INSTRUCTIONAL DESIGN AND ASSESSMENT

Establishing a Distance Learning Site for a Traditional Doctor of Pharmacy Program

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Nova Southeastern University in Fort Lauderdale, FL, expanded its traditional, entry-level doctor of pharmacy program to West Palm Beach, FL, using compressed videoconferencing. This descriptive paper outlines considerations in the development of the distant site, describes the distant site facilities and the role of the faculty, identifies policies and procedures, and presents outcomes and implications. Student and faculty surveys were conducted regarding their impressions of the distance teaching methods. Faculty members received instruction on the technical aspects of compressed video as well as on interactive strategies and educational planning. As pedagogy changes from traditional face-to-face settings to videoconference-based environments, continuing education and the development of innovative ways to incorporate technology into the classroom is encouraged.

Keywords: Distance learning, Doctor of Pharmacy, videoconference

INTRODUCTION

Distance education, defined as “the separation of the instructor and the students by space and/or time,” has been an integral and rapidly advancing component of the academic system for many years. By increasing accessibility, it enables learners to continue their education, despite possible restraints such as geography, family, and/or occupational obligations. Distance education encompasses a vast spectrum of delivery techniques, which have evolved from correspondence courses, to television courses, to online classes, and now to a more technologically innovative system known as interactive compressed videoconferencing.

Unlike correspondence and television courses, which lack 2-way communications, compressed videoconferencing offers synchronous learning opportunities with 2-way audio and visual capability. Live (face-to-face) didactic lectures are simultaneously broadcast in a 2-way interactive format by transmitting a combination of data, voice, and video through 3 Integrated Services Digital Network (ISDN) telephone lines to students at multiple distance sites. Despite physical separation, this technology allows both the instructor and the students to work in real time, similar to a traditional classroom setting. With compressed video technology, student-instructor interactivity is maintained, with the ability to conduct planned group discussions as well as question and answer sessions. Interactivity is further enhanced with 2-way visibility, so that neither party is speaking or being spoken to by a faceless voice. The only components compromised with videoconferencing technology are the loss of natural motion, spontaneity of class discussions, the inability to receive visual cues from the faces of the students, and the loss of student-instructor connectivity.

Student-instructor connectivity can, however, be maintained by one or more of the following methods: virtual office hours, e-mail, chat rooms, bulletin boards, telephone, facsimile (fax), or postal service.

Worldwide, institutions for learning have either used or evaluated the possible use of one or more of these aforementioned methods to educate students in a variety of disciplines such as medicine, public health, and business. Prompted by reduced funds for academic training, Michigan State University’s College of Human Medicine had positive results when it explored the use
of videoconferencing technology to provide instruction to medical students, residents, and faculty, and to conduct administrative meetings. The project employed two devices: a questionnaire to assess the participants’ thoughts regarding the use of videoconferencing technology as an instructional delivery system and an observation sheet to record technical difficulties. After 28 sessions, the survey results provided strong support for continued use of the videoconferencing technology with considerable lessons learned and recognizable areas of improvement. The identified lessons learned were to prepare an exact list of required equipment; to ensure timely and efficient communications between the vendor and the appointed purchasing office; and to instruct presenters on how to effectively use technology in the classroom.\textsuperscript{10}

In a comparative study by Umble et al, public health professionals were evaluated to determine the effects of receiving a continuing education course on federal immunization standards, either in a traditional classroom or using satellite broadcast. The study endpoints were significant improvements in knowledge, agreement with the standards, self-efficacy, and adherence to practice recommendations. The study incorporated a survey that was distributed before, immediately after, and 3 months following completion of the 14-hour course. Training offered either in the traditional classroom setting or using satellite broadcast technology resulted in comparable outcomes in all endpoints, thus supporting future use of distance education in national public health programs.\textsuperscript{11}

