Distance Learning in a Rural Environment: Strategies, Opportunities, and Barriers

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Distance Learning in a Rural Environment: Strategies, Opportunities, and Barriers

Monte Miller, PhD

Presented here is a study of the development and implementation of a two-course sequence designed to offer social workers and other health care professionals distance education with regard to practice with persons with disabilities in rural Maine. The focus is on the selection of delivery technologies for the courses, course development, barriers to distance learning, and strategies for overcoming these barriers.

Course Development

The two-course sequence was funded by the U.S. Department of Health and Human Services through the University of Maine's Center for Community Inclusion (Maine's U.A.P.). The project was designed to deliver distance education regarding practice with persons with disabilities. Project participants included preservice students and practitioners from disciplines including social work, nursing, occupational therapy, physical therapy, speech communication, and other allied health disciplines. Preservice students are students who have received formal education for practice in their respective disciplines but do not have any post-graduation practice experience. Distance learning is important to the profession of Social Work. Schools of Social Work are being asked to respond to the needs of adult learners who cannot attend traditional classes on campus (Heitkamp & Henly, 1998).

The initial activity was to develop a two-course sequence which met the needs of both students and practitioners in rural Maine. A needs assessment was conducted, revealing that both preservice students and practitioners were interested in education regarding practice with persons with disabilities. Six hundred and fifty surveys were sent out to students and practitioners in social work, nursing, psychology, speech communications disorders, occupational therapy, and physical therapy. The response rate, including follow up mailing, was 48 percent (n = 316). The needs assessment revealed a number of factors which influenced the development and delivery of the courses.

Barriers

Although both students and practitioners were interested in the course, multiple levels of availability, skill, and comfort levels existed throughout the state with regard to technology. Choices for course delivery technology included Interactive Television (ITV), compressed video, Internet communication, and computer mediated communication. The needs assessment indicated that both preservice students and practitioners, including social workers, preferred to use a medium other than ITV. The accessibility of potential learning technologies varied throughout the state.

Technologies

ITV, also known as Interactive Television, is one of the most common technologies used to deliver distance learning courses. ITV typically involves an instructor teaching in one primary classroom which is actually a television studio. The interaction between the instructor and the students in the primary classroom is broadcast to remote site classrooms. The remote site classrooms are equipped with television monitors and telephones so that they can ask questions and contribute to the learning process. For instance, the instructor in the primary classroom may pause to answer a question which has been called in from one of the remote site classrooms. Although the students can see each other and communicate by telephone, the process takes much of the spontaneity out of the learning environment.

Compressed video is similar to ITV in that there is typically one primary classroom and several remote site classrooms. The primary difference is that all of the classrooms have compressed video technology which allows students and instructors to communicate in real time. There is no need to use a telephone to contribute to the class discussion. When students have something to say, they can hold up their hand and ask a question or make a comment. The video and audio are transmitted via digital transmission lines which make this real time

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communication possible. There are a few problems with the various systems. First, it takes a moment for the communication to be broadcast across the digital lines, so there is a slight delay which can result in students speaking at the same time or missing each others comments. Second, the technology is much more expensive than traditional ITV sites, so states usually have fewer compressed video sites. This can result in students having to drive long distances to participate in a class.

Internet Communication is used for distance learning. Internet Communication frequently involves posting information, such as readings, graphics or exercises on a web page, and then having students respond using a "mail to" link. This is a link which says "click here to send your answer." The student clicks on the link, a message screen appears, the student types in his or her response, and sends it to the instructor. There are other methods of using Internet Communication, but this is the most typical. This type of communication has several disadvantages. First, the student is left with a "message has been sent" screen and then must click back to the course's web page to continue. Second, the student cannot read other students' responses or communicate with other students about the assignment.

Computer Mediated Communication is still another technology for delivering distance learning courses which involves using groupware software. Groupware simply means that that software is designed to be used by multiple users who will have access to the same set of resources. Computer Mediated Communication differs from regular electronic mail (e-mail) in that when a user enters the system instead of a mailbox a set of folders appears on the screen. For instance, in a social work course, the folders which appear when you log into the system might be Syllabus, Assignments, Case Studies, Social Work Values, Discussion, and Readings. Students use the syllabus to know which folders to open. Each folder contains a list of e-mails, just like a regular e-mail mailbox, so the students can read and respond to each other's assignments and

comments. The structure provided by Computer Mediated Communication allows the instructor to monitor and moderate classroom discussion and provides a structured yet interactive environment for the virtual classroom (Minoli, 1996). The virtual classroom is the cumulative learning environment in which a course is delivered. If a course is being delivered using ITV, then the virtual classroom would consist of the primary ITV classroom and the remote ITV classrooms.

