

Adoption of a learning management system by polytechnic students: A case study in Singapore

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Abstract

This study examines the use of Blackboard as a communication and learning facilitation tool in a tertiary institution (polytechnic) situated in Singapore. For past decades, polytechnics in Singapore have been viewed as institutions that provide 'para-professional training' (Sanderson, 2002). Nevertheless, securing a place in a polytechnic is extremely competitive, with only 40% of applicants gaining a place (Sanderson, 2002). The case study is based on marketing students' experience of using Blackboard in one of the largest polytechnics in Singapore. The sample consisted of 390 undergraduate business students, drawn from a first year marketing subject.

Students were in two age groups, making up almost all of the respondents and gender was slightly unevenly distributed. The only gender difference identified was that females were more likely to use Blackboard for communication purposes rather than face-to-face communication. The study also revealed students' highly positive view of Blackboard because it is easy to use, user friendly and a time saver. Confirmatory factor analysis was undertaken to determine Blackboard's capability of providing students with an optimum learning environment. The items loaded into four factors. Based upon these loadings, four factors were named: usefulness, time saving quality, ease of use and, enjoyment and positive self-image. It is recommended that further study be undertaken to establish Blackboard's contribution to subject management to establish more fully Blackboard's overall contribution as a teaching and learning resource.

Keywords: Blackboard; Polytechnic in Singapore; educational technology

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Introduction

This paper looks at the roll out of Blackboard as a dissemination and communication tool in an undergraduate business diploma in one of the largest polytechnics in Singapore. There are five polytechnics in Singapore. The main offering from all these polytechnics is a diploma of two to three years duration.

Bachelor degrees are also available from some of the polytechnics such as Ngee Ann Polytechnic which offers a Bachelor of Science in Early Childhood Educational Studies and Leadership. This is a joint venture between Ngee Ann Polytechnic, Singapore and Wheelock College in Boston, USA (Ngee Ann Polytechnic, 2008a). Another example is the Bachelor of Fine Arts in Creative Producing which is offered in conjunction with Chapman University at California, USA (Ngee Ann Polytechnic, 2008b). One of the distinguishing features of polytechnic education in Singapore is the strong emphasis on practice-based learning. "Work attachment is included as part of the practical curriculum and this can vary from the usual 6–8 weeks to 6 months in certain courses. This enables students to gain on-the-job experience" (Polytechnics in Singapore, 2008).

Polytechnics in Singapore are also viewed as institutions that provide 'para-professional training', which is "distinguished by a combination of practical, hands-on training, overseas/local industry attachments, and research and development work" (Sanderson, 2002, p. 91). Many students seeking an earlier entry into the labour market prefer this path of education, as opposed to getting an 'A' level certificate¹ and then doing a university degree. The Ministry of Education Singapore sets a minimum qualification of a full General Certificate of Education (GCE) 'O' level certificate² to students seeking entry into a polytechnic (Teo & Wong, 2000). Entry into any form of higher education is extremely competitive, with only 40% of applicants gaining a polytechnic place (Sanderson, 2002).

Another reason many high school leavers choose to further their education in polytechnics is that polytechnic graduates are well sought-after by employers, with the majority of them securing full-time permanent jobs. According to the 2007 Polytechnic Graduate Employment Survey (GES), 93 % of fresh graduates from polytechnics in Singapore found full-time permanent positions within six months after their graduation and command higher salaries which showed a continuing improvement in placements from 2006 as indicated in the GES survey (Joint-Polytechnic Graduate Employment Survey, 2008).

Throughout the last two decades, many factors have influenced the adoption of Learning Management Systems (LMS) as a dissemination and communication tool. These factors have been identified in the literature as important to teaching and learning in the tertiary sector (Aggarwal, 2000; Curtis & Lawson, 2001; Madden-Hallett & Ho, 2008; Servonsky, Daniels, & Davis, 2005). However, the available literature only relates to the university sector in the North American, European and South Pacific regions. This research makes a major contribution to the heretofore paucity of information about the adoption of LMS in the unexplored tertiary institutions such as polytechnics in South East Asia.

An equally important contribution is made by this research to the area of the utilisation of LMS that are comparable with students' ability and willingness to adopt new technologies. Madden-Hallett and Ashley (2008) argued that Generation Y (Gen Y) were not responsive to the adoption of leading edge technologies. The current research addresses the adoption of a well known, robust technology more befitting Gen Y because it has already successfully traversed the new technology adoption process.

