

The Use of Various ICT's in Blended Collaborative Learning at the University of Botswana

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ABSTRACT

Instructional technology has become a fundamental aspect of the e-learning objective of many institutions of learning across the world. Given the diverse needs of learning institutions in terms of infrastructure, objectives and student accessibility to institutional resources, it becomes imperative that e-learning systems are designed so as to allow the institutions the flexibility to efficiently accomplish their unique goals and aspirations. This is more especially important in the resource-deficient institutions located in developing countries.

The overall objective of this paper was to determine which one, among WebCT, server-based Local Area Network (LAN) folders, and course websites delivery methods best suits the local context given inadequate access to technology, poor Information Communication Technology (ICT) infrastructure, and derisory (ICT) skills in developing countries (Seleka G, Gianinni D, 2005). Whereas numerous studies have been conducted on blended learning in developed countries, very few such studies have been carried out in developing nations. This study will seek to establish whether the criteria found in developed countries should be applied to the developing world environment as it is or with some modification for useful implementation.

The study took an experimental format wherein usage of three course delivery methods, LAN folders, WebCT, and course websites were analyzed using descriptive statistics.

Keywords: blended learning, e-learning, server based LAN folders, WebCT, course websites

INTRODUCTION

This study addressed three methods that lecturers at the University of Botswana uses for course delivery. The first, which is very basic and unsophisticated, is to put the course material in a file server, server based local area network folders (LAN folders). Students can download handouts and assignment questions, and possibly hand-in answers to the assignments online. Apart from organizing the course materials in server there is not much that can make it interactive. Lecturers may also create email discussion lists to supplement the LAN folders.

Lecturers who are more IT savy can design course websites. The level of sophistication of a course website will tend to differ from one lecturer to another. However, using just the basic facilities of HTML and without special coding in scripting languages such as JavaScript, it is possible to produce quite reasonable e-learning materials, albeit with a very restricted range of interactivity. The websites can be designed so that students can discuss with instructors as well as with other students. Admittedly, this is not what is meant by e-learning but websites have been used for that purpose.

The University of Botswana introduced WebCT in early 2000, which is a commercial educational application that has been purposefully designed for e-learning. Many lecturers and students have been taught how to use WebCT in course delivery by the university's educational technology department. While many have migrated to WebCT some lecturers including those in the faculty of business still use LAN folders or course websites or a combination of the three.

The phenomenon of blended learning has taken center stage in educational circles of today, particularly in institutions of higher learning. Sometimes called hybrid learning, integrated learning or collaborative learning, blended learning is learning that is facilitated by the effective combination of different modes of delivery, models of teaching and styles of learning, and founded on transparent communication amongst all parties involved with a course (Heinze and Procter 2004). Some of the fundamental aspects of blended learning include the use of online communication tools (Giannini and Seleka, 2004), the Internet, collaborative software, classroom management software as well as e-tutoring or e-mentoring (Wikipedia).

The goal of this paper is to seek an understanding on the relevance and applicability of various blended learning tools to the developing country environment. Numerous studies have been undertaken on the use of instructional technology as an essential element in teaching delivery (Burgess 2003, Zapalska et al. 2004, and Morss 2004). While there has been some research on the subject in a developing country context (Giannini and Seleka 2004, Czerniewicz and Brown, 2004), the emphasis has not been on how well the various ICTs used in pedagogy are suited to the local environment. Our aim then, was to find a framework that explains the factors that lead to the successful implementation and use of ICTs in instructional technology with prominence given to learning environments with limited computing resources and user skills.

Central to our discussion is that while some blended learning ICTs, particularly the web-based ones, have been proven to be successful in developed countries, perhaps their applicability to the developing country circumstance needs to be further investigated to check if they need modification or supplements in order for them to be useful locally. Many learning institutions located in developing countries are grappling with poor infrastructure, shortage of IT trained personnel and limited computer skills among the student communities. Furthermore, some higher education management teams still understand information systems issues as a support function rather than as an essential aspect to institutional planning and strategy (Paterson, 2003). Whereas these factors may not necessarily be unique to developing countries, they are by their nature, more

prevalent in environments akin to those in developing countries as opposed to those in the developed world. The “Digital Divide” has been mentioned as one of the main causes for this (Zurita, 2005).

