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Enhancing the Use of Internet and Web Services for Quality Learning: An Action Research

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ABSTRACT

Internet and Web services have been used in both teaching and learning and are gaining popularity in today's world. E-Learning is becoming popular and considered the latest advance in technology based learning. Despite the potential advantages for learning in a small country like Bhutan, there is lack of *eServices* at the Paro College of Education. This study investigated students' attitudes towards online communities and frequency of access to the Interne, and how students locate and use different sources of information in their project tasks. Since improvement was at the heart of this research, an action research approach was used. Based on the idea of purposeful sampling, a semi-structured interview and observations were used as data collection instruments. 10 randomly selected students (5 girls and 5 boys) participated in this research as the controlled group. The study findings indicated that there is a lack of educational information technology services, such as e-learning at the college. Internet connection being very slow was the main barrier to learning using e-learning or accessing Internet resources. There is a strong relationship between the quality of written task and the source of the information, and between Web searching and learning. The source of information used in assignments and project work is limited to books in the library which are often outdated and of poor quality. Project tasks submitted by most of the students were of poor quality.

Keywords: E-learning, eServices, Web Searching, and Quality Learning.

INTRODUCTION

Over recent decade, new technologies have captured the interest of educators especially about information technology, such as the Internet and Web services. The Web is increasingly becoming popular for its benefits (Ran, 2003) and offers a wealth of information on unlimited topics (Ackland, Spink, & Bailey, 2007) for all users; for example, Web search engines allow access to global data and information on any topics. The Internet is not only used for sharing information but also used for teaching and learning, entertainment and sports, and a variety of business to business applications (Makrehchi & Kamel, 2006).

Today, the online learning and social network, and its role in promoting and facilitating the quality of teaching-learning activities, is an emerging subject. The outcomes of such an invention have seen advancement in the use of (1) video conferencing used for teaching/learning, (2) online learning and teaching systems, such as a blackboard, (3) social networking, and (4) search engines.

In Bhutan, most of the schools and colleges use a traditional 'face-to-face' method for teaching and learning. The source of information used in assignments and project work is limited to books in the library which are often outdated and of poor quality (Maxwell et al., 2008). Internet and Web services are a new technology in Bhutan, which was introduced in 1999.

Since improvement was at the heart of this research, an action research approach was used (Kemmis & McTaggart, 1988b, 2005; Maxwell, 2003). This study utilized Kemmis and McTaggart model of Action Research Model (1988a) as a theoretical framework (see Appendix I).

RECONNAISSANCE

The reconnaissance of the action research cycle involves analysis and reflection of the situation.

Situational Analysis

Internet and web service is a new technology and service in Bhutan, which was introduced in 1999. DrukNet (www.druknet.bt), a division of telecommunication, was the only Internet service provider (ISP) then. Today there are few ISPs in the country. However, only DrukNet registers Bhutanese website domains (.bt) as a part of the Bhutan Network Information Center. DrukNet registers both top level domain (eg www.druknet.bt), as well as second level domains (eg www.pce.edu.bt). Empathizes has been given to the information and communication technology (ICT) (and web services) in recent days by the government. For instances, computers were distributed in

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the remote schools, dial up Internet connection was made free since 1st April 2007.

Research Problem

In Bhutan, only a few colleges and schools have access to the Internet. During the three years of teaching experience at the Paro College of Education[2], it was observed that most of the project work and assignments submitted the students were of poor quality. It was confirmed by the interview and observations made recently and also in consultation with the colleagues at the college. The issues of interest for the investigations were:

- students' performance in their project work;

- students' attitudes towards online communities (social network, blogging, search engine); and

- how students locate and use different sources of information in their project task.

Action Research Question

Based upon the above argument and to address the issues, the following question was the basis of this study.

How can I improve the quality of students' written tasks by using the Internet and Web services?

