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Distance Learning in Retrospect

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This article describes the design and implementation of a long-term education project, a joint effort of the Service Employees International Union, Bunker Hill Community College, and nine Massachusetts community hospitals. The object was to offer an associate degree in medical radiography to eleven participants. Details of the funding source, admission process, curriculum, student support services, quality assurance, and problems and solutions are outlined. The authors offer recommendations for future replication.

History

In 1990 the commonwealth of Massachusetts instituted the Department of Medical Security (DMS) to oversee moneys of the DMS Labor Shortage Trust Fund, which was created by assessment of a fee of one-tenth of one percent of revenues on all acute-care hospitals. The purpose was to provide financial support for health care initiatives in areas of labor shortage at a time when several professions were deemed to be seriously underrepresented, among them nursing, radiology, and respiratory and physical therapy.

Service Employees International Union (SEIU) Local 285 presented a proposal that would benefit its members in entry-level, low-paying hospital jobs and train a group of qualified SEIU employees in one of the identified shortage areas. To fulfill its goals, the union formed alliances with nine hospitals throughout the commonwealth and with Bunker Hill Community College (BHCC) in Boston. The institutions, and their distance from BHCC, which would either provide or coordinate the educational offerings, were Burbank (in Fitchburg, 50 miles), Boston City (5 miles), Cape Cod (in Hyannis, 60 miles), Falmouth (84 miles), Framingham (12 miles), Hale (in Haverhill, 32 miles), Hillcrest (in Pittsfield, 160 miles), Jordan (in Plymouth, 45 miles), and North Adams Regional (148 miles). BHCC offered both a regular full-time and an innovative part-time evening medical radiography option, which provided students with jobs and an

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opportunity to acquire new skills. SEIU was awarded a three-year grant of \$250,000 to begin in January 1991. The member hospitals determined that the grant would finance the free medical radiography program, which would be offered statewide.

The original proposal included a fiber-optic system that would have allowed the didactic materials to be sent to all the hospitals, but DMS considered its inclusion excessively extravagant and requested a revised budget.¹ To comply, one of the authors single-handedly discarded the fiber-optic portion, thereby leaving the educational plan in place without the means to implement it with appropriate, up-to-date technology. However, the grant had been awarded, the money was in hand, and the majority of the players set out to activate this ambitious project.

To further complicate the issue, the committee that initiated the plan modeled it after an apprenticeship program in which participants become immersed in the practical setting, thereafter receiving related coursework as necessary. Because this approach did not meet national accreditation standards, BHCC staff were unwilling to consider it. They said the proposed model was an unacceptable education plan, one that had been used years previously when medical radiography programs were housed in hospitals and operated paternalistically, employing students as staff rather than as active learners. It was essential that the new program be credible, coordinated, and meet all national accreditation standards.

Because the funding was limited to a single three-year period, it was necessary to resolve the issues quickly. A clearly worded statement of the college's accreditation requirements was offered. In discussions with all those involved, it became obvious that students would gain competency through the hands-on aspect. This would be accomplished by starting the program on a part-time basis, offering a foundation of instructive material that would be integrated into the clinical experiences. In addition, testing demonstrated that all the interns had to learn basic mathematics before tackling the program's college-level algebra requirement. Students were encouraged to take the basic coursework at a college or university nearest their place of employment or residence. A few interns had acquired transferable credits, but the majority had to begin at square one. The curriculum committee prepared individual educational plans. Classes had been provided and credit obtained through transfer, external studies, and contract and on-site delivery.²

The endeavor to educate students at several different sites presented staff with demanding and time-consuming tasks, including training participants on site to be clinical educators and adjunct faculty. At the same time, they had to conduct the program and maintain quality to ensure that students at a distance completed the program and passed the registry examination. Clinical instructors drawn from hospital staff were offered orientation and follow-up workshops concerning the issues and the supervision of students. All new clinical sites were approved, and two Boston medical centers were included in the distance-learning experiences.

Admission

The students selected by the SEIU for the latest option came from various academic backgrounds. The union had to determine their acceptability in terms of their longevity and union standing and whether they met the college prerequisites. This was difficult because some students were at the developmental level — two who were selected were not eligible to start for that reason and took about a year to attain the necessary level for

acceptance to the program — while others had already earned college credits. All students were notified that they must maintain a B average in all radiation science (RSR) courses and a C in general college courses to meet the stated program requirements. Students had to be high school graduates or the equivalent, have taken a biological science with laboratory work, and test into college algebra (MAT 195). All college entrants had to take a computerized placement test, which measured their ability in mathematics, English, and reading. Students placed in developmental courses had to complete all required coursework before being accepted into the program.

Eleven interns were chosen on the basis of their ability, longevity, and employment status. There ensued discussions as to the most effective method for offering the program. Consultation with medical radiography faculty led to fashioning the distance option, as it came to be known, after an existing successful part-time evening program (see Exhibit 1).