¹ Singapore-Cambridge General Certificate of Education 'Advanced' (GCE 'A') Level

² Singapore-Cambridge General Certificate of Education 'Ordinary' (GCE 'O') Level

This paper fills a gap in the research pertaining to Gen Y and the adoption of technology in education specifically in the polytechnic sector in South East Asia.

Literature review

The following section reviews the current literature on Web-based/on-line learning, the application of Blackboard in tertiary teaching as a support tool and the likelihood of technology adoption by Gen Y. Web-based/on-line learning is described in detail and both advantages and disadvantages of its use are outlined. Blackboard's many features are then described and the major criticisms are listed. Blackboard in relation to Generation Y is then discussed, followed by a description of current issues faced by Generation Y as tertiary freshmen.

Web-based/on-line learning

Web-based learning or on-line learning support structures have been increasingly adopted during the past decade (Aggarwal, 2000). One of the advantages of most Web-based learning courses is that they provide a combination of static and interactive materials, and while they are technology based they are used to support on-campus teaching. Other advantages of Web-based learning are its ease of use, its contribution to clear communication (Bradford, Porciello, Balkon, & Backus, 2007), the ease with which content can be updated and hyperlink functions that permit cross-referencing to other resources (Aggarwal, 2000; McKimm, Jollie, & Cantillon, 2003).

The utilisation of both Web-based resources and traditional face-to-face teaching in a tertiary institution is normally supported via an intranet capability. This is usually "password protected" and accessible only to registered users. Thus it is possible to protect the intellectual property of online material and to support confidential exchange of communication between students (Madden-Hallett & Ho, 2008; McKimm et al., 2003). Recent developments in Web-based learning have benefited tremendously from the developments in easy-to-use LMS such as WebMentor, WebCT and Blackboard, all of which offer almost the same basic features of an instructional platform (Abdalla, 2007). In Singapore, most tertiary institutions use LMS to facilitate teaching and learning for many on-campus degrees. Blackboard has become a popular tool for this purpose.

Blackboard

In brief, Blackboard is a teaching aid that works within an Internet browser. Blackboard offers space for discussion boards, tests and quizzes, grade books, instructor profiles, and a chat room (Madden-Hallett & Ho, 2008; Stewart & Scappaticci, 2005). It also provides the instructor and students with capabilities such as the capacity to post documents in PDF and HTML format, to create various types of document files that can be shared with students and are easy to download, it provides a grade tracking function, and has the facility for scheduling classes, meetings and assessments via a calendar (Madden-Hallett & Ho, 2008; Merron, 1999).

The criticism of Blackboard (and other Learning Management Systems) is that because students can easily access materials they may assume there is no need to attend class and their absence will not impact their academic progress which has been borne out by Grabe, Christopherson, and Douglas (2004-2005) who indicate that those who accessed online notes were less likely to attend class but who

nevertheless performed better on examination. Edwards and Usher (2001) note that the Internet and other forms of electronic interface provide students with learning flexibility and a consequent feeling that there is no need to attend class. Conversely, Woodfield, Jessop, and McMillan (2006) state that attendance is 'the strongest predictor' of students' academic success when measured with other variables. It would appear from the literature that there are extenuating circumstances that affect attendance and performance with both acting as independent variables.

Generation Y and technology adoption

Research conducted by McCrindle (2006) suggests that Generation Y, i.e., those born between 1977 and 1988, (Jorgensen, 2003), strongly desire community and use technological means to find it. The use of on-line community may be a suitable venue to engage students in a way that is far less intimidating than face-to-face communication. Blackboard is considered a user friendly medium because it has been in use for over a decade and has been thoroughly tried and tested and is now regarded as a robust and common tool. Regardless of Gen Y's proclivity for well trodden ITC environments, Blackboard is designed to support users from those who are technologically savvy to the raw beginner. The likelihood of a raw beginner being amongst a cohort of polytechnic students however, would be remote given that in a study conducted by Lenhart, Madden, and Hitlin (2005) over 87% of today's youth are online. Indeed it is thought that student communities would expect materials to be provided on-line and information technology would be relied upon as a strong teacher to student interface, to facilitate learning (Barraket, Payne, Scott, & Cameron, 2000).

