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An evaluative study on the significance of the Web in an Australian university context

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Abstract

The Web has permeated many aspects of social activities in the modern society. It has also created a new paradigm in the world of commerce as well as in the field of education. Most Australian educational institutions have directly or indirectly made use of the Web to facilitate teaching and learning. Web-based technologies have become a powerful tool in supporting students in both traditional coursework as well as online learning. Web-based learning, as a strong manifestation of e-learning, has also become more feasible and acceptable within the tertiary education context. As the main stakeholders in web-based learning are students and lecturers, it is important to understand their views and attitudes toward the Web as a learning resource. This paper reports a recent study which investigated the significance of the Web in an Australian university context. It involved the participation of 115 students and 31 lecturers from the Faculty of Education at this university. Questionnaire and semi-structured interview were used in this study. The results indicate a strong recognition of the role of the Web in teaching and learning. However, there are differences between perceived expectations of web-based teaching by students and lecturers and the ways in which it is conducted and managed. Some recommendations are also made to create a more meaningful and powerful web-based learning environment.

1. Introduction

The rapid development of networks and web-based technologies has permeated many aspects of social activities in the modern society, including the field of education. Web-based learning is becoming more feasible and acceptable within the Australian university context. Educational institutions in different levels have directly and indirectly made use of the Web to facilitate teaching and learning in both traditional coursework as well as virtual learning. Web-based technologies are widely used for different academic purposes, such as communication, information retrieval, assessment, course management, etc. As the main stakeholders in Web-based learning are students and lecturers, their views and attitudes toward the Web, as a learning resource, must be understood. It is important that these support tools are used in a way that is mostly desired, so that students' demands can be better addressed.

The study reported in this paper is a mixed method case study conducted at the University of Tasmania, Australia. The whole study involved the participation of 502 students and 100 lecturers from seven different faculties and disciplines within this university. This paper, however, focuses on the Faculty of Education and reports the data gathered from 115 students and 31 lecturers this discipline. It looks at how this particular participant group views the role of the Web and the effectiveness of the web-based learning environment in this educational setting. Data collected from questionnaires and semi-structured interviews were analysed using a Statistical Package for the Social Science (SPSS, version 16) software and the NVivo qualitative data analysis software version 8. The results indicate a strong recognition of the Web as a resource in teaching and learning. This study also discovered some differences between perceived expectations of web-based teaching by

students and lecturers, and the ways in which it is conducted and managed. Therefore, recommendations were made to create a more meaningful and powerful web-based learning environment.

2. Background

Web-based learning is gaining a great market in the Australian university context. Firstly, university students are the most suitable group for web-based learning as they are more mature than the other student groups, for example, younger students in schools and colleges. Most university students have had experiences of traditional lectures and communication with faculties and peer students, therefore, they are motivated enough to continue study without face-to-face contacts (Klassen & Vogel, 2003). Secondly, the Web has presented the lecturers and professors at universities with a range of opportunities with which to support and enhance their curricula (Sauter, 2003). Therefore, Web-based education is diffusing across countries, educational levels, universities and disciplines (Aggarwal, 2003; Aggarwal & Legon, 2008). The question for Australian universities is no longer whether to adopt this learning mode, but how to use the Web and web-based technologies to better assist students' learning.

Computers and web-based technologies are adopted to support all types of learning environments. According to Wilson (1996), there are three major categories of learning environments, classroom-based learning environment, computer microworld, and virtual learning environment. The Web provides a valuable contribution to all the three learning environments, as it expands access of education for all learners, and provides opportunities for communication between teachers and students (Parikh, 2003). Web-based learning refers to a mode of education delivery that 'exploits the communication and information facilities of the internet for the delivery of learning experiences to students' (Pilgrim & Creek, 1997, p. 1). It brings incredible benefits to learners and education institutions, such as easier access to quality education, affordable education, convenience and flexibility to learners and reduction of environmental impacts. Hence, web-based learning has become a new culture in this era of globalisation as it has a unique feature that enables students to continue their education without facing hurdles of distances (Raisinghani, 2003).