Bader and Roy of Moorhead State University (MSU) evaluated the capability of interactive television (ITV), in combination with a website and e-mail, to deliver a master of business administration course.\textsuperscript{12} In the fall of 1997, 7 students were enrolled at each of the 2 remote sites and 10 were in the traditional classroom. At the end of the course, the students were asked to complete 3 questionnaires, which evaluated instruction, interactive television facilities, and the instructor’s use of technology. Overall, the students offered positive responses regarding the instructor and the instructor’s use of technology. With regards to the students’ perceptions of ITV as an effective mode of educational delivery, significant differences among students were noted. Students with prior ITV experience were more receptive to the technology, but also more critical of technical difficulties compared with those without prior exposure to the technology. Students at the local site perceived that the technology negatively affected their ability to learn and were less likely to enroll in another ITV course. Remote students, nonetheless, were more tolerant of the technical problems and more likely to participate in future courses via ITV. Despite being on campus or at a remote location, the students’ performance on assignments and examinations was comparable.

Nova University in Fort Lauderdale, Fla, initiated the use of distance education in 1972. By 1994, Nova Southeastern University (NSU) had established itself as an institution capable of providing worldwide compressed videoconferencing. Prior to the 1994 merger of Nova University and Southeastern University of the Health Sciences, Southeastern had developed a North Miami site to service its nontraditional, post-baccalaureate, Doctor of Pharmacy (PharmD) program in 1991. Due to the students’ inability to disrupt their careers and relocate for the purpose of proximity, program enrollment numbers were low. As a result of the request by the American Council on Pharmaceutical Education to maintain nontraditional PharmD programs, the university’s existing infrastructure, and NSU’s mission to utilize technologically innovative delivery systems to provide convenient, high quality education, a distance-learning format was needed. Since the NSU educational philosophy supports a live presentation format, correspondence courses were not an option. Compressed videoconferencing was chosen over satellite broadcast as the delivery system for the PharmD program for 2 essential reasons: its ability to conduct high quality, live, 2-way interaction at a much lower cost and NSU’s previous success with this technology in the education department.

Since January 3, 1995, NSU College of Pharmacy (COP) has utilized 2-way interactive compressed videoconferencing technology for instructional delivery of its distance-learning, nontraditional, post-baccalaureate, PharmD program to students in Fort Lauderdale, Fort Myers, Jacksonville, Orlando, Sarasota, Tampa, and West Palm Beach, Fla. The COP’s nontraditional program also extends to Ponce and San Juan, Puerto Rico. A thorough review of the literature suggests this was the first time that pharmacy education used 2-way live media for instructional delivery to distance sites. To date, NSU’s nontraditional, post-baccalaureate PharmD program has successfully graduated over 260 students. The positive experience gained from this initiative prompted the College to consider piloting a distance education program as part of its existing traditional, entry-level, PharmD curriculum in an effort to address the current workforce demands.
Rationale

Since the establishment of this complete videoconference-based traditional, entry-level pharmacy program is the first of its kind, the intentions of this descriptive paper are 5-fold: to outline considerations in the development of the distance site, to describe the distance site facilities, to describe the role of the faculty, to identify the policies and procedures, and to discuss the outcomes and implications discovered in the beginning years of the distance site program.

Development of the Distance Site

West Palm Beach was identified as the distance site location due to a large number of applications from the Palm Beach, Martin, and St. Lucie County area. It was determined that in the event of serious problems or if the West Palm Beach academic environment was not found to be comparable to that of the Fort Lauderdale campus, both sites would be integrated in Fort Lauderdale with minimal logistic and relocation concerns. The actual distance learning site in West Palm Beach was selected by the President of the University and the Dean of the COP based upon available space and existing NSU operations. Prior to the PharmD program, NSU had already established a working relationship with the owners of the office complex. At that time, NSU was leasing space for the WPB administrative office, computer lab, and several graduate programs.

