IT to Facilitate Distance Education

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INTRODUCTION

The essence of distance education is the physical separation of teacher and learner (Sauve, 1993). In many countries, universities are increasingly employing distance education. Some institutions are incorporating distance education as a way to extend the classroom by employing delivery mechanisms that replicate the presentation of material in a manner similar to face-to-face communication. Other institutions are investigating new delivery mechanisms that support a revised perspective on education. These latter institutions are revising their processes for interacting with students and taking a more customer-centered approach to the delivery of education. There are many options available to universities when deciding how to employ technology to support delivery of distance education.

The purpose of this investigation was to document the various modes of delivery mechanisms currently employed in distance education. It was anticipated that this documentation process would help to determine an understanding of the alternative mechanisms. It was also anticipated that an outline of all approaches, with an indication of the more innovative ones, could serve to provide guidance to institutions regarding the adoption of technology to support delivery mechanisms in distance education and to individuals researching the area.

This article discusses the impact of technology on the delivery mechanisms employed in distance education. To begin, the next section reviews appropriately related research in distance education. A proposed framework is then presented that outlines alternative delivery mechanisms for various levels of employing technology to support distance education. The proposed framework provides an overview of the relationship between technology-based delivery mechanisms and the extent to which the innovative use of technology can affect distance education. Finally, conclusions are presented that outline the more innovative concepts involving the use of technology in distance education and include a call to action for other researchers interested in investigating this subject area.

BACKGROUND

As the use of technology to support distance education increases, so does research into various aspects involved in the relationship between technology and the various forms of delivery of course material. The data in Table 1 presents examples of selected research projects involving investigations into technology and delivery mechanisms. The data in the table suggests the emergence of two major themes. First, it is incumbent upon institutions to consider students more like customers. This means that student demographics should be studied when considering modifications to delivery mechanisms. Thus, a specific type of individual (non-traditional, self-motivated, and mature) is more inclined to satisfactorily perform academically in a distance education situation. Second, the adoption of an asynchronous mode of delivery, found to be satisfactory in some research situations, represents an innovative use of technology. This, in turn, leads to the use of a delivery mechanism that supports learning that is independent of both time and place. The issue of time and place independence is discussed further in the following section.

ALTERNATIVE DELIVERY MECHANISMS: A PROPOSED FRAMEWORK

Figure 1 presents a description of alternative modes of generic delivery mechanisms. Whalen and Wright (1998) describe distance education as technology-based delivery of course material where faculty and students are separated both spatially and temporally. Thus, place

Table 1. Distance education research projects

TOPIC	SOURCE	FINDINGS
TECHNOLOGY	• Menlove and Lignugaris/Kraft (2004) • McWright (2003) • Perreault et al (2002) • Papp (1999) • Reif and Kruck (1999)	• Technology is used to increase course enrollments and respond to student flexibility requirements • Success depends on the effective use of technology • Students familiar with the technology appreciate the flexibility • Student and instructor competence contributed to successful delivery
INTERNET	• Knowlton (2003) • Oravec (2003) • Williams (2003) • Paulson (2002) • Darbyshire and Burgess (1999)	• Basic skills become more important • Teaching using the Internet is more productive and rewarding • Stakeholders could see the benefit of employing the Internet to deliver material and facilitate course administration
PROFILES	• Collins and Pascarella (2003) • Conrad (2002) • Kung (2002) • Thurmond et al. (2002) • Aggarwal and Kemery (1999)	• Learners' sense of engagement is more dependent on their connection with the material than instructors or colleagues • The most important student profile would be a non-traditional, self-motivated, mature individual who requires schedule flexibility because of other life commitments
SATISFACTION	• Jamieson (2004) • Stein and Glazer (2003) • Van Schaik et al. (2003) • Zheng and Smaldino (2003) • Aragon et al. (2002) • Kekkonen-Moneta and Moneta (2002) • Wheeler (2002) • Lou et al. (1999) • Motiwala and Duggal (1998)	• Students can learn equally well in either delivery format regardless of learning style • Students' perceived satisfaction would be the same for both face-to-face delivery and technology-mediated delivery • The use of interactive e-learning modules fosters higher-order learning outcomes • Students were satisfied with the self-paced flexibility of the asynchronous discussion threads

concerns the location for the delivery of educational material, while time relates to the relationship between presentation and receipt of the message. Both Time and Place have been categorized as "same" or "different" in Figure 1.

The bottom left quadrant in Figure 1 represents the traditional lecture mode of delivery with both the student and instructor at the same place, at the same time. While technology may be employed to enhance the delivery of material in this case and is representative of the term "educational technology," it is not considered to represent a form of delivery mode for distance education.

The bottom right quadrant is characteristic of a library. Thus, material in the form of a manuscript is developed by an instructor and made available for students to read. The Place is the same, the library, but the Time may be different. This mode of delivery allows the student to choose when the delivery will be incurred. Further, there may be some technology incorporated in the form of CD-ROMs or other electronic versions of manuscripts.

The top half of Figure 1 represents modes of delivery that incorporate technology having the ability to change the perspective of education and also to support the concepts underlying distance education.

The top left quadrant represents an interactive delivery mode. Material may be delivered at the same time, but the student and instructor may be in different places. Technology supports this form of delivery through telecommunications. Both audio and video communication may be used in this delivery mode. It is, thus, possible to have interaction between student and instructor in a synchronous mode.

The top right quadrant also employs technology, but in an asynchronous delivery mode. The material to be delivered is made available by the instructor through technology, and the students are able to access the material based upon their own schedules. The Centre for Innovative Management (CIM) at Athabasca University in Canada employs this delivery mechanism. Athabasca University is Canada's leading distance university, with over 22,000 students. CIM provides the world's first and largest online Executive MBA, with over 1,000