Due to the rapid development of network and information technology, students' demands on flexible learning delivery in tertiary education institutions are also increasing. The Web adoption in university contexts appears in different ways, depending on the purposes of the adoptions. The initial intention of Web adoption in education is to create a virtual learning environment or to support traditional classroom teaching. However, web-based technologies are recently used for various purposes to meet students' diverse needs in university contexts. The four dominant purposes are communication (El-Seoud, Al-Khasawneh, & Awajan, 2007; Khan, 1998), information retrieval (Zaiane, 2001), collaboration (Chin, 2004) and assessment (Hsu, Marques, Hamza, & Alhalabi, 1999). Apart from these four purposes, web-based technologies also contribute in some other areas to supplement face-to-face learning, such as providing recorded lectures, assignment submission, and course management (El-Seoud et al., 2007; iParadigms, 2009). Involving web-based technologies in teaching enables a more complete and satisfied learning environment which can better fulfil students' increasing needs.

Australian universities fully or partially rely on the Web to deliver course materials and learning experiences. Educators and researchers name learning modes according to the percentage of learning materials and experiences delivered via the Web and web-based tools. Aggarwal and Legon (2000) categorise three 'Internetalizing' models in the web-based learning environments in Australian universities. These three models are introduced below:

- Web support for information storage, dissemination, and retrieval: the Web is used as a support for information storage, dissemination, and retrieval in traditional classrooms;
- Web support for two-way teaching: a hybrid and blended learning style which indicates to a mixture of traditional learning method and web-supported learning;
- Web-based teaching: the Web is used to substitute the traditional face-to-face classroom teaching, and all the learning materials and experiences are transferred entirely online.

Many literatures have contributed in finding out views of university lecturers and students on the influences of the Web and web-based technologies, however, not many have examined differences between views from these two perspectives. In traditional as well as web-based courses, there is a gap between what is taught and what is learned (El-Seoud et al., 2007), between what is intended and what is achieved (Oliver & Omari, 2001), and between perceptions of students and teaching staff as they think and practice from their own perspectives (Trigwell, Prosser, & Waterhouse, 1999). Lecturers and students have different views and perceptions toward the adoption of the Web and web-based technologies, which influence their decision making in teaching and learning practices. Learning outcomes will be enhanced when the teaching methods suit learners' needs. In contrast, the enhancement would not be significant if the gap is not considered and filled (Oliver & Omari, 2001). There are not many studies investigating these gaps, therefore, there is an opportunity for this study to contribute to the field.

The special site where this research took place was the University of Tasmania in Australia. As one of the oldest universities in Australia, in the year 2008, the university hired 2383 academic teaching staff and provided higher education for 22600 students which include 1992 off-shore students who were studying online (University of Tasmania, 2009a, 2009b). The faculty of Education is one of the largest disciplines within the university and involved 86 academic teaching staff and 1488 students in the same year. Similar to the other faculties at the university, the Faculty of Education implements a variety of web-based technologies and a courseware platform to support lecturers' teaching and students' learning in many ways. The web-based environment contains two components, the My Learning Online (MyLO) system and other supplementing web-based tools. These two components together support the students and lecturers within the faculty for various learning purposes. It is believed that the potential educational benefits identified, educational usage outlined, and recommendations made in this research are all transferable to other education institutions which intend to provide future students with supportive, effective and meaningful web-based learning environments.

3. Aims and objectives

This paper reports a recent study which investigates the significance of the Web as a learning resource in an Australian university context. While the whole study examine the Web adoption in seven disciplines at the University of Tasmania, this paper identifies in which ways the Web is used to support students' learning by both students and lecturers in one particular faculty, the Faculty of Education. The paper also examines and compares the views of these two stakeholder groups toward the Web as a teaching and learning resource. In addition, this study intends to investigate how the students and lecturers evaluate the web-based learning environments in their own academic area. According to their expectations and evaluations, this research gives recommendations for the future adoption and development of web-based learning at this university.

4. Participants and methods

This study is in a mixed method research paradigm which utilises both quantitative and qualitative methods to gather and analyse data. The whole study looked at the evaluation of the Web and web-based technologies and asked for the participation of 502 students and 100 lecturers from seven different academic faculties/disciplines of Arts, Business, Education, Health Science, Law, Science, Engineering and Technology and Australian Maritime College (AMC). This paper, however, focuses on the data collected within one academic faculty, the Faculty of Education. The 115 students and 31 lecturers were chosen randomly from those who were studying or teaching at the time of data collection from September 2009 to March 2010. They are from all the three campuses of the University of Tasmania in Hobart, Launceston and Burnie.

