An Organizational Diffusion Study on Distance Education

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Abstract

This research explored the diffusion process of distance education in schools of public health to determine best practices in the planning and implementation of future programs. The researcher traced the diffusion process by utilizing a multiple-case study methodology using a semi-structured interview to collect the perceptions of Distance Learning Coordinators within five schools of public health and a monitor survey of each program's website to corroborate interview data. The research focused on the implementation of programs and explored why schools of public health developed distance education programs; how schools of public health restructured to facilitate development and implementation of distance education programs; and how distance education was refined to meet the needs of the schools of public health.

Introduction

The advents of the personal computer, networking capabilities, and communication technologies have permanently altered the face of education. Within the scope of higher education, schools of public health are challenged to fully utilize these technologies to advance their missions of service, research, and teaching. According to the accrediting agency for schools of public health, Council on Education for Public Health, each school establishes its own individual mission and subsequent goals and objectives while at a minimum preparing “public health practitioners who are able to identify and assess needs of populations; plan, implement and evaluate programs to address those needs; and otherwise assure conditions which protect and promote the health of populations.” Schools of public health serve as venues for the training and preparation of the public health workforce. However, according to the Institute of Medicine (IOM) (2003), only 20% of public health workers possess specific training in public health. As the professional

competencies of public health practice are further and better defined, those practitioners that are trained in public health will need additional professional development (Council on Linkages, 2001)

While much research on distance education has been conducted within higher education (Lewis, 1997, 1999, 2003), little has been conducted concerning the use or feasibility of distance education within schools of public health or on how or why they would utilize distance education. Organizations and workgroups tasked with addressing the professional development needs of the public health workforce have recommended using distance education as a strategy to address educational gaps and to facilitate access to lifelong learning. (IOM, 2002, 2003; Public Health Service, 1998) Although these reports recommend distance education, they are based on anecdotal evidence rather than research of distance education programs.

In order to determine best practices in the planning and implementation of future programs, this study explored the diffusion process of distance education in schools of public health. The study focused on the implementation phase of diffusion of the innovation (Rogers , 1995) of distance education within the organizational context of the schools of public health, investigating the following questions:

- Why are schools of public health developing distance education programs? What are the motivating factors?

- How are schools of public health restructuring to facilitate development and implementation of distance education programs?

- How has distance education been refined to meet schools of public health's needs?

Methods

In order to explore the implementation processes that schools of public health utilize with distance education programs, a multiple-case study was employed. Case studies are appropriate and “the preferred strategy when ‘how' or ‘why' questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context” (Yin, 2003).

The researcher recruited participants from a pool of nine certified schools of public health which offered a Master of Public Health program through distance education (either with or without a residency/onsite requirement) beyond the school's state limits during the fall of 2003. Of the nine schools of public health meeting the study criteria, four had participated in the Graduate Certificate Program, a Centers for Disease Control and Prevention project which funded the creation of alternative, distance certificate programs. Considering the potential impact of this program on the results, the five schools recruited for the study were divided into two groups: Group One schools (n=2) received Graduate Certificate Program funds and Group Two schools (n=3) did not. According to Yin (2003), literal replication of case studies is accomplished with two to three cases. Each of the schools' Distance Learning Coordinators (DLC) identified by the Association of Schools of Public Health participated in the study.

Rogers ' (1995) diffusion of innovations theory within organizations informed the development of the research and guided the data analyses. According to Rogers , the innovation process in

organizations is divided into two broad activities, initiation and implementation, which are further subdivided into five stages: agenda setting, matching, redefining/restructuring, clarifying, and routinizing. Initiation activities include the agenda setting and matching stages and involve the gathering of information, subsequent conceptualization, and planning for adopting the innovation, concluding with the decision to adopt. Implementation involves all activities surrounding the actual use of the innovation, including redefining/restructuring the innovation and the organization, clarifying the relationship between the two, and routinizing the innovation as an ongoing element within the organization. The questions for the semi-structured interview (See Table 1) were developed based on the stages of diffusion of innovation in organizations.