Age and gender

Students entering tertiary education are expected to manage their time and remain motivated with a greatly reduced level of teacher involvement. A high and consistent level of self-motivation may be more likely in older students than in students entering higher education directly from pre-university schooling facilities. However in the polytechnics students tend to have come directly from high school, i.e., finished GCE 'O' level (Teo & Wong, 2000), and are expected to navigate the turbulent waters of post-secondary education without the lifejacket of parental guidance in relation to using technology, hence the need for Blackboard to provide a truly user friendly environment. It is of great importance then to discover in this research if indeed Blackboard is perceived by the users as helpful or simply another obstacle to overcome in their quest for knowledge.

The use of Blackboard as a personal aid in learning was also considered in relation to gender. Some of the earlier literature indicated that there is a gender difference when using technology which favours males (Furger, 1998; Spender, 1995; Ullman, 1997). However this difference may have since become less apparent as information technology has become ubiquitous (Raphael, 2002) and a study by Morss (1999) indicates that there were no gender differences in student perspectives of using Blackboard to facilitate learning. While Brown and Liedholm (2002) suggest that females benefit from an online learning environment because they are freed from the pressure of responding within a limited time frame and from the pressure of having to respond with a correct answer as when in a face-to-face teaching and learning situation. Whilst it is understood that setting up an ideal environment to achieve optimum learning involves knowing and being able to

respond to complex and involved conditions and considerations this study seeks to clarify whether Blackboard can enhance students' learning.

Case study – Effectiveness of Blackboard in facilitating student learning for a polytechnic marketing subject

This study focuses on on-campus students enrolled in an undergraduate marketing subject – Principles of Marketing. Students involved in the research came from one of the largest Polytechnics in Singapore which is located in the western region of the country. The department in which the subject was developed and delivered had already employed Blackboard LMS as the primary mechanism for the delivery of course materials. The subject was taught as a two-hour lecture, with a two-hour weekly tutorial. The course homepage (in Blackboard platform) had provisions for announcements from course instructors, a subject guide, lecture notes, assignments details, and additional documents related to the subject.

In July 1999, the Polytechnic in question introduced the 'own-a-notebook' scheme for students. To date all new students enrolling in the Polytechnic courses are required to own a laptop computer. This ownership gives them the flexibility to work on assignments, surf the Internet for information, use Blackboard to access subject Web-sites, participate in online discussions, and communicate with tutors and classmates through email anytime and anywhere they wish (Ngee Ann Polytechnic, 2008c).

Method

Data were collected using a two-page questionnaire administered in the lecture of the final week in semester 1, 2007. The students were pursuing their Diploma of Business (in a range of disciplines such as Management, Marketing, Accounting, Information Systems and Tourism and Hospitality Management) at a government funded polytechnic located in the western region of Singapore. Students were informed that the study was anonymous and not part of the assessment regime of the subject.

The survey was designed to cover a range of issues identified in the literature as possibly impacting educational outcomes. Students were asked a total of twenty-five self-developed questions most of which required a response on a five-point Likert scale with 'strongly disagree' and 'strongly agree' at the extremes. This approach has been used previously in the literature which examines teaching and learning methods (Harasim, 1999). Generally a mean closer to five is used by many studies to indicate agreement; however, in this paper a different item format was used, that is, a mean closer to one indicates agreement, to avoid common method bias (Cambell & Fiske, 1959).

Twelve statements were adapted from previous research by Maenpaa (2006). This earlier work examined consumers' perceptions of Internet banking services. The questions in the prior study (Maenpaa, 2006) that dealt with financial matters such as the convenience of managing loans, security, personal finances and investment were considered inappropriate for this study and thus were deleted.

As will be described, the majority of questions focused on students' perceptions of the value of Blackboard in facilitating learning and as a communication tool. The issues considered in the survey included benefits, enjoyability and difficulty of use as compared to traditional delivery. This study is also partly based on that of Maenpaa (2006) in particular, constructs relating to convenience, status, auxiliary features and exploration.

Results

A total of 390 students responded to the survey (XX% which is the majority of the population). It was composed of students enrolled in a marketing subject. The opening questions asked respondents to state their age, gender and level of experience as a computer user.

