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The Development and Delivery of a Distance Learning (DL) Course in Industrial Technology

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This transmission can be in the form of compressed video/interactive television (ITV), video conferencing, satellite transmission, Internet, or web-based delivery and can be used separately or in combination to deliver instruction. Delivery may require students to be at a specific location at a specific time, such as ITV, or the instruction can be made available and accessed at the student's convenience which is the case with Internet courses.

Purpose

During spring semester, 1999, Morehead State University (MSU) offered 23 compressed video and 10 Internet courses. One of the compressed video courses developed and delivered was a graduate level course from the Department of Industrial Education and Technology (IE&T). The purpose of this article is to explain how to develop and deliver a distance learning course in industrial technology. There are many issues to consider in the preparation and development phase. In addition, advantages, success/problems and limitations will be covered. A better understanding of this topic should help faculty in industrial technology programs in the event they need to create or convert a course to be taught via distance delivery.

Current State of Distance Learning

Until recently each college or university by mandate or design has been responsible for education in its immediate geographic area. The enormous growth of the Internet has opened new means of delivering

university courses without geographic boundaries (Kroder, 1998). The past decade has witnessed the widespread development and delivery of DL courses, and trends indicate this will continue. In the mid 1990s, Peterson's guide reported that nearly 400 accredited colleges and universities in North America employed online instruction of some sort (Velsmid, 1997). According to CCA Consulting, nearly 50% of higher education institutions currently engage in some type of online learning ((Blackboard, Inc., 1998). Futurists predict an increasing demand for higher education in the next century (Bayram, 1999). If a school ignores this chance to deliver courses via DL it faces losing students to other institutions that act quickly to exploit a new method of reaching them (Kroder, 1998). Institutions that can accommodate learners when they are ready to embark upon a course and provide them with more flexible time-to-degree possibilities are more likely to succeed as both distance and campus-based enterprises (Saba, 1998).

Many universities offer students an opportunity to complete an entire Master's Degree online. In fact, the Dean of the College of Business at MSU recently announced students could now complete the MBA via distance learning. In addition, Herther (1997) noted that over 150 accredited institutions offer entire bachelor's degree programs to students who rarely, if ever, visit campus. Distance learning with its flexibility in time and space is attracting more and more attention.

As the distance delivery system matures and continues to serve an

Introduction

Distance learning (DL) is one of the hottest topics in higher education today. After more than 50 years of experimenting with distance education as a marginal activity, governors of several major states declared their intention to mainstream it (Saba, 1998). Several states and regions have established major initiatives such as the California Virtual University, Western Governors Virtual University, Penn State University's World Campus, the Southern Regional Electronic Campus, and the Kentucky Commonwealth Virtual University.

Distance education can be defined as the transmission of instruction from one location to multiple locations via telecommunications technology (Morehead State University, 1999).

increasing number of learners, industrial technology faculty members need to prepare for teaching courses utilizing the DL technology.

The Development and Delivery

During the fall semester 1998, faculty in the Department of IE&T were encouraged to develop a proposal to begin teaching selected classes utilizing the DL technology. The Evaluation Techniques course (VOC 630) is part of the core requirement for the Master's in Vocational Education/Industrial Technology and was chosen as the first course to be taught using the DL delivery method. The course has been taught for many years and was modified to be taught via compressed video/interactive television (ITV). The class met once a week during spring semester, 1999, on Tuesday evening from 4:15 p.m. to 6:55 p.m. There were 12 students at the on campus site and 11 students at three remote sites.

ITV is two way-audio and two way-video. The Office of Distance Learning currently supports 21 ITV locations in 15 counties within MSU's 22 county service region. The delivery system is transmitted via special phone lines called T-1. This system is part of the statewide telecommunications network called the Kentucky Telelinking Network. Utilizing this delivery system requires students and faculty to be in a specific location (an ITV video classroom) at a specific time for instruction to occur.

Prior to teaching a DL course each faculty member is encouraged to attend training on how to use the hardware and the software. In addition, most training will cover issues affecting distance education such as copyright policies, and techniques, tips and tricks for online course development and delivery. The Office of Distance Learning at MSU provided the necessary training. Instructors teaching a DL course need to have specific knowledge of computer software programs as well as knowledge of television studio procedures. The Office of DL at MSU encourages each faculty to present lectures using the PowerPoint presentation software. In

addition, MSU uses CourseInfo, a course management software that will be discussed a little later in this article.

The three-day faculty training was invaluable. It is very likely that all faculty involved in distance education will be encouraged or required to complete the necessary training. Most colleges, under the banner of faculty development, are now requiring faculty to undergo special technical and performance training before teaching in the distance learning program (Rubialas, 1998).

