Data Communications and E-Learning

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INTRODUCTION

Information and communications technology (ICT) has increasingly influenced higher education. Computer-based packages and other learning objects provide a useful supplement to students studying conventionally by illustrating aspects of the curriculum. Other packages are directed at aspects of course administration such as automated assessment (for example, see Randolph et al. (2002)). Initially such software and materials played only a supplementary role in course offerings, but this has changed rapidly. For example, Coleman et al. (1998) describe a successful early attempt to replace all lecturing with computer-aided learning. Remote delivery of courses also became a viable option because of the advent of the WWW. For example, Petre and Price (1997) report on their experiences conducting electronic tutorials for computing courses. Online education of various sorts is now routinely available to vast numbers of students (Alexander, 2001; Chen & Dwyer, 2003; Peffers & Bloom, 1999). Various terms have been used to label or describe forms of education supported by information technology. These include e-learning (e.g., Alexander, 2001; Campbell, 2004), Web-based learning (e.g. Huerta, Ryan & Igbaria, 2003; Khosrow-Pour, 2002), online learning (e.g., Simon, Brooks & Wilkes, 2003), distributed learning and technology-mediated learning (e.g., Alavi & Leidner, 2001); with e-learning probably the most commonly used term used to

describe education and training that networks such as the Internet support.

E-learning has become of increasing importance for various reasons. These include the rise of the information and global economy and the emergence of a consumer culture. Students demand a flexible structure so that they can study, work and participate in family life at the same time (Campbell, 2004). This flexibility is reflected in alternative delivery methods that include online learning and Internet use. We have also become more sensitive to cultural and gender differences, and to the learning needs of the challenged. These needs may be addressed by e-learning (Campbell, 2004).

A number of studies have compared student learning and satisfaction between e-learning and traditional classroom teaching. In an early study, Hiltz and Wellman (1997) found that mastery of course material was equal or superior to that in the traditional classroom and that e-learning students were more satisfied with their learning on a number of dimensions. In particular, they found that the more students perceived that collaborative learning was taking place, the more likely they were to rate their learning outcomes as superior to those achieved in the traditional classroom. They did however identify some disadvantages to e-learning. These included ease of procrastination and information overload. More recently, Piccoli, Ahmad and Ives (2001) found that the academic performance of students in the two environments was similar, but that while e-learning students had higher levels

Figure 1. Categories of online activities
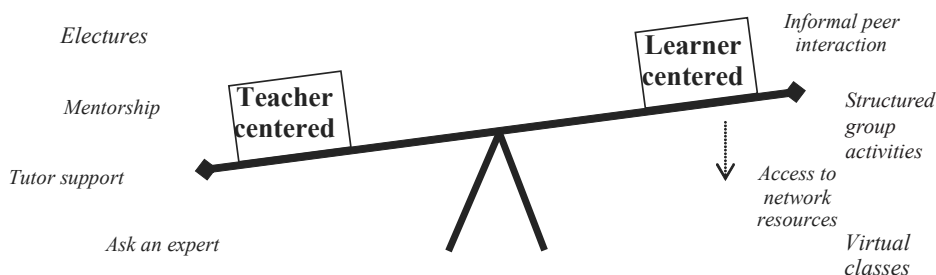
of self-efficacy, they were less satisfied with the learning process. Alexander's comment that "the use of information technology does not of itself improve learning" (Alexander, 2001, p. 241) perhaps highlights the fact that e-learning can be many things and that the intention to introduce e-learning is no guarantee of success.

The different types of teaching and learning activities that are made possible by the Internet are shown in Figure 1. Harasim and Hiltz (1995) divided these activities into two categories: learner or teacher centered. There is, however, no common agreement about which category is the best and many researchers argue for a mixture of learning activities, emphasizing group learning (Bento & Schuster, 2003; Klobas & Renzi, 2003). At the moment there still seems to be an overemphasis on teacher centered approaches, which hopefully will slowly change as a better knowledge of e-learning develops.

BACKGROUND

This article provides an illustration of blended e-learning by describing how we deliver and manage courses in a postgraduate degree in telecommunications management. We aim to foster learner centered education while providing sufficient teacher centered activities to counter some of the known concerns with entirely learner centered education. We use the Internet as the communication infrastructure to deliver teaching material globally and Lotus LearningSpace to provide the learning environment. While the primary aim of our approach is to enhance the student learning process, there are also other incentives that are consistent with this. The university is able to attract a more diverse range of students – those requiring flexibility of study and the other benefits of e-learning. Thus initiatives of this type can benefit the university while meeting the additional needs of students that are discussed in the introduction.

The use of learning and content management systems (LCMS) such as Blackboard, WebCT and Lotus Learning-Space have made e-course development less onerous for faculty. These systems provide a set of tools for publishing, communicating, and tracking student activity. Various guidelines have been suggested for evaluating and choosing software for e-learning (Klobas & Renzi, 2000). After establishing our requirements for a software tool for developing and delivering courses online, we evaluated various alternatives. The requirements that we identified included:

- Instructors should not have to program and debug HTML code;
- All courses should have the same professional look and feel without having to hire computer programmers to write special software, and students should always be presented with the same interface for all their courses;
- The software should be fully integrated (one software package should allow the instructor to do everything required, such as course development and course management);
- Professional support.

After evaluating various alternatives we choose Lotus LearningSpace (LS). Successful use of LS by instructors proved to be significantly less dependent on the technical knowledge of the instructor than was the case with some other popular LCMS. It allows the instructor to focus on the learning of the students rather than on creating and debugging HTML.

LS provides instant feedback to the students and instructor, and enables progress and problems that students encounter as they go through the curriculum to be monitored. Students also have a discussion area where they can ask questions and communicate with the instructor as well as with other students.

LS allows us to create distributed courses that students and instructors can access whether they are online or offline. Students are able to download material for a course onto their machine so they can go through the curriculum without having to have a direct Internet connection. Using the offline access method makes it easier for students to learn wherever they are located and for instructors to develop and manage course material and reduce critical network bandwidth requirements. Features that facilitate flexible student centered learning include:

- Schedule - provides students with a structured approach to assignments, materials, and assessments. Through the schedule, students can link to everything required to complete their course.
- MediaCenter - allows immediate and searchable access to all materials for the course as the instructor makes them available.
- CourseRoom - provides a discussion group facility, which hosts collaborative interchange between student groups and/or students and instructors.
- Profiles - helps students and instructors get to know their classmates to form productive teams and to network outside the course.

Features that facilitate course management include LS Central for course management and the Assessment Manager for setting up and tracking of students' progress in their courses.

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