The Data collection methods are in forms of questionnaires and semi-structured interviews. All the participants provided responses to the questionnaire, and 6 students and 2 lecturers further volunteered to undertake semi-structured interviews. The questionnaires provided the researcher with an opportunity to gain a general idea within the research area. The interviews, however, allowed a further exploration of the research matter. This paper reports the findings emerged from both data analysis processes. Quantitative data gathered from the questionnaires were analysed using the SPSS (Statistical Package for the Social Sciences) version 16.0. The textual data collected were analysed using the NVivo qualitative data analysis package version 8 and the constructivist grounded theory approach (Strauss & Corbin, 1994, 1998).

5. Findings

The findings emerged from the two stages were considered and compared. Both the analysis stages are introduced in this section with an emphasis on the quantitative component. In this section, the students and lecturers' responses are reported according to the following four categories emerged from quantitative data analysis stage:

- Instrumentality of the Web (Questions 8 - 15);
- The Web as a social enhancement (Questions 16 - 21);
- The Web and learners (Questions 22 - 31);
- The Web as a teaching and learning resource (Questions 32 - 35).

The questions were designed on a five abbreviation Likert-scale (Likert, 1932). To answer the questions in the first category, the participants were indicated to choose from a scale of 1 (Very Often) to 5 (Never). However, to response to the questions in the other three categories, they were instructed to select from a scale of 1 (Strongly Agree) to 5 (Strongly Disagree). The participants' responses on these questions/statements are introduced within this section. Examples from the interviews are given to support the data analysis. The data concluded from the SPSS software are organised in tables. It can be seen from the tables that the data show a high degree of agreement of the participants on most of the statements at 95% confidence interval.

Instrumentality of the Web

Table 1: Descriptive statistics results obtained by participants' responses with respect to Q 8 to Q 15.

Question items	Students (N=115, missing data=2)	Lecturers (N=31, missing data=0)

	Mean (M)	Median (Me)	95% CI for M		Mean (M)	Median (Me)	95% CI for M	
			Lower	Upper			Lower	Upper
Q8. How often is the Web used to support students' learning in your course?	2.00	2.00	1.84	2.16	2.00	2.00	1.55	2.45
Q9. How often is the Web used as a communication tool in your course?	2.04	2.00	1.86	2.23	2.16	2.00	1.73	2.60
Q10. How often is the Web used to find learning materials in your course?	1.66	2.00	1.52	1.80	1.87	2.00	1.50	2.25
Q11. How often do you participate in online discussions in your course?	3.94	4.00	3.77	4.11	2.52	2.00	2.02	3.02
Q12. How often do you get feedback via the Web in your course?	3.57	4.00	3.37	3.78	2.84	2.00	2.32	3.36
Q13. How often do you share learning resources via the Web with other/your students?	3.23	3.00	3.02	3.44	2.20	2.00	1.72	2.68
Q14. How often is the Web used as an assessment tool in your course?	3.70	4.00	3.51	3.90	3.26	3.00	2.78	3.74
Q15. How often is the Web used as a management tool in your course?	3.18	3.00	2.98	3.37	2.68	3.00	2.18	3.17

Mean/Median scored on Likert scale: 1=Very often to 5=Never.

From Table 1 it can be seen that both students and lecturers had a positive view on the overall adoption of the Web. Both these two participant groups claimed that the Web was often used to support students' learning in their courses (Q8), especially for the purposes of communication (Q9) and finding learning materials (Q10). Interestingly, the behaviours of the students and lecturers fell in different ends on two statements. While the students rarely participated in online discussions (Q11) or give feedback via the Web (12), the lecturers claimed that they adopted the Web often for these two learning purposes. It can also be seen from Table 1 that the lecturers shared learning resources over the Web more often than the students in this faculty (Q13). These differences can also be seen from their interview responses:

> *I share online resources with my students all the time. When they find something useful and interesting, they also share with me and the other students in the class, and then we talk about it and we test it.*
>
> *Lecturer1*

> *The lecturers sometimes share learning resources with us. However, you would rarely see students sharing things with each other. They learn at their own pace… There weren't many people participating in the discussion board either. At the beginning of the semester I was hoping someone would start the conversation first, but they never did.*
>
> *Student 4*

In addition, these two participant groups' views on the frequency of the Web adoption for assessment were also different (Q14). The students in this faculty thought that the Web was rarely used as an assessment tool. The lecturers in the same faculty, however, claimed that they did use the Web sometimes to assess teaching and learning performances. Lastly, both students' and lecturers' responded that they sometimes used the Web as a management tool in their courses (Q15).