Competence

The researcher has been teaching both elective IT and fundamental IT modules to the students of Bachelor of Education at the Paro College of Education for last three years. Some of the subjects taught recently were Web-based teaching, database management (MS Access), introduction to programming and subject content development tools. Besides teaching, the researcher also has a keen interest in other IT areas, such as designing online teaching and learning systems, and social networks; recently, he designed and developed Charo network[3] for information sharing and learning. Yet, there is a need to investigate not only the use of ICT in a classroom, but also to learn more about his own classroom teaching, as a learner.

Literature review

Internet and Web services have been used in both teaching and learning and are gaining popularity in today's world. Internet technology has become an important educational technology tool in accessing information for developing higher education (Ismail & Zin, 2008). Bates (2005) believes there are four reasons for using technology in education:

- To improve the quality of learning;

- To improve access to education and training;

- To reduce the costs of education; and

- To improve the cost-effectiveness of education.

E-Learning is becoming popular (Mann, 2006) and considered the latest advance in technology based learning (Charp, 2001). A study carried out in Malaysia (Baker & Mohamed, 2008) and India (Sajja, 2008) found that ICT has been proven to be a very important aspect of the teaching learning process.

In 2003, online learning has been used intensively for teaching and learning in Hong Kong when the schools were closed during the SARS (Severe Acute Respiratory Syndrome) crisis (Fox, 2007). New Web services, such as social networking, bloging and search engines are being used. New platforms, such as Blackboard[4], Web 2.0, and Sakai[5] are also being used for learning and teaching. Online assignment referencing system and editing software have been used to ensure the quality and presentation of students work. However, there is a lack of some of these services at the Paro College of Education in particular and in Bhutan at a large. E-learning at the Paro College of Education is at an early stage (Kinley, 2009). A study carried out by Kinley (2009) indicated that both the lecturers and students of the college face problems in using and accessing e-learning. A key problem has been, and continues to be, is the Internet bandwidth, which is very slow. A student has access to the Internet only approximately 2 to 4 hours a week on average.

RESEARCH PLAN

The process of action research involved a spiral of self-reflective cycles of planning, acting and observation, and reflection (Kemmis & McTaggart, 2005). The theoretical framework and action research plan adopted in this research are illustrated in Appendix I and Appendix II respectively.

Procedure

The action research was conducted in a typical teaching classroom with the students enrolled in the unit FIT2103 (Fundamental Information Technology module 3) for Bachelor of Education (Mathematics primary). The participants were interviewed and 18 previously completed written assignments were collected during the reconnaissance (see *Pre Intervention* section). Once the baseline data was collected from the students, intervention actions were performed (see *Action Intervention* section). During the post intervention stage, the participants were interviewed once again with the same interview questions to investigate the effects of the intervention actions.

Data Collection

This research used a qualitative method approach. Interviews and observations, using field notes, were used as the data collection techniques. Prior to the study, an ethical approval was sought from the college and the participants. Extra care was taken to ensure that the participants were not disturbed from their normal duties.

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[2] http://www.pce.edu.bt.

[3] http://www.charonet.com

[4] www.blackboard.com

[5] www.sakaiproject.org

Pre Intervention: Baseline Data

Based on the idea of purposeful sampling, a semi-structured interview was used as data collection tool (see Appendix III). Interview provides substantial information on the subject under review. It triangulates and validates the data collected through questionnaires and observations (Ingwersen & Järvelin, 2005, p. 247). 18 previously completed written assignments were also collected from 10 participants for the data triangulating. The recorded interviews were transcribed carefully. The information gathered here, which was carried out during the reconnaissance (week 1, week 2 and week 3), was used as the baseline data to identify issues related to the research.

Participant observation was used to collect the intervention data. The observations during the normal teaching hours were noted in dated field notes. The observations made during week 5 to week 11 were used to support the data collected during Pre- and post-intervention. Observation provides instance real time data on the study and is use to gather information that are not collected otherwise by other methods, such as interviews and questionnaires.

