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System-related Factors that Predict Students' Satisfaction with the Blackboard Learning System at the University of Botswana

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Abstract

This study examined students' satisfaction with the Blackboard Learning System and the factors that predict their levels of satisfaction. The sample for the study comprised 503 undergraduate students of the University of Botswana selected from seven faculties and 42 departments of the university. Data were collected through a survey questionnaire. The results showed that all the system-related factors focused upon in the study, i.e. net benefits, self-regulated learning, content quality, teaching/learning quality, system quality, and service quality, correlated with users' satisfaction with the Blackboard system and the factors jointly predicted 54% of variations in the students' satisfaction. Based on these findings, it is recommended that the university needs to improve the support services provided for users of the system. The Blackboard support staff should always consider making themselves available for assistance bearing in mind that the system is all about technology which can develop technical faults at any time.

Keywords

E-learning, Course management systems, Blackboard Learning System, User satisfaction, University of Botswana.

Introduction

Information Communication Technology (ICT) is now a central construct that enables and/or supports the process of e-learning and has made remarkable progress in the last two or three decades (Rao, 2006). Course management systems are components of e-learning and their adoption for web-based instruction continues to increase. Wang et al. (2007) defines e-learning as referring to learning via the Internet. A course management system (CMS) is a software program or integrated platform that contains a series of web-based tools to support a number of activities and course management procedures (Severson, 2004). Examples of proprietary course management systems are WebCT/Blackboard, eCollege, Desire2Learn, LearningSpace, and ANGEL, as well as a growing number of open source systems such as The Sakai Project, Open Source Portfolio Initiative, Moodle, and uPortal (Bradford, Porciello, Balkon, and Backus, 2007). Course management systems are a class of information systems that manage teaching and learning. They were developed to support and enhance the organisational processes of content creation, storage and retrieval, transfer, delivery and application. At the University of Botswana, the course management system being used for classroom and online educational assistance is the Blackboard Learning System, hereinafter referred to as Blackboard. Blackboard is an integrated, user–machine system for providing information or content to support teaching and learning.

Blackboard provides powerful and easy-to-use systems for educational instruction. According to Bradford et al. (2007), the system allows the instructor to easily meet the needs of the students and lecture notes, audio recordings, animations, learning activities, case studies and video clips can be added very easily to the system. These resources may be developed by the instructor or very commonly through web links to supplemental online material. Blackboard provides the opportunity for students to use the familiar environment of the internet for educational purposes. The argument is often made that the use of Blackboard and other course management or learning as pedagogical tools is good

from the standpoints of both student learning and faculty instruction. Such tools provide a medium to present curricular materials in a way that promotes the development of students' organisational, communication, and time-management skills.

According to Bradford, Porciello, Balkon and Backus (2007), the Blackboard Learning Management System was founded in 1997 with a vision to provide a user-friendly means by which college professors could put course information, including syllabi, reference sites, and study guides, on the Web.Blackboard merged with CourseInfo LLC, a course management software provider and startup company at Cornell University, in 1998, and the merged company thereafter released their first software product for online learning. Blackboard Inc. acquired its Richmond, USA-based competitor MadDuck Technologies, in 2000, purchased CampusWide Access Solutions Inc. from AT&T and CEI SpecialTeams from iCollege Inc. in 2001, and Promethius, another online learning competitor, in 2002. Blackboard Inc. later merged with the rival e-learning software company, WebCT, which gave Blackboard Inc. control of up to 80 per cent of the academic course management system market in North America" (Bradford et al., 2007). As of June 2006, the Blackboard Empire included over 12 million users in over 60 countries. Blackboard offered products in 12 languages to over 2, 200 learning institutions.

However, despite the increasing use of Blackboard for teaching and learning the world over and at the University of Botswana specifically, little attention has been given to examining the factors that predict or explain users' (students, teachers, course designers, or course administrators) satisfaction with the system. The focus in this study was user satisfaction from the perspective and opinions of the students.

An adequate knowledge of the factors that influence the adoption and use of Blackboard by students and the interrelationships among the factors is clearly needed in order for university administrators, course designers and teachers to be able to improve students' experience, productivity and satisfaction with the system. It is against this background that this study was designed to examine the factors that predict students' satisfaction with Blackboard at the University of Botswana.