Frequency analysis

The results showed that all respondents were between 16-24 years of age. Gender of respondents was somewhat unevenly distributed, with 57.2% indicated for female and 41.8% for males. The next variable was level of experience as a computer user, with 55.6% of the respondents considered themselves to be either 'a bit experienced' or 'experienced'. Whilst this was a self-evaluated question it was felt that given the general level of computer use in the community respondents would be sufficiently conversant with computer use to give an accurate self-analysis.

Respondents were also asked to indicate their level of agreement with the statements as shown in Table 1. The intention of these questions was to establish the students' viewpoint on Blackboard as a learning facilitation tool including suggestions for potential development (such as a results tally utility). The results indicate that students prefer (mean <3) Blackboard as a facilitation tool for their learning, that the package is user friendly but that the 'impression of themselves' was not enhanced by using Blackboard. The results also indicated they believed Blackboard to be a helpful tool for accessing administrative information about a subject.

The statements which elicited the two most favourable responses from students using Blackboard all related to getting information about their marks. For example, the most favourable response with a mean of 1.98, (SD .741) related to students viewing their assessment results on-line. The next favourable response indicated that a calculator designed to estimate what they would need to score to gain a pass, credit, distinction or high distinction would be a useful tool (mean 1.98 and SD .811). The last item in this category again related to a calculator so that students could tally their results as their assessments were completed (mean 2.14 and SD .819). A student taking a strong interest in their results is a well known educational phenomenon. Using Blackboard to assist them to calculate hypothetical and actual results may prove to be useful because students may then be able to estimate their level of commitment to gain their desired results.

The statements also with favourable means are those that relate to a facility in Blackboard that would enable students to search within Blackboard for information about other subjects and topics (mean 2.0).

Table 1. Agreement/Disagreement

Questions	Mean	Std Dev
It would be useful if I could view all my assessment results.	1.981	.741
It would be useful to have a calculation tools so that I can use it to estimate what marks I would need to score a mark within the designed ranges of Pass, Credit, Distinction & High Distinction.	1.989	.811
It would be useful to have a calculation tool so that I can tally my progressive results.	2.143	.819
Learning to operate Blackboard was easy for me.	2.049	.714
It was easy for me to familiarize myself with Blackboard's functions and information sites.	2.062	.651
I found Blackboard user friendly and easy to use.	2.096	.668
I get all the information I need (subject guide, assignment topic, lecture notes etc.) for taking care of study more conveniently from Blackboard than from the face-to-face lecture.	2.223	.824
By using Blackboard I get better service than from the face-to-face lecture.	2.534	.827
It would be fun to have more visually interesting multimedia materials available on Blackboard.	2.285	.788
It would be useful if I could view other subjects offered by the Faculty of Business and Law, on Blackboard in which I am not enrolled.	2.314	.778
By using Blackboard I had more time for my family/friends/hobbies	2.593	.840

Two items to which students responded favourably are; the convenience of getting information from Blackboard than from face-to-face lectures, and Blackboard providing better service than attendance at lectures. The results indicate that students strongly believe Blackboard provides good service and that they prefer it to face to face interaction with instructors (mean >2.22). The final three positive statements relate to the students' perception of Blackboard. Specifically its potential to carry visually interesting multimedia materials (mean 2.28), its potential to provide students with additional information about other suitable subjects (mean 2.31) and that it allowed them more time (because of its ease of use) with family and friends (mean 2.59). The means and corresponding SD of these three items suggest that as Blackboard is being used its full potential is underutilised. It would be of value to conduct further research to establish from the user's perspective areas that could be improved.

Respondents believed that using Blackboard did not enhance their image by making them stand out (mean 2.94) or make them appear 'cool' (mean 3.18) to others. This may be partly due to the fact that as previously discussed, Blackboard is well known and its use may be considered fairly pedestrian by these self declared experienced pc users.

Questions concerning respondents' reasons for using Blackboard reveal that almost all used the medium to access lecture notes (99%) and slightly over half at 50.8% used it to stay informed about the administration of the subject. More favourably 72.8% of respondents indicated that they used it to access information about assessment. The final item in this category related to students accessing the subject guide via Blackboard. The response rate was 60% in favour of such use. It would appear that Blackboard, as it is used at this site, was a useful dissemination and teaching support tool with fair to excellent adoption by students.