Distance learning courses usually require greater preparation for each class session than is required for traditional lecture classes. Because most DL television studios are not equipped with chalkboards, instructors must prepare written materials suitable for the camera and electronic transmission (Rubiales, 1998). This preparation can be somewhat difficult because not only are faculty members preparing PowerPoint slides and handouts for students but they must also prepare in class activities, problems, etc., in a nice, neat, readable format that transmits clearly across many miles. No more waiting until the last minute to prepare materials or spontaneously deciding on a problem solving activity during class. This is not to say you can't be spontaneous. A document camera is available with a pad of paper and marker in case it is needed. The document camera allows the instructor to project spontaneous hand written documents if necessary. However, it is advised to do this sparingly and try to have your materials prepared in advance.

Distance learning courses also affect timelines. Faculty who are accustomed to distributing materials in class, for example, must prepare and mail materials to students in advance. It is possible to fax material to the site just prior to class. However, if there are a lot of materials to be sent this can be time consuming and quite hectic. The Evaluation Techniques course was taught on Tuesday evenings. It was necessary to mail class materials to the remote sites on Thursday, of the week before, to ensure they would get to the site on time. There were a few times

when the materials did not arrive for the Tuesday class and this was very disruptive for the class. Materials would then need to be faxed just prior to class, at which time the facilitator at each site would need to make copies for all students. This is one of the problems to try and avoid if at all possible.

During the training session, the Office of Distance Learning pointed out the importance of allowing yourself sufficient time to get prepared to teach a DL course. In fact, the training instructors indicated that six to twelve months were probably needed to properly prepare a course for distance learning. Often, faculty may not have a lot of advance notice. Preparation for the Evaluation Techniques course began about one month in advance. This made the entire spring semester very difficult. Most faculty have many other responsibilities during a semester, a full teaching load, advising, committee and other service work and professional activities. For the Evaluation Techniques class all lecture notes needed to be converted for use on the PowerPoint software. All materials and handouts had to be prepared in a form that would transmit clearly over a distance. In order to enhance students' learning, the course management software, CourseInfo needed to be learned and utilized.

During the first several years of web-based instruction, many faculty members developed required instructional materials using available scripting and authoring programs such as Hypertext Markup Language (HTML) and Standard Generalized Markup Language (SGML). Today, there are many web-based instruction programs that have been developed by institutions and commercial establishments. The programs were developed to address the need for faculty to create on-line courses without having to invest large quantities of time to learn HTML or similar programs (Fredrickson, 1999). The one used at MSU is CourseInfo 2.0 developed by Blackboard, Inc. Fredrickson (1999) contends this is another premier program, due to its ease of use, the various discussion forums and intuitive

interface. It can be used to post announcements, quizzes, assignments and has a variety of tools for students to use such as a digital dropbox, e-mail, a chat room and the ability to check grades on assignments and tests. CourseInfo is a valuable tool for on-line course management whether the course is taught as ITV or offered on the Internet. Fredrickson (1999) discusses the strengths and weaknesses of several web-based instruction programs such as Serf, CourseInfo, WebCT, and ClassNet.

The Blackboard, Inc. web site, <http://www.blackboard.com> is a great place to start for anyone interested in learning more about distance education. The site contains information on instructional design tips, steps to taking your course online, ways to get students more engaged in online conferences and a related site of online educational resources. In addition, the site contains information about advantages/disadvantages for faculty and students in regard to distance learning. The information is generic enough to be used with other course management software.

Advantages/Disadvantages

There are many advantages for faculty and students in regard to distance learning. Table 1 reveals some of the advantages for faculty and students who engage in ITV courses. Table 2 reveals additional advantages for faculty and students engaged in full Internet courses.

Table 1 indicates that flexibility in time and distance is the major advantage of distance learning technology.

Some of the disadvantages of distance learning are listed in Table 3.

Conclusion

The initial DL experience for the Department of IE&T has been positive. A different course is being taught this summer and another is being prepared for fall semester, 1999. While there are some limitations associated with the distance delivery system, students are willing to take DL courses for their flexibility in time and distance. It appears that distance learners are willing to endure some of the limita-

tions associated with distance learning in order to save a considerable amount of time required to attend regular classes on campus. It is anticipated that the IE&T faculty will teach many more selected courses using the distance learning technology.

If, and when, the time comes for you to develop or modify a course for distance learning rest assured there are many resources to help you get prepared. Your institution will probably provide you with some valuable initial training. From there you can read the myriad of literature, check out DL related web sites and speak to your colleagues in order to get some additional tips. Remember that you are not alone in this endeavor. It is actually sort of fun and exciting to get involved in the DL experience, while admittedly, a lot of work.

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Table 1. Advantages of ITV Courses

1. Educational opportunities are close to home
2. Students receive exposure to telecommunication technologies
3. Access to media-rich learning environment
4. Opportunities to develop technology competencies
5. Contact with students in other locations in the region.

Table 2. Additional Advantages of Full Internet (Online) Courses

1. Students can determine time and place of learning "classtime"
2. Students have access to global resources and experts
3. Students can engage in course at home or work.

Table 3. Disadvantages of Distance Learning

1. Little or no "in-person" contact with faculty member
2. Occasional feelings of isolation
3. Time involved to learn how to negotiate the system
4. Occasional technology problems
5. Student must be more active and self directed in learning environment
6. Increased wait for feedback about assignments.