Chapter XVIII

Web-Based Collateral Support for Traditional Learning: A Field Experiment

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The emergence of the Web and the growth of multimedia technologies offer new mechanisms to support and enhance traditional classroom instruction. This chapter reports on a field study in the use of a Web-based distance learning tool. Students enrolled in traditional classroom courses were provided with asynchronous distance learning support consisting of anytime/anyplace access to classroom lectures via the World Wide Web. The traditional classroom lectures were audio-recorded and the audio transcripts digitized, compressed and stored, along with the synchronized lecture slides, for accessing and viewing via the Web. Usage patterns were unobtrusively monitored and correlated with performance. Additionally, participants' perceptions were collected, compiled and analyzed. The results showed that repeated use of the Web-based supplement was correlated with better overall performance in the class. They also provided some clues to the motivations of users who seek out and explore collateral Web-based support for their own individual learning. This study provides a foundation for further research and application by: 1) helping to assess the utility of collateral support for traditional instruction using Web-based media, 2) shedding light on user adoption behaviors and attitudes, and 3) identifying practical considerations in the implementation of Web-based support for distance learning.

Distributed communication technologies, especially those offered via the World Wide Web, are widely believed to have great potential in the area of distance learning (Lewis, Alexander and Farris, 1997). In this context, the term asynchronous learning networks (ALNs) has been used to characterize the anytime/anyplace nature of the support available

to student groups who are dispersed in both time and place (Hiltz, 1997). The use of ALNs and other technologies such as audio- and video- conferencing to augment and, in some cases, even replace traditional learning methods appears to be gaining momentum. However, empirical research is needed to understand how best to exploit the technological features of such distributed systems to maximize their value in education (The Institute for Higher Education Policy Report, 1999). This chapter describes an empirical study that attempts to assess the antecedents and consequences of Web-based collateral support to augment traditional learning.

This study focuses on an application of the emerging technology of media streaming. Streaming extends the distributed communication capabilities of the Web by allowing audio and/or video messages of virtually any length, to be delivered in successive incremental "chunks," each of which can be played while the next chunk is being delivered in the background. Assuming the data delivery rate is equal to or faster than the data use rate, the chunks are integrated seamlessly by the client and the message is viewed (or heard) without interruption. Since play can begin as soon as one chunk is delivered there is no excessive initial delay. And since chunks can be discarded after use, there is no excessive storage requirement. Thus, it becomes feasible to distribute even the highly data-intensive media of audio and video over the Web.

Media streaming technology has matured recently, increasing its attraction for a variety of applications, including education. San Francisco was recently host to Streaming Media 98, a conference and exhibition devoted to this subject. RealNetworks and Macromedia are leading corporate players in streaming technology, while Microsoft has recently entered the arena with its product, NetShow. Perhaps the most obvious application of streaming technology to support distributed learning is in migrating traditional classroom lectures to the Web, a concept which is the focus of this study.

BACKGROUND

Technology support for distance learning has been the focus of intense study over the last decade (The Institute for Higher Education Policy Report, 1999). However, our understanding of and ability to exploit distance learning applications continue to evolve in response to dramatic and constant technological advances (Mason and Kaye, 1989). The recent revolutionary impact of the World Wide Web has spawned a period of intensified interest by making the widespread delivery of learning support easy, reliable and affordable. Some have suggested, quite arguably, that this revolution will alter the face of education as we know it—that our notions of the traditional classroom, teacher and student are artifacts of an obsolete paradigm and that the future will completely redefine their roles [see for example, Rossman (1992)]. Hiltz (1998) foresees a future shake-up among schools competing for students, survived by prestigious institutions serving larger numbers of students through technology-bred economies of scale and Web-enhanced accessibility.

While there are dissenting opinions about specific future impacts, it is clear that institutions of higher education have much at stake and, despite the confusion and uncertainty that stems from the dizzying pace of technological change, there is a rush to explore, adopt and implement (Massy, 1997). Such efforts inform and are informed by a growing body of anecdotal, experiential and empirical knowledge (Harasim, Hiltz, Teles and Turoff, 1995; Harasim, 1990).

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