Distance Education for Graduate Nursing: One State School's Experience

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ABSTRACT

This article describes the authors experience in teaching graduate nursing courses to students in the rural state of West Virginia during the past 20 years. The strengths and weaknesses of each technological method are detailed, from both the instructor and student perspectives. The most recently implemented system (fall 2003), Webcasting, is also described. The support required within the institution, particularly from Instructional Design and Information Systems staff, and throughout the state is reviewed. The lessons learned from one school's long history with distance education are analyzed from the theoretical perspectives of adult learners and virtual students. We share our experiences with other nurse educators so they can devote more effort to the curricular aspects of their courses, rather than reinventing the technological wheel.

West Virginia is the second most rural state in the United States, and its citizens have always experienced challenges related to access to institutions of higher education. Two thirds of the 1.8 million people in the state live in communities of less than 2,500 (*West Virginia Blue Book,* 2000). The federal Office of Management and Budget (1995) has designated 44 of West Virginia's 55 counties as non-metropolitan. As a land-grant university, West Virginia University has a special responsibility to improve access to its offerings for all citizens of the state. The West Virginia University School of Nursing (WVUSON) has been a leader in designing its programs so more nurses within the state can continue their education to advanced degrees.

The School of Nursing has long recognized that graduate-level nursing education is a complex endeavor affected by geographical, educational, economical, social, and professional factors. Because the vast majority of WVUSON graduate students are women who balance full-time employment and parenting with attending school, time is a precious commodity. The one element WVUSON can directly affect is the time/travel factor by offering courses using distance education methods. This article reviews the methods used by WVUSON over more than 20 years to try to make graduate nursing education more accessible for more nurses within the state. We will also analyze the advantages and disadvantages of the different delivery systems and share the lessons we have learned from students and faculty who have journeyed together down these various pathways. The lessons learned are analyzed from the theoretical perspectives of adult learners and virtual students.

HISTORICAL OVERVIEW OF DISTANCE EDUCATION WITHIN WEST VIRGINIA

Traveling to Remote Areas

After the master's degree program was established at WVUSON in 1977, it was recognized that the program was not accessible to nurses in the more populous, southern part of the state. Thus, WVUSON took the program

Received: December 31, 2003
Accepted: April 14, 2004

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"on the road" with faculty traveling south and, later, to the northern panhandle of the state. However, this method has been replaced by technology-based methods.

Satellite Network

In the late 1980s, the Satellite Network (SATNET) of West Virginia was developed and funded by state dollars. The network consisted of 16 colleges and universities who worked together to deliver college-level courses via a satellite network. Courses offered through the network were competitively selected via a proposal process from any of the involved institutions. SATNET was a one-way video, two-way audio system, delivered via C-band satellite or Kuband. There was a telephone bridge (i.e., conference calls conducted via regular telephone lines) to each site where courses were being received. The telephone line was reserved at each site for the length of the class period; thus, the telephone cost per hour made SATNET a very expensive delivery system. However, the School of Nursing had access to 6 to 8 sites throughout the state each semester, making courses more geographically available to nurses pursuing the master's degree.

The use of SATNET for graduate nursing courses was a natural evolution from a project developed during a 5-year period beginning in 1988 to provide baccalaureate nursing courses statewide via the satellite network. WVUSON received a 5-year training grant from the U.S. Bureau of Health Professions, Division of Nursing, for a Program for Educating Nurses via Satellite Links. As part of this program, several faculty members attended development workshops conducted by expert consultants on how to teach via distance education. Thus, a core group of faculty members, including the first author (L.O.), learned the techniques of teaching via television. This project and these development opportunities were the impetus for a core of faculty members to be at the forefront of testing each new delivery system as it became available. Many members of this core group have continued to pioneer Web-based courses and applications.

MDTV

The next step in the evolution of delivery systems was the Mountaineer Doctor Television Network (MDTV), which became available in 1995. MDTV is compressed video with two-way audio and video. Compressed video is less expensive because of the use of dedicated telephone lines with no need for satellites. MDTV was the result of a grant from the Office of Rural Health Policy and was originally developed so the WVU School of Medicine could provide consultations with patients and providers in rural areas. Specialists at the WVU Health Sciences Center were able to see patients via television and provide consultation services. WVUSON used this system to deliver several courses in the master's curriculum.

