The Potential of Web 2.0 Technologies in Transforming Higher Education

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Abstract

How we learn and by what means is changing. The emergence of Web 2.0 technologies has created new conditions and new opportunities for learning within higher education. Increased access to the Internet via a combination of mobile devices and communication infrastructures are providing access to a growing library of information. Few campuses today are without their own email, digital libraries and virtual learning environment. Today's students are increasingly comfortable in the use of online tools and techniques, including searching for and evaluating online information, selecting and downloading applications, using social networking sites and contributing to online discussions.

The aim of this dissertation is to examine the potential of Web 2.0 technologies within higher education along with their potential in transforming current approaches to teaching and learning. The advantages and disadvantages of using such technologies will be considered in order to determine their potential impact on both learning processes and outcomes.

Overall, this dissertation provides a discussion as to whether Web 2.0 technologies have the potential to radically change current learning practises or whether they are simply the latest developments in the relationship between formal and informal learning. It is concluded that while these technologies offer enormous collaborative learning opportunities, further developments are required to realise their potential.

Chapter 1 – Introduction

The first decade of this century saw the emergence of Web 2.0 technologies. In contrast to Web 1.0 technologies which provided basic text, graphics and information, Web 2.0 enabled people to share, participate and collaborate. These advances in information and communication technologies have meant that e-learning has become part of our everyday lives. 'Learning is happening constantly in many new ways because of collaborative opportunities offered by social networking sites, wikis, blogs and many other interactive digital sources' (Davidson and Goldberg, 2009, p.9). These technologies used to connect learners have significantly shifted thinking in higher education. At the centre of this shift in thinking is the idea that students should be actively engaged in a sustainable community of learners. The point has been made that 'if e-learning approaches do not deepen the learning experience of students, they are not worth much' (Weigel, 2002, p.1). The affordances of new communication technologies and their ability to create and sustain communities of learners have quietly established e-learning in the mainstream of higher education.

There are many definitions of e-learning but Randy Garrison (2011, p.2) defines it as 'electronically mediated asynchronous and synchronous communication for the purpose of constructing and confirming knowledge'. As Garrison describes, e-learning can be delivered asynchronously or synchronously. Asynchronous e-learning does not require all participants of an e-learning experience to be present at the same time. Examples of this type of e-learning include e-mail and discussion boards. In contrast, Synchronous e-learning takes place when all participants of an e-learning experience are present at the same time. Examples of this type of e-learning include online chat rooms and instant messaging.

Beyond this description of e-learning, there are two applications which constitute e-learning. These are online learning and blended learning. Fully online learning is a form of distance education which allows students to study independently in their own time without face to face contact with a teacher. While forms have distance education has been with us for many years. The advances in these technologies have greatly increased the options for providing interactive learning experiences.

> *'While e-learning has an element of distance education, it has evolved from a different field of theory and practice. Distance has become but a relatively minor*

structural constraint in providing a quality, highly interactive learning experience. E-learning represents a true paradigm shift with regard to distance education.'
(Garrison, 2011, p.2)

On the other hand, blended learning is the most common form of e-learning used in traditional higher education institutions. Blended learning combines face to face communication with various opportunities created online. Most courses in higher education have an e-learning presence in terms of online access to content and feedback.

Mark Prensky describes today's students as 'Digital Natives'. According to Prensky (2001, p.1) 'students have changed radically. Today's students are no longer the people our education system was designed to teach'. He goes on to explain that 'today's students represent the first generation to grow up with this technology. They have spent their entire lives surrounded by and using computers, videogames, digital music player, video cams, cell phones and all other toys and tools of the digital age. Computer games, email, the Internet, cell phones and instant messaging are integral parts of their lives. It is now clear that as a result of this ubiquitous environment and the sheer volume of their interactions with it, students think and process information fundamentally differently from their predecessors' (Prensky, 2001, p.1).

