The Awareness and Knowledge of Web 2.0 Technologies in Education: An Australian Perspective

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Abstract: This paper will discuss how Web 2.0 technologies were used in one of the foundation units for the Bachelor Degree of Commerce at Curtin Business School. The research targets undergraduate students, lecturers, and tutors of the Business Information Systems (BIS100) at the School of Information Systems in Curtin University. The research sample size is 122 students for surveys, ten students and seven instructors for interviews. Only 88 students responded to the post-survey. Most universities have already planned, or are currently planning, to change from instructor-delivered teaching to student-facilitated learning with the help of Web 2.0. Because interest has been expressed in the application of Web 2.0 technology in education in some schools, it was deemed worthwhile to carry out further research on the subject. The main purpose of this paper is to investigate the impacts of Web 2.0 technologies on teaching and learning performance at Curtin University, Australia. This research will provide additional information about why Web 2.0 should be adopted in education and will provide several strategies to formulate the adoption of Web 2.0 successfully. The Critical Realism paradigm, which consists of both positivism and interpretive, were applied in the study to explore and understand the relationship between the use of Web 2.0 and the teaching and learning performance. Qualitative and quantitative approaches were used to collect data from surveys and interviews. The results from the post-survey were compared with pre-survey results, to determine any changes in the levels of both awareness and knowledge since the pre-survey. On top of that, face-to-face and email interviews were conducted with students and email interviews with tutors. Significant findings show that the levels of awareness and knowledge of students using Web 2.0 were low at the beginning of the semester, with a slight increase in the levels of awareness and knowledge as the students were exposed to several Web 2.0 tools. In addition, it was noticed that males have more knowledge of Web 2.0 technologies than do females, and are more interested in technology than are females. It was also found that the percentage of students using Web 2.0 to organise group meetings, to communicate with other classmates, and to communicate with their tutors has increased by 6.62%, 7.7%, and 1.82% respectively. Some students found Web 2.0 technologies easy to use and very flexible because they can be easily customised according to users' requirements, such as Blackboard, the Learning Management System at Curtin University. Web 2.0 tools facilitate easy networking. They help students to more easily collaborate and communicate. Moreover, students do not have to rush to complete, print, and submit assignments to the tutor or lecturer. In regards to teaching, adopting Web 2.0 technology will increase student engagement and it will make classes more interesting and interactive, which may lead to an increase in, creativity, usability, and participation. This technology may encourage better interaction amongst students, and between students and the tutor. However, the Internet is always a necessary part of any work with the Web 2.0 tools. If Web 2.0 tools are used in classes, students may find it difficult to focus and be distracted by other activities such as browsing, chatting, or playing games online. The use of Web 2.0 technology in classes may discourage social interaction, although this depends on how the teacher uses the tools. Further research should be carried out to tackle any disadvantages and challenges of adopting web 2.0 in teaching and learning in Australia and globally.

Keywords: Web 2.0, e-Learning, Awareness and Knowledge, Usability

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Background

NOWADAYS, INTERNET HAS become a utility for most businesses and individuals. In most countries, the percentage of Internet usage has exponentially increased in the last ten years (eTForecasts n.d.). Internet usage not only comprises desktop or laptop internet usage but also mobile internet usage. Today, all the new mobile phones, smart phones, and even PDAs (Personal Digital Assistants) come with Internet facilities. Most Australian Phone Providers offer free Facebook and free Twitter when signing up with certain mobile plans. "As far as social networking and mobile marketing Facebook now has more than 600 million users and over a third of those use Facebook Mobile" (Turner 2011) People use the Internet for various purposes, namely: research, education, marketing, information, and entertainment. Internet is rapidly evolving as it provides many facilities to meet users' needs and requirements. The recent evolution of the Internet is Web 2.0, which is referred to as "network as a platform." It consists of social networking sites, video-sharing sites, web applications, Wikis, blogs, and podcasts. Furthermore, this technology can support education in terms of participation, interaction, sharing of knowledge, social networking, critical reading, critical thinking and writing, collaboration, and expression of opinions.