Since 1996, all health sciences students in state-supported schools have been mandated by the state legislature to have a minimum of 3 months of rural health clinical practice. Rural Health Education Partnership (RHEP) sites were developed to provide onsite faculty for students in their rural clinic sites. RHEP sites also received MDTV broadcasts. Thus, course availability increased with these new sites, and students were able to receive classes from the main campus, while they were off campus fulfilling their rural clinical requirement. MDTV is still used today for patient consultation, administrative meetings within the state, and some educational offerings.

Web-Based Courses

After personal computers became widely available, some WVUSON graduate courses were prepared as Web-based classes. An advanced pathophysiology course was the first course in the master's curriculum to be entirely Web based; other courses alternated between Web delivery and compressed video presentations, as well as on-campus, all-day workshops (e.g., clinical courses). Web-based courses added the dimension of asynchronous learning and eliminated much travel time for students to MDTV sites throughout the state. Even with up to 8 sites available for MDTV classes in any given semester, many students had to travel more than an hour to access these sites. Web-based courses are highly desired by students because of the convenience of time and place, but challenge faculty to design the course to be as interactive as possible.

Webcasting

The latest technology being pioneered at WVUSON is MediaSiteLive™ Webcasting. MediaSiteLive is a Web-based communication system offering simultaneous capture and Webcast of video and multimedia materials. With MediaSiteLive, an instructor at either the Morgantown or Charleston Health Sciences Center campus teaches a live class to students who are sitting at their own personal computers. The instructor can use any computer software and applications, such as charts, diagrams, PowerPoint slides, a statistical program, or links to a Web page. Students log on to a Web page for the course and can see and hear the instructor and view the audiovisual material. Students can also access the class from home, work, or anywhere they can access a computer. Student can easily interact with the instructor by using the "ask" button displayed on the Web page. The questions or comments are sent to the instructor's computer and can be answered live.

Each of these methods has distinct advantages and disadvantages for both students and instructors, as summarized in Table 1.

SUPPORT REQUIRED TO OFFER DISTANCE EDUCATION

Administration

The road we have traveled in distance education has been possible because of a team of talented people within the School of Nursing, the university, and the state. The

TABLE 1
Advantages and Disadvantages of Different Distance Education Methods

Method	Time Period	Advantages		Disadvantages	
		Students	Instructors	Students	Instructors
Off-campus classes in north and south of state	1982-1989	• Regular classroom interaction between students and faculty.	• Face-to-face interaction with students.	• Travel time to satellite campus. • Scheduling class time to meet the needs of working students.	• Travel time to class. • Communication via telephone or mail. • Extended time away from campus. • Overnight stays difficult for faculty with young children.
Satellite Network	1989-1998	• More sites available for class. • Students can see and hear teacher. • Students can ask questions in real time.	• Conduct class from home campus. • Provide immediate feedback to student questions.	• Travel time to class sites. • No flexibility in class times. • Many technical problems, which impeded clear transmission of class content. • Reluctance to use telephone bridge to ask questions. • Can only communicate with faculty by telephone or mail.	• Expense of telephone lines and satellite time. • Competition for satellite time with other institutions in state. • Technical problems in system that instructor could not control.
Mountaineer Doctor Television Network (MDTV)	1995-2003	• More interaction possible among students at different sites and between students and instructor. • Ability to access system at rural health clinical sites. • Students asked questions more freely.	• Faculty can see students at different sites. • Fewer technical problems than with satellite delivery.	• Travel time to sites. • Little flexibility for class time because of competition with other units for time on network.	• Very costly. • Need to develop ease “in front of camera.” • Class must be well developed and “timed” in advance of class presentation. • Must be able to tolerate technical glitches.
Web-based courses	1998-present	• No fixed class time; may be synchronous or asynchronous. • No travel time. • E-mail communication and bulletin board in WebCT. • Learn to work with other students on projects using computer technology.	• Opportunities to develop creative class experiences and assignments. • Instant response to students possible with e-mail and bulletin board discussions. • Flexibility for faculty schedule. • Paperless course; all assignments can be completed electronically. • Increased teaching satisfaction with learning new technologies.	• Miss traditional class interactions. • Want to see teacher and other students. • Want more lecture format.	• Less personal interaction with students. • Challenged to help students work independently in class. • Challenged to maintain some organization of ideas in chat room discussions. • Review of examinations more difficult when students not on campus.
Webcasting MediaSiteLive™	2003	The advantages of Web-based courses plus: • Ability to see the instructor. • Ability to submit questions and receive responses from instructor immediately. • Ability to go back and review class again at their own pace. • Class is always available (archived).	The advantages of Web-based courses plus: • Several software programs can be used in each class. • Class may be presented early (non-live). • Increased flexibility of scheduling. • Can gauge students’ understanding by questions being asked. • Polling feature allows instructor to ask questions of students or survey responses to material presented.	• Poor reception of video component of class if students do not have sufficient bandwidth.	• Faculty must be able to solve technical problems that students have in receiving Webcasts.

