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Faculty and Students' Awareness and Challenges of E-learning in a College of Education

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This study explored the use of e-learning by student teachers and faculty members at the Paro College of Education, Royal University of Bhutan. It provides an overview of the current status of e-learning at the College including the challenges faced by both faculty members and students teachers, and the influence of ICT resources on the use of e-learning by the lecturers and student teachers. The results indicated that there exist challenges in exercising e-learning at the College for teaching and learning. The data indicated that the Internet connection is slow and revealed that most of the lecturers have average computer competency. This study strongly recommends that the College develops a strategic plan for ICT infrastructure and resources that includes policy and guidelines for use. This study also suggests that lecturers and student teachers use freely available e-learning management software.

Background

What difference does Information Communication Technology (ICT) make to learning? This question has been asked in many forms for over 35 years, and there is no simple answer (Kennewell & Beauchamp, 2007). Not so long ago, a computer and Internet connection were considered luxuries, but now these facilities are becoming a necessity. ICT is a fast growing technology. In teaching and learning ICT has advanced the use of video conferencing, search engine databases such as *Google* for information retrieval, and other technologies in education contexts. The Internet, as one of the ICT technologies, offers a wealth of information on unlimited topics for any kind of user (Ackland, Spink, & Bailey, 2007). All the data retrieved from the Internet may be considered resources for teaching and learning. Additionally the Internet is being used for numerous social activities, information sharing, entertainment, business, management and government.

At the Paro College of Education (PCE), Royal University of Bhutan (RUB), the provision of computer laboratories and access to the Internet, has apparently led to better teaching and learning processes, to some extent. At the College there are currently three computer laboratories and a library available to 746 students and 48 teaching staff. In the September semester of 2008, 61 different modules were offered in the Bachelor of Education and Post Graduate Diploma in Education programs at PCE (Kinley, 2008). One of the factors contributing to the quality of education is the availability of resources (including ICT) and services such as e-

learning for teaching and learning. An overview of the existing network infrastructure at the College is outlined in the Appendix.

Purpose of the Study

The purpose of this research was to explore and provide an overview of the status of e-learning at the PCE, Bhutan. The research also explored the challenges faced by the students and teacher educators of the College and generally provided significant information on the use of e-learning. The core objectives were to:

- Investigate the lecturers' and students' awareness of e-learning management software;
- Explore the availability of resources for e-learning services in the College; and
- Explore the challenges faced by the lecturers and students.

Research questions. The following research questions were formulated.

1. What access do the students and lecturers have to computers?
2. What access do they have to e-learning?
3. What is the level of lecturers' computer competence and e-learning awareness?
4. What are some of the challenges faced by the students and the lecturers in using e-learning services?

Literature Review

In recent decades, new technologies, exemplified by the Internet, have become increasingly popular for their potential for Web services such as e-learning (Ran, 2003). Rosenberg (2000) defined e-learning as the use of Internet technologies to deliver a broad

array of solutions that enhance knowledge and performance. According to Rosenberg, e-learning is based on three fundamental criteria:

1. E-learning is networked, which makes it capable of instant updating, storage/retrieval, distribution and sharing of instruction or information.
2. It is delivered to the end-user via a computer using standard Internet technology.
3. It focuses on the broadest view of learning – learning solutions that go beyond traditional training paradigms (p. 28).

Rosenberg's (2000) definition of e-learning is adopted as the working definition of e-learning in this article.

E-learning is becoming more popular in university education worldwide (Chitanana, 2008). New Web services such as social networks, blogging and search engines are being used while learning management system (LMS) such as Blackboard¹ and Sakai²; and technology advanced hardware such as Smart Board³, are also being used for learning and teaching. Online learning has been used intensively for teaching and learning in Hong Kong since 2003 when schools were closed during the SARS (Severe Acute Respiratory Syndrome) crisis (Fox, 2007). A study carried out in Malaysia (Baker & Mohamed, 2008) and India (Sajja, 2008) found that ICT services such as e-learning have proved to be a very important aspect of the teaching-learning process. However, it will take some time to gain popularity in developing countries such as Bhutan because of the lack of services and infrastructure.