Web 2.0 is a revolution in education, as the principles of Web 2.0 are contribution, collaboration, and creativity. Web 2.0 websites offer significantly more interactive functionality than do "Web 1.0" websites. In general, the principles of Web 1.0 are the 3Rs, i.e. Reading, Receiving, and Researching (Anderson 2007). E learning is performed through Web 2.0, which uses Cloud Computing. Web 2.0 technologies allow user participation by supporting anonymity, better collection of information, freedom of expressing ideas, quick and easy communication, and enables study to take place anywhere and at any time. There is a need for a shift from instructor-delivered teaching to student-facilitated learning (Hazari, North et al. 2009). With Web 2.0, teachers become facilitators and encourage students to think and write more critically. Many universities around the world, including Curtin University, Australia, are adopting this technology in their education sector to encourage students to learn with ICT. For instance, the School of Information Systems at Curtin University has started adopting the Web 2.0 tool "Google Doc" in one of their undergraduate classes to encourage their students to learn new technology, which is widely available in the marketplace.

The Associated Press (2011) reported, "The rapid growth of smartphones and electronic tablets is making the Internet the destination of choice for consumers looking for news." Many studies have indicated that the Internet has become an essential for most people and Web 2.0 has become increasingly popular, especially in the education sector. For instance, "Non-profit organizations Joan Ganz Cooney Center and the Sesame Workshop conducted several surveys amongst parents and children. What they found out was that little children use the internet -- quite regularly" (Ho 2011). However, the level of awareness about Web 2.0 in some educational institutions is low and that some people are misled about the uses of Web 2.0. It was found that some students did not even know that the Web 2.0 tools could be used for personal purposes as well as for their education. Some students and teachers lack the relevant skills and are therefore reluctant to use new Web 2.0 technologies. Because some schools have shown an interest in Web 2.0 technologies, it is worth carrying out further

research into the potential of Web 2.0 in teaching and learning environments, especially for Generation Z.

This research analysed whether Web 2.0 applications have a positive or negative impact on education, by taking into consideration all the risks that may occur. It examined whether education is improving with the help of Web 2.0, and how it is improving. The first factor that the researcher will test is students' level of awareness of Web 2.0 technologies. Then, the feedback of both students and teachers will help determine whether there is a need for changes to the user interface of the Web 2.0 tools and/or in the usability of the tools. Strategies for adopting Web 2.0 technology successfully will be identified and discussed.

Research Methodology

Research Questions

The primary research question relates to the overall research goal. From the literature, it was found that Web 2.0 provides an easy and quick means of communication and sharing of knowledge. However, there is lack of knowledge management as well as lack of common understandings. It was found that language is a major barrier to e-learning. The main purpose of this research is to identify the barriers and challenges of adopting Web 2.0 in education at Curtin University; and whether language is still a major concern of online education. The research question is: *What are the barriers to, and challenges of, adopting Web 2.0 in teaching and learning at Curtin University ?*

While the secondary research questions are:

1. *If Web 2.0 technologies have a positive impact on teaching and learning*, *how will Web 2.0 improve education learning in future?*
2. *If Web 2.0 technologies have a negative impact on Education*, *what changes need to be made to the Web 2.0 technology itself*, *or in the way Web 2.0 is used in education andlearning?*
3. *In case of low awareness of the usability of Web 2.0 technologies*, *what are the strategies to diffuse and adopt this innovation?*