The Web as a social enhancement

Table 2: Descriptive statistics results obtained by participants' responses with respect to Q 16 to Q 21.

Question items	**Students (N=115, missing data=0)**				**Lecturers (N=31, missing data=1)**			
	Mean (M)	Median (Me)	95% CI for M		Mean (M)	Median (Me)	95% CI for M	
			Lower	Upper			Lower	Upper
Q16. Web-based learning can replace face-to-face learning.	3.77	4.00	3.56	3.99	3.35	3.00	2.83	3.88
Q17. Learning via the Web is more motivating than learning face-to-face.	3.89	4.00	3.69	4.08	3.74	4.00	3.46	4.03
Q18. Web-based learning can provide good facilities for interacting with lecturers and other students.	2.53	2.00	2.36	2.69	2.23	2.00	1.88	2.58
Q19. Online communication among students and lecturers is more effective than face-to-face communication.	3.73	4.00	3.53	3.92	3.77	4.00	3.37	4.17
Q20. Web-based learning enhances interpersonal relationships between lecturers and students.	3.39	3.00	3.20	3.57	3.26	3.00	2.82	3.69
Q21. Web-based learning lacks interpersonal interactions.	2.06	2.00	1.90	2.23	2.84	3.00	2.44	3.24

Mean/Median scored on Likert scale: 1=Strongly agree to 5=Strongly disagree.

Table 2 shows the descriptive statistics obtained in relation to the participants' views on the Web as a social enhancement. Generally speaking, it is an agreement that Web-based learning can provide good facilities for interacting with lecturers and other students (Q19). However, the two participant groups both disagreed that learning via the Web can be motivating than learning face-to-face (Q17) or online communication can be more effective than face-to-face communication (Q18). Also, the views of these two groups were divided on some questions. For instance, While the students' views on whether web-based learning can replace face-to-face learning appeared to be negative (Median scored=4), the lecturers' views on this statement were divided (Median scored=3). The different points of views of lecturers on this statement were evident in their interview responses:

> *Emails are used for the purposes of contacting, definitely, particular from lecturers to students, because in the unit that I am teaching and coordinating students from all over the world contact me by directly emailing me as their lecturer. So it (using emails for communication) has been pretty huge.*
>
> *Lecturer1*

> *In a face-to-face situation, a good teacher or a lecturer is more likely to provide information and learning opportunities in a variety of ways to adapt to individual learning styles… And also in a face-to-face situation, there is far greater feedback happening; it is an ongoing feedback that is occurring. And as a teacher or a lecturer, you are well able to see what is happening and to see whether people understand something not only from their actual communication verbally, but also non-verbal communication.*
>
> *Lecturer2*

It is important to mention that Q20 and Q21 were designed to have opposite meanings. It means that if the "1 = strongly agree" option is selected in Q20, the "5 = strongly disagree" option should be selected in Q21. Interestingly, the students' and lecturers' views are both divided on Q20 which states that web-based learning enhances interpersonal relationships between lecturers and students (Median scored=3). Their responses to Q21, however, are different. While the students agree that web-base learning lacks interpersonal interactions (Q21), the lecturers' views are divided (Median scored=3).

The Web and learners

Table 3: Descriptive statistics results obtained by participants' responses with respect to Q 22 to Q 31.