In Bhutan, ICT is recognized as one of the most important tools to achieve development objectives. Perhaps in this technology age, it is also seen as one solution to the widely expressed concern of a perceived decline in the quality of education (Choden, 2008; Dorji, 2005; Wangchuk, 2007), although there is a dearth of empirical evidence to substantiate such criticisms. Bhutan's ICT Policy and Strategy includes e-learning as one of the

strategies to enhance the quality and accessibility of education by 2010 (Bhutan Information and Communications Technology Policy and Strategies, 2004).

Some of the colleges in Bhutan such as Samtse College of Education have made systematic efforts to introduce ICT for learning support in the provision of distance teacher education programs. The in-service teachers involved in ICT-facilitated distance education at the College found that the ICT-based learning support was valuable. However, there were significant barriers to full integration including overloaded network systems, lack of availability of technical support, limited ICT infrastructure, resistance to change and the need for training (Jamtsho & Bullen, 2007, pp. 156-158).

Research Method

Before proceeding with the study, all the research ethics protocols of the college were observed.

Participants

Forty four lecturers and ten undergraduate students participated in the study. Among the lecturers, thirty four (77%) were male and ten (23%) were female. The lecturers were from different departments. Of the students, five were female and five male. The students were enrolled in the Bachelor of Education program.

Data Collection

A mixed research method was used in the study to include both quantitative and qualitative data. Cresswell (2009) and Shaw (2003) promote the use of quantitative and qualitative methods as supporting each other and giving greater weight to the findings of a study. The lecturer participants provided quantitative data through a questionnaire while the student participants provided qualitative data through the interview. Semi-structured interviews were used to assess their e-learning awareness, Internet and e-learning access, and challenges they faced with e-learning services. All the interviews were digitally recorded and transcribed using Audacity, an open source software program (SourceForge, 2008).

The questionnaire for the lecturers included demographic items, and four 5-point Likert scaled items to gather information on the e-

¹ www.blackboard.com

² www.sakaiproject.org

³ www.smarttech.com

learning awareness and status at the college. The literature guided the development of the questionnaire. Forty four (44) of forty eight (48) lecturers returned a completed questionnaire, thus providing a broadly representative sample (91.6%) of the lecturer population in the college.

Data Analysis

The combination of qualitative and quantitative analysis, commonly known as mixed method analysis, can be combined to expand the scope of a study (Greene, Caracelli, & Graham, 1989). The qualitative and quantitative data were analyzed separately. The interview data were transcribed, coded and analyzed to investigate the participants’ awareness, access and challenges faced with regard to e-learning. To ensure anonymity each participant was identified by a pseudonym, Student S1, Student S2, Student S3, and so on. The quantitative data collected through the questionnaire were entered into SPSS (statistical package for social science) and statistically analyzed. The results of the qualitative and quantitative analyses were then combined at the interpretive level of the study but each data set remained analytically separate from the other. The response rate was 100% for the interview and 91.6% (44 of 48) for the questionnaire.

Results

The research questions deal with access, awareness, competence or expertise and challenges. The findings are presented in this order.

Access to Computers and E-learning

The study revealed that most of the lecturers (86%) have a computer in their office; 96% of them use a computer for planning and developing teaching materials; 68% use computers for classroom teaching (see Table 1). On the other hand, students have access to computers approximately two to four hours per week because of limited availability (see Appendix). Most (65.9%) of the lecturers do not have access to any of the e-learning management software. The College has Online Teaching and Learning System (OLTS) for teaching and learning, developed by an academic staff. The professional development program for the lecturers was also conducted twice by the concerned academic staff. Only a few students and lecturers (12%) use the OLTS for teaching and learning purposes.

Awareness of E-learning Management Software

Most of the schools and colleges in Bhutan use a traditional ‘face-to-face’ method for teaching and learning (Kinley, 2009). At the PCE none of the students selected for the interviews had heard about any of the e-learning management softwares and some of them were not aware of e-learning. On the other hand, a few lecturers were aware of the existence of Moodle (29.5 %) and Blackboard (18.2 %).

