Technology is providing a positive impact on delivery mechanisms employed in distance education at the university level. Some institutions are incorporating distance education as a way to extend the classroom. Other institutions are investigating new delivery mechanisms, which support a revised perspective on education. These latter institutions are revising their processes for interacting with students, and taking a more “learner centered” approach to the delivery of education. This article discusses the impact of technology on the delivery mechanisms employed in distance education. A framework is proposed here, which presents a description of alternative modes of generic delivery mechanisms. It is suggested that those institutions, which adopt a delivery mechanism employing an asynchronous mode, can gain the most benefit from technology. This approach seems to represent the only truly innovative use of technology in distance education. The approach creates a student-oriented environment while maintaining high levels of interaction, both of which are factors that contribute to student satisfaction with their overall educational experience.

INTRODUCTION

Universities are in the information dissemination business and computers are changing the way they work. Accordingly, “... while IT can offer new experiences and a diminished dependence on rigid University structures, the social aspect of learning remains a vital component of successful education.” (Forer et al., 1999:331). While technology has changed the nature of non-classroom based education by allowing physical separation, it has also enabled interaction, which is considered by some researchers to be the basis for successful education.

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, which replicate the presentation of material in a manner similar to face-to-face communication. Other institutions are investigating new delivery mechanisms, which support a revised perspective on education. These latter institutions are revising their processes for interacting with students, and taking a more “learner 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. Technology can both support and enhance distance education. Indeed, technology can be employed to change the way in which distance education is delivered.

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.

The research method employed consisted mainly of reviewing secondary sources of currently published descriptions of the use of technology to support delivery mechanisms in distance education. Sufficient references were explored in order to identify and describe all the varieties of delivery mechanisms. Further, primary sources were included which
represent the authors’ experiences with distance education. While one author is involved in the administration of a distance education program, the other author’s involvement includes direct interaction with various delivery mechanisms (interactive and asynchronous) both as a student and currently as an instructor.

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 which outlines alternative delivery mechanisms for various levels of employing technology to support distance education. The discussion of the framework is supported by examples of distance education in a sample from various countries. 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, which outline the more innovative uses of technology in distance education and a call to action for other researchers interested in investigating this subject area.

**CURRENT DISTANCE EDUCATION RESEARCH**

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. Table 1 presents examples of current research projects.

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. As Aggarwal and Kemery (1999) suggest, 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 presented above, represents an innovative use of technology. This, in turn, leads to the use of a delivery mechanism, which supports learning that is independent of both time and place.

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Papp</td>
<td>1999</td>
<td>Teaching using the Internet is more productive and hence rewarding. Students, who are becoming familiar with the technology, appreciate the flexibility of the process and the experience of interacting with a state-of-the-art method of delivery.</td>
</tr>
<tr>
<td>Lou et al</td>
<td>1999</td>
<td>Students, responding to a specific distributed, on-line learning technology, perceived satisfaction and interpretation of the learning process would be the same for both face-to-face delivery and technology-mediated delivery.</td>
</tr>
<tr>
<td>Darbyshire and Burgess</td>
<td>1999</td>
<td>While there was general satisfaction with the process of employing the Internet to deliver education material and to facilitate course administration in a multi-campus environment, all stakeholders reported they felt they were proceeding up a learning curve. It was anticipated that subsequent uses would prove more beneficial for everyone involved.</td>
</tr>
<tr>
<td>Aggarwal and Kemery</td>
<td>1999</td>
<td>The most important student profile for a web-based teaching environment would be a non-traditional, self-motivated, mature individual who requires schedule flexibility because of other life commitments.</td>
</tr>
<tr>
<td>Reid and Kruck</td>
<td>1999</td>
<td>The majority of off-campus courses, which employ technology as a delivery mechanism, do so to increase the course enrollment base and to respond to student flexibility requirements.</td>
</tr>
<tr>
<td>Motiwala and Duggal</td>
<td>1998</td>
<td>A significant number (86.6%) of Master of Public Administration students were satisfied with the media of delivery in an Internet-based computer concepts course. The students liked the self-paced flexibility of the asynchronous discussion threads.</td>
</tr>
</tbody>
</table>
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