Garrison (2011, p.1) also states that 'the greatest mistake is to try and integrate new communications technology into passive educational approaches. E-learning will fail if we merely add on to or repackage our current educational designs'. This view brings me back to the purpose of this dissertation which is to examine the potential of Web 2.0 technologies in transforming approaches to teaching and learning within higher education. Before analysing the potential impact that these technologies can have in transforming higher education, it is necessary to review some of the differences between communicating using computer media and communicating face to face.

While new technologies are rapidly appearing which provide easy audio and video capture and integration, the main method of communication online continues to be text based. This creates a major transition as the cues present in face to face communications are reduced to those chosen to be conveyed through text. Two of the main differences of computer mediated communication compared to face to face communication are outlined below.

Anonymous - Anonymity is possible because participants are only identified through an online name, email address or personally chosen identifier. The lack of visual cues in text based communication allows speakers to choose what they reveal about themselves. This is also the case in online worlds where people can choose what image of themselves they want to present in an avatar.

Asynchronous - As communications are stored on a server for retrieval at the convenience of the recipient, speaker and audience do not need to be present at the same time or place. This allows conversations to spread over longer period of time than in face to face communication. It also allows communication to take place at any time of the day or night, across time zones and outside of the traditional classroom setting.

Both face to face and computer mediated communication offer different possibilities and it's ultimately these differences that will determine the success of text base, computer mediated communication for educational purposes. Garrison provides an interesting view on the text based communication offered through e-learning. This view will be explored further in chapter four in relation to a number of Web 2.0 tools.

> *'This form of communication is central to e-learning and its use can only strengthen the educational experience through sustained online discourse and reflection. There is every reason to believe that text-based communication in an e-learning context would have advantages to support collaborative constructivist approaches to learning. The importance of text-based communication will reassert itself in higher education through e-learning and as a result enhance the educational experience.'*
> (Garrison, 2011, p. 17)

This dissertation will first look at the development of the World Wide Web. It will have particular focus on the shift from Web 1.0 to Web 2.0 in order to understand why these developments are challenging current approaches to teaching and learning.

The second chapter will focus on the community of inquiry model. This model represents a process of creating a meaningful learning experience through the development of three independent elements; social presence, cognitive presence and teaching presence. This will

provide a foundation for analysing whether such Web 2.0 technologies have the potential to challenge current approaches to teaching and learning.

The third chapter will provide the main analysis of the use of Web 2.0 technologies within higher education. This chapter will aim to build on community of inquiry model in order to analyse whether these Web 2.0 technologies have the potential to challenge current approaches to teaching and learning. This chapter will have particular focus on the use of wikis, blogs, social networks and virtual worlds and will include examples of how these technologies have already been explore outside of formal education settings.

The fourth and final chapter aims to provide a justified conclusion in answer to the original question as to whether Web 2.0 technologies have to potential to challenge current approached to teaching and learning.

Chapter 2 - Brief History of the Web within Education

This chapter provides a brief look at the developments of the World Wide Web to provide an understanding of why these developments are challenging current approaches to teaching and learning.

Web 1.0

The arrival of the web browser in 1993 provided people with the opportunity to access more information than ever before. Web 1.0 was all about having a web presence with personal and professional web pages, information posted on the web and search engines used to find and retrieve these pages. While posting personal work to the web required some expertise when the web first appeared, systems have been developed since that make creating simple pages as easy as using a word processor. Blogs in particular have made it very easy to instantly post information online.

In education currently, web presence is most evident in this Web 1.0 mode. The implementation of digital libraries and access to electronic resources is a change that has had a profound effect on academia and is one that has been implemented in higher education at the institutional level. Access to online material such as journals and e-books is also creating a web presence for documents that allow for easy access and use. Where these features on web still remain in use today, they represent a Web 1.0 mode rather than a Web 2.0 mode for education.

Web 2.0

While Web 1.0 was about being seen, Web 2.0 is about being seen with by others and becoming part of a community. The focus is on participation through the use of technologies such as social networks, blogs and wikis. In education, Web 2.0 tools are currently quite limited. Widespread adoption of such technologies has yet to occur. This is because Web 2.0 practices do not conform to the traditional classroom or lecture based approach to teaching and learning. The tradition of the teacher as authority, single speaker and content manager is at odds with the collaborative potential offered by these technologies.

