (Australian Institute of Health and Welfare, 2011).

Moreover, results from this study, albeit drawn from a relatively small sample size, have been found to mirror many of the findings from similar international studies and literature. The results and recommendations presented throughout this study are an opportunity for Australian university learning and teaching faculties to develop and implement future effective reform, knowledge management, and social capital using Web 2.0.

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