Question items	**Students (N=115, missing data=0)**				**Lecturers (N=31, missing data=2)**			
	Mean (M)	Median (Me)	95% CI for M		Mean (M)	Median (Me)	95% CI for M	
			Lower	Upper			Lower	Upper
Q22. The Web can provide useful ways of giving feedback to students.	2.28	2.00	2.21	2.45	2.10	2.00	1.79	2.40
Q23. The Web creates an	2.49	2.00	2.35	2.63	2.58	3.00	2.20	2.96

interactive learning.								
Q24. The Web can enhance independent learning.	2.03	2.00	1.91	2.16	1.94	2.00	1.62	2.25
Q25. The Web can accommodate learners with different learning styles.	2.25	2.00	2.08	2.41	2.26	2.00	1.96	2.56
Q26. The Web can accommodate learners with different cultural backgrounds.	2.15	2.00	2.02	2.28	2.32	2.00	1.99	2.66
Q27. The Web can encourage learners to take an active part in learning.	2.40	2.00	2.26	2.54	2.32	2.00	1.96	2.68
Q28. Web-based learning provides learners with great flexibility.	1.97	2.00	1.85	2.08	1.87	2.00	1.55	2.20
Q29. Using the Web cab enhance students' learning outcomes.	2.33	2.00	2.21	2.45	2.16	2.00	1.86	2.46
Q30. The Web is helpful in developing students' problem-solving skills.	2.30	2.00	2.15	2.46	2.41	3.00	1.98	2.84
Q31. The Web provides an opportunity for collaborative leaning.	2.38	2.00	2.21	2.55	2.30	2.00	1.88	2.72

Mean/Median scored on Likert scale: 1=Strongly agree to 5=Strongly disagree.

The data showed a high degree of agreement of the participants. From Table 3 it can be seen that both the students and lecturers had a positive view on most of the statements in this section. For example, they both supported that the Web can provide useful ways of giving feedback to students (Q22) and enhancing independent learning (Q24). Both these groups agreed that the Web can accommodate learners with different learning styles (Q25) and cultural backgrounds (Q26). One piece of evidence gathered from the interview is introduced below:

> *The beauty of this (web-based learning) is everybody is working at their own paces. The structure of having a class where everybody is at different levels and one teacher cannot possibly go to all these students and help them individually. So the students at the middle (level)are OK, the other ends are struggling and get left behind, and the students at the other end, the gifted students are bored, and they don't get any extra help or whatever.*
>
> *Student 3*

In addition, the responses from the participants on the other statements were also positive. Both the students and lecturers supported that the Web can encourage learners to take an active part in learning (Q27) and web-based learning provides learners with great flexibility (28). They also agreed that using the Web can enhance students' learning outcomes (Q29) and the Web provides an opportunity for collaborative leaning (31). It is important to mention that while the students support that the Web creates an interactive learning (Q23) and is

helpful in developing students' problem-solving skills (Q30), the lecturers' views on the same statements were divided (Median scored=3). Therefore, further analysis was conducted to identify factors that may affect their views on this question. Crosstab and Chi-square test were conducted on Q23 and Q30 by *Gender* and *Length of teaching at the University of Tasmania* of the lecturers. The results indicated that the gender of the lecturer participants does not correlate with their views on Q23 (χ=8.104, df=4, p-value=0.087 > 0.05) or Q31 (χ=8.562, df=4, p-value=0.073 > 0.05). Similarly, the length of teaching at the university does not correlate with their views on either Q23 (χ=14.467, df=8, p-value=0.070 > 0.05) or Q31 (χ=8.382, df=8, p-value=0.397 > 0.05).

The Web as a teaching and learning resource

Table 4: Descriptive statistics results obtained by participants' responses with respect to Q 32 to Q 35.

Question items	**Students (N=115, missing data=0)**				**Lecturers (N=31, missing data=1)**			
	Mean (M)	Median (Me)	95% CI for M		Mean (M)	Median (Me)	95% CI for M	
			Lower	Upper			Lower	Upper
Q32. The Web is a good tool for teaching and learning.	1.70	2.00	1.58	1.82	1.87	2.00	1.59	2.15
Q33. The Web can provide good facilities for exploring in learning.	1.63	2.00	1.53	1.73	1.65	2.00	1.44	1.85
Q34. The Web provides powerful resources for gaining academic knowledge.	1.76	2.00	1.63	1.89	1.55	2.00	1.36	1.73
Q35. The Web can provide useful ways of assessing students' learning.	2.17	2.00	2.00	2.33	2.27	3.00	1.94	2.59

Mean/Median scored on Likert scale: 1=Strongly agree to 5=Strongly disagree.