It is these factors have prompted major debate about the potential of Web 2.0 tools in transforming higher education. Garrison (2001, p.6) cited Marshall McLuhan (1995) who argued that 'the content of new media is always is initially always older media. Thus, the first use of cinema was to record plays and the first use of the Internet was mail. Likewise, the first educational application of the Internet was to disseminate lectures and replace paper syllabi. Now, however, we are challenged to go beyond these early adaptations and develop educational approaches that exploit the possibilities of e-learning to support sustainable communities of learners'.

Chapter Summary

This chapter has provided a brief look at the developments of the web which have brought about new opportunities learning. The following chapter will provide a theoretical foundation for the analysing the potential of Web 2.0 technologies within higher education.

Chapter 3 – Theoretical Foundations

Community of Inquiry

The community of Inquiry model is an instructional design model for e-learning which was developed by Randy Garrison, Terry Anderson and Walter Archer. This model represents a process of creating a meaningful learning experience through the development of three independent elements. These elements are social presence, cognitive presence and teaching presence. This will provide a foundation for analysing whether the communication technologies presented through the Internet have the potential to challenge current approaches to teaching and learning in creating and sustaining a community of learners.

Social Presence

The original working definition of social presence is 'the ability of participants in a community of inquiry to project themselves socially and emotionally, as real people, through the medium of communication being used' (Garrison, Anderson and Archer, 2000, p.94). 'Social presence in an academic context means creating a climate that supports and encourages probing questions, scepticism and the contribution of explanatory ideas' (Garrison, 2011, p.32).

There are many social learning theories which see learning as a product of social interaction. Situated learning is one social learning theory which is relevant to e-learning. Situated learning is most commonly associated with Lave and Wenger (1991) who argue that learning is unintentional and situated within authentic activity, context and culture (Lave and Wenger, 1991). 'This view of learning focuses on the way knowledge is distributed socially. When knowledge is seen as situated in the practices of communities then the outcomes of learning involve the abilities of individuals to participate in those practices successfully' (Beetham and Sharpe, 2007, p.18). As Wenger explains, this is in contrast with traditional classroom or lecture based models of education:

> *'Our institutions, to the extent that they address issues of learning explicitly, are largely based on the assumption that learning is an individual process, that it has a beginning and an end, that it is best separated from the rest of our activities, and that it is the result of teaching.'* (Lave and Wenger, 1991)

It's this denial of community that is said to be the greatest failing of traditional distance education where courses are to be completed by the student in isolation. This is based upon the assumption that learning is an individual experience and that there is little need to negotiate meaning and confirm understanding. However, it is widely accepted that learning has strong social component. This view immediately appears to presents real opportunities for the use of Web 2.0 technologies within higher education.

Cognitive Presence

Cognitive presence is described as 'the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry' (Garrison, Anderson and Archer, 2001, p.11). It is closely associated with the concept of critical thinking. The concept of critical thinking originates from Dewey's (1933) reflective thinking model. For Dewey, 'reflective or critical thinking has practical value in that it deepens the meaning of our experiences and is therefore a core educational aim' (Garrison, 2011, p.43).

Most cognitive approaches learning take the view of constructivism which suggests that learning is an active and constructive process. Constructivism is largely associated as the work of Jean Piaget. His constructivist theory of knowledge (1970) was based on the assumption that 'conceptual development occurs through intellectual activity rather than by the absorption of information' (Beetham and Sharpe, 2007, p.18). This led Piaget to oppose the direct teaching of model of education. Again, this view appears to present real opportunities for the use of Web 2.0 technologies within higher education.

Teaching Presence

The final element of a community of inquiry is teaching presence. Teaching presence is described as 'the design, facilitation and direction of cognitive and social processes for the purpose of realising personally meaningful and educationally worthwhile learning outcomes' (Garrison, 2011, p.55).

