Future of Distance Learning: Technology vs. Learning

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Abstract—There are many Learning Management Systems (LMS) that are used for teaching in higher education institutions, WebCT, Blackboard, MOODLE and eCollege are the few to name. However, teaching online requires a new set of skills, knowledge, and professional growth for teaching faculty. These LMS provide comprehensive functions for curriculum design, course management and performance assessment. In the higher education context, it is essential that an e-learning platform can support the learner-centered mode of learning. Globalization is part of distance education thus enabling students from various geographical locations with varying cultures, backgrounds and expectations. The use of LMS has therefore grown considerably in universities around the world. A LMS needs offer flexibility to meet these different learning needs. As web technologies are evolving utilizing the ever increasing bandwidth at affordable cost, will learning philosophies evolve too? With the availability of mobile apps that can support various forms of stream broadcast, learning does not have to be limited to a classroom setting anymore. It can happen while taking a flight and/or commute bus/train, sitting in your living room while enjoying the coffee, waiting in a doctor’s office for an appointment, or during your morning two hour walk. Technology does provide full support for these and other type of multitasking approaches of learning. Question is that whether we are ready for it? This paper discusses the various aspects of technology in the light of learning/teaching evolution over the years. Future educational institutions are expected to transform tremendously due to advancement of technology. A needs assessment evaluation methodology is applied to investigate these research questions. Are we as educators ready to face this challenge?

Index Terms—Distance Education, E-learning, Web-Based Distance Learning Systems, Web-based Distance Education System” (WBDES).

I. INTRODUCTION

In today’s fast changing, high paced life and 21st century technology traditional education approach need to be revisited. The people on the other hand are also much more mobile as compared to few years back, especially due to development of mobile communication systems. People are engaged in a set of varying activities during their daily life so the main concern, most of the educational institutes have is that how to accommodate education needs of increasingly active population. The purpose of mobile education is to move today’s stable education environment to a virtual, flexible education environment of the future [1]. This form of learning plays important role not only in academic institutions but also in small and medium-sized enterprises, which have the will to renew knowledge and experience of their employee. It is because of this new trend that most universities all over the worldwide are turning into online education providers by adopting internet technology, learning and teaching via the use of learning management systems that enables institution to offer their courses to student population who are either on campus or off campus.

As a result of greater than before internet use and advancement of the internet infrastructure, education activities commonly take advantage of the internet as well as network technology. Many additional technological tools like electronic books, electronic mails and conference environments are commonly used to further enhance educational activities. Due to escalation in the use of such tools and related education methods, a special education system has been in use. This education system is called “Web-based Distance Education System” (WBDES). Today, distance education systems are established in many universities and education teaching activities are performed via these systems. One of the big reasons in increased use of WBDES is the requirements of these kinds of systems in parallel with developments in the field of information technology [2]. In addition, academic institutes are facing another challenge and that is non-availability of the trained faculty, who knows and is experienced to teach online. Therefore training faculty that are used to teaching in traditional modes and are new to online teaching can enhance teaching effectiveness and also instill confidence in their ability to teach online, thus benefitting students [3, 4].

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In higher education institutions online teaching and learning is broadly integrated into various types of teaching and learning strategies and each of these has been acknowledged as an effective instructional method and tool [10]. Among many other benefits of online learning are its interactivity, accessibility and flexibility. These benefits enable students to have access to the course materials from anywhere and at any time. On the other hand teaching for faculty and Learning for students in online courses impose certain challenges on both faculty and students. Faculty plays an important role and therefore should be prepared to meet all of the demanding requirements of teaching online courses. It is also obvious that roles and responsibility of faculty increased with the introduction of online teaching, contrary to an early assumption perceived [14]. The best practice in education is the most efficient (least amount of effort) and effective (best results) way by which a faculty member can convey its accumulated knowledge and skills to his/her students. At the end what matters is the high quality of student learning, whether that learning is offered on campus or online. It is also worth mentioning that online education requires discipline and time management skills from both the students taking the class and the faculty teaching course. However the quality is affected by the choice of LMS.

II. COMPARISON

The combination of multiple approaches to teaching and learning and use of technologies is also sometimes called blended approach. In general, any time an instructor combines more than one delivery or instructions methods, through the use of resources both the physical as well as virtual ones, it becomes a blended approach [15]. It is always challenging for an instructor to recreate the productive environment of a traditional onsite class and at the same time overcome difficulties posed by online learning environment while teaching a class using the blended approach [16]. However, sometimes in the area of online learning, hybrid is the term used to refer to courses that are offered partly in online and partly in face-to-face format. In this paper we use the term HYBRID for the course that has simultaneous online and face-to-face modes of instructions in the same section.

When an instructor starts teaching an online class using a web learning environment, the first challenge they face is that they attempt to handle online class the same way they are used to conducting their face to face (F2F) class. This behavior however is not surprising, especially for those who are teaching an online class for the first time, since they have not yet discovered the new opportunities that are offered and are inherent to this environment. In order to make full use of the potential presented by the online environment the instructor needs to play the role that is analogous to a guide on the side. In order to achieve a better teaching and effective learning atmosphere the students also need to be advised to take a more proactive and responsible role while taking an online class.

Many educators and researchers have raised concerns whether the learning outcomes achieved during online classes are the same as in a more traditional F2F class [17] whereas others [18, 19] claim that there is no substantial difference in achieving learning outcomes for the two modes of delivery. The performance comparison between the two delivery modes for a course also revealed no difference [20]. Moreover, people have reported no difference in the quality of instructions in the two formats [21] not considering the human factor.

WebCT and Blackboard are among many e-learning platforms that are used by higher education institutes among many other type of Learning Management System (LMS) that provide comprehensive functions on curriculum design, course management and performance assessment. Authors in [5] note that the lack of communication and interaction between students and teachers and students could weaken their learning motivation and lower their interest.