Blackboard Learning System at the University of Botswana

The University of Botswana (UB) was established in 1982. This was after the breakup of the multinational and multi-campus University of Botswana, Lesotho and Swaziland, which had been established in 1964 to serve the three southern African countries of Botswana, Lesotho and Swaziland. The University main campus is situated in Gaborone, the capital city. During 2006/2007, the University had a total enrolment of 16,238, students of which 12,934 were full time. Approximately 51% of the students were females. Of the total enrolment, 15,248 were pursuing undergraduate programmes (University of Botswana, 2007). The University has six faculties, namely: Business, Education, Engineering and Technology, Humanities, Science and Social Sciences comprising thirty-nine (39) departments. It also has a School of Graduate Studies and several specialised centres and research units and a staff strength of 2,640, of which 994 were academic. The academic programmes are offered at certificate and postgraduate levels (University of Botswana, 2007). The University of Botswana defines e-learning as the appropriate organisation of information and communication technologies for advancing student-oriented, active, open, collaborative and life-long learning process (UBeL, 2002).

The implementation of e-learning at the University of Botswana was motivated to fulfil the university's responsibility, among other things: prepare students for effective participation in the wider information society; use ICT to increase the success rates of students; provide the opportunity for the University to enhance flexible learning anytime, anywhere and at student's own pace; and enable access to relevant national and international resources and enable instructors to handle large classes (UBel, 2002:16). The university also has a policy-guided e-learning program that emphasised a blended approach to e-learning in which various modes, methods and media are integrated and organised for appropriate learning (Batane and Mafote, 2007; UB WebCT Report, 2007).

The University of Botswana embarked on a programme of e-learning in 2001 when it mandated the EduTech Unit of its Centre for Academic

Development to transform the education process at the University technologically (Uys, 2003). EduTech carries out the training of faculty in the effective and appropriate use of educational technologies at the university. The Unit also provides resources such as state-of-the-art computer laboratories known as smart rooms. The smart rooms were constructed to facilitate technology-based, open, active, and collaborative learning, and are fully equipped with wireless Local Area Networks (LANs), videoconferencing facility, digital projectors, scanners, and the Blackboard system. A smart room is typically laid out with clusters of computers situated in such a way as to enable eye contact among instructors and learners. This is similar to what obtains in some other higher education institutions that are implementing e-learning, as in Korean Universities (Leem & Lim, 2007) and the University of the Witwatersrand, South Africa (Lowe and Kaplan, 2007).

During 2006, 145 lecturers of the 827 faculty used e-learning in the delivery of their courses and during 2007/08 academic session, 258 lecturers of the 994 academic staff used it in the delivery of their courses. The number of students enrolling in e-learning course is also growing. During the first semester of 2006-2007, more than 1,300 students were added to online courses (University of Botswana, 2006). According to the UB Blackboard/ WebCT Report, 2007:9, "it is difficult to tell the exact number of students online because most students are enrolled in more than one course. A rough estimation of about 8000 + students are enrolled on Blackboard".

Literature Review

The literature on information systems (IS) development and use is replete with studies that show that varied factors could be used to predict or explain why users of information system accept or avoid, adopt, use, or become satisfied or dissatisfied with information systems. Among the most commonly highlighted factors are: perceived ease of use (e.g. Chang and Vera-Pang's, 2011; Zhou, 2010), self-efficacy (e.g. Abad, Morris and Nahlik, 2009, system quality (Wang et al., 2007), content quality (Wang et al., 2007), and perceived usefulness, individual impact, service quality, intention to use (Tella, 2009). Studies have paid and still pay considerable attention to e-learning quality. The quality issue has received attention from educational institutions such as the Western Interstate Commission for Higher Education (WICHE), and the Institute for Higher Education Policy (Frydenberg, 2002). The institutions which adopted this approach focused on the quality of e-learning system as a whole, instead of limiting their focus to single factors such as service quality or system quality only. However, MacDonald et al. (2001, 2005) proposed a model called the Demand-Driven Learning Model (DDLM) that relied on the following five factors which were considered to be essential to creating e-learning quality in higher education: structure, content, delivery, service, and outcome.