Curriculum

An initial review of the curriculum determined that the distance students, like all Bunker Hill Community College students, would be required to pass practical examinations for the first two positioning courses, RSR 106, Essentials of Positioning 1, and RSR 107, Essentials of Positioning 2. The integration of distance and on-site medical radiography students accomplished the following:

- maintained quality assurance;
- improved the sense of belonging among the distance students; and
- increased communication between distance and college-based faculty.

BHCC assembled a team to adapt the medical radiography curriculum for SEIU distance learning. Members included the dean of Health Care Professions, Medical Radiography Program faculty, Center for Self-directed Learning staff, academic instructors, and clinical site coordinators. Their first challenge was to assess and design an individualized education plan for each intern. Students fell into three groups: three had fulfilled many mathematics, science, and English requirements; six were ready to undertake college-level mathematics and English and were already taking science courses at other institutions; and two had to complete developmental courses prior to being admitted to college-level courses.

The second challenge was to examine the program courses and decide how each could be adapted to distance-learning modalities.³ Basing them on existing BHCC models, the committee tailored some courses to the requirements of the External Studies Program of the Center for Self-directed Studies. Other courses were devised as individual contracts, a format that allows instructors to break subjects down to distinct modules. Students must meet with instructors at scheduled times for review and assessment within a two-semester time frame to fulfill the requirements. The committee also surveyed courses offered by other institutions that would enable students to take classes nearer to their homes. For courses outside these formats, students had to travel to BHCC on a specific schedule. For example, six-hour sessions of Physics 1 and Physics 2 were scheduled every other weekend.

The third challenge was to examine the sequence of medical radiography course offerings and, using that framework, design an individual educational plan for each

Exhibit 1

Model Curriculum

Year 1

First Semester	Credits
Standards of Patient Care	4
College Writing 1	1
Mathematics	3
Total	10

Second Semester	
College Writing 2	3
Radiation Physics 1	3
Imaging Methods 1	3
Total	9

Summer Semester	
Radiation Physics 2	3
Behavior or Social Science elective	3
Total	6

Year 2

Third Semester	Credits
Imaging Methods 2	3
Anatomy and Physiology with Laboratory 1	4
Total	7

Fourth Semester	
Anatomy and Physiology with Laboratory 2	4
Essentials of Positioning 1	3
Clinical Internship 1	2
Total	9

Summer Intersession	
Health and Disease	2
Essentials of Positioning 2	3
Clinical Internship 2	1
Total	6

Year 3

First Semester	Credits
Essentials of Positioning	2
Radiology Biology and Protection	3
Clinical Internship 3	1
Total	6

Second Semester	
Practicum 1	2
Practicum 2	2
Total	4

Summer Semester	
Practicum 3	3
Practicum 4	3
Total	6

Total Credits 63

intern. Countless hours were spent analyzing the program of study sequence and exploring the feasibility of offering courses out of sequence. The committee considered factors including the educational impact on the program, the availability of qualified instructors, and each intern's work schedule. Once the plans were drawn up, it was time to inaugurate the first semester, which was accomplished in September 1991. A typical plan comprised contract courses, courses at nearby institutions, and an external studies course.

Because of their proximity to the college, the three Boston City Hospital interns attended classes with the regular medical radiography students.

As the first semester progressed, students began to show evidence of distress. Some had difficulty keeping up with the work schedule, and delays in sending and receiving materials through the mail were frustrating for all. Students who were not used to studying on their own had to learn to manage their time. It became necessary to identify a contact person at each participating hospital who could administer tests and assess the students' academic progress. They worked closely with the college site coordinator to monitor and recognize the discrete needs of each student.

By the spring 1992 semester, the individual plans of each intern had to be reviewed and updated to provide the basis for documenting each student's progress and fulfilling needs for the following semester, including scheduling times and locations of courses as well as purchasing and mailing books and materials. In addition, the SEIU director and hospital management had to negotiate work release time for students on the basis of their individual education plans, a time-consuming and often frustrating process. Factors such as failure of students to complete a course on time disrupted plans and presented scheduling problems.

Student Support

Another challenge for the BHCC team was to provide telephone and on-site support and encouragement as well as academic guidance to the distance-learning SEIU interns, who reported their work schedules and indicated the best times they could be reached at work and at home. Initially, it was difficult to establish the lines of communication, and interns discovered that they had to keep in touch with many people for different reasons. The main task of the BHCC site coordinator was to keep track of each intern's academic progress and needs.⁴ It involved ordering books and materials from the bookstore and ensuring that they were mailed to the appropriate recipients. Telephone conversations ranged from inquiries concerning interns' progress with course materials to dealing with work release schedules and personal problems. Such calls were usually placed during evening hours when interns were apt to be home and have the time to discuss pertinent subjects.

The interns, who met as a group for orientation at the beginning of the program, were required, at least once a semester, to present themselves at the college for additional information and update sessions. Aside from such contacts, most counsel and support was offered via telephone and on-site visits by the coordinator and instructors. The site coordinator's responsibilities left little time for arranging schedules and telephone calls, and the scarcity of long-distance lines presented a drawback. It was difficult to anticipate students' needs for this new venture, and the mundane tasks of mailing books to students, making sure interns were returning material to the appropriate college departments, and collecting medical forms consumed large amounts of time.

