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ABSTRACT

The state of Pennsylvania has embarked on a statewide initiative for distance education called the Center for Agile Pennsylvania Education (CAPE) consisting of community colleges and colleges and universities across the state; Duquesne University has joined this state-wide consortium in which members are encouraged to provide courses in areas of strength for sharing and exchange. To facilitate participation, a VTEL technology platform was installed at Duquesne University; it cost approximately $91,000. Cost of transmission is approximately $42 per hour if connecting with another MCI customer and approximately $82 per hour if connecting to another long distance carrier. Other associated costs typically are incurred for rental of the remote site(s), between $30 and $100 per hour of connect time. What has made distance education economically feasible is the fact that full motion video can now be transmitted with reasonably good quality over ISDN (Integrated Services Digital Network) telephone lines. Each school within the University was asked to identify areas and locations which can be targeted as distance education possibilities. Obvious advantages to both school and student are tremendous cost savings on travel and lodging. Other advantages include minimal or non-existent residence requirements, coursework that can be scheduled around work and family, quality of instruction on a par with resident degree programs, and comparable costs. (Contains 17 references.) (AEF)

DISTANCE LEARNING AND TODAY'S EDUCATIONAL ENVIRONMENT

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ABSTRACT

The large pool of part-time non-traditional students along with the increasingly popular notion that the student is a customer who must be served provides an impetus for distance education/learning initiatives. Technology will have a significant impact on the way colleges and universities deliver their educational products now and in the future. Although still relatively expensive, distance learning equipment can be cost-justified by the competitive advantage it provides.

This paper will describe a distance education/learning project being undertaken at Duquesne University using technology manufactured by VTEL. Both equipment configuration and program initiatives will be discussed.

INTRODUCTION TO DISTANCE LEARNING

For purposes of this paper, the terms distance learning and distance education will be used interchangeably. In a general sense, distance education is any form of teaching and learning in which the teacher and learner are not in the same place at the same time, with information technology their likely connector (Gilbert, 1995). Distance education is the process of extending learning or delivering instructional resource-sharing opportunities to locations away from a classroom, building, or site to another classroom, building, or site by using video, audio, computer, multimedia communications, or some combination of these with other traditional delivery methods (Gross, Muscarella, and Pirkl, 1994). This paper is concerned primarily with interactive distance learning, the type that connects people with other people via technology. It means getting people and video images of people into the same space so they can help one another learn something. It is a system that connects learners with distributed resources (Filipczak, 1995).

Distance education has become the new focus of college and university presidents, largely the result of a maturing and diverse college populace. Budget constraints, the dwindling pool of traditional students, increased competition from rival institutions along with significant cost-effective advances in technology have resulted in many new and creative distance education initiatives. Improved

technology allows for the transmission of signals over terrestrial lines called ISDN (Integrated Services Digital Network) lines that produce reasonably good picture quality. This has made distance learning possible for many educational institutions. ISDN lines carry much more information than regular phone lines but not as much as fiber optic cables. With ISDN lines, the video gets compressed before it goes through the cables, causing a slight delay between delivery and reception. Rapid movements produce "jerky" picture transmission. When fiber optic cables become available, most video-conferencing will upgrade to that medium (Filipczak, 1995). In years past, expensive satellite transmission charges made the cost of delivery for distance learning prohibitive for most colleges and universities and many businesses.

WHY DISTANCE EDUCATION?

In a live video-conference presentation at the April 1996 Quality Forum held in Pittsburgh and co-hosted by Duquesne University, Carnegie-Mellon University, and the University of Pittsburgh, the father of modern management, Peter Drucker, predicted that in the next ten years, more college students will study off-campus than on-campus. An examination of recent statistics published by the U.S. National Center for Education Statistics (1991) indicates that in excess of 57 million adults are enrolled in part-time educational activity, and a mere 13 percent are in pursuit of a degree. We are in a period in our history that emphasizes life-long learning for various reasons, and statistics support this. Of the 57 million people mentioned above, 30 percent are involved in education for personal reasons, and 60 percent are involved in an effort to advance on the job. This very large population of what we have historically referred to as non-traditional students must be serviced. This group of students will be older, probably over 26, and most will work. They will require flexible learning schedules (Gross et. al., 1994). Older students have begun to outnumber traditional age students, and as a result of todayÆs business climate, they may need to renew their educational skills several times during their careers. If your institution does not wish to extend its campus to service the non-traditional market, perhaps your cross-town rival will, and this may constitute a competitive threat. Many institutions of higher education consciously seek opportunities to expand their pool of students while at the same time servicing their community. In any event, non-traditional educational delivery systems, such as distance learning, seem to have an appeal to the non-traditional pool of students. Distance learning is just one of many educational delivery models to consider. There are some who feel that public institutions will have to develop an array of distance education courses to complement on-campus courses in order to remain affordable. At this point in time, The Open University in the United Kingdom is the premier distance teaching institution in the world.