Table 4 provides the descriptive statistics obtained on the participants' views toward the Web as a teaching and learning resource. Both the students and the lecturers agreed that the Web is a good tool for teaching and learning (Q32). They also supported that the Web can provide good facilities for exploring in learning (Q33) and powerful resources for gaining academic knowledge (Q34). However, different from the students' positive views on the role of the Web as an assessing tool, lecturers' views on this statement were divided (Median scored=3). Crosstab and Chi-square tests were conducted to identify factors that may affect their views on this question. However, the results showed that neither of *Gender* nor *Length of teaching at the University of Tasmania* correlated with their views on this statement. The findings discovered in this section were also supported by the participants' arguments gathered in the interviews:

> *I use Google very often to Google information. It is quick and convenient. And I can download many documents as PDF files. There is heaps of information (on the Web) so I think in most of the time, I prefer to surf on the internet to get information instead*

of going to the library. The books and ideas you get from the library can be old sometimes.

Student 2

6. Discussions

This paper reveals that the significant role of the Web and web-based learning is recognised by the students and lecturers in the Faculty of Education at the University of Tasmania. The Web is adopted in learning and teaching for a variety of academic purposes especially in the processes of communication, information retrieval, collaborative learning and assessment (Parikh, 2003). In addition, the Web and web-based technologies are seen as an important supplementary tool for face-to-face learning mode (Aggarwal & Legon, 2000). Appropriate use of the Web can effectively enhance lecturer-student and student-student interactions (El-Seoud et al., 2007; Klassen & Vogel, 2003). It also serves as a significant tool in supporting personalised learning and accommodating learners with different learning needs. Lastly, web-based tools play as a platform that enables teaching and learning within this educational context, particularly within the virtual courses in which students cannot make physical presence to the campuses.

Moreover, it is also shown that there are differences between perceived expectations of web-based teaching by students and lecturers and the ways in which it is conducted and managed. This finding is an evidence of the theories which believe that there are gaps between intentions of teachers and the actual learning outcomes achieved (El-Seoud et al., 2007; Oliver & Omari, 2001). It is important to take students' expectations into consideration if teaching objectives are to be achieved. As argued by Le and Le (2007), adopting web-based resources does not necessarily mean learning will follow. For instance, although online discussion boards are available within the faculty, the student participants in this research claimed that they rarely participated. Therefore, the success of web-based learning depends greatly on the involvement of lecturers and students, as one lecturer argues that '*the more active they are in online discussions, the more benefit the whole group can get.*'

By discussing these end-users' views and evaluations, recommendations were made on the further development and modifications of web-based learning. As the whole study also involves another six academic faculties and disciplines within the University of Tasmania, this study was able to give suggestions on the development of web-based learning within the whole university context. It suggests that taking students' expectations and needs into consideration can help create a more supportive and meaningful web-based learning environment in this educational context. The Web and web-based technologies have to be used in a way that is mostly desired by students in order to enhance learning outcomes. At the same time, instructions and reinforcements should be provided to guide students in using these resources. In addition, there is a constant need from both students and academic staff for training and updating skills with new developments, functions, and applications of the technology (Clulow & Brace-Govan, 2003). Not only lecturers need these technique support, adequate training sessions and preparations need to be provided to help students establish their own learning goals, manage their time and utilise group discussion tools in web-based learning (Klassen & Vogel, 2003).

7. Conclusion

The Web and web-based technologies are adopted by Australian education institutions across all levels and disciplines nowadays. All Australian universities directly or indirectly use the Web to support their students and lecturers in both traditional classrooms and web-based learning. In establishing a successful web-based learning environment, it is important to have a clear recognition of the end-users' views toward this learning mode. This paper

reports an investigation on students' and lecturers' views toward the Web as a learning resource within the Faculty of Education, University of Tasmania. The findings were reported from four aspects, instrumentality of the Web, the Web as a social enhancement, the Web and learners and the Web as a teaching and learning resource. It is believed that this study has the potential to given such recognition to the University of Tasmania as well as other higher education institutions, so that adjustments can be made in the future to create more supportive, effective and meaningful web-based learning environments.