LITERATURE REVIEW

The literature review divulges that there is extensive research available on e-learning as a whole and on blended learning specifically. The research further suggest that blended-learning is not really a new paradigm to teaching and learning but what is new is rather “that today’s Internet-based tools can facilitate communication, interaction, and collaborative learning in ways that were not possible before” (The Node, 2001). Specific to our argument and objectives, some recurring premise for the use of ICTs as well as some factors that impact the success of applications or platforms used in blended learning are discussed below.

Flexibility and convenience

The introduction of Internet-based learning has helped overcome the time and distance limitations associated with learning in a traditional environment (Burgess, 2004). The fact that both learners and instructors can, to some degree, learn or instruct anytime of the day and from anywhere in the world where there is Internet connectivity offers the stakeholders an impetus to engage in blended learning.

Cost reduction

Blended learning reduces instructor-led instructions to the minimum necessary, which translates to reduced costs incurred as a result of live instructor-led instructions (Alvarez, 2005). This could be particularly relevant to the developing country context given the scarcity of resources. It is, however, important to determine the perspective from which the cost factor is viewed. Although the research indicates that cost savings can accrue on reduced live instructor-led instructions, physical infrastructure and scheduling efficiencies (Marsh, McFadden and Price), little data is available on costs incurred on running the blended learning platform or tool itself.

Access to technology

The issue of access to technology has been discussed only scarcely in both developed and developing country literature (Seleka and Gianinni, 2004). This issue is, nonetheless, important to any discussion on the use of ICTs in blended learning, particularly in a developing country context. This is because resource unavailability is widespread in such environments (IUT, 2005) and this tends to negatively impact blended learning.

On the other hand, van Dijk (2003) and other researchers argue that while technology is essential it is insufficient and thus a “pre-occupation with physical access and shallow demographics” should be avoided. It is thus imperative that when discussing access to technology both physical access to technology and “real access” (Bridges, 2001) are considered.

Computer Skills

Linked to the issue of technology access is that of computer skills. According to Masters and Oberprieler (2003), lack of IT skills is one of the barriers of equitable online participation in the developing world. There is dispute as to the exact of computer skills needed for Internet-based learning. Ryan (2001) as quoted in Burgess (2004), argues that e-learning does not require extensive computer skills although familiarity with computers and software does reduce the intimidation factor.

Platform or Tool Used

The tool of choice among those who have adopted blended learning is the use of the World Wide Web (www) and specifically WebCT® and BlackBoard® (Zaplaska et al, 2004). One of the reasons cited for the widespread adoption of Internet-based platforms has been the interactivity they offer (Zaplaska and Brozik, 2002). This interactivity is said to be important in providing students with the feedback and interaction that allow them to better appreciate the learning material. There is no research material on the use of alternative platforms, specifically network based LAN folders.

OBJECTIVES OF THE STUDY

Based upon the research above we stipulate our objectives as follows.

1. To review e-learning literature
2. To ascertain what factors lead to successful implementation and deployment of ICTs in a blended environment in developing countries.
3. To determine the specific limitations found in developing countries that call for a different approach to e-learning in general and blended learning in particular
4. To investigate whether a single specific tool or combination of ICT tool(s) or platform can adequately meet the requirements of a blended environment in a developing country.

Methodology and Research Design

Sample and Measures

The population for this research was made up of first, second and third year business students in the university of Botswana, a total of 200 students. Questionnaires were administered in class, and students were asked to complete them immediately and were collected some few minutes later.

Questionnaire Design

The survey questionnaire was made up of five parts. The first part of the questionnaire was designed to collect data about the gender of the respondents. The second part of the questionnaire had two questions. The first question asked the respondents to indicate the level of popularity of each of the course delivery methods in the university. The second question asked the respondents to indicate how often they use each of the course delivery tools. In the third part of the questionnaire, respondents were asked to indicate the rate at which they use certain facilities that are known to exist in each of the course delivery tools. These included downloading of course materials, doing tests and quizzes, holding

discussion with other students or with the course lecturer. The fourth part of the questionnaire had four statements related to technical problems users may experience while using any of the tools. The problems included accessibility, availability, speed and user-friendliness of the system. Respondents were asked to show their level of agreement to the statements using a Likert-like scale constructed as follows: 1. Completely agree 2. Agree 3. Neutral 4. Disagree and 5. Completely Disagree. In the last part of the questionnaire respondents were asked to indicate the course delivery method that best suits their educational needs. This part had 13 statements related to facilities offered in an e-learning environment as well as convenience and security of using each of the tools. Respondents were required to indicate whether the tool performed satisfactorily or not.