team is led by a visionary dean who is able to assess the needs of the state and encourages faculty to modify, innovate, and experiment. This administrative support is crucial to faculty who want to experiment with new technologies. Support must include allocation of time to learn new technologies, as well as encouragement and praise of completed projects. If strong administrative support is lacking within a school, we suggest that faculty interested in learning and developing these distance technologies partner with other departments within their university or with other schools of nursing in their region. This may enable faculty to return to their schools with the knowledge and expertise to encourage their administrations to move more expeditiously in this arena.

Funding

Small grants have often provided the beginning resources for the methods used. These grants were actively encouraged, supported, and evaluated, and the success of these grant demonstrations enabled some of the methods to become self-supported within the University or Health Sciences Center. The School of Nursing has showcased its work within the University and throughout the state with MDTV, Web-based courses, and most recently, Webcasting. Thus, WVUSON faculty have earned a reputation as innovators and leaders in the development of cutting-edge technologies in the delivery of distance education.

For schools unable to attract grant funding for such innovations, we believe that partnering could also facilitate grant applications. The partnering school may be willing to mentor faculty to help them write a successful grant application. In addition, faculty members who learn these new technologies in the partnering experience may be able to return to their home institution and influence strategic planning within their school to move into this technological area of instruction.

Faculty

A nucleus of faculty who relish the challenge of learning new technologies is crucial to the success WVUSON has enjoyed related to distance education. Such faculty members are usually self-starters in this area and only need the recognition and support of the dean and department chairperson.

Technical Expertise and Support

The technical expertise and support provided by the Instructional Design and Information Systems staff within WVU have been essential to these projects. When we were learning how to prepare a Web-based course for the first time, we had the luxury of a doctorally prepared Instructional Design consultant who could personally help us put the course materials into a Web course. The Information Systems staff has embraced Webcasting with enthusiasm and have instructed faculty members individually; they also provide 24-hour telephone consultation for system users. Technological infrastructure includes availability of these experts to students via e-mail or telephone to help with any technical problems students may have in receiving the classes.

Faculty have learned many of the programs, such as WebCT and MediaSiteLive Webcasting, and can now produce their classes independently as a result of the excellent support and consultation from both groups of specialists. These Instructional Design and Information Systems specialists have become true colleagues and have made learning a joyous, shared adventure. The requisite background of such specialists in information technology is Microsoft Certified Professional (MCP) or Microsoft Certified System Engineer (MCSE), certifications earned through self-study courses and a series of six to seven examinations. WVU has actively supported the staff to attain these certifications by allocating time and money for courses and examinations. These qualifications are necessary due to the complexity of the WVU network infrastructure.

Outside Help

Support is also needed in the form of help from various institutions, and their staff, throughout the state. This help includes technical support at sites receiving MDTV broadcasts, willingness of faculty at other institutions to proctor students taking tests on the computer, availability of computer classrooms for testing, and coordination of technical support between the WVU main campus in Morgantown and divisional campus in Charleston. Students' employers provide assistance by allowing students to use hospital computers to engage in "chat room class" or by proctoring students who are unable to travel to a designated site for computer testing due to last-minute work or family emergencies.

Professional Recommendations

The American Association of Colleges of Nursing (1999) outlined five major issues to consider in the development of standards to support distance education:

- Planning.
- Technology infrastructure.
- Faculty development.
- Student support.
- Evaluation of outcomes.

We have found that, based on our 25 years of experience, these issues are indeed vital to the success of quality distance education classes.

LESSONS LEARNED

While the students WVUSON has reached via distance education during the past 25 years are adult learners, more are becoming virtual students, due to implementation of a Web-based curriculum. Adult learners (Knowles, 1980) and virtual students (Palloff & Pratt, 2003) each have different characteristics and needs (Table 2) that must be addressed when implementing distance education methods. The implications of our experiences with

TABLE 2
Assumptions of the Adult Learner and the Needs of the Virtual Student

Assumptions of the Adult Learner*	Needs of the Virtual Student†
As people mature, their self-concept moves from that of a dependent personality toward one of a self-directing human being.	Programs based on ability to meet the educational needs of nontraditional students.
Adults accumulate a growing reservoir of experience, which is a rich resource for learning.	Focus on the learner, rather than the instructor.
Adults' readiness to learn is closely related to the developmental tasks of their social roles.	Cost effectiveness
Perspectives change as people mature—from future application of knowledge to immediacy of application.	Reliable technology that is easy to navigate and transparent (i.e., user friendly or easy for novice users to learn).
Adults are motivated to learn by internal, rather than external, factors.	Appropriate levels of information and human interaction.