Despite the existence of an ITV network in Maine, students and practitioners indicated that they preferred to use other means of communication for learning, primarily due to the lack of flexibility that ITV offered. ITV had two primary drawbacks in the view of the needs assessment respondents. First, the potential student would have to drive to an ITV site. This can be a considerable barrier in any rural state, but particularly for Maine. Over 80% of the state is comprised of small towns, plantations, island communities, and unorganized townships/territories (Spruce, 1994). This geographic dispersion creates significant barriers with regard to the development and delivery of educational opportunities. Stated in a more direct fashion, many potential students did not want to drive long distances through inclement weather over substandard roads in order to reach an ITV location.

Second, ITV broadcasts occur at specific times at specific sites. Many respondents indicated that their personal schedules including employment and child care did not allow them the flexibility to attend educational programs at specific times. Asynchronous learning, or learning which could take place at the convenience of the student, seemed to be a logical approach. A compressed video network also existed in Maine, but it had even fewer sites than the ITV network, and thus was not a good fit with the learners' needs for similar reasons.

Skills and comfort with various technologies also varied widely. For instance, computer skills ranged from Internet publishing and use of electronic mail to the ability to word process. Also, a characteristic which may be more prevalent in rural areas, there was great disparity with regard to the types of computers that potential course participants possessed. Computers ranged from state-of-the-art to extremely outdated.

Finally, as the courses were developed, and students began to enroll, another barrier that was identified was tuition sharing. Administrative personnel from private universities or different branches of public universities were not receptive to their students registering for a course at the University of Maine and paying tuition to the University of Maine. Fiscal issues arose almost immediately after the courses were offered. Tuition sharing contracts are one plausible solution, but developing the terms of such contracts can be difficult and time consuming. The situation is complex in that a student from a private university may want to use an Internet access account from the private university to access a distance learning course offered by a state university. Further, the student may wish to transfer the credit to the private university as part of her or his degree program.

Employing a strengths perspective is one possible tactic for developing tuition sharing agreements. One strength is that distance learning classes can be used as electives and offer students expertise that is not available at their own institution. Another acknowledged strength is the time and resources required to develop a distance learning course. An additional strength is that students from different institutions of higher education bring different perspectives. All of these strengths are worthy of acknowledgment by tuition sharing agreements between institutions of higher education. Students, institutions of higher education, and ultimately society can benefit from equitable and rational tuition sharing agreements as we move forward into an era of increased learning opportunities.

Opportunities and Solutions

The strong preference for not using ITV was a driving factor in the selection of technology for the courses. Multiple factors indicated that a computer mediated communication approach combined with an Internet format might best serve the needs of this rural population of learners. Computer mediated communication utilizing groupware software offers several advantages which seemed to fit with the potential learners' needs. The advantages, as listed by Minoli (1996), include collaborative learning and research, access to databases, an effective tool for conducting class in virtual classrooms, and provision of student and instructor interaction in an asynchronous fashion. Asynchronous means that students can complete course assignments at their own pace and on their own schedule. Some students may prefer to complete assignments at 6:00 a.m. while others may work on assignments during the day or during the evening. This flexibility is an important aspect of distance learning which makes it convenient and accessible to potential students with different schedules and obligations such as work and child care. Other benefits which are particularly attractive for a rural environment are low cost, ability to function with multiple applications (i.e., Internet software), and ease of use (Minoli, 1996).

Another factor was the availability of Independent Service Providers (ISPs) in Maine. Independent Service Providers (ISPs) provide access to the Internet for a fee. They are privately owned commercial enterprises. ISPs provide an alternative to using a university account to access the Internet. This provides several advantages. For example, although the University of Maine System does maintain several "modem pools," or numbers to call to provide Internet access to students across the state, the use of the University of Maine's system brought two distinct disadvantages. First, despite the state's effort to provide access to technology, many areas of the state did not have a modem pool which offered a local number for Internet access. In other words, a potential student

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using such a modem pool would be assessed long distance telephone charges for his or her time on the Internet. Second, although the states technical support personnel did their utmost to provide prompt quality service to users, technical problems including overloaded servers, connection problems, and connection reliability were often reported. Because of these difficulties, students enrolling in the two-course sequence were encouraged to use Independent Service Providers. Many Independent Service Providers existed throughout the state with local numbers for Internet access and technical assistance that was superior to state-provided Internet service.