Research Findings

Out of 200 questionnaires that were distributed 138 were correctly completed representing a 69% response rate of which 65.7% were females.

Popularity of Course Delivery Tools

The survey wanted to know how popular the three e-learning tools are within the university. This was done by asking the students two questions. In the first question students were asked to give their opinion on what is the most popular tool used in the university. Students were asked to indicate the level of popularity of each of the three e-learning tools using a five level Likert-like scale constructed as follows: 1. Extremely popular, 2. Very popular, 3. Popular, 4. Not very popular, 5. Not popular at all. In the second question students were asked to indicate how often they use any of the tools in a Likert like scale constructed as follows: 1. Very often, 2. Often, 3. Sometimes, 4. Rarely, 5. Never. The results of these two questions are shown in Table 1.

Table1: Popularity of the Three e-learning Tools

Question	WebCT		LAN Folders		Websites	
	Mean	S.D	Mean	S.D	Mean	S.D
How popular is the use of this method?	2.29	0.9	2.72	1.1	3.21	1.3
How often do you use it?	2.11	0.9	2.55	1.2	3.01	1.4

The results indicate that WebCT is the most popular tool and the most widely used among the two. Websites are not common and least used by students to access course materials. Websites are supposed to be more user-friendly to use and have more facilities than LAN folders but they are less popular compared to LAN folders. This could be because it is more involving to create a website than creating a LAN folder, **which is made by developing a file in server, and hence fewer lecturers use them.**

Commonly Used facilities in Each Course Delivery Tool

Students were asked to indicate facilities that they use in each course delivery tool. The level of usage was constructed as follows: 1. Very often, 2. Often, 3. Sometimes, 4. Rarely, 5. Never. As shown in Table 2, in all course delivery tools downloading of course

materials and assignments, and submission of assignments came up top while discussion with instructors and with other students came last. It is disappointing to note that WebCT is also mostly used to download course materials and assignments, submission of assignments and reading class announcements and less on holding discussion with instructors and other students. One of the major uses of commercial e-learning tools such as WebCT is to enhance interaction among students and between students and lecturers. Computer mediated communications technologies are being recommended increasingly within the university environments as a means to enhance flexible delivery and student learning. Certainly the lack of student teacher interaction cannot be blamed on the students alone because teachers are supposed to initiate the process by designing online tutorials and probably making online interaction an assessable component of a course. Again it is noted that the most heavily used course delivery tool is WebCT followed by LAN folders and Course websites are not common.

Table 2: Commonly Used Facilities in Each Course Delivery Tool

Use	WebCT		File Server		Websites	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Downloading some course material/assignments	1.82	1.1	2.16	1.3	2.56	1.5
Submission of Assignments	2.35	1.2	N/A	N/A	3.13	1.4
Reading class announcements	2.38	1.2	3.13	1.4	N/A	N/A
Email	2.83	1.4	N/A	N/A	3.83	1.3
Doing Tests/Quizzes	3.05	1.3	3.42	1.4	3.43	1.3
Accessing other websites relevant to the course	3.19	1.4	N/A	N/A	3.29	1.5
Discussion with Instructors	3.38	1.4	N/A	N/A	4.32	1.1
Discussion with other students	3.67	1.3	N/A	N/A	3.94	1.3

Students were asked to indicate their level of agreement or disagreement to four statements concerning accessibility, speed, availability and use-friendliness of each of the three course delivery tools. Level of agreement was constructed using a Likert-like scale constructed as follows: 1. Completely agree, 2. Agree, 3. Neutral, 4. Disagree, 5. Completely disagree. WebCT has come up as the most user-friendly tool followed by course websites. WebCT is also rated as the most available system followed by LAN folders. However, LAN folders have been rated as being faster to access than WebCT. This is expected because WebCT serves the whole university while file folders are local within faculties and departments thus serving very few users. Websites are also supposed to be faster than WebCT because they also serve few students. Many students were unsure if they can access the various course delivery tools from outside the university with some indicating specifically that they have never tried, maybe due to the fact that they do not have physical access beyond the university.