Table 1
Lecturer’s Access to Computers and E-learning

No	Question	Never (%)	Seldom (%)	Often (%)	Always (%)
1	Do you have access to a computer in your office?	6.8	6.8	11.3	75
2	If, yes do you use the computer for planning and developing your teaching materials?	0	2.3	20.5	75.5
3	Do you use the computers for teaching your students?	4.5	27.3	38.6	29.5
4	Do you have access to any of the e-learning management software?	65.9	22.7	6.8	4.5
5	If, yes do you use the software in your teaching?	52.3	22.7	6.8	0
6	The PCE has Online Teaching and Learning System (OLTS) for teaching and learning. Do you use this system for teaching your students?	59.1	29.5	6.8	4.5

Perceptions of Computer Expertise

The survey of lecturers revealed that 86.4% perceived their computer competency was at an average or above average level (see Table 2). In addition, 91.0% considered that they had an average or above average level of competency using the Internet (see Table 2). The findings from the questionnaire data (see Table 2) and the interviews (Student S9,

2008) have indicated that most of the lecturers and students perceived that they had an average or better level of computer expertise which implies awareness and competency. In general, most of the lecturers and students believed they knew how to use computers and the Internet. However, few had used computers for their teaching and learning purposes.

Table 2
Lecturers' Perception of Their Level of Computer Expertise

No	Question	Very Poor (%)	Poor (%)	Average (%)	Good (%)	Very Good (%)
1	What is your level of expertise in using computers?	0	13.6	43.2	34.1	9.1
2	What is your level of expertise in using the Internet?	2.3	6.8	43.2	36.4	11.4
3	What is your level of expertise in using computers for teaching?	4.5	15.9	40.9	31.8	6.8

Table 3
Challenges Faced by Lecturers

Do you face any challenges while using e-learning or in accessing e-learning?							
	Challenge	Strongly Agree (%)	Agree (%)	Neither Agree nor Disagree (%)	Disagree (%)	Strongly Disagree (%)	Missing (%)
1	Lack of computer access in lecturer's offices	20.5	11.4	13.6	38.6	15.9	
2	Lack of comfort using computers	6.8	25	15.9	31.8	20.5	
3	Lack of students interest	2.3	13.6	43.2	31.8	9.1	
4	Lack of lecturers' interest	2.3	9.1	25	45.5	11.4	6.8
5	Problems with Internet access such as slow connection	68.2	22.7	0	4.5	2.3	2.3
6	Lack of technical support/advice	18.2	22.7	31.8	27.3	0	
7	Lack of administrative support/initiative at faculty level	13.6	18.2	36.4	29.5	2.3	
8	Lack of awareness regarding ways to integrate the software into teaching	11.4	50	22.7	15.9	0	
9	Lack of access to computer lab with your classes	13.6	47.7	18.2	15.9	4.5	
10	Inadequate training and professional development program on using ICT for teaching.	18.2	45.5	22.7	13.6	0	
11	Inadequate ICT infrastructure and resources	15.9	29.5	31.8	20.5	0	2.3

Challenges Faced by the Lecturers and Students

The lecturers' responses were that they had problems in using e-learning. The data indicated that the Internet connection is too slow as 91% of the lecturers raised this issue. The students also had the same problem.

Student S4 and Student S5 pointed out that the Internet connection was very slow:

"The main challenge faced in using e-learning is the slow Internet connection" (Student S4, 2008, p. 4). "The Internet connection in the labs is very slow" (Student S5, 2008, p. 4). There was a lack of awareness regarding the ways to integrate e-learning into teaching

(61.4%). The training and professional development program on using ICT for teaching was regarded as inadequate by 63% of the lecturers who also complained of inadequate ICT resources and infrastructure. On the other hand, most of the lecturers have access to computers in their office (see Table 1), so more than 54.5% of the lecturers perceived no problem of access to computers (see Table 3). The study found that the majority of the lecturers, who have computers in their office, were confident in using their machines (see Table 2).