Students were able to use ISPs to access the course materials on the Internet and groupware allowed students to communicate and participate in the "virtual classroom" on their own schedule. The combination led to ease of use, low cost, and a "user friendly" two-course sequence. The groupware software which was chosen for the class was First Class (Soft Arc, 1995). Several factors made First Class a logical choice for use in the courses in Maine. First Class is used in Maine High Schools and Middle Schools so many of the potential students were already familiar with this software (Maine Department of Education, 1995). Secondly, First Class provided a Windows-based structure which allowed students to explore the courses' material in a logical fashion.

When logging onto the First Class System, a set of course folders appears instead of just a mailbox like typical e-mail systems. These folders show up as icons, and you click on them to view their contents. It is very similar to exploring a web page and thus intuitive for many course participants who already had Internet experience. After clicking on a folder's icon, a list of e-mails concerning that topic would appear. For instance, you could click on the folder labeled "DIS Paradigms: Ways in Which We View Disability" and view the discussion of how various professions view disability. The discussion might include how social work's strengths perspective emphasizes viewing persons with disabilities

as having many abilities and focusing on the abilities rather than the limitations. You could also send an e-mail to contribute to the discussion.

Course folders on the First Class System for the two course sequence had titles such as "Welcome to DIS 490: Introduction to Disability Studies," "DIS Assignments," "DIS Readings," "DIS Paradigms: Ways in Which We View Disability," and "DIS Read Me First." Some of the folders served obvious functions. The "Welcome to DIS 490: Introduction to Disability Studies" folder provided the URL (web address for the course), a copy of the course syllabus, the e-mail addresses of the course instructor, and the e-mails of some previous students. The "DIS Read Me First" folder served as a place for students to discuss "hot topics," a place for instructors to provide clarifications regarding assignments and class materials, and a location for posting new web sites which were pertinent to the course. Distance learning courses which utilize interactive technology such as the Internet or groupware software must provide a means through which to infuse new course material that may actually be emerge as the course progresses. In other words, faculty shift their role from teaching and lecturing to instructional management and peer learning including managing and facilitating discussion of new material as a course progresses (Flynn, 1996). First Class provided this opportunity with structure and flexibility in communicating with students. The University of Maine has purchased a site license for First Class software. Information about First Class software, including purchasing it, can be found at www.softarc.com.

After considering the needs assessment findings, the barriers, and potential technological approaches, the courses were developed using a blend of technologies. Course delivery technologies included computer mediated communication, Internet-based resources, traditional textbooks, and video tapes. For instance, although the case study materials for the course could have been delivered on CD, videotape was selected because in a rural state such as Maine, the likelihood of having a computer with

a CD drive was much less than the likelihood of having a VCR. The video which was used as the source of the case studies was developed through Interdisciplinary Training for Health Care for Rural Areas, another rural health care project in Maine (Kovacich, 1995). The video included numerous case studies which were developed using actual cases in rural Maine. Students registering for either of the courses received a packet including materials such as the course syllabus, the video tapes, a course reference guide for using the Internet, First Class software instructions, and telephone numbers to call for assistance. The blend of technology did require a computer, but it supported a course structure which allowed both preservice students and practitioners to participate from their homes or places of employment. The virtual classroom for the two-course sequence included computer mediated communication, Internet-based resources, traditional textbooks, and video tapes. The distance that so often makes education not feasible in a rural environment was overcome by blend of technologies including video, the Internet, and electronic computer mediated communication.

Evaluation of Courses

The courses offered during the Spring, 1998, semester were evaluated using a one-shot paper and pencil survey. The survey consisted primarily of forced choice items including yes/no categorical items and some Likert-type scale items. The survey also provided the opportunity for open-ended responses. Twenty-two of twenty-three participants completed the survey for a response rate of 96 percent. Respondents were from the disciplines of social work, special education, psychology, nursing, communication disorders, and human development. The course respondents were all female with a mean age of 26 years (sd = 8.993). Seventy-three percent (n = 16) of the course participants reported that faculty were more available to them through the distance learning courses than through traditional classroom courses. Thirty-six percent (n = 8) of the course participants indicated they preferred interacting with faculty through First Class over

interacting with faculty by face-to-face contact. First Class was rated as the best medium to use to get immediate assistance from faculty by 68% (n = 15) of the respondents. Respondents reported their comfort with using the technology at 1.733 (sd = 0.922) on a scale of 1 to 3 with 1 being "uncomfortable" and 3 being "very comfortable." Finally, a Pearson's R was calculated with regard to the relationship between age and comfort with the technology. The finding indicated a significant negative relationship between age and comfort ($r = -0.427$, $p < .05$). In other words, the older the student, the less comfortable the student tended to be with the technology.