More research is required to determine whether Web 2.0 technologies still have a positive impact on teaching and learning, and hence, how they will improve education learning in future. From the literature review, it was also found that Web 2.0 tools do not have translation facilities to support international students. Hence, many misunderstandings occur. Sometimes, students do not have any interest in participating online due to many factors, one of which is laziness. They tend to be more isolated as well. With Web 2.0, it is difficult for teachers to assess students because of indirect contact. The level of plagiarism may increase. Web 2.0 distracts some students; they tend to check their Facebook account for example, and ignore their studies. Moreover, Web 2.0 applications may not be reliable because if there is a system downtime, students will not be able to study and their work will be delayed. This secondary research objective will determine whether Web 2.0 technologies will have a negative impact on teaching and learning at university. If so, some recommendations will be provided to change the Web 2.0 itself or the way Web 2.0 is being used in education. The research will also help to identify strategies to promote Web 2.0 technologies, and to diffuse and adopt

them. The findings will contribute to the development of recommendations stemming from the research.

Research Method

This research made use of the critical realism approach, which combines both quantitative and qualitative approaches, to collect and analyse data (Dash 2005; Healy and Perry 2000; Bisman 2002; Krauss 2005; Leech and Onwuegbuzie 2007). In this research, surveys and interviews were used to collect data from BIS100 students and instructors.

Pilot Study, Pre-Survey, and Post-Survey

The research was performed by using the survey research method to collect data more effectively. Answering Survey research is easier, quicker to compare the answers, and code and statistically analyse answers. It allows self-expression, richness, and creativity to take place. With survey research, there are fewer irrelevant or ambiguous answers from participants (Neuman 2006). At the beginning of the study before conducting the surveys, a pilot study was carried out to test the validity of the questions of the survey, i.e. whether the questions are too ambiguous which will then cause misinterpretations and thus, invalid answers would be used for analysis in this research causing inaccurate and insignificant results. The pilot study involves distributing the survey to 20 summer school students of Business Information Systems 100 unit - School of IS at Curtin University to test the validity of the questions of the survey. After verifying the correctness of the survey questions through the pilot study, the pre-survey was then prepared. The latter was given to 122 students of BIS100 unit of the School of IS at Curtin University during the first week of the semester to assess their awareness and knowledge of Web 2.0 technology. At the end of the semester, a post-survey was conducted in order to re-assess students' awareness and knowledge about, and attitudes to Web 2.0. This survey helped to investigate whether the levels of awareness and knowledge of students about the Web 2.0 technology had increased after using and experimenting with several Web 2.0 tools during the semester in the BIS100 class.

The survey contained three types of questions, namely: closed-ended, scaled-response and open-ended questions. The open-ended questions gave students the opportunity to add their own comments to the survey. Closed-ended questions comprised questions that provided limited choices to the participant, whilst the scaled-response questions, which form part of closed-ended questions, involved a scale of responses such as Always-Often-Sometimes-Seldom-Never.

Face-to-Face and Email Interviews

Interview research method was also applied in order to support the surveys and to gather qualitative information. Since there were only two out of ten students who were available for a face-to-face interview, the rest were interviewed via email. Seven tutors were also interviewed via email since it was difficult to organise a focus group with them due to their availability. The reason why the researcher utilised email interviews was because of the availability of the interviewees and participants' responses are much more detailed, thoughtful and richer because they have time to reflect on the questions and their answers

to make sure that their answers do make sense and are clear, and they can modify their answers before submitting. With Face-to-Face interview, the interviewer can to some extent control the surroundings and use complex questions. This Interview has the highest response rate. On the other hand, e-Interview gives interviewees whatever time is needed to construct a response to a particular question and express their views. Participants can answer the questions at their own pace, time, convenience without any noise disturbance (Neuman 2006; Ison 2009; Opdenakker 2006).