In creating this pioneer program, a group of faculty and staff were responsible for ensuring a professional presence and learning environment at the distance site. Weekly meetings between the WPB faculty members, NSU administrators, and staff from the Office of Information Technology (OIT) were held during the months prior to and just after the arrival of the students to discuss the needs and progress of the program. To guarantee the timely completion of the distance learning site, deadlines for space allocation, purchases (eg, furniture, equipment), remodeling, and equipment installation were created. The faculty visited the WPB facility to identify potential space for a primary classroom, secondary classrooms, study rooms, an office suite with a re-
ception area, a compounding laboratory, and a drug information and resource center. In selecting suitable rooms for class instruction, physical components such as size, configuration, location, and the number of students were taken into consideration. Engineers and members of OIT were consulted to evaluate and make recommendations regarding classroom acoustics, lighting, environmental factors (eg, temperature, humidity levels), the necessary amount of electrical output, and the necessary audiovisual equipment (Figure 1).13,14

**Distance Site Facilities**

In the WPB Pharmacy Program, students attend lectures in a 1500-square-foot multimedia classroom intended to accommodate 60 students and equipped to serve both as a distance (receiver) and local (sender) site. Lecturers have the ability to deliver material with the use of a computer, a document camera, a Smartboard, a videocassette recorder (VCR), and/or a digital video disk (DVD) player, all of which can be manipulated with either a control panel (Crestron) or a remote keypad (PictureTel). Provision of multiple technologies gives the professor flexibility in developing their own approach for instructional delivery.5 The professor, the lecture material (eg, slides), or both are transmitted for viewing by the students, on either a large screen located at the front of the room or one of the 2 ceiling mounted television monitors in the mid-section of the room. The professor or the computer technician has the ability to switch between images of the lecturer and the lecture material, if necessary. Two television monitors are also floor mounted at the front of the room for the purpose of allowing the lecturer to view students at the remote site(s). Questions and classroom discussions are conducted with the use of a handheld, lavaliere, and/or strategically placed ceiling microphones. (Figure 2) A second multimedia classroom with 2-way video conferencing capability is assigned for “virtual” office hours and elective courses. Furthermore, the site provides the students with multiple designated study rooms, a computer laboratory with 22 workstations, and a student lounge.

In order to provide the West Palm Beach students with practical experience similar to that of the Fort Lauderdale campus, a compounding laboratory was built to coincide with the students’ first year pharmaceuticals course. The compounding laboratory was constructed from an existing 22’ by 34’ room in the office complex. The laboratory, which is designed to accommodate 20 students in an optimal traffic flow pattern, is equipped with five 8’ by 3.5’ compounding stations, 4 sinks, an emergency shower and eyewash station, and abundant storage space. Each station is equipped with standard compounding equipment and electronic and torsion balances. An 18’ by 6’ room, offset from the compounding lab, has been redesigned for storage shelving and computer workstations for prescription labeling.

The drug information and resource center is designed in a 22’ by 38’ room for the purpose of serving as both a library and a future training site for drug information students and residents. The room contains 4 computer workstations with online medical resources and internet capabilities, a basic medical library with texts and journals; 2 copiers, a scanner, and a fax machine. Within the center, a 10’ by 10’ office space was constructed for the drug information faculty.

Role of the Faculty

In August 2000, the WPB Pharmacy Program began with a faculty and staff consisting of a program director, a director of experiential education, an assistant professor of pharmaceutical sciences, an assistant professor of pharmacy practice, and an administrative assistant. After 1 year, the West Palm Beach faculty saw a need for increased assistance with course facilitation, student advising, and other areas necessary for successful daily operation. Since that time, the West Palm Beach site has welcomed new faculty members in the areas of phar-
Policies and Procedures

Due to the technologically advanced nature of this distance learning program, program-specific policies and procedures have been outlined and implemented. All lectures, with the permission of the professors, are videotaped at the transmitting site. In the event of an interrupted or lost transmission, a duplicate videotape is produced and shipped to the remote site for viewing by the students on a designated day and time.

Since identical lecture handouts, texts, assignments, and exams are used between the sites, facilitators are to contact course coordinators/content professors on a regular basis to arrange the physical and/or electronic transport of such materials. Only faculty members or other authorized personnel are permitted to transport and/or reproduce test material. In addition, prior to the scheduled testing day and time, exams are to remain in securely locked file cabinets. After testing is complete, all test scantrons are copied and maintained as a backup in case the originals are lost or damaged during return delivery to the respective course coordinator/content professor at the transmitting site.