Actions Intervention

Lecturing and hands-on tutorials on search strategy and information retrieval, and academic writing skills were conducted from week 4 to week 8 in a normal teaching manner for the students (including the participants), who were enrolled for the unit FIT2103. In order to investigate the quality of the data downloaded, one assignment on local area network (LAN) was issued to the students (including the participants).

Post Intervention

After the intervention, similar interviews and observations to that of the pre intervention were conducted on the same 10 participants. The assignment, issued earlier during the intervention stage, was collected from the students; the research participants' assignment was used for analyzing the post intervention data.

DATA ANALYSIS AND RESULTS

The information gathered from 10 interviewees through audio records and field notes were transcribed carefully. The two different sets of assignments from the participants (each collected before and after the action) were compared and analyzed extensively based on a grounded theory approach using content analysis (Julien, 1996). The data collected were categorized under different themes.

Internet Connectivity and Elearning

Internet and the Web services, such as e-learning are becoming popular in the 21st century. The Internet is the main source and offers a wealth of information on unlimited topics for all kinds of users (Ackland, et al., 2007). E-learning is defined as instruction delivered via an electronic media including the Internet, Intranets, extranets, satellite broadcast, audio/videotapes, and interactive TV(Chitanana, 2008). New platforms, such as

Blackboard[6], Web 2.0, Smart Board[7] and Sakai[8] are also being used extensively for learning and teaching. However, there is lack of some of these services at Paro College of Education. During the reconnaissance, most of the participants were not aware of Web services, such as search engine, social learning and e-learning. The sessions on search strategies were beneficial to the students as they were equipped with search and information retrieval skills.

Besides awareness, another main barrier to learning using e-learning or Internet resources, was a low Internet connection, 1Mbps of Internet Bandwidth (Kinley, 2009). The computer-student ratio was low. There were 98 computers in the three computer laboratories for 746 students. A student has access to the Internet approximately 2 to 4 hours a week on an average.

Access to Computers

Most of the previously completed written assignments were hand written; 11 out of the 18 assignments collected from the 10 participants during reconnaissance, were hand written. On the other hand all the assignments submitted by the participants during the post intervention phase, were written using computers. Students could embed images and graphics in the word document. It was easier for them to edit text. This study found out that the quality of the assignments written using computers were much better than the hand written ones. This was assured by the comparative study of the marks scored in the two sets of assignments submitted during the baseline and the post intervention.

Source of Information

For the intervention assignment, all the participants used updated information from the Internet. Two participants used information from the library besides the Internet. The sessions on search strategies were beneficial to the students in order to locate information on the Internet. The participants could search information database such as Google Scholar.

CONCLUSION

The author believes that this study was important and was carried out successfully. The planned actions were implemented on time according to the time-line, as shown in the Appendix II. There is a strong relationship between what students learnt and the environment, between the quality of written task and the source of information. The style and format of the written task were better and the information provided was more accurate. The written tasks completed using computers and the information gathered using the Internet and Web services were better in quality.

However, there were limitations to the study. By the nature of the research, the study has to be carried out during the normal teaching classes. Though only 10

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[6] www.blackboard.com

[7] www.smarttech.com

[8] www.sakaiproject.org

students were randomly selected for the study, the intervention activities, such as sessions on search strategies and assignment assessments, had to be conducted for all the students (34 in number), who were enrolled in FIT2103. Moreover, these activities had to be carried out on time as per the term plan for the unit.

There may be other services and ways to improve quality of the written tasks. The researcher tends to do further research to investigate the effects of Web services on students' learning.