References:

Aggarwal, A. K. (2003). A guide to eCourse management: The stakeholders' perspective. In A. K. Aggarwal (Ed.), *Web-based education: Learning from experience* (pp. 1-23). Hershey: IRM Press.

Aggarwal, A. K., & Legon, R. (2000). Web-based education. In A. K. Aggarwal (Ed.), *Web-based learning and teaching technologies: Opportunities and challenges*. Hershey: PA: Idea Group Publishing.

Aggarwal, A. K., & Legon, R. (2008). Web-based education diffusion: A case study. In L. Esnault (Ed.), *Web-based education and pedagogical technologies: Solutions for learning applications* (pp. 303-328). Hershey: IGI Global.

Chin, P. (2004). *Using C&IT to support teaching*. London: RoutledgeFalmer.

Clulow, V., & Brace-Govan, J. (2003). Web-based learning: Experience-based research. In A. Aggarwal (Ed.), *Web-based education: Learning from experience*. Hershey: IRM Press.

El-Seoud, S. A., Al-Khasawneh, B., & Awajan, A. (2007). *Using Web-based course to enhance educational process at Jordan Universities - A case study*. Paper presented at the Conference ICL.

Hsu, S., Marques, O., Hamza, M. K., & Alhalabi, B. (1999). How to design a virtual classroom: 10 easy steps to follow. *T.H.E. Journal, 27*(2), 96-104.

iParadigms. (2009). Turnitin. Retrieved 30th July, 2009, from http://www.turnitin.com/static/index.html

Khan, B. H. (1998). Web-based instruction (WBI): An introduction. *Education Media International, 35*(2), 63-71.

Klassen, J., & Vogel, D. (2003). New issues arising from e-education. In A. Aggarwal (Ed.), *Web-based education: Learning from experience*. Hershey: IRM Press.

Le, Q., & Le, T. (2007). Evaluation of educational software: Theory into practice. In J. Sigafoos & V. Green (Eds.), *Technology and teaching* (pp. 1-10). New York: Nova Science Publishers.

Likert, R. (1932). *A technique for the measurement of attitudes*. New York: Archives of psychology.

Oliver, R., & Omari, A. (2001). Exploring student responses to collaborating and learning in a web-based environment. *Journal of Computer Assisted Learning, 17*(1), 34-47.

Parikh, M. A. (2003). Beyond the web: Leveraging multiple internet technologies. In A. Aggarwal (Ed.), *Web-based education: Learning from experience* (pp. 120-130). Hershey: IRM Press.

Pilgrim, C. J., & Creek, M. J. (1997). *On-line education - A university strategy*. Paper presented at the Ascilite.

Raisinghani, M. S. (2003). Web-based education in the 21st century: A transnational perspective. In A. Aggarwal (Ed.), *Web-based education: Learning from experience* (pp. 71-89). Hershey: IRM Press.

Sauter, V. L. (2003). Web design studio: A preliminary experiment in facilitating faculty use of the web. In A. Aggarwal (Ed.), *Web-based education: Learning from experience*. Hershey: IRM Press.

Strauss, A., & Corbin, J. (1994). Grounded theory methodology: An overview. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research*. Thousand Oaks, CA: Sage.

Strauss, A., & Corbin, J. (1998). Grounded theory methodology: An overview. In N. K. Denzin & Y. S. Lincoln (Eds.), *Strategies of qualitative inquiry* (pp. 158-183). Thousand Oaks: SAGE Publications.

Trigwell, K., Prosser, M., & Waterhouse, F. (1999). Relations between teachers' approaches to teaching and students' approaches to learning. *Higher Education, 37*, 57-70.

University of Tasmania. (2009a). Staff 2008. Retrieved 21st September, 2010, from http://www.utas.edu.au/docs/statistics/Utas.stats.08/Table1_02.xls

University of Tasmania. (2009b). Students 2008. Retrieved 21st September, 2010, from http://www.utas.edu.au/docs/statistics/Utas.stats.08/Table1_01.xls

Wilson, B. G. (1996). *Constructivist learning environments: Case studies in instructional design*. Englewood Cliffs: Educational Technology Publication.

Zaiane, O. R. (2001). Web usage mining for a better web-based learning environment. Retrieved July 22, 2009, from http://www.cs.ualberta.ca/~zaiane/postscript/CATE2001.pdf