Another problem was inadequate student computer access. The Appendix shows that the number of computers (98) is too few compared to the number of students (746) in the College. The computer student ratio was 1:76 and as a result, each student had only two hours of computer access per week.

Conclusion and Recommendations

The objectives of the study were realized. The findings lead to practical recommendations in four areas of ICT in Paro College for the benefit of teacher educators and their students: infrastructure, policy, resources- specifically e-learning software, and professional development for the lecturers (teacher educators).

ICT Infrastructure

A university, college or school cannot implement e-learning successfully without adequate resources and proper planning. Resources are essential for any developmental activities. In Bhutan, the current technological infrastructure renders the use of ICT impractical (Jamtsho & Bullen, 2007). The study indicated that 45% of the lecturers felt that there was a lack of ICT infrastructure and resources in the College (see Table 3). Slow Internet connection (only 1Mbps bandwidth) is one of the major problems faced by both the lecturers and the students. A student pointed out that the access to a computer and to the Internet from the college laboratory is a barrier to learning (Student S3, 2008). The computer-student ratio is too high (nearly 1:8) for effective use and e-learning. The data generally confirmed that there were inadequate ICT resources and infrastructure thereby causing a major barrier to quality teaching and learning. As the Internet is the main source of

information for the students' assignments and projects, this study recommends the upgrading of the Internet bandwidth in order to access and retrieve information from the Web at a greater speed, and increasing the number of computers in the computer labs to provide computer access for all the students.

Policy on ICT/networking

Most colleges and universities have an e-learning policy and strategic planning for technology in place. An e-learning plan will serve as an enabling force to help a college achieve success in implementing its strategic initiatives (West Hills e-Learning Strategic Planning Committee, 2002). An institutional strategic plan and learning design are considered most important aspects with regard to the development of e-learning (Al-Humiyyan, Al-Huwail, & Al-Sharhan, 2008; Chitanana, 2008). Research done by Jebeile (2003) in a secondary college in Sydney, Australia, recommended that various activities be supported by the Web and strategic plans be considered for the integration of e-learning into teaching. At the Paro College of Education, there is no policy or documentation on the ICT infrastructure, resources and future plans. This study strongly recommends that there be a policy and guidelines for the development and maintenance of ICT infrastructure and resources as a part of a strategic plan for the college.

Freely Available E-learning Software

Some of the learning management software (LMS) such as *Blackboard* is expensive for a small college like PCE. However, there are many other open source e-learning software programs which are freely available online for use. This study suggests using freely available LMS such as Sakai, Moodle or CourseLab.

Professional Development Program

Training and professional development programs are essential in order to equip the teaching staff with the latest technology competence and confidence. At the PCE, 63% (see Table 3) of the lecturers felt that there is a need to conduct training and professional development programs on integrating ICT for teaching. This study has found that two professional development programs were undertaken at PCE on 'Online Learning and Teaching System' (OLTS). OLTS has

necessary features such as assigning module coordinators, uploading/downloading lectures notes, and activating student feedback. However, the data collected indicated that only lecturers from the IT department and a few from other departments were using the OLTS.

This study strongly recommends OLTS to be used across the departments for better teaching and learning. The College could encourage lecturers to engage with the OLTS by providing incentives and other measures such as: freeing lecturers from some teaching and administrative duties; awarding a certificate

upon completion of the program; reflecting technology professional development activities in their annual performance appraisal; receiving credit towards promotion, study leave, access to research opportunities and conference attendance. In Bhutan, although emphasis is given to the use of ICT in teaching and learning (The Wheel of Academic Law, 2005), online social networks and online learning are new to the culture and hence to the curriculum. There is a need also for further research to assess, investigate and explore how online social networks can be used for teaching and learning.

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Appendix
 Network Infrastructure

	Network services	
1	Number of Network Points	267
2	Number of Computer Laboratories	3
3	Number of computers in the labs	98
4	Total number of Computers	150
5	No. of Users	814
6	Size of Bandwidth	1Mbps
7	Cost of Bandwidth per Month	Nu.30, 000 (US\$681)
8	Type of Internet Connection	Leased line

Source: Network information record file