Higher education is currently facing three major challenges. First, to provide high quality instruction adapted to the twenty-first century; second, to supply education to every young student and adult who requires it; and third, to deliver programs as cost-effectively as possible (Duquet, 1995). The entire landscape of higher education is undergoing changes. Competition for students is more intense than ever. At the 1996 meeting of the American Assembly of Collegiate Schools of Business (AACSB) held in Los Angeles from April 21-23, it was reported that "corporate university" programs now number approximately 400, and at least 30 percent are now seeking educational accreditation from the very same accrediting agencies with whom we are associated. Among the leaders in this group are Motorola University and the Arthur D. Little School of Management. These "corporate universities" pose a competitive threat to long-established programs in higher education, and in particular, graduate programs. In the United States, we are faced with the prospect of retraining 50

million workers, and corporate America is using distance learning for all aspects of internal and external training. Because of technology, geographic barriers no longer exist; a competing college or university from across the country can deliver a "best in class" educational program which attracts your students in your own "backyard" via technology.

TEACHING AND LEARNING PRACTICES

Peraya (1996) in a position paper on the WWW and Rogers (1995) reinforce a prevailing notion in today's educational community, namely that over the last 15 to 20 years, educators have been influenced by the social and cognitive sciences to the extent that our educational system is now focused on learning rather than teaching. Learning is defined as students' guided efforts to construct knowledge for themselves, in addition to merely receiving information from an instructor and other resources (Rogers, 1995). Learning is independent of time and place. Knowledge is "socially constructed though action, communication, and reflection involving learners." Teachers may gradually become advisors, managers, and facilitators of learning rather than providers of information (Peraya, 1996).

The straight lecture method of instruction is a thing of the past! Studies have proven that attention spans for even the most attentive students do not exceed 15 to 20 minutes. To make distance learning, or any kind of learning, more effective, the instructor must actively involve learners in the learning process; give them something to do besides listen to the professor talking (Filipczak 1995, Robinson, Rogers 1995 and Ward 1995). Faculty training is critical for distance learning success. It is a fatal error to assume that one should simply replicate regular classroom instruction, but on camera, for effective distance learning. The professor must not only develop quality instructional materials and activities, but also must be mindful of the use of technology. Insightful attention to pedagogy is an essential aspect of all types of instructional design, but it is particularly important when one's presentation is being captured on camera. Rogers (1995) contends that distance learning has the potential to meet new educational demands because it can provide instructionally effective, highly interactive learning experiences that are flexible, equitable and responsive to individual needs. This will not happen accidentally; it must be skillfully planned. The instructor must maintain faculty to student interaction via conversation, Email, class meetings, and visits to remote sites in order to achieve success and to distinguish distance learning from self-instruction programs. Purposeful learning occurs when individuals recognize a gap between where they are and where they want to be and draw upon available resources in order to close the gap. It has also been determined that group learning, insofar as it creates a learning atmosphere of mutual support, may actually be more effective than individual learning (Robinson). Distance education naturally lends itself to the formation of groups, particularly at remote sites.

The list of recommendations for the distance learning instructor is too lengthy to enumerate in this paper. The major points will be summarized, shared, and discussed when this paper is presented.

DISTANCE LEARNING AT DUQUESNE UNIVERSITY

Duquesne University decided to invest in distance learning technology early in 1995. The University's Division of Continuing Education was asked to develop distance learning/education initiatives for the University, and a very capable member of that division was assigned the

responsibility of coordination. A series of excellent training sessions for administrators and faculty have been conducted over the past academic year in an effort to generate understanding, interest and enthusiasm. The technology platform chosen was VTEL, and the equipment was delivered and installed late in the summer of 1995. The initial installation was made in a large conference room in the School of Business, but plans currently call for the equipment to be moved to a smaller dedicated classroom in the University's new technology-rich Bayer Learning Center. A number of large VTEL installations exist across the country. Two of the more notable and established VTEL initiatives include the systems of the state of Oregon and Oklahoma State University. Oklahoma State University has been successful in implementing a rather extensive distance learning program. The state of Pennsylvania has also embarked on a statewide initiative for distance education called the Center for Agile Pennsylvania Education (CAPE) consisting of community colleges, colleges and universities across the state. Duquesne University has joined this state-wide consortium in which members are encouraged to provide courses in areas of strength for sharing and exchange.