Unit of Analysis

According to the Research Questions, the researcher examined students' perceptions, attitudes, and knowledge of Web 2.0 tools in their study and the students' learning performance. The focus of the research is also the tutors' viewpoints on the use of Web 2.0 technology in their teaching. The main goal of the research is to determine the level of students' awareness and knowledge of Web 2.0, and if and how Web 2.0 has improved teaching and learning. The study will identify the benefits of using Web 2.0 tools in education and the strategies for further improvement to diffuse and adopt Web 2.0 technology in education. Since the BIS100 unit of the School of Information System at Curtin University makes use of Web 2.0 tools, such as Google Docs, the target population was obviously the students and tutors of the BIS100 unit of the School of IS at Curtin University. Other factors that influenced the choice of target population were that the researcher herself was studying at the School of IS, Curtin University and was working as a tutor for the BIS100 unit. Hence, the sample size was mainly based on the number of students in the researcher's classes. In total, there were only 122 respondents, which equal to 18% of the target population. Their viewpoints were very significant for valid data collection and analysis in this research. The perspectives of instructors of the BIS100 classes were also very important for this research because they have more knowledge about Web 2.0 technologies in an educational setting.

Discussion

Findings from Pilot Study, Pre-survey, and Post-Survey

Prior to conducting the pre-survey, a pilot study was carried out during the summer school in order to test the validity of the questions of the survey. Since the questions were found unambiguous, no changes were made to the pre-survey questions. Hence, the data collected from the pilot study has been combined with the data from the pre-survey. At the beginning of 2010, the pre-survey was conducted during the first week only. The researcher herself distributed the surveys to students; waited in the classroom while the students and the tutor were completing the survey, and collected the surveys as soon as they finished. Few students asked questions about Web 2.0 or the survey itself and the researcher had to limit her answers since the main purpose of the pre-survey was to test the students' level of awareness and knowledge of Web 2.0 technology.

The survey consisted of three sections: Demography, Expertise in IT, and Learning Style. The Demography section gathered students' personal data such as gender, age, and student status (whether they are international or local students). This section helped to determine only the differences between male and female perspectives. During the last week of the

semester, a post-survey was being performed. The purpose of the post-survey was to determine whether there have been any changes in the students' level of awareness as well as in the level of knowledge since the pre-survey, when Web 2.0 was still new to students. All the results from the post-survey were compared with the results from the pre-survey.

After analysing the data and comparing the results from the pilot study and pre-survey and the post-survey, it was found that the levels of awareness and knowledge of Web 2.0 Technology have slightly increased since the beginning of the semester (see Figure 0-1). This means that after introducing Web 2.0 Technology in the Business Information Systems 100 classes, students started to familiarise themselves with Web 2.0. Obviously, it was expected that the level of awareness be 100% because Web 2.0 technologies had been introduced and used in the BIS100 classes during the whole semester.