Also relevant to this study is a model developed by Tella (2009) for evaluating the Blackboard system at the University of Botswana. The evaluation model highlighted the importance of the following nine interrelated factors: system quality, content quality, service quality, teaching and learning quality, student self-regulated learning, user intention to use, organisation preparedness, user satisfaction, and net benefits. Each of these factors is explained next.

System Quality: According to Delone and Mclean (2003), system quality refers to an overall quality of hardware and software of a learning system and the elements of the system that affect the end user in the way they interact and use a system. Therefore, Blackboard system quality in this study refers to the elements of the system that affect students at the University of Botswana in the way they interact and use the system. Some researchers had identified system quality as one of the key potential predictors of users' satisfaction with a system. For instance, Eom (2010) applied path analysis modeling to examine the relationships between students' satisfaction with and their perceived learning outcomes in the context of university online courses. The results indicated that system quality, information quality and self-managed learning behaviour significantly predicted students' satisfaction levels, while system use and computer self-efficacy did not.

Content Quality: In the context of an information system, information quality refers to output that an information system provides. Content quality

represents information quality in this study because the output of the Blackboard learning system is the information content it provides to students. Course content quality is defined as the extent to which the course content management system provides valuable content in the judgement of the student users relative to their learning needs. The quality of course content is measured by its important attributes, i.e. timeliness, relevance, usefulness, accuracy, importance, availability, and completeness. Shin (2009) explored the factors influencing the adoption of IPTV within the technology acceptance model (TAM), and confirmed the impact of information quality and system quality on consumers' technology experience. The study specifically shows that the perceived quality of content and system was found to have a significant effect on users' perceived usefulness and perceived enjoyment. Koivumki, Ristola and Kesti (2008) focused on how different dimensions of information quality affect consumers' satisfaction towards and eventual acceptance of mobile information services. How these dimensions affect consumer satisfaction in both utilitarian and hedonic use contexts was analysed. The results show that all the information quality dimensions examined had a statistically significant positive relationship with user satisfaction, while user satisfaction in turn had a positive relationship with the intention to use the service again. The results also indicated that content is more important for users with hedonic goals.

Service Quality: Service quality is considered as the overall level of support delivered to students in their use of the Blackboard learning system by the Blackboard service provider at a particular Blackboard installation. It includes the types and levels of support rendered to the students by a combination of the institutions' information system department, Blackboard support team, and/or an outsourced Internet service provider. Stone, Good and Baker-Eveleth (2007) reported that assessments of system/service quality in tasks performed using the system impacted perceived performance of the marketing organisation which they studied and also mediated individual-level impacts such as perceived usefulness, attitudes toward using the system, and system use.

System Usage: Straub et al. (1995) found that actual system usage has a notable practical experiential value for managers interested in evaluating the impact of information technology. Igbaria et al. (1997) found that individuals are likely to use a system if they believe it is easy to use and will increase their performance or productivity. Objective measures of actual use are difficult to obtain for Internet-based technologies and therefore many of the TAM studies either left out usage as a dependent variable, focusing solely on behavioural intention, or else used perceived usage as a proxy. Page-Thomas (2006) in a regression analysis on web usage frequency reported that users usually find it easy to learn to use the web and that users' self-reported uses of the web for purchasing activities are the best predictors of how frequently they will use the web. The results highlighted the importance of training users to effectively use hypermedia-based systems like the web, and the design of systems that are easy to navigate and that provide advanced functionality for transactional activity.