As Garrison describes, creating teacher presence in an e-learning community also appears to be a real challenge. 'To be constrained by the restricted frame of traditional classroom presentational approaches is to ignore the capabilities and potential of e-learning, Implicit in

this recognition is the need to rethink the purpose, approach and nature of the educational transaction. Despite the challenges associated with designing and delivering a meaningful and worthwhile learning experience, it is clear that the technologies associated with e-learning provide enormous opportunities and choice for connection and reflection that cannot be ignored' (Garrison, Anderson and Archer, 2001, p54). 'The responsibilities of teaching in any context are complex. They include being a subject matter expert, an educational designer, a facilitator and a teacher. However, as has been noted, the liberating frame of e-learning significantly alters how these responsibilities are fulfilled' (Garrison, 2011, p.55).

Teaching presence responsibilities are said to require sustained attention to a number of issues. As Garrison describes, 'the main concern is to establish and sustain the learning community to ensure progression towards intended educational goals' (Garrison, 2011, p.58). In addition 'the community must be somewhat self-sustaining and self-correcting; therefore too much teaching presence may adversely affect the discourse and the process of building understanding. When students begin to take responsibility to construct and confirm understanding, teaching presence has found the appropriate balance' (Garrison, 2011, p.58).

Chapter Summary

This chapter has established a foundation for analysing the potential of Web 2.0 tool in transforming higher education. This is based on the community of inquiry model. This model represents a process of creating a meaningful learning experience through the development of three independent elements; social presence, cognitive presence and teaching presence. The following chapter will build on upon this model to analyse the potential of Web 2.0 tools in transforming higher education.

Chapter 4 – Analysing the Potential of Web 2.0 Tools within Education

The previous chapter focused on the community of inquiry model. This model represents a process of creating a meaningful learning experience through the development of three independent elements; social presence, cognitive presence and teaching presence. These elements are said to be essential to the educational transaction. This chapter will aim to build on this model in order to analyse whether Web 2.0 technologies have the potential to challenge current approaches to teaching and learning. This chapter will have particular focus on the use of wikis, blogs, social networks and virtual worlds as these technologies best represent the nature of Web 2.0 in relation to the community of inquiry model mentioned previously. This chapter will also include examples of how these technologies have already been explored outside of formal educational settings.

Wikis

A wiki is described as a 'website or database developed collaboratively by a community of users, allowing any user to add and edit content' (Oxford English Dictionary, 2011). One of the most popular wikis in public use is Wikipedia. Wikipedia is essentially a collaborative encyclopaedia which allows users to contribute and edit entries. This in turn provides a way of authenticating the content to ensure that information is correct. In an educational context wikis lend themselves to group based work as students are able to read and build on each other's work. An example of this would be a group-writing assignment where students research a specific topic and enter their contributions into the wiki. 'Because everyone in the group can add, edit, delete or change the contents, this makes the process democratic. Changes are visible instantly, which encourages responsibility for one's actions and accountability to the group. In addition, it is also possible for the teacher to track work done by each student in a collaborative effort, which encourages a high level of contribution (Solomon and Schrum, 2010, p.36).

When considering whether these technologies have to potential to challenge current models of teaching and learning, it appears wikis in particular present major challenges in establishing teaching presence. This is one of the essential elements defined in the community of inquiry model for creating a meaningful learning experience. Caroline Haythornthwaite and Richard Andrews (2011) emphasise this as they explain how 'one of

the major changes in institutional settings that has occurred with the move to online education has been the adjustment from teacher centric to student centric learning (Haythornthwaite & Andrews, 2011, p.83). 'The major theoretical and practical approach adopted for teaching online has been that of collaborative learning (Haythornthwaite & Andrews, 2011, p.83). Collaborative learning advocates a transition of the teaching role from authority and disseminator of information to facilitator of knowledge acquisition (Haythornthwaite & Andrews, 2011, p.83).