* Source: Knowles (1980).
† Source: Palloff and Pratt (2003).

distance learning are analyzed based on these theoretical assumptions.

Lessons Learned About Students

- Students are willing to learn and adapt to the various changes in distance education technology because they realize these technologies allow them the opportunity to become self-directed learners.
- Since adults desire immediacy in application of knowledge, complete and organized information must be presented to students up front. Detailed orientation to the technology is mandatory, so students can quickly get to the work of learning what they perceive is important to their professional goals.
- Discussion about the study habits needed and the differences in online courses, compared to traditional classroom instruction, is essential for each class of students. Palloff and Pratt (2003) indicated that students often consider online courses easier, whereas in reality, such courses require twice as much time because of the amount of reading and processing involved.
- Because one of the needs of virtual students is reliable technology that is easy to navigate and transparent (i.e., user friendly or easy for novice users to learn), a plan must be in place for a support system for technical difficulties that is available to students 24 hours per day, 7 days per week. Requirements for computer capability and bandwidth must be clearly delineated when students are admitted to the course, so they have the appropriate information necessary for success in Web-based courses.
- Prompt feedback to students is essential in distance education. Because students do not have the traditional, face-to-face communication of conventional classrooms, it is vital that electronic communication be more frequent and highly responsive. Not only is this one of the seven best practices in undergraduate education (Chickering & Gamson, 1991), it is also one of the needs of online learners as described by Palloff and Pratt (2003).
- One of the unexpected benefits of distance education using current technologies is that older students who may not have been very computer savvy entering the program exit with highly improved skills in this area. These are skills they bring back to their workplace to increase job efficiency, communication, and satisfaction. This is also another example of the self-direction of adult learners who integrate new knowledge and skills into their rich professional and social experiences.
- Another way to address the needs of nontraditional students is by developing partnerships, which we have found are readily available within the state. Faculty and staff at other institutions in the state, as well as students' employers, recognize the efforts of the School of Nursing in enabling students to pursue graduate education within their home communities and want to help in any way they can.
- Because virtual students need the class to be learner focused, it is imperative to evaluate each new innovation early in the semester, as well as formally at the end of the course, so problems can be solved before the course ends, if possible. The effect of new technology on students must be assessed often so students feel that all efforts are being made to facilitate their learning.

Lessons Learned for the School of Nursing

- Some faculty members enjoy experimenting with new technologies and derive much job satisfaction from these efforts. They become expert in designing distance education classes and then can mentor other faculty.
- Instructional and information support expertise is vital to distance education efforts. Time invested in building collegial relationships among faculty, administrators, and specialists in technological infrastructure will pay back multifold.

- Adoption of technologies that allow for working students to pursue graduate education results in increased student recruitment and enrollment, and is cost effective.

SUMMARY AND FUTURE IMPLICATIONS

This article described some of the challenges faced by the rural state of West Virginia in providing distant education to citizens who may lack access to traditional educational programs. In addition, we described our experience of establishing an electronic learning (e-learning) environment (National Research Council, 2002) within the WVUSON to offer the graduate nursing program via computer-mediated distance learning (distributed learning) (National Research Council, 2002). Theories about the characteristics of adult learners and the needs of virtual students helped us understand our experience and plan our courses with the needs of the such students in mind.

The WVUSON has been a leader in pioneering distance education methods to reach students within the state. These efforts were described and analyzed, and the lessons we learned were shared for other nursing faculty who face similar challenges. We have demonstrated that distance education can be successful. However, greater challenges lay ahead, particularly regarding the recreation of the paradigm in which students learn. Electronic tools are available to enable learning to be more creative, and the possibilities are limitless, as information technology increases exponentially each year (National Research Council, 2002). Nurse educators are challenged to reconceptualize the teaching process to one in which students are co-creators of communities of learning. Perhaps our young future faculty, using the technology they grew up with, hold the key to continued reshaping of the learning process in graduate nursing education.

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