Net Benefits: Wu and Wang (2006) defined this as an idealised comprehensive measure of the sum of all past and expected future benefits from using Blackboard as perceived by users, and that takes into account past and expected future costs of use, including the expenditures and time taken in learning to use and using the system. In order to measure net benefits, one needs to adopt one or more stakeholders (e.g. students) points of view about what is valuable and what is not about the system as suggested by (Seddon, 1997). Net benefits was measured in this study by the perception of the students on how valuable the Blackboard learning system was to them. This was measured using a modified version of the net benefit sub-scale used by Wang et al (2003). On the benefits side of the net benefits equation is the increased performance of individual and group learning by a student. For a University of Botswana student, important net benefits resulting from the use of a Blackboard system included improvements in the learning outcome and performance, decision-making, the quality of the students produced by the university though the system. Through the virtual service connections, students can learn and enhance their knowledge. By actively participating in virtual service connection, a student can become more visible to their peers. Net benefits is also concerned with improved performance at the University of

Botswana, improved outcome/outputs, quality of graduates, cost reduction, as well as increased work volume. Previous research on net benefit, e.g. Cegarra-Navarro and Carriónkey (2011) reported the key benefits of telemedicine in the e-learning context as including the fact that it enables the doctors to identify and replace poor practices and also avoid the re-invention of the wheel, and cost reduction by minimising unnecessary work caused by the use of poor methods.

Learning and Teaching Quality: This is the improved quality of teaching and learning processes, as perceived by the students. The variable is important because the expected core role of the Blackboard learning system is to support and improve learning and teaching. In this study, improvements in teaching and learning quality areas measured by students' assessments of the improvements in the way courses are delivered through the Blackboard platform, and the quality of interaction with tutors on the platform.

Self-Regulated Learning: Schunk and Zimmerman (1994) defined self-regulated learning as "the process whereby students activate and sustain cognitions and affects that are systematically oriented toward an attainment of their goals." Cognitive self-regulation can be taught to students (Hwang and Liu, 1994). This means that students are guided in order to play an active role in learning, become self-organised, self-directed, independent, and actively participate in the learning process to construct their knowledge (Vovides, et al, 2006). According to the constructivist learning theory, students utilise open applications to construct more complicated meanings. However, not all learners are able to manage their learning process and master the content at hand, especially in e-learning environments. This is where Blackboard can provide the support to guide learners in the use of the appropriate tools to help them acquire, for example, the strategic knowledge to collect and organise data and then demonstrate what they have learned (Niederhuser and Stoddart, 2001). The Blackboard learning system should inspire, motivate and guide the students to develop self- regulated learning cognitive skills. The opportunity learners have to self-regulate their learning under Blackboard can go a long way in determining the users' satisfaction with the system. Students' self-regulated learning is considered as one of the Blackboard users' satisfaction factors in this study because it is critical for measuring acceptance, satisfaction and even success of a system in educational context. In this study, self-regulated learning is defined as the way learners actively participate and take decisions regarding their learning under the Blackboard learning system, and measured using a modified version of the learners' self-regulated scale developed by Schunk and Zimerman (1994).

Organisation Preparedness: This denotes the level of readiness of the University of Botswana in implementing an effective e-learning WebCT CCMS. The indicators used to measure this variable are e-learning infrastructure, funding, skills and capacity building.

User Satisfaction: This is the dependent variable on this study, and is defined as a user's level of satisfaction with the system in terms of individual outcomes on a pleasant-unpleasant continuum (Zhou, 2010). User satisfaction in this study refers to the degree to which an individual user is satisfied with his or her overall use of the Blackboard learning system. Collective findings from prior IS research have suggested that user satisfaction is a strong and critical manifestation of a systems' success (Delone and Mclean, 1992, 2003), and several measurement inventories have been developed and validated to measure it. In this study, user satisfaction was measured using a constructed and validated user satisfaction scale that required the students to use four-point rating scales to indicate how satisfied they were using Blackboard at the University of Botswana in terms of the following variables: relevance, dependability, accuracy, usefulness, adequacy and effectiveness.

Tella (2009) had used the above nine variables in a research model which he used in a doctoral thesis to assess the effectiveness and efficiencies of implementation and use of the Blackboard at the University of Botswana. This study, which is based on data collected for the thesis, focuses on the extent to which user satisfaction, which was one of the variables that was used to evaluate the Blackboard implementation and use at the university, can be

predicted with data collected during the study on seven of the eight other variables in the model, except organisation preparedness.

Research Questions

To achieve the objective of the study, the following research questions were specified.