Table 3: physical access and ICT skills

One-Sample Statistics	WebCT		File Server		Websites	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
The system is not easy to use	3.93	1.2	3.65	1.2	3.73	1.2
In many cases the system is down	3.65	1.1	3.53	1.2	3.42	1.0

The system is slow	3.39	1.1	3.45	1.1	3.42	1.0
I cannot access the system from outside the university	3.23	1.3	2.47	1.3	3.01	1.3

Software tools differ in their level of sophistication, user friendliness and range of other facilities. Students were given the features shown in column one in Table... and asked to indicate whether each tool best suited their educational needs. Respondents were asked to indicate their level of agreement with each statement on five point Likert-type scale that was constructed as follows: (1) Strongly agree, (2) Agree, (3) Uncertain, (4) Disagree, and (5) Completely Disagree.

Results shown in Table .. indicate that WebCT is superior

	WebCT		File Server		Websites	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Course Material Downloading	1.66	0.89	2.18	0.99	2.30	1.11
User Friendliness	1.68	0.80	2.42	1.03	2.29	0.98
Assignments Downloading	1.68	0.84	2.22	1.06	2.78	4.32
Reliable Access	1.85	1.06	2.53	1.17	2.27	1.22
Easy Access	1.92	0.93	2.60	1.13	2.48	1.09
Class Announcements	2.08	1.24	2.86	1.29	2.56	1.28
Emailing	2.21	1.12	N/A	N/A	2.89	1.27
Discussions	2.27	1.22	N/A	N/A	2.94	1.31
Security	2.43	1.08	2.85	1.17	2.82	1.01
Contacting Course Lecturer	2.47	1.30	N/A	N/A	2.89	1.27
No Need for Training	2.55	1.39	2.68	1.30	2.85	1.33
Accessible form Anywhere	2.55	1.39	3.58	1.30	2.89	1.28
Real-time chatting	3.22	1.32	N/A	N/A	3.11	1.20

Recommendations:

From the study, we recommend, that while Web-based commercial platforms (WebCT in particular) appear more popular than other e-learning tools among students, educators should make an effort to ensure that the full potential of such tools is exploited. There is certainly nothing wrong with using WebCT to download course material or submitting assignments, but users could benefit more if they used the great power of interactivity and discussion threads. Also, where possible, e-learning tools should be used to complement each other; for example, Server based LAN folders are easier to set up, and faster to access than WebCT, they are generally not available outside the University. Having both platforms would allow for more flexibility. Although the cost aspects were not investigated in the study, it is imperative that policy makers understand the cost implications of choosing a particular platform over others. In our study, we found that WebCT was not used to its fullest potential. The costs for setting up, implementing and licensing the platforms applications are, nonetheless, relatively very high. We

recommend that policy makers aggressively encourage the use of such tools in such a way that users get the most benefit.

Conclusion:

It would seem that overall; the study confirms most of the key aspects discussed in the literature review. Thus, most of the data from developed countries could also be applicable on the developing country context. There are, however, some key issues that are peculiar to the developing countries. For instance, the download speed for WebCT is relatively lower because of lower bandwidth. Furthermore, we could conclude that at the University of Botswana, the most popular methods of course delivery are WebCT and LAN folders; course Websites are generally not used. This is in contrast to the situation in developed countries where in addition to WebCT and LAN folders, lecturer-set up course websites are substantially deployed.

Further Research

As seen from this survey study, the researchers focused on students perception of different ICT tools in course delivery at The University of Botswana excluding the lecturers perception, who are the major stakeholders in choosing the tools to be used; we therefore feel that further research is necessary taking in consideration the lecturers perception as well. A follow-up paper titled “**The Use of various ICTs in Blended Collaborative Learning at the University Botswana II – Lecturers’ Perspective.**”

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