Garrison raises this point further by explaining that 'it is the teacher who has legitimate responsibility to define the curriculum and design the educational activities. Unfortunately, in traditional educational contexts there is little opportunity for collaboration in the planning process. That is, the student has little opportunity for collaboration in the planning process or in defining expected outcomes of the educational experience. This creates a contradictory situation where the student is expected to assume responsibility for activities and an outcome over which they have had no input and offered little control (Garrison, 2011, p.11). By being included in the larger process, and being provided choice where appropriate, students are given a sense of control and therefore are able to take responsibility for the quality of the educational outcome. It is collaborative efforts that help students assume responsibility for their learning (Garrison, 2011, p.11). These factors would appear to welcome a form of blended learning.

Blogs

A blog is described as 'a personal website or web page on which an individual records opinions, links to other sites, etc. on a regular basis' (Oxford English Dictionary, 2011). Blogs are mainly text based but they can include a number of different media forms such a videos, photos and audio. Blog entries appear in reverse chronological order, so the newest entries appear at the top of the page. They allow for instant publishing online and invite audiences to provide feedback as comments. It's this posting and commenting process which is said to make blogs useful tools within education. A New York Times article form 2008 even suggested that 'a future Nobel Prize winner might not be an oncology researcher at a distinguished university but a blogging community where multiple authors, some with no official form of expertise, actually discover a cure for a form of cancer through their

collaborative process of combining, probing and developing insights online together' (Davidson and Goldberg, 2009).

Blogs are already being used to a certain extent in education. One of the main advantages they offer appears to be how they encourage students to think critically. With blogs, students write entries with the understanding that a potential audience can read it. In an educational context this audience would at least be other members of the course. Writing for an audience means thinking about the ideas first and then writing the ideas so that others understand what you are writing about.

When considering whether these technologies have to potential to challenge current models of teaching and learning, blogs in particular emphasise the differences between computer mediated communication and face to face communication. As mentioned previously 'serious questions have been asked concerning the extent and degree to which text based communication alters the flow and structure of higher order teaching and learning' (Garrison, 2011, p.16). Garrison explains how a study of questioning and cognitive functioning supports text based communication for higher order learning. This builds upon the community of inquiry model by establishing cognitive presence.

> *The questions and responses were at a higher cognitive level than in a face to face context and that a possible explanation is the asynchronous nature of written communication. It would appear that because students have more time to reflect, to be more explicit and to order content and issues, teachers were able to conduct high-level questioning.'* (Garrison, 2001, p.17)

Social Networks

A social network is described as 'a dedicated website or other application which enables users to communicate with each other by posting information, comments messages, images, etc. (Oxford English Dictionary, 2011). A more accurate description of social networking is described by Hannah Green and Celia Hannon (2007):

> *'Social networking refers to the aspect of Web 2.0 that allows users to create links between their online presence such as a webpage or a collection of photos. These*

links may be through joining online groups or by assigning direct links to other users through lists of 'friends' or contacts.' (Green and Hannon, 2007, p.13)

As mentioned previously, it is widely accepted that learning has a strong social component and that learning is often situated in our relationships with others (Lave and Wenger, 1991). The nature of social networking has strong links with this perspective. This sees learners as active participants in the learning experience rather than passive recipients. This case study from the University of Maryland, USA provides a good example of how social networks have previously been used effectively for education. This case study features in Caroline Haythornthwaite and Richard Andrews 'E-learning Theory & Practice'.

The Hot Dish Social Networking Application: A Social Leaning Resource
Christine Greenhow, University of Maryland, USA

When preliminary studies suggested the educational and social potential of social networking sites, we decided to explore whether users would participate authentically through a social network site. To examine this, we developed an open source social networking application called Hot Dish and implemented it within young people's existing social network on Facebook. The goal was to engage young people (ages 16-24) in literacy and socio-scientific inquiry around a pressing social issue of interest to them: environmental issues and climate change. The project also sought to engage them in related environmental activism through offline and online challenge activities. Along with questions about how participants would progress, we were also interested in whether their interest in and knowledge of environmental science and climate change issues would increase, and if so, how? Would a sense of community develop? Perhaps most importantly would their online contributions translate into real world actions or consist solely of virtual activism?