1) What inter-correlations exist among the system-related factors (system quality, content quality, service quality, teaching and learning quality, student self-regulated learning, and net benefits) in respect of the Blackboard Learning System at the University of Botswana?
2) Which of the Blackboard learning system related factors best predict users' satisfaction with the system?
3) What is the joint predictive strength of all the factors in explaining the users' satisfaction with the system?

Methodology

The study was carried out at the University of Botswana during the 2008/2009 academic session. A survey research design was used on a target population that consisted of all undergraduate students who had been using the Blackboard at the university. According to the UB Fact and Figures, 2008/09, there were 16, 238 students distributed across seven faculties and 42 departments. Out of this number, the publication estimated that at least 8,000 were using Blackboard across all faculties at the time of the study. The sample sizes were based on 7.5% of the students in each faculty. This resulted in a target sample of 600 students.

In each faculty, a core course was chosen at each of the four levels of study in the four-year undergraduate programmes (core courses are compulsory foundation courses in an academic programme which all students must study and pass in an examination before graduation), for a total of four core courses for each faculty. The total number of students taking each of the core courses was identified for each faculty, and about 10% of them were targeted with a view to obtaining at least 7.5% returned and usable copies of the questionnaire.

A questionnaire was used to gather data from the respondents in this study. The items in the questionnaire were adapted from various previous IS success measures. The design of the questionnaire was guided by the literature review, previous survey questionnaires used in similar studies, and the research questions. The choice of a questionnaire for the collection of data was based on the fact that most studies on information system success have adopted the use of questionnaire for the collection of data (Hussein, et al, 2007)

Sub-scales for collecting data for measuring each of the following constructs were included in the questionnaire: (1) user satisfaction (the dependent variable), (2) System quality, (3) Content quality, (4) Service quality, (5) learning and teaching quality, (6) system use, (7) self- regulated learning, and (8) net benefits. Items in the sub-scales had 4-point Likert response scales with the points coded and labelled as 1 "Strongly disagree", 2 "Disagree", 3 "Agree", "Strongly Agree". The 4-point scales are known as forced choice Likert scales as "respondents were not allowed a "not sure/indifferent" response in order to overcome the neutral and don't know responses (Hussien et al., 2007) and avoid potential distortion of results.

The questionnaire was hand distributed to the participants. The questionnaire was pilot tested on a selected sample of the population in order to ascertain the validity and reliability of its items and sub-scales. The questionnaire was self-administered by the students during a lesson in each of the selected core courses after the instructions on how to respond to the items in the questionnaire were explained to them by the researcher. Out of the 600 copies of the questionnaire administered to the students, 503 were returned, giving 84% response rate.

Results

Table 1 reveals that correlation exists between the overall users' satisfaction score and the other system related factors/measures of Blackboard system. The results show that student self-regulated learning had the highest correlation with users' satisfaction. This is followed by students' self-regulated learning ($r = 0.51$) and net benefits ($r = 0.50$). A correlation of other factors reveals content quality and teaching and learning quality as having ($r = 0.49$), system quality

(r = 0.46) while service quality had the lowest correlation with users' satisfaction (r = 0.37). This suggests that all these factors correlate with users' satisfaction with Blackboard system.

Nevertheless, the results reveal that some correlations are higher than others. Among the highest inter-correlations that are higher than 0.5 are content quality with system quality (r = 0.588); content quality and teaching/learning quality (r = 0.525); and system quality with teaching/learning quality (r = 0.506). These high correlations are what should be expected, as users are likely to link perceptually teaching/learning quality with content quality as content is what is taught and expected to be learned. Also, they are likely to link content quality with the technology or system (Blackboard) through which it is made available to them. The other similarly high inter-correlations (above 0.5) are between user satisfaction and self-regulated learning (r = 0.511), between user satisfaction and net benefits (r = 0.500), and between user self-regulated learning and net benefits (r = 0.511). A few other inter-correlations are very close to 0.5. Among these are: user satisfaction with content quality (r = 0.497) and with teaching/learning quality (r = 0.497), and teaching/learning quality with self-regulated learning (0.485).