Several students included anecdotal comments on their surveys. Participants reported that the "networking" that occurred between students, practitioners, and healthcare providers was a lasting benefit. Students also commented on the ease of using the technology and that they would not have been able to receive education regarding practice with disability in any other way due to constraints of distance and time. Many course participants continued to sign on to the courses' conferences after they had completed the two-course sequence. Finally, course participants reported an increased awareness of disability-related needs in rural social service systems and an increased ability to respond to those needs.

Limitations

There are several limitations to this study. First, the instrument that was used to conduct the study was designed specifically for the study and may have introduced bias with regard to reliability and validity. The instrument should be tested for reliability and validity for future studies. Second, the number of participants in the study was small. A larger number of students may have produced different findings. Third, the sample was a sample of convenience — those students who were participating in the innovative two-course sequence. The results from this study should not be generalized to any other populations.

Some other general limitations are noteworthy. As noted by Morris (1995), the term "rural" is not homogeneous: many areas which are categorized as rural differ from each other in numerous ways. Rural states may differ on important characteristics such as commitment to technology or distance learning. For instance, Maine had a statewide network of ITV sites and compressed video sites but was lacking in terms of modem pool access. Other rural states may have a comprehensive network of modem pools for Internet access, but no compressed video sites. Another point is that distance learning technology continues to evolve. Choices made in the development and delivery of this two-course sequence may not be appropriate as new and superior technology continues to be developed.

Discussion

Despite the limitations, many lessons were learned through the development and implementation of the two-course sequence. The choice of technologies is the first major task an educator faces when developing distance education opportunities for students in a rural area. The choice of the most recent technology, such as course materials on CD, may be not be wise if most of the potential students do not possess computers with CD capabilities. It is important to utilize a basic social work skill and conduct a needs assessment of the community you plan to serve. What types of hardware exist? Is the audience familiar with any of software that you might use to deliver the course? In Maine, First Class seemed a logical choice because many of the students had been using the First Class software for years. It is also wise to explore the capabilities of the university or educational institution whose infrastructure will need to support the course. The University of Maine's infrastructure, particularly with regard to local access to Internet connections, was not appropriate for delivery of the two-course sequence. Independent Service Providers were a much more logical course. Finally, the political implications for distance learning are important. It is crucial for the social work educator to explore previous distance learning attempts, collaborative tuition agreements, and include other professionals in the development of distance learning offerings if the offerings are to be accepted. In other words, another basic social work skill, problem solving, must be employed when designing distance education courses.

There are other barriers that come into play when designing a distance learning course. Activities such as the needs assessment, web page design, piloting the software or combinations of software, and developing complementary course materials are all time-consuming. Front loading time for these activities is wise (Abernathy, 1997). In addition to the initial investments of time and energy, teaching distance education courses involves reading large amounts of text-based communication, problem solving software difficulties, and a commitment to ongoing management of the interaction that is occurring the through technology in the "virtual classroom."

With regard to the findings of the study of the two-course sequence, additional research needs to be conducted, but the findings did provide some insight to focus future research. Faculty and student interaction through computer mediated communication may be a means to improve student access to faculty for both distance and traditional courses. Computer mediated communication may also be a way for faculty to provide immediate assistance to students in a more timely and effective manner. Such communication may also provide logical alternatives to traditional office hours or face-to-face meetings, and students may prefer computer mediated communication to traditional faculty and student face-to-face interaction.

Another factor to consider in conducting research as to the use of technology in distance learning is the age of the students. From this limited study, it seems possible that there may be an inverse relationship between age and comfort with technology. This would be an important factor to consider in designing distance education opportunities for nontraditional students or students older than traditional students, ages 19 to 25.

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Conclusion

In conclusion, the experience of designing, delivering, and evaluating this two-course sequence answered some questions but raised many others. Social work skills, including conducting needs assessments, problem solving, and collaboration, were used throughout the process. Additional research regarding all aspects of distance education including technology selection, technology combinations, potential barriers and solutions, student faculty interaction, and course effectiveness needs to be conducted.

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