The Hot Dish social networking application was the first of its kind to prominently feature editorial alongside user generated content all enveloped by the unique socialising, profiling, sharing and inviting features that are hallmarks or social network sites like Facebook. Launched in March 2009, the application positioned participants in the role of producers of content where they read, rank, annotate, post and share digital content relevant to the topic at hand. Hot Dish also emphasises the link between online debate and civic participation offline. Over the course of a three-month study period, young people

contributed two-thirds of the content available within the network. Overall the programme looked to be a success. Contributions indicated increased interest in the topic, in self-expression and in civic involvement. For example, surveys revealed that overall interest in environment science and climate change increased among all users. Young people appeared to use current events to connect more meaningfully with career interests and fields of study they were learning in school (Haythornthwaite & Andrews, 2011, p.69-70).

While social networking applications clearly appear to fit in with the social context of learning, serious questions have been asked as to whether social networks have to potential to radically change to educational system. The sorts of learning practices evident in social networking have been explored by Luckin, et al. (2009) who suggests that while most learners express a generally positive orientation towards using the Internet to support their learning; their actual interests were mainly focused on supporting learning activities:

> *Learners seem cautious about others values associated with the Web 2.0 initiative, such as the shared construction of knowledge in a public format. There was little evidence of ground breaking activities and only a few signs of criticality, self-management or meta-cognition reflection.* (Luckin, et al., 2009, p.87)

This view was recently supported in findings from a six country survey (De Rosa, et al., 2007) that found that the use of social networking sites did not increase the likelihood of young people saying they would self-publish creative work, share ideas with others, participate in online discussion groups or meet others with similar interests. Additionally, recent research (Madge.et al., 2009) has found little evidence of formal educational benefits from the use of social networking and concluded that their use 'is more for socialising and talking to friends about work than for actually doing work' (Madge.et al., 2009, p.149).

In order to investigate this further I conducted some research of my own through the use of an online survey. The survey was completed by 55 students who currently study at the University of Plymouth. The majority of these surveys were completed by students who are currently studying Digital Art and Technology although a number surveys were completed by students form other courses at the University.

When asked whether they have ever self-published creative work online outside of the requirements of their University course, 64% of students said that they had. Also, the exact same number of people said they have previously set up a group on Facebook to help their studies. This appears to support the previous claim that the use of social networks in education currently are more for socialising and taking to friends about work.

The survey was also used to discover student's preference for the amount of face to face communication they feel they require in completing their studies. This was done on a scale of 1 to 4 with 1 being no face to face communication, 2 being a limited amount of face to face communication, 3 being a moderate amount of face to face communication and 4 being an extensive amount of face to face communication.

When asked how much face to face communication students felt they required with their instructors, 36% of students had preference to an extensive amount of face to face communication with their instructors in completing their studies, 28% of students said they felt they required a moderate amount of face to face communication with their instructors in completing their studies and 36% of students said they felt they required a limited amount of face to face communication with their instructors in completing their studies. None of the students said they felt require no face to face communication with their instructors.

When asked how much face to face communication students felt they require with their course mates in completing their studies, the majority of students (55%) had preference to an extensive amount of face to face communication. 25% of students said they felt required a moderate amount of face to face communication with their course mates in completing their studies, 11% of students said they felt they required a limited amount of face to face communication with their course mates in completing their studies and only 9% of students felt they required no face to face communication with other member of their course. The results from this part of the survey are presented in figure 1.