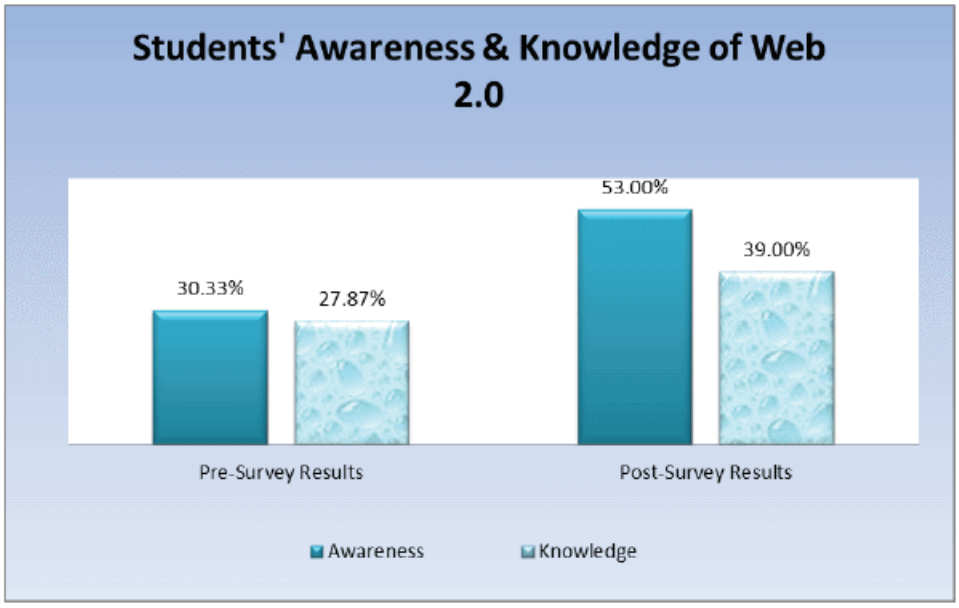
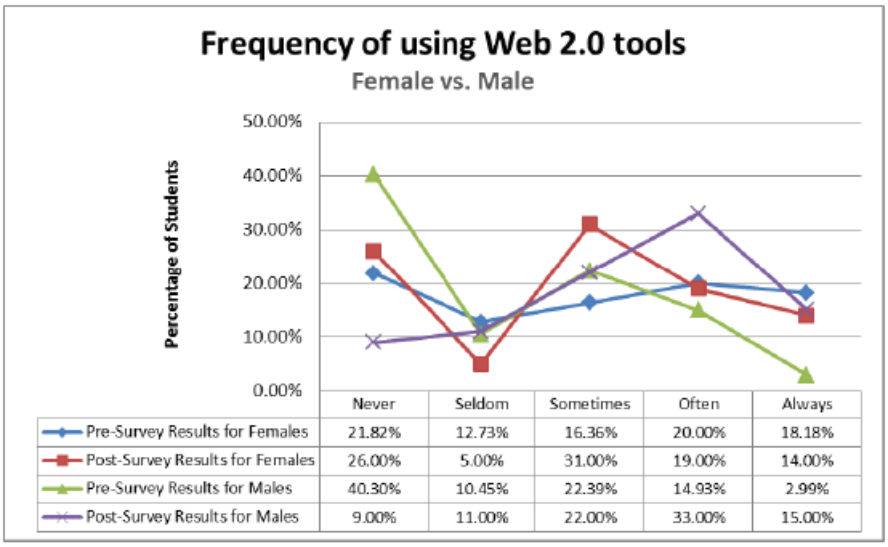


Figure 0-1: Awareness and Knowledge of Students on Web 2.0 Technology

However, only 53% of students have heard of Web 2.0 technologies. It can be deduced that either they have heard about this but are unfamiliar with Web 2.0, or they have not attended most classes and that is why they do not know what Web 2.0 is. Most students have been using certain Web 2.0 technologies but some of them are still unaware that these technologies are actually part of Web 2.0. The level of knowledge has increased by 12.01% for males and by 4.18% for females (see Figure 0-2). This indicates that males know more about Web 2.0 technologies than females. Males are more interested in technology than are females. It was noticed that a high percentage of females sometimes use Web 2.0 tools, after becoming familiar with the Web 2.0 tools in BIS100 classes and a very low percentage of females have never used Web 2.0 tools.



	Never	Seldom	Sometimes	Often	Always
Pre-Survey Results for Females	21.82%	12.73%	16.36%	20.00%	18.18%
Post-Survey Results for Females	26.00%	5.00%	31.00%	19.00%	14.00%
Pre-Survey Results for Males	40.30%	10.45%	22.39%	14.93%	2.99%
Post-Survey Results for Males	9.00%	11.00%	22.00%	33.00%	15.00%

Figure 0-2: The Frequency with which Students use Web 2.0 Tools (Female vs. Male)

Moreover, it was found that the percentages of students using Facebook and Blackboard have been increased by 17.23% and 18.85% respectively (see Figure 0-3). This may be due to new users hearing about Facebook in class and beginning to use and like it. Moreover, at the beginning of the semester, the new, first year students were unfamiliar with Blackboard and its applications. During the whole semester, the students were required to use Blackboard very often as they had to download lecture notes or even iLectures. In the BIS100 unit, students had to work on tutorials and submit them via Blackboard. The semester test was also carried out on Blackboard.