Papers reporting comparison between Blackboard and Moodle have been confined to limited samples and focused on students’ perceptions only, which are related to the impact of the LMSs on student level of engagement [7]. This is also confirmed in [6], by and large, LMSs are not used more than as electronic document repositories, rather than being used as active learning tools. Therefore students are much more likely to assume a passive role, where they are downloading class material or checking course announcements, rather than becoming active players and sharing ideas with class mates or participating in threaded or group discussions.

Course Management Systems (CMS) is an increasingly important part of academic systems in higher education. When choosing a Course Management System for an educational institution, the usability of the system is the key to the effectiveness and efficiency of the online courses that are to be implemented. When an educational institution is choosing an LMS the usability of the system for the online courses for which this system is going to be used is the key factor. Effectiveness and efficiency of the selected system depends on its usability for both instructors and the students in the class. The effectiveness of the course will help students to achieve the specific goals of the course. The ease of navigation through the course shell will help the students locate all the essential components of the course with little effort. If the course is not effective and/or efficient, then it may frustrate students and we may not have students’ learning. While investigating and comparing the usability of two learning management systems, an open source course management system Moodle and Black-Board, [8] also considered operational factors including reliability, external support, flexibility in design and functions, and features of the CMS. The study suggest to consider additional factors including ease of adaptation, stability of the platform as well as the total cost of ownership is another important factor to consider. Because of the high fee for some of the commercial systems, these are not options for educators and academic institutions working with limited budgets. Therefore some institutions afford only the basic versions of these commercial systems thus limiting the educational experiences of students. Thus forcing smaller institutions to consider cheaper alternatives for these commercial LMS, today’s volatile economy and shrinking budgets makes this a viable solution.
This article [9] reports a case study regarding adoption of web-based learning and teaching through LMS by faculty and discusses the factors that permitted as well as hindered the web-based approach. Authors report that for many institutions the reasons for adoption of LMS were not totally related to improving teaching and student learning but were also inspired by the politics of the context such as top-down authority directives, funding grants, and faculty politics. They conclude that institution leadership can facilitate a climate conducive to innovation adoption, this being an important factor for institutions establishing web-based teaching through LMS. The article [9] also showed that another equally important factor is the development of faculty expertise with the use of new technology required more than just the acquisition of skills and that there must be an ongoing program of faculty development to raise the awareness of how to be more effective while teaching using new technologies.

III. OUR APPROACH

National University (NU), an independent, nonprofit institution of higher education has dedicated itself to providing educational opportunities to a diverse population of working, adult learners since 1971. The School of Engineering and Computing (SOEC) at National University (NU) was established in July 2002, and has attracted a current student body of over 1300 whose profile generally mirrors that of the university itself [11]. NU, the second largest private non-profit university in California, has over 23,000 mainly non-traditional students: students whose average age is over 30. The university also boasts of a large population of students from traditionally underrepresented groups, such as women and minorities. Typically, most of these students, whether at the undergraduate or graduate level, are re-entering an academic environment after having been out in the working world for some time. SETM offers nine undergraduate and eight graduate degree programs with several specializations. Over 90% of these programs are offered both in the online and on-ground modes. SETM has over 10 years of experience in online education [11]. Traditionally, engineering education has been content-centered and design-oriented. It also primarily involves problem solving skills. Traditional pedagogical methods do not provide the necessary impetus for students to get a feel for complex engineering subjects. The higher levels of engagement require novel teaching methodologies such as games to fully understand the subject matter fundamentals. Hence an online engineering education requires an integrated system and method for the easy, efficient, accurate, and far-reaching facilitation of human interactions, effective laboratory exercises, and novel pedagogical methods such as games [11].

Figure 1 provides an overview of online course layout adopted by the School of Engineering and Computing (SOEC). They have also been designed to meet the five pillars of online learning described by Bourne et al [13] which include learning effectiveness, student satisfaction, faculty satisfaction, access, and cost effectiveness. Course components in the week by week layout include reading assignments in the course textbook as well as other assigned reading, a set of topic lectures that cover key points and related to the learning outcomes, sets of questions for discussion during class meetings and for synchronous discussion via a Voice over Internet Protocol (VoIP) chat room for the course, and a set of assignments, including both work to be done on an individual basis and work to be done in project teams [12]. For online courses, National University is making use of the Voice over Internet Protocol (VoIP) System built within the eCollege learning platform. This has the following features [12]:
• Voice over IP (VoIP)
• Two-way audio and video conferencing
• Application sharing
• Interactive whiteboards
• Synchronized Web browsing
• Electronic hand raising, feedback and Q&As
• Viewable class lists
• Instructor-led floor control
• View student screens
• Breakout groups
• Participation meters
• Multimedia courseware with third-party authoring support
• Group text chat

IV. UNIQUE FEATURES

Students in our engineering program have access to a variety of online and physical resources. The course shell provided by eCollege environment has the capability for the easy sharing of links and documents. The webbography section provides a method for sharing links and the doc sharing function allows faculty to upload relevant documents. Each section of eCollege can be written in HTML, which provides the capability to add additional links. The course shell also includes a set of short webcasts for each of the four weeks. These webcasts are of about 10 minute duration covering important concepts for that particular week. In some cases the lecture slides also include audios.

V. CONCLUSION

This paper provides a summary of the step-by-step approach adopted by SOEC from the design, development and implementation as well as assessment of online engineering degree courses/programs. Several features, such as online laboratories, tablets with inking technology, serious game development, and synchronous discussion sessions, are explained. Continuous improvements are being made to these features for enhanced and effective student learning.

REFERENCES


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