Figure 1. Student preference for face to face communication within higher education
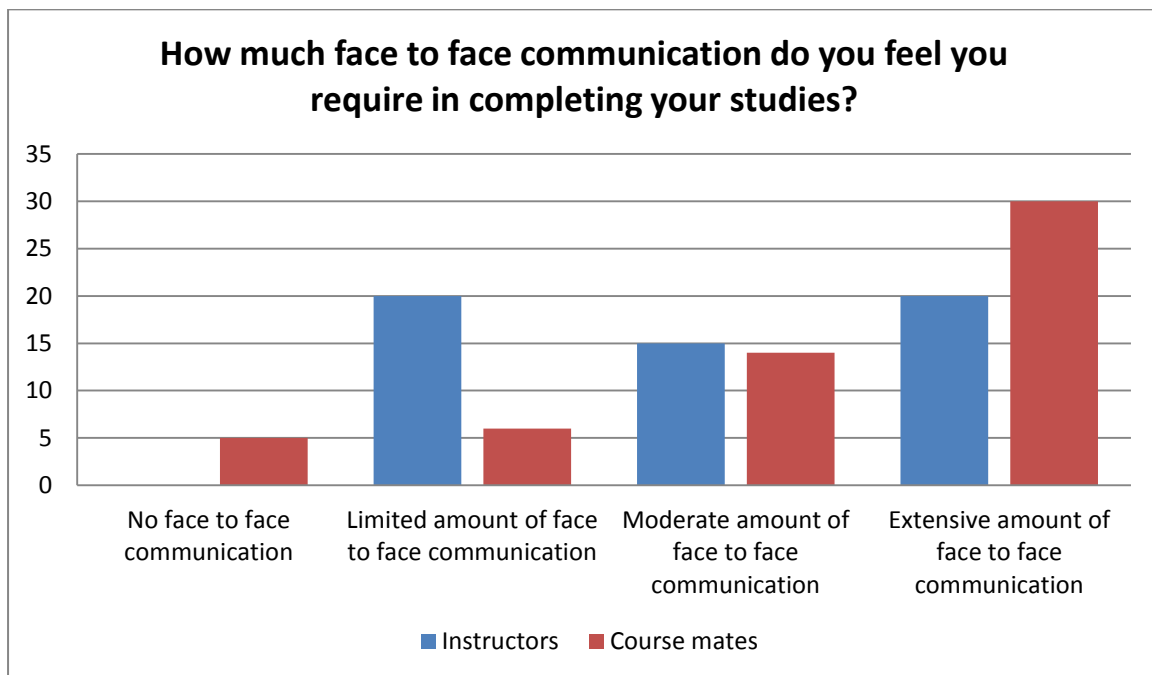
These findings suggest that students have a strong preference for the social interaction that comes with being on campus with their peers. While they may use such technologies as social networks in their daily lives, their relationships with others appear to be a very important factor in the learning process. This would again seem to welcome a form a blended learning opposed to the idea that such technologies can be used for fully online learning experiences.

Virtual Worlds

Meadows (2007, p.34) defines virtual worlds as 'online interactive systems in which multiple people, sometimes millions of people, share in the development of an interactive narrative.' Often referred to as Massively Multiplayer Online Games, two of the most popular of these environments are Second Life and World of Warcraft.

Second Life in particular is already making bold steps into education. Second Life is a 3D user created world which allows people to interact with each other through their own personal avatar. Although it currently appears that there is no substitute for face to face communication, the use of avatars in these virtual worlds makes being virtually there almost

as good as being physically there. In this sense, virtual worlds provide an enhanced social experience that goes beyond a number of Web 2.0 technologies.

The 'Terra Incognita' project of the University of Queensland has built a classroom in Second Life. 'In addition to supporting lecture style teaching, the project allows small groups of students to break off from the central classroom. Instructors can visit or send messages to any of the groups and can summon them to re-join the larger group'. Simply recreating the classroom experience virtually doesn't appear to be much of a change from traditional methods of education. The value of using virtual worlds is that they allow learn while doing, opposed to instructing them on what they need to know before doing (Beetham and Sharpe, 2007, p.26).