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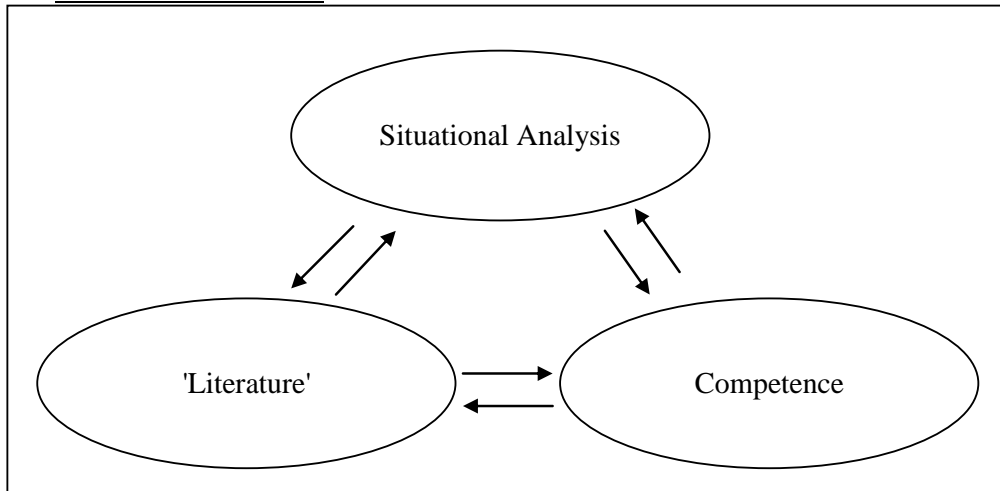
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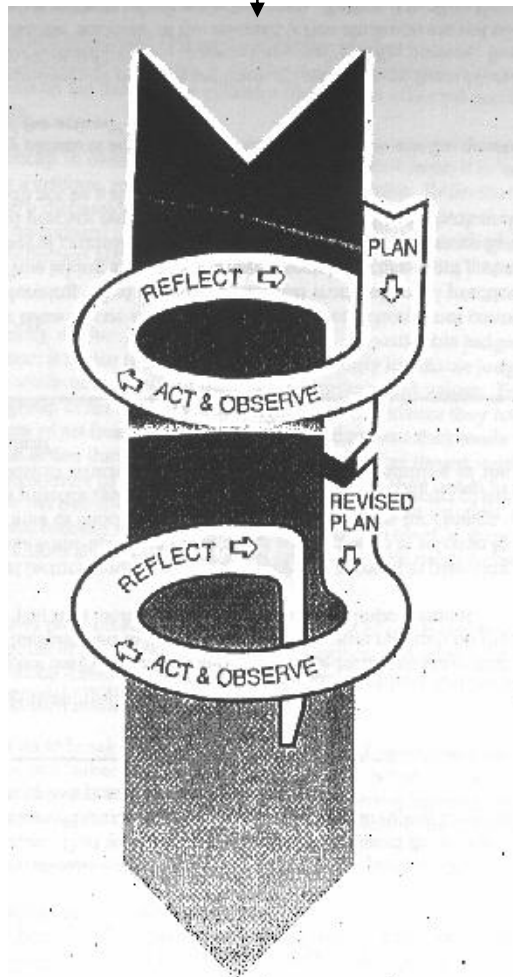

Figure 1: The Reconnaissance and Action Research Spiral linked by the Action Research Question (Kemmis et al. 1988; Maxwell, T. W. 2003).

Table 1: Action Timeline

No	Activities	Time Frame
1	Ethical Approval from Paro College of Education and research participants	Week 0
2	Baseline Data (Interviews and observations)	Week 1, Week 2 and Week 3
3	Action (practice strategies and steps)	Week 4, Week 5, Week6, Week7, Week 8
4	Intervention Data (observations)	Week 5 to 11
5	Post Intervention Data	Week 12, Week 13, and Week 14

Appendix III

Semi Structured interview

Student Number: _____

Gender: Male   Female   Date:

   A. Student's performance in previous project work.

      1. Can you share your views on the performance of your previous project work or assignment?

      2. What are some of the methods you have adopted for learning?

      3. How often do you use computer to write you assignment?

   B. Source of information for the project work

      4. How often do you use information from Internet for your assignment?

      5. Which form of the Internet (search engines, social network, e-learning, etc) do you use for your task?

   C. Students' attitudes towards online learning communities

      6. How do you use online learning communities (social network, bloging, podcast)?