Quality Assurance

All U.S. accredited radiography technology programs are governed by the Joint Review Committee on Education in Radiologic Technology (JRCERT). To retain accreditation, each program must follow specific guidelines. JRCERT monitors each program every

five years or sooner, depending on the program's previous review. Quality assurance is maintained by assessing a provider's curriculum, faculty, clinical affiliates, and personnel. When SEIU approached Bunker Hill Community College, its Medical Radiography Program was accredited for two options, full-time day and part-time evening. Distance learning became the third. The two-year, full-time program includes integrated classroom, laboratory, and clinical components; the nine-semester, part-time evening program clusters the instruction in a five-semester schedule followed by four semesters of clinical experience.

There was concern as to how JRCERT might view the decision to model the distance option on the part-time program. The major difference between the two was that the distance option negotiated release time for students to attend class and clinical portions of the curriculum. Prior to the agency's next scheduled visit, an outside consultant was hired to review the program from the perspective of JRCERT standards. It was felt that the consultant, who was not associated with the college or its program, would be more objective than an insider. He reported that the program met all the accreditation guidelines but that it would be difficult to explain how the three different approaches produced the same results. To meet such resistance, the faculty designed, as an introduction to the accreditation team's visit, a multimedia presentation that clearly compared and contrasted the similarities and dissimilarities of the three options. Additionally, clinical affiliates provided a realistic setting for the students' clinical experiences. The college was responsible for obtaining signed contracts that clarified the hospital/college role and verified the partnership.

The distance option was also evaluated by SEIU and the Ford Foundation. The latter, considering countrywide duplication, monitored the program from its beginning. SEIU monitoring was required by the grant.

Problems

Several problems had to be addressed during the life of the grant: appointing and training on-site clinical instructors, Committee on Allied Health Education and Accreditation's approval of the new clinical sites, effective communication among all participants, and meeting the multiple needs of students, staff, faculty, and hospitals.⁵

Communication seemed to be the most difficult issue, but we implemented a number of methods that provided clear and direct interactions, including the designation of a liaison at each site. That person received, monitored, and returned all course material, namely, tests, forms, and evaluations. The college counselor telephoned each intern weekly, at a set time and place, to keep abreast of progress and concerns.⁶ Each student received a list of titles, addresses, and phone numbers and the role and responsibilities of all persons involved in the project to facilitate direct contact with an appropriate person when questions arose. College faculty, who had to increase the frequency of their visits to the clinical sites, were able to offer personal direction and suggestions to those who sought advice.

Much resistance emerged, one of the greatest obstacles being to convince full-time medical radiography faculty to participate. Their apprehension was expressed in such questions as *Where do I find time to add more work to my schedule? With whom will I confer about distance teaching since this is the first such offering in the state? What type of compensation will I receive? How will this project affect program outcomes?* College on-site clinical personnel were concerned that the new distance clinical

instructors would not be easily integrated because they lacked experience and knowledge of the program. The clinical instructors at participating hospitals had little or no experience as educators. All of this meant that individual training and instruction would be essential to ensure successful course presentation. One approach was to utilize audio-conferencing, as Henry suggested.⁷ The faculty and support staff met monthly with the division dean to manage coordination of students and faculty, which kept the program on track.⁸

The faculty at distant sites kept in close contact with the on-site faculty, usually weekly, via telephone. Such communication concerned course materials, student grading, and requests for assistance with the clinical evaluation tool. Formal meetings were held with participating hospital personnel, who were invited to meet at the college, giving them an opportunity to interact and better understand the concept and direction of the program and this particular project. Faculty and staff orientation was accomplished through a series of workshops designed to

- enhance this mode of education;
- offer the faculty the opportunity to become familiar with individual styles of the college staff;
- establish the concept of the team approach; and
- encourage a sense of collegiality.

Once the program was set in motion, the coordination improved tremendously. Major components included

- continual assessment and evaluation;
- active participation by the distance students;
- in-depth examination of clinical competencies; and
- constant fax use.

Recommendations

We offer several recommendations resulting from our intimate connection with the program during the years of the grant.

- Incorporate the necessary fiber-optic technology.⁹
- Involve college personnel in the initial selection of student interns.
- Employ two persons at the college to deal with students exclusively, to counsel, register, communicate, administer, and visit, and direct all curriculum efforts and initiatives in close coordination with project and college personnel.
- Purchase additional instructional aids for the new clinical sites.
- Allow students to “own” more of the project, that is, by requiring them to pay a nominal fee each semester to help defray total project costs.

- Most important: replicate this program statewide, using appropriate technology, with another group of interns.

Fulmer et al. note that “people are the key to success in distance learning. These include motivated students, full- or part-time faculty at outreach sites for clinical supervision and liaison, flexible on-campus faculty.”¹⁰ Our experience has certainly validated this statement. 🚲

Update

Ten of the eleven students enrolled in the program graduated and are registered technologists working in the field.

The manuscript for this article was formatted and Exhibit 1 created by Nancy K. Pitchford.

Notes

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