However, some factors had much lower inter-correlations with one another: system quality with service quality (r = 0.336), with self-regulated learning (r = 0.331), and with net benefits (r = 0.296); service quality with teaching/learning quality (r = 0.393), with self-regulated learning (r = 0.342), and with net benefits (r = 0.242). These results indicate that the students' perceptions and ratings of both system quality and service quality were low, which probably also explains why these two factors are also weakly correlated with the system success factors such as user satisfaction and net benefits, as the table shows.

Table 1: Descriptive Statistics and Intercorrelation Matrix among Factors (N=503)

			Factors (Variables)						
Factors (Variables)	Mean	Standard Deviation	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) User Satisfaction	102.4314	23.987	1.000						
(2) System Quality	14.874	2.874	.464	1.000					
(3) Content Quality	11.169	2.315	.497	**.588**	1.000				
(4) Service Quality	7.411	2.694	.367	.336	.418	1.000			
(5)Teaching/Learning Quality	7.986	2.067	.497	**.506**	**.525**	.393	1.000		
(6) Self-regulated learning	10.451	2.472	**.511**	.331	.421	.342	.485	1.000	
(7) Net Benefits	13.456	3.389	**.500**	.296	.343	.242	.393	**.511**	1.000

Table 2 presents the results of the regression of user satisfaction on the six system-related variables. The regression results show an adjusted R-square value of 0.541 (table 2(a)), and an F-ratio of 93.872 (table 2(b)), the latter of which is significant at 0.05 level (0.000 < 0.05). These results indicate that the six independent variables (*net benefits, self-regulated learning, content quality, teaching/ learning quality, system quality, service quality*) jointly (as indicated by the R-square value) explained or predicted 54.1% of the variations in the students' satisfaction with Blackboard system. The prediction is also significant, as indicated by the F-ratio.

Table 2(c) provides information on the individual contributions of each of the six factors in predicting user satisfaction with the system. The results show, firstly, that each of the factors (except service quality) makes significant contributions to the prediction (as indicated by the significance of the t values, which are less than 0.05, as shown in the rightmost column of the table.)

Secondly, the standardised coefficients (Beta values) which indicate relative strength of each factor in the prediction of user satisfaction show that net benefits contributed most to the prediction of user satisfaction (Beta value = .282), followed in declining order of strength by system quality (Beta = .244), teaching and learning quality (Beta = .196), self-regulated learning (Beta = .117), content quality (Beta = .116). Although service quality had a Beta value of .035, its contribution is not significant, as indicated in the final column (Sig. = 0.05 not less than 0.05). These results imply that five of the six factors exert significant contribution to the explaining or predicting user satisfaction with the Blackboard system.

Table 2: Regression of User Satisfaction on Blackboard System-Related Factors (N = 503)

(a) Model summary

Multiple R	.739
R Square	.547
Adjusted R Square	.541
Std. Error of the Estimate	4.932
Log-likelihood Function Value	-1107.304

(b) ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	13526.129	6	2254.355	93.872	.000
Residual	11215.289	467	24.016		
Total	24741.418	503			

(c) Coefficients

	Unstandardised Coefficients		Standardised Coefficients			
	B	Std. Error	Beta	Std. Error	T	Sig.
(Constant)	-.676	.755			-.895	.371
Net Benefits	.323	.043	.282	.038	7.455	.000
Self-Regulated Learning	.185	.063	.117	.040	2.943	.003
Content Quality	.195	.071	.116	.042	2.751	.006
Teaching/Learning Quality	.365	.076	.196	.041	4.782	.000
System Quality	.327	.054	.244	.040	6.098	.000
Service Quality	.099	.050	.069	.035	1.965	.050

Discussion

This study has examined students' satisfaction with the Blackboard Learning System: an investigation of the predictive factors at the University of Botswana. The results have revealed that all the system related factors (*net benefits, self-regulated learning, content quality, teaching/learning quality, system quality, service quality)* correlate with users' satisfaction with Blackboard system. However, some system factors have higher correlation close to .5 and higher than .5; including content quality, teaching and learning quality, students' self-regulated learning, and net benefit; while factors such as system quality and service quality had the lowest correlation with users' satisfaction. These lower correlations might be because users usually experience difficulties such as system failure or other related issues. Also, lower correlation of the service quality to users' satisfaction might be due to the system weak support services provided to the users which might be considered as not strong enough to satisfy the users.