An examination of gender responses indicated that there were only very small differences between female and male respondents in their reported responses to how well they were able to interface with Blackboard. The results are tallied in Table 2.

Table 2. Gender responses to using Blackboard

Gender	Learning to operate Blackboard was easy for me		I found Blackboard user friendly and easy to use		It was easy for me to familiarise myself with Blackboard's features and information sites	
	Positive response	Negative response	Positive response	Negative response	Positive response	Negative response
Female	80.5%	2.7%	81.4%	.9%	83.6%	1.4%
Male	79.5%	3.1%	75.1%	3.1%	81.3%	4.3%

On most other items there was very little difference (less than 10%) between female and male respondents except on the item of Blackboard offering better convenience than clarifying matters with the lecturer or tutor in a face to face situation. On this item female respondents indicated an overall positive response of 67% while male respondents' positive response was less than 40%. This finding appears consistent with Brown and Liedholm (2002) as noted earlier.

Both location of use and time of use showed strong leanings as indicated, with 63% of respondents (n=249) using Blackboard at home. This was followed by 33.2% (n=129) using Blackboard on campus, with users at work and other, both with 2%. The bracket of those who use Blackboard at home also indicated the highest response on the item of convenience with 73.5%. Of the 33% (n=129) respondents who indicated they used it on campus, 48% also thought it provided better service, while 52.5% of the predominantly home users thought it provided better service.

Respondents who use Blackboard from home (46.5%) also responded favourably to the item 'By using Blackboard I would have more time for my family/friends/hobbies' (n=115). Results also indicated that 323 respondents (84.4%) did not use Blackboard to chat or socialise with other students, while 14% did so sometimes.

In terms of the usual time of use of Blackboard, 51.7% indicated they used it most often in the late evening. This was followed by 27.3% who used it at midday. The least often time of use was early morning and late morning with 5.5% and 5.0% respectively. Implications for program upgrades and maintenance would suggest that these activities if undertaken in the morning (rather than after standard office hours as is normally the case) would be less onerous on students.

Principal Component Analysis

A second investigation was undertaken using confirmatory factor analysis to determine Blackboard's capability of providing students with an optimum learning environment. Current literature (Madden-Hallett & Ho, 2008) suggests students would benefit from an interface that was useful, robust, intuitive and entertaining to use. Upon further investigation hypothetical features, such as a calculator to assist students to estimate future assessment results in order to extrapolate future final grades, were suggested for students to consider. Blackboard was also examined in relation to how much time students felt they saved by having this tool and its

provision of a pleasant and agreeable learning environment. Convenience was also considered relevant given the context of the modern generation and their desire for easy availability of products and services and the time saving aspects that allow them more time for leisure. Esteem was reported as being influenced in a learning environment through development of relationships (Curtis & Lawson, 2001), which it may be supposed would be cultivated in Blackboard's online chat rooms.

The seventeen items which composed part of the Blackboard questionnaire used a five-point Likert scale and were subjected to principal components analysis (PCA) using SPSS Version 17.0. These statements cover a broad range of topics including effort and performance expectancy, social influence, and attitude toward using technology (Viswanath, Morris, Gordon, & Davis, 2003). These topics are built upon the constructs of ease of use (Adams, Nelson, & Todd, 1992), enjoyment (Liao & Cheung, 2002), esteem (Maenpaa, 2006; Viswanath et al., 2003), time saving (Maenpaa, 2006; Viswanath et al., 2003), and convenience (Liao & Cheung, 2002; Maenpaa, 2006; Viswanath et al., 2003).

Prior to performing PCA the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser-Meyer-Okin value was .835 thereby exceeding the recommended value of .6 and the Barlett's Test of Sphericity reached statistical significance, supporting the factorability of the correlation matrix.

Principal components analysis with varimax rotation revealed the presence of four components with eigenvalues exceeding 1, explaining 30.2 per cent, 13.2 per cent, 9.6 per cent and 6.5 per cent of the variance respectively. An inspection of the screeplot revealed a clear break after the fourth component. These four components explain 48.6% of variance in the data set and are identified in Table 3. The four factors, and the variables which loaded on them, are also described in Table 3: Rotated Component Matrix.

Based upon these loadings, four factors were named and they are presented in Table 4, Factor Names.