The cost of the VTEL system installed at Duquesne University was approximately $91,000. Major equipment items purchased include two cameras, one an instructor's camera with tracking capabilities, a document camera-overhead projector unit, sound equipment, three 27 inch video monitors, a 486DX microcomputer with distance education software, a network connection subsystem, and ISDN lines. Cost of transmission is approximately $42 per hour if connecting with another MCI customer. If connectivity involves switching to another long distance carrier, the cost of transmission escalates to approximately $82 per hour. Other associated costs typically are incurred for rental of the remote site(s), between $30 and $100 per hour of connect time. Multi-site programs require that each site dial into a commercial telephone bridge called a multi-point conference unit (MCU), and each site pays an additional dollar per minute. The CAPE Consortium of which Duquesne University is a member, has purchased its own MCU, and plans to have it operational by the fall of 1996 at which time the dollar per minute charge will no longer be assessed. Although the VTEL technology allows for connectivity to non-VTEL equipment such as PICTURE-TEL, some degradation does occur in transmission as a result of transmission protocol. We have been successful in connecting and transmitting to non-VTEL sites. This technology incompatibility is not at all unlike incompatibilities we have encountered with other technologies in the past when they were in their infancy. The incompatibility problems can be overcome with a little extra effort.

What has made distance education economically feasible is the fact that full motion video can now be transmitted with reasonably good quality over ISDN telephone lines. Frames are lost in broadcast transmission, and as a result some movements, particularly those that are rapid, make the actors appear slightly robotic. There is also a very slight delay in sound. This frame loss and sound delay can be overcome by using satellite transmission, but the hourly cost of satellite transmission is prohibitive for most educational institutions and really not necessary. Transmission via ISDN lines is adequate for most educational presentations, and it is not annoying to watch a broadcast after an initial adjustment. In the future, we will transition to the use of fiber optic cables for delivery.

Duquesne University has made a significant monetary expenditure for distance learning equipment and training. Each school within the University has been asked to identify areas and locations which can be targeted as distance education possibilities. The position taken by the School of Business at this time is that we are willing to deliver any of our courses via distance learning, if we can find

partners and if the faculty member is a willing participant. We have had preliminary discussions about providing financial incentives for faculty who deliver courses or programs in a distance education format. Satisfying an educational need in an area or locating a complementary partner are perhaps the most difficult aspects of becoming established in the delivery of distance education programs. Efforts in these areas are time-consuming and involve a great deal of research and planning.

The School of Business is discussing the possibility of delivering an MBA program to a group in Nicaragua, in part, through distance education and in part via face-to-face instruction. This is very much in keeping with conclusions drawn by Duquet (1995). There are demands for education and continuing education in many under-developed countries, but "face-to-face teaching provided by conventional institutions is too costly and does not cater to the diversity and specificity of demand. Distance learning in conjunction with face-to-face teaching seems to be the only alternative for the years ahead." Obvious advantages to delivery of programs via distance education are convenience to both school and student and tremendous cost savings on travel and lodging.

It is estimated that there are approximately 300,000 students taking for-credit courses at a distance. Cited as advantages are minimal or non-existent residence requirements, coursework that can be scheduled around work and family, quality of instruction on a par with resident degree programs, and comparable costs (Chadwick, 1995). Bob Filipczak, editor of Training Magazine writes (1995) that much of the research about distance learning over the last 50 years has shown that there is no significant difference in the effectiveness of distance learning compared with face-to-face instruction. This may be good news or bad news depending on how one looks at this issue. The primary disadvantage is the lack of personal contact.

Our School of Pharmacy recently delivered a series of continuing education credits to a group of pharmacists in Northwestern Pennsylvania. This arrangement worked well because there is not a pharmacy school located in that part of the state. Our chemistry department has partnered with several schools in the midwest, and the result is that chemistry courses originating at Duquesne are being video-conferenced to the midwestern US. We are negotiating with several other sites to deliver educational programs, but our distance learning initiative at this point is still in its infancy.

The concept of distance education, as one might readily surmise, is not without its critics. As reported in the Chronicle of Higher Education (1996), the American Federation of Teachers has issued a position paper that essentially opines that the shared human space of a campus is essential to an undergraduate education and cannot be compromised too greatly without rendering the education unacceptable. The paper also declares that graduate programs taught entirely through distance education also are "problematic." The paper emphasizes that questions raised grow out of concern for educational quality, not job security. "Better education, not cost-cutting, has to be the first principle," the paper concludes.

CONCLUSION

There is widespread agreement that institutions of higher education are in the midst of a paradigm shift. We are faced with a shrinking pool of traditional students, and as the concept of continuous lifelong learning becomes a reality, we are faced with an ever-increasing pool of non-traditional

students that we must service as customers. Competition among institutions of higher learning for these non-traditional customers is keen. These customers, however, have jobs and responsibilities which cause them to seek non-traditional delivery of educational programs. One such vehicle for instructional delivery, once frowned upon by the educational elite, is distance learning. Distance learning has the potential to provide many students with the most viable means of improving their skills, and distance learning should continue to grow as committing to classroom time is difficult for the adult learner. We now have the technology to deliver reasonably good quality broadcasts for distance learning. It is our responsibility as educators to develop and deliver educational products that produce results through distance learning that meet or exceed our expectations.

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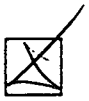

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