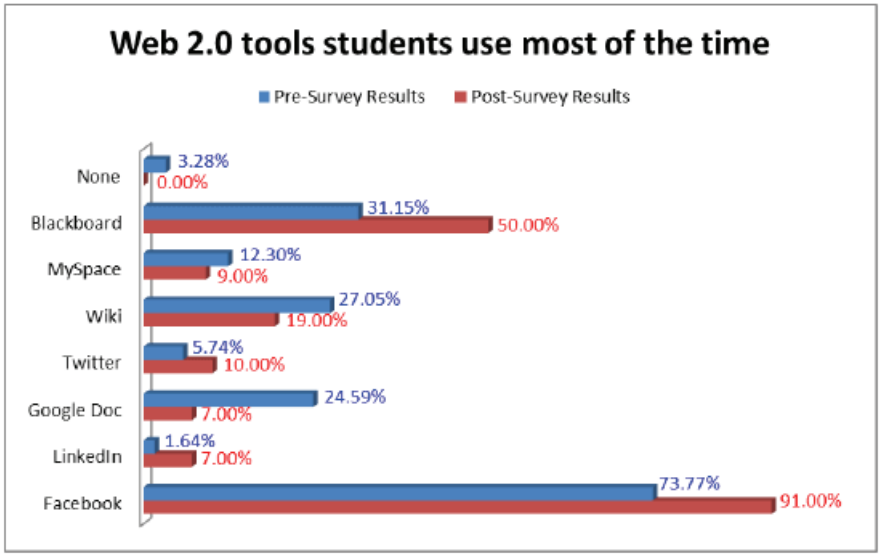


Figure 0-3: Web 2.0 Tools that Students use most of the Time in their Everyday Lives

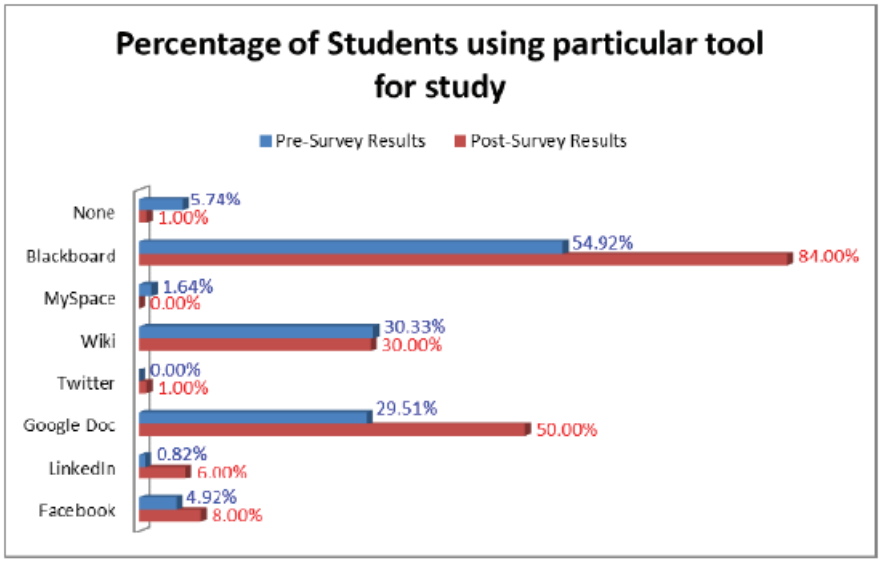


Figure 0-4: Web 2.0 Tools that Students use for Study

The percentage of students using Web 2.0 to organise group meetings, to communicate with other classmates, and to communicate with their tutors has also increased. This shows that the levels of awareness and knowledge of Web 2.0 have definitely increased and students have begun to use Web 2.0 tools for study purposes. Teachers have been successful in teaching Web 2.0 technologies to students in the BIS100 unit. There has been a success in

engaging students and motivating them to use Web 2.0 tools, as proven in figures 0-4 and 0-5.

