December 1999

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Recommended Citation

Litecky, Charles; Shin, Yong; and Arnett, Kirk, "Video Conferencing Technologies To Support Web-Based, Anytime Anyplace Learning Outside The Distance Education Classroom" (1999). *AMCIS 1999 Proceedings*. 322.  
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Video Conferencing Technologies To Support Web-Based, Anytime Anyplace Learning Outside The Distance Education Classroom

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Abstract

This paper presents the details of a pilot study in a research partnership to assess the technologies, costs, and benefits involved in high-level, video-conferencing support of hands-on computer base education at a distance and in an anytime anyplace Web environment. The partnership involves a university’s information systems degree program and a large telecommunications company. Together these organizations cooperatively hope to improve distance education, particularly the important niche of information systems Web-based learning in the IS program of study.

Introduction

Herther (1997) reported in 1997 that over 150 accredited colleges and universities were providing non-traditional bachelor's programs that allow students to spend considerably less time in the classroom and on campus. Today, this movement has accelerated to different campuses and institutions, different degree programs, and to different individual classes. As a result, distance education courses are becoming ubiquitous. This expansion has not escaped the business world where an estimated $12 billion would have been spent on distance learning last year (Herther, 1997). This research is directed to the current advances in technologies that are being used to support this rapidly evolving learning method. More specifically, this research is to analyze the technologies, and build a partnership: with MCIWorldCom, and the authors’ institution under the eventual support of the Department of Education, Fund for Improvement of Post Secondary Education, Learning Anytime Anywhere Partnership (LAAP/FIPSE 84.399). This partnership aims to provide the research and the technology to support a technology oriented education facility such as a virtual help desk that is specifically created to help with hands-on computer-related learning problems in Web-based information systems courses.

As these university courses and degree programs that have a hands-on computing emphasis are being delivered, specialized efforts are required to support the hands-on components in a fashion that mirrors well developed instructional techniques such as instructor-monitored computer laboratories. These efforts are being made in some business training programs where much “real world” problem solving takes place. For instance, MCIWorldCom uses Net Conferencing from an Atlanta-based training facility to support its sales staff of over five thousand. Still, this product does not have the support that would be needed to help a student locate and correct a programming bug from a distance since the instructor cannot directly monitor the students’ efforts. To improve such instructional monitoring of the learners’ progress, there is a need to provide additional, outside of the classroom support. One solution is to provide a virtual help desk staffed with expert assistance in the context of the problem domain and armed with purposely varied levels of teleconferencing bandwidth to experimentally support study of distance learning.

Teleconferencing technologies are constantly being improved as even inexpensive desktop teleconferencing facilities such as Microsoft's Net Meeting offer sufficient capability to study distance learning (Prabhakar, 1999 in process). The authors’ experience has shown that desktop technologies are frequently too slow or unreliable to serve as a virtual helpdesk. But this is changing. For instance, Huray (1999) reports that an association of southeastern universities (SURA) are building the networks and exploring technology issues for testing instructional, video conferencing systems. Despite the general adherence to standards, there are concerns between the 1:1 mapping of specific vendor supplied products. Huray noted that "a number of software kluges were employed for intercommunication among various products, and the systems have been found to be more interoperable than we originally suspected." Still the efforts of this group are promising as a common ground for instructional videoconferencing and as part of the authors’ university-wide effort to support teleconferencing.

Software and hardware solutions in concepts such as the “university without walls” are still emerging, and that same support for technology in the classroom at the higher levels of media richness as in video conferencing (see Table 1 below) is not universally established. A promising theoretical support for the effectiveness of
video conferencing support in instruction is related to emerging theories of media richness. In the table, for example, based on the work of Daft, Lengel, and Trevino (1986), increasing levels of web-based support may be concomitant with increasing media richness. In this view, higher levels of media richness represent a desirable property of technology based communications that increases the extent to which one feels in the physical presence of the other party. In general, the higher levels of technology support, the richer levels of media and the correspondingly higher cost. For instance, much of today’s distance learning takes place where interactive instruction is provided via ISDN lines and dedicated classrooms. Where expensive ancillary equipment for two way video and audio support is added, it is expected to show increasing levels of media richness and higher levels of effective learning.

Possibly because of the current high cost of distance learning in the classroom, few resources have been devoted to out of classroom support. Today’s most common support is a web site, voice mail, and email that supports distance learning on an asynchronous basis. There have been few advances in "outside the classroom" support of computer assignments in learning. Thus this research aims towards providing higher levels of assistance for outside the classroom computer assignments in distance learning. The research also investigates costs and benefits associated with any time anyplace computer support in distance learning environments. In short, the partnership involves experimental investigation of the costs and benefits associated with better support for instruction where computer training is a substantial component.

In current configurations it is common for distance education facilities to have leading edge technology to deliver the instructional content. Yet, these leading edge facilities often have little or no computer support for the students. As a result, computer usage is often at the low-end of resource availability. This placement results in the inability to effectively teach courses, which have a substantial computer requirement. For those courses that have a computing requirement, much of the computer work must be achieved in an "outside the classroom" environment. This dilemma drives this research.

The report presented at the conference will be an update on a pilot study of products and technologies to support information systems computer work at a distance. It is anticipated that this report will be supported by partnership arrangements with MCIWorldCom. This work is to take place over the summer terms before the conference. Thus the results should be available in time for the conference and should provide interesting and helpful content to those examining these technologies for Web-based teaching and training.

Table 1 -- Levels of Non-Classroom Support for Computer Instruction

<table>
<thead>
<tr>
<th>Level</th>
<th>Description of Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 0</td>
<td>E-mail or voice mail support on an asynchronous basis and web site help</td>
</tr>
<tr>
<td>Level 1</td>
<td>one-on-one voice mail support that is interactive and synchronous</td>
</tr>
<tr>
<td>Level 2</td>
<td>one-on-one internet telephony with chat capability</td>
</tr>
<tr>
<td>Level 3</td>
<td>one on one interactive application sharing supported over the Internet with low speed video conferencing</td>
</tr>
<tr>
<td>Level 4</td>
<td>video conferencing via high speed communications links</td>
</tr>
<tr>
<td>Level 5</td>
<td>a virtual laboratory staffed by help desk support personnel over high speed communication links</td>
</tr>
<tr>
<td>Level 6</td>
<td>Face-to-face interactive support at remote locations</td>
</tr>
</tbody>
</table>
References


Huray, Paul., Video Conferencing Email Test Results (unpublished correspondence), February 19, 1999.