Outcomes and Implications

Due to the success of the new program, NSU further expanded its traditional, entry-level PharmD program to include Ponce, Puerto Rico, in August 2001. The Ponce site utilizes the same synchronous learning model and technology as the Fort Lauderdale and West Palm Beach sites. Again, geography is the only difference between the programs. Since the initiation of the distance sites, the entering pharmacy class size has increased from 120 to 180 students. This includes students at the Fort Lauderdale, West Palm Beach, and Ponce site. With a successful first year in Ponce, NSU plans to further expand its program with the development of a distance site 260 miles west of Fort Lauderdale, in Tampa, Florida.

As the West Palm Beach program continues to expand, more faculty members are being recruited to support daily operations, address the academic needs of the students, and to uphold the integrity of the institution. The plan is to increase the faculty by 3 members per year for 4 years to a target number of 12. To accommodate for the increasing number of students and the necessary space requirements, the COP Dean, the NSU Office of Development, and the West Palm Beach Program Director outlined plans for the reallocation and remodeling of existing space (more than 40,000 square feet) within the office complex. Recently, the construction of a new classroom, a student government office, a student recreation room, and additional faculty offices were completed.

The implementation of the West Palm Beach program was financially supported by grants, and increasing student enrollment supports the ongoing expansion process. Regardless of whether students matriculate to the local or the distance site, all students pay the same tuition.
To evaluate the distance site program, there are several assessment tools being utilized. The academic performance of students has and will continue to be assessed by various subgroups to determine the impact of student location, teaching methods, and pre-pharmacy academic history on success. For example, in an analysis of student performance in a pharmaceutical course, there was no statistically significant effect on the location of the student (live versus remote) on exam performance.\(^1\)

During the first 2 years of the program, the West Palm Beach faculty members conducted midterm surveys with their student advisees to ascertain the students’ likes, dislikes, and overall thoughts on being in a distance education environment. In general, the students realize that the use of the compressed video technology affords increased access to pharmacy education, and for some with family commitments, does not require them to relocate or commute to the main campus in Fort Lauderdale. The students’ greatest discontentment with the technology was the frequent interruptions during lectures due to call disconnections that occurred when the program first started. Another notable dislike the students expressed was the instructors’ initial apprehension with the equipment and failure to acknowledge the distance site(s). Throughout the course of the first year, students began to acknowledge improvements with the technology and instructor interactivity with the distance site.

On a continual basis, NSU’s Office of Information Technology (OIT) conducts surveys to assess student concerns regarding the technical aspects (eg, quality of audiovisuals, technical problems/difficulties) of the program. Based on student feedback, OIT directors make every effort to implement the changes and adjustments necessary to ensure an optimal learning environment. During orientation week and several times throughout the academic year, members of OIT teach and/or reiterate the proper use of the videoconferencing technology.

Many faculty members welcome the opportunity to improve their instructional skills with different technologies and explore different teaching modalities. However, like the students, faculty tend to dislike the fact that the audiovisual communications are not “errorless” and that they are sometimes unable to maintain a strong connection with the distance site students. The other pitfall that has been identified is the close student-instructor relationships that are lost as the ratio of students per instructor increases.

To improve confidence and competence with videoconference teaching, the faculty, both local and distance, receive hands-on training classes that focus on the technical aspects of teaching with compressed video, as well as sessions on interactive strategies and educational planning. These seminars, conducted by various members of the education department, are regularly scheduled during the COP annual faculty development week.

**CONCLUSIONS**

The establishment of this videoconference-based distance learning site is a beginning step in addressing the workforce needs of the pharmacy profession by increasing access and educational opportunities for students. To ensure that the academic needs of the students are met on a continual basis, West Palm Beach plans to recruit more faculty to assist with course facilitation, student advising, and precepting at clinical practice sites. Technology, instructor, and student performance assessments will be an ongoing process so that any areas for improvement can be addressed in a timely manner. As pedagogy evolves from the traditional face-to-face setting to a videoconference-based environment, continuing education and the development of innovative ways to incorporate technology into the classroom is encouraged.

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