Similarly, all the six system-related factors together made 54% prediction of users' satisfaction with Blackboard learning system. This suggests that the variables have direct prediction on the users' satisfaction with Blackboard system and that all the six factors exert significant contribution to user satisfaction with the Blackboard. Nevertheless, the results also show that the students rated both system quality and service quality lower than the other system-related factors such as content quality, teaching/learning quality, self-regulated learning.

The inter-correlations reported among the system-related factors and users' satisfaction corresponds with the previous studies identified in the literature. Similarly, the joint prediction of the factors to users' satisfaction with the Blackboard learning system corresponds with the findings of some earlier research. For instance, Eom (2010) reported that system quality, information quality, and self-managed learning behaviour significantly affect students' satisfaction. On content quality, Shin (2009) reported that perceived quality of content and system was found to have a significant effect on users' perceived usefulness and perceived enjoyment and users' satisfaction. Koivumki, Ristola and Kesti (2008) reported how different dimensions of information quality affect consumers' satisfaction. Stone et al. (2007) and Ozkan and Koseler (2009) have reported service quality as a key determinant of users' satisfaction with e-learning, while Cegarra-Navarro and Carriónkey (2011) reported the importance of net benefits in determining users' satisfaction with a system.

Conclusion

Blackboard learning system is becoming the most popular and commonly used e-learning system and is believed to be the most commonly recent e-learning platform in many universities the world over. Even, non-educational organisations are also making use of this system to train their employees. However, measuring and determining factors predicting users' satisfaction with Blackboard learning system is considered to be one of the main issues in e-learning systems evaluation. The analyses in this study show the causal relationships between the identified factors and the users' satisfaction with the Blackboard learning system. The findings also validate those of many earlier studies.

Nevertheless, it is important to recognise some limitations in the scope and methods of the study. Firstly, the study was conducted among only one (students) of the three main stakeholder groups (students, staff and ICT support staff) in the Blackboard Learning System at the university. Secondly, only one data collection instrument, i.e. the questionnaire, was used to collect the data on the students' opinions and ratings on both the dependent and the independent factors in the study. Thirdly, although research on the impacts of e-learning implementations in African universities is rare, the data for this study were collected from only one African university, the University of Botswana's implementation of the Blackboard Learning System. The scope of the study was also limited by time, financial and data collection constraints that limited the sample size that was used. However, it is hoped that other researchers would design and use other types of instruments for other stakeholders in different African institutions that use other e-learning platforms than the Blackboard Learning System.

Recommendations

Teaching and learning support is the core business of e-learning systems such as Blackboard. The results of the study show that service quality has the lowest correlation with users' satisfaction with Blackboard. This suggests either that service quality is weak or imperceptible to the students. Hence, it is recommended that the university needs to improve the support services provided for the users of Blackboard. The Blackboard support staff should consider improving and making service support visible by making themselves available for user assistance roles, bearing in mind that the system is all about technology that students may not understand fully, or which can develop technical faults at any time. The University of Botswana should consider increasing the number of adequately trained Blackboard support staff on campus.

Teaching and learning quality correlated strongly with user satisfaction. However, there is still need for improvement in the quality of teaching and learning through Blackboard at the university, as the majority of the courses in the university were still delivered outside the system at the time of the study.

There is also the need to improve the content quality of courses delivered through Blackboard. There is need for the people in charge of the system at the university (i.e. Blackboard Administrator and the e-learning support team) to make sure that quality content in terms of substance, relevance, media and formats is uploaded on the system. In other words, there is a need for course content quality control to ensure that all the content on the system is up to specified standard. Modification could also include encouraging lecturers to add more activities to what is currently available on the system.

Finally, in order to further enhance the overall satisfaction of the users, there is a need for regular upgrading of the system, perhaps in every 3-5 years, to ensure that the system keeps pace with new developments in e-learning pedagogical methods and tools.

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