> *'Users thus create their own experiences and construct their own knowledge. Different from much of classroom learning the experience is immersive and learning-by-doing'.* (Wagner, 2008)

An example of how effective these environments can be is occurred in January 2008. While playing the Massive Multiplayer Online Game America's Army, a man named Paxton Galvanek had been learning to respond to critical incidents. As Kapp and Driscoll (2010, p.108) describe how in the 3D learning environment he learnt to evaluate a prioritise casualties, control bleeding, recognise and treat shock and administer aid when victims were not breathing. Galvanek helped rescue two victims from an overturned SUV on the shoulder of a North Carolina interstate. He was the first on the scene and was able to safely remove both individuals from the smoking vehicle. Because of the training he received in America's Army virtual classroom, Mr Galvanek had mastered the basics of first aid and had the confidence to take appropriate action. He took the initiative to assess the situation, prioritise actions and apply the correct procedures.

Virtual worlds are also said to engage students in higher-level cognitive thinking. One example of this is the River City Project. The River City Project was developed to help students learn scientific inquiry. With the look and feel of a video game, the River City project was designed to represent a virtual 19th century town which happens to be plagued by disease. Working in small research groups, the students have the ability to read

documents, examine photographs, visit the hospital and interview River City citizens in an attempt to discover why residents are becoming ill.

Virtual worlds open up opportunities for collaboration where avatars essentially inhabit 3D versions of social networks. Some even believe that such virtual worlds will replace the web as we know it.

> *'Just as once many in higher education loudly proclaimed that the Internet was of no practical use and was filled with questionable material and marketing, so to do critics today have their doubts about virtual worlds. But the web grew into a vital part of our lives, and a growing number of people believe that virtual worlds will do the same'.* (Kelton, 2008, p.22)

Chapter Summary

This chapter has examined the potential of Web 2.0 technologies in transforming current approaches to teaching and learning. This chapter has had particular focus on the use of wikis, blogs, social networks and virtual worlds for educational purposes. Building on the foundations on the community of inquiry model and research conducted by myself the findings appear to welcome a strong form of blended learning opposed to fully online learning experiences.

Chapter 5 - Conclusion

It is clear that Web 2.0 technologies offer effective opportunities for learning. These opportunities allow students to think and learn both independently and collaboratively. This dissertation has discussed the potential of Web 2.0 technologies in transforming approaches to teaching and learning within higher education. It has had particular focus on the community of inquiry model developed by Randy Garrison, Terry Anderson and Walter Archer. This model represents a process of creating a meaningful learning experience through the development of three independent elements; social presence, cognitive presence and teaching presence.

Web 2.0 technologies have enormous capabilities to bring people together to share and create knowledge. Numerous examples also suggest a higher order learning experiences from the use of such technologies. In this sense, Web 2.0 technologies have all the potential to change current approaches to teaching and learning. However, this study has found that students still value the face to face communication that comes from being on campus. This appears to be a fundamental setback in the adoption of these technologies within higher education. What was evident though was the use of Web 2.0 technologies to support their studies. This appears to welcome a strong form of blended learning.

In conclusion, this dissertation has discussed the potential of Web 2.0 technologies in transforming higher education and contributes to an on-going debate as to whether higher education institutions require radical change in order to meet the needs of what Prensky (2001) termed 'Digital Natives'. Looking ahead to the next phase of development, the future looks likely to focus on deeply embedding the social aspect of Web 2.0 with extensive use of collaborative spaces and social networking sites. Metz (PC Magazine, 2007) describes a version of Web 3.0 as a web you can walk through. Without leaving your desk, you can go house hunting across town or take a tour of Europe. You can walk through a Second Life style virtual world, surfing for data and interacting with others in 3D. While it is difficult to establish a definite conclusion, developments in technologies like Second Life have real potential to declare the traditional higher education institutions obsolete. Therefore, it may be simply a matter of time before educators are forced to change their approaches to teaching and learning.

As Privateer (1999) states:

> *'It makes little sense for academia to continue a tradition of learning significantly at odds with technologies that are currently altering how humans learn and interact with each other in new learning communities.'* (Privateer, 1999, p.77)

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