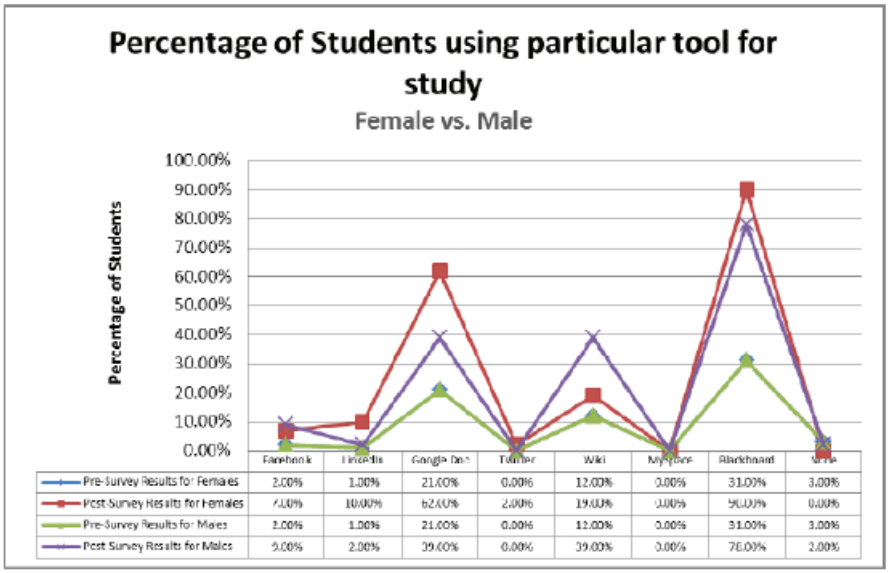


Figure 0-5: Web 2.0 Tools that Students use for Study (Female vs. Male)

Findings from Interviews

In addition to the surveys, face-to-face and email interviews were conducted with students and email interviews with tutors. It was noted that Web 2.0 tools bring many benefits to students' study. Web 2.0 technologies such as Google Docs are cheaper or free, and they are very convenient for students. They are easily accessed from any location and at any time. They also allow students to have access to a greater number of resources, and more importantly, to up-to-date news. Some students found Web 2.0 technologies easy to use and very flexible because they can be easily customised according to users' requirements, such as Blackboard, the Learning Management System at Curtin University. Web 2.0 tools facilitate easy networking. Web 2.0 tools help students to more easily collaborate and communicate. Moreover, students do not have to rush to complete, print, and submit assignments to the tutor or lecturer. Students can also view the iLectures several times and at their own convenience.

Google Docs supports group assignments more efficiently and effectively because it provides sharing facilities (Google Inc 2009). They also upload templates for assignments on Google so that all students follow the same template, which will then facilitate the tutor's work (Rienzo and Han 2009, 126). Some Web 2.0 tools also allow the sharing of ideas anonymously. So, more discussions that are anonymous should be provided in classes so that those students, who are reticent or lack the confidence to share their views with others, will be more willing to do so. By using anonymous discussions through Blackboard or Facebook for instance, a wealth of ideas may be gathered. It was noticed that students found Google

Docs convenient, very easy to remember and efficient to use. There is no need to learn how to use Google Docs, as most of its functions are similar to those of Microsoft Word. Google Docs is very practical and user-friendly. It is very easy to navigate throughout Blackboard and material can be downloaded quickly.

However, Web 2.0 technologies can bring some disadvantages to education. Many errors arose with the drawing tools in Google Docs application as well as with Blackboard. For instance, some students saved their work and when they tried to submit their answers, a pop-up window appeared, saying that some questions had not been completed. Those students had to wait for a while for the system to respond correctly. Moreover, other students experienced major issues with Blackboard. Whilst they were typing their answers, the window froze and refreshed by itself. The students then lost either all or part of their answers. These problems led to student frustration. Errors in Network will affect students' studies. iLectures, which are the recordings of the traditional lectures, may reduce student motivation to attend classes. It is important to note that some Web 2.0 tools, such as Wikipedia, do not provide accurate, scholarly information as they can be accessed and modified easily by anyone. There are also some privacy issues with Web 2.0 technologies as their information can sometimes be publicly accessed or shared with certain people. The most important drawback that needs to be considered is that when using certain Web 2.0 tools in class, students can become distracted easily and quickly and hence, they will not follow the class properly.