The individual factor scores had inter-item scale reliability (Cronbach's Alpha) coefficients ranging from 0.849 to a low of 0.720. Given that coefficients above 0.70 are considered acceptable (Furnham, Steele, & Pendleton, 1993), the four factor model is sound. The model reflects similar factors as those proposed by Maenpaa (2006) with some movement of items across the developed factors. Although this model is not as comprehensive as that of Maenpaa (2006) there are strong similarities. Maenpaa's factor of 'convenience' is here split across the factors of 'usefulness', 'time saving' and 'ease of use'.

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Table 3. Rotated Factor Matrix^a

Items	Factor			
	1	2	3	4
It would be useful to have a calculation tool so that I can tally my progressive results.	.818			
It would be useful to have a calculation tools	.777			
It would be fun to have more visually interesting multimedia materials available on Blackboard.	.633			
It would be useful if I could be provided with information about other subjects that are similar in some way to one of the subjects in which I am enrolled.	.469			
It would be useful if I could view all my assessment results.	.461			
By using Blackboard I get better service than from the face - to - face lecture.		.638		
Using Blackboard shortened the amount of time I spent on my study.		.605		
Using Blackboard for my studies improved my study performance and effectiveness.		.571		
I get all the information I need for taking care of my study more conveniently from Blackboard than from the face-to-face lecture.		.556		
When I need more support or advice from the lecturer or tutor, I prefer email or on-line chatting services in the Blackboard.		.471		
By using Blackboard I have more time for my family/friends/hobbies.		.428		
It was easy for me to familiarise myself with Blackboard 's functions and information sites.			.828	
Learning to operate Blackboard was easy for me.			.731	
I found Blackboard user friendly and easy to use.			.696	
Being able to use Blackboard I give a 'cool' impression of myself to other people.				.800
By using Blackboard I stand out from ordinary people who use traditional methods.		.346		.596
Sometimes it is fun just to browse around and see what can be found in Blackboard.	.358			.477

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.

^a. Rotation converged in 6 iterations

Table 4. Factor Names

Factor Number	Factor Names	%Variance a	% Variance b	Maenpaa's factors
Factor 1 ($\alpha=.790$)	Usefulness	27.264	14.341	Convenience ($\alpha=0.643$)
Factor 2 ($\alpha=.750$)	Time Saving	10.579	13.503	Convenience ($\alpha=0.643$)
Factor 3 (α =.849)	Ease of Use	7.141	12.030	Auxiliary features ($\alpha=0.643$) Convenience ($\alpha=0.643$)
Factor 4 (α =.720)	Enjoyable and positive self-image	3.655	8.764	Status ($\alpha=0.602$) Entertainment ($\alpha=0.670$)

a) Extraction sums of squared loadings

b) Rotation sums of squared loadings

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Wang's (2003) study regarding e-learning environments and user satisfaction indicated that four factors, which explained 78% of the variance, were relevant. The factors identified were named as learner interface, learning community, content, and personalization. Only one of these factors appears in this study and that of Maenpaa (2006) which is learner interface or ease of use as described in this study. The other three factors identified by Wang, such as learning community, content, personalisation were not identified in this study.

Conclusion and recommendations

This study looked at responses from students attending a polytechnic in the western region of Singapore. The study sought to investigate undergraduate students' use of Blackboard as a facilitation device for learning. The analysis showed that there was only one major difference between females and males in their responses with females preferring to clarify matters via Blackboard rather than seeing the lecturer or tutor face to face. The hypothetical provision of a results tally tool elicited very favourable responses from a large majority of students and it may be well worth considering the provision of this feature as a standard item in future iterations of the Learning Management Systems (LMS).

The study also revealed students highly positive view of Blackboard because it is easy to use, user friendly and a time saver. The results also aligned with previous work by Liao and Cheung (2002), Maenpaa (2006) and Viswanath et al. (2003) regarding the convenience, ease of use, time saving ability and enhancement of esteem from using Blackboard.

Future research could include an analysis of Blackboard and its ease of use and time saving benefits as compared with students located in Asia and North America or the Pacific region. This would be particularly relevant given the ever increasing number of students studying at an overseas location. The use of Blackboard as a facilitation tool could further enhance the education experience of students making tertiary education more affordable and accessible for a greater number of people.

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