In regards to teaching, adopting Web 2.0 technology will increase student engagement and it will make classes more interesting and interactive, which may lead to an increase in, creativity, usability, and participation. This technology may encourage better interaction amongst students, and between students and the tutor. Web 2.0 technologies will obviously help decrease paperwork as iLecture notes are provided through Web 2.0. If students do not understand the terms used by the teacher during the class, they can immediately search for them online in order to better understand the teacher's material. Teachers can easily communicate with and teach external and offshore students. They can mark assignments at any time and from anywhere. This could make this task quicker and more efficient to accomplish.

However, the Internet is always a necessary part of any work with the Web 2.0 tools. If Web 2.0 tools are used in classes, students may find it difficult to focus and be distracted by other activities such as browsing, chatting, or playing games online. The use of Web 2.0 technology in classes may discourage social interaction, although this depends on how the teacher uses the tools. Teachers could encourage students to network more effectively in the class with the help of particular Web 2.0 tools. There may also be resistance from the University because of the policy. Data can be lost unexpectedly. The system may crash at any time. Google Docs lacks the advanced features of Microsoft Office. Some Web 2.0 tools may be incompatible with different platforms (Rienzo and Han 2009).

According to tutors, during the first 45 minutes of tutorials, students should use computers, and this should be followed later by class discussions. Facebook can be used to share ideas with the tutor, or to ask him/her questions after class. Classes can be used to analyse and solve problems since analytical thinking is not provided on the Internet. For instance, Scott (2009) reported that ―Platt spends class time focusing on critical thinking, problem solving, and team-based learning. He puts together mini-podcasts to explain confusing concepts and encourages students to ask questions on their Twitter page to get instant answers from their peers." It is important to note that there are currently no Web 2.0 tools available solely for

teaching purposes. Those being used are mainly for administrative tasks. Moreover, it is recommended that Web 2.0 not be adopted early in the technology lifecycle.

Conclusion

Web 2.0, referred to as "Network as platform", is a revolution in education. It supports e-learning. One of the Web 2.0 applications, Google Docs, is already in use in one of the units at the School of Information Systems at Curtin University. Many studies have indicated that Web 2.0 is becoming an increasingly important aspect of the Internet, especially in the education sector. However, some studies also showed that in some educational institutions the level of awareness about Web 2.0 is low. Because interest has been expressed in the application of Web 2.0 technology in education in some schools, it was deemed worthwhile to carry out further research on the subject. Overall, it was found that the levels of awareness and knowledge of Web 2.0 technology have slightly increased since the beginning of the semester. This indicates that after introducing Web 2.0 technology in the Business Information Systems 100 classes, students increased their knowledge of Web 2.0 and its applications. Most students have been using Web 2.0 but some of them are still unaware that those technologies form part of Web 2.0. It was also found that males know more about Web 2.0 technologies than do females, and they show more interest in technology than do their female counterparts. Further research will be carried out to investigate the impact of Web 3.0, particularly how it will facilitate Education. Web 3.0 is the future revolution of the Internet. It will merge virtual worlds, such as second life, with the Web. At the WWW2006 conference in Edinburgh, Tim Berners-Lee stated that Web 3.0 will involve the integration of high-powered graphics (Scalable Vector Graphics), which will allow semantic data to be collected from the RDF (Resource Description Framework) web, i.e. the semantic web. Further, Ted Nelson, the inventor of hypertext, suggested that Web 3.0 would consist of a Three-Dimensional Social Networking system (Anderson 2007).

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