Table 1 : Stages of the Diffusion of Innovations Theory and Corresponding Interview Questions

Stage	Corresponding Question
Agenda-setting	• What motivated your school to begin a distance education program?
Matching	• When deciding to adopt a distance education program, what were the perceived barriers? • When deciding to adopt a distance education program, what were the perceived facilitators?
Redefining & Restructuring	• What policies or infrastructure changes did the school make in implementing the program? • In what ways, if any, has the initial concept of distance education changed as the program was implemented?
Clarifying	• What actual barriers did you encounter in implementing the distance education program? • What actual facilitators did you encounter in implementing the distance education program?
Routinizing	• Describe the future of distance education within your school?

Additionally, a monitor survey was used to assess the presence of distance education program components and to corroborate that those components identified in the interviews were apparent on each school's website. A monitor survey is a modification of the windshield survey used in community assessment. The windshield survey involves driving through areas and literally assessing what can be seen through the windshield. (Sharpe, 2000) A monitor survey involves systematically assessing organizations' resources available on the world wide web through a computer monitor.

All interviews were tape recorded and transcribed. These text files were then loaded into a qualitative software package called NVivo®, a product of Qualitative Solutions & Research. According to Patton (2002), “qualitative software programs facilitate data storage, coding, retrieval, comparing, and linking—but human beings do the analysis.” All data were collected and stored in an NVivo project file, which stores both table data and text filed. (Richards, 2000)

Analysis of data was conducted using content analysis, a method which involves segmenting each interview into thematic categories. (Morse, 1995) Coding was used to categorize the topics that were identified. Coding is “the process of identifying persistent words, phrases, themes, or concepts within the data so that the underlying patterns can be identified and analyzed” (Morse, 1995). In order to address issues of validity, an external coder used the preliminary codebook to code two questions from the first interview that had been analyzed by the primary researcher. The external coder then met with the researcher to review and discuss each coded passage. This process resulted in an inter-rater reliability of 88%, with only three discrepancies out of 25 total coded passages. During this meeting, ways to improve the codebook were discussed and the decision was made to further reduce the number of categories. The researcher coded each of the interviews an additional two times, first by hand and then in NVivo.

The researcher then created a monitor survey instrument to assess the presence of program components by searching the organizations' websites. The monitor survey captured information on the following:

- The school of public health's mission statement, goals, and/or purpose statement, specifically mention of concepts such as outreach and educating practitioners.

- Descriptions of distance education programs on main school pages and in student catalogues. Subcategories of program descriptions included residency requirements, number of hours to complete degrees, and technology requirements.

- How students were instructed to access student services, such as career counseling, advisement, registration, etc.

- Student assessment tools and orientation and introductory units.

Findings from the monitor survey were loaded into NVivo and coded using the same codebook used for the interviews. The purpose of utilizing the monitor survey was to corroborate findings from the interviews and achieve data triangulation.

With the single-case analysis completed in the final recoding of the interviews corroborated by findings from the monitor survey, cross-case analysis was instigated. In keeping with the two group organization of the study, the researcher compared the presence of themes in Groups One and Group Two, schools receiving Graduate Certificate Program funds and those that did not. The emerging themes were found three times across the groups and at least once within each group. As there were no significant differences between Group One and Two, all findings were reported in aggregate. In the final cross-case analysis of all five schools, a theme was determined by its presence in at least three schools.

Results

The researcher traced the diffusion process by analysis of the perceptions of the Distance Learning Coordinators (DLCs) within five SPHs gathered through a semi-structured interview and an analysis of data from a monitor survey of the organizations' websites. The results of the qualitative analysis are presented in seven categories of themes described below:

Motivation: Motivation to begin distance education programs included reaching out to public health professionals; fulfilling an assessed need; responding to the demand of external forces; and being motivating by an individual or champion. Four of the schools responded that reaching out to the public health practitioner was a primary motivation. As one participant said, they wanted to "do a better job of outreach to our professional public health community." Another spoke directly of access for the student saying, "I think generally speaking it was to increase access to this type of education to students who otherwise would not have had the opportunity."

Programs also were motivated by assessed need, needs identified through various research. For examples, schools mentioned research which had revealed a lack of formal public health training by practitioners and studies on trends in student enrollment. Closely related to assessed need was demand, expressed in various forms ranging from students asking for classes to organizations requesting distance education program proposals. All schools identified an instigating person, or a champion, as motivation. These champions were most often "faculty members, [who] sort of had some interest in distance education."

Facilitators : Once the decision to adopt a distance education program was made, several factors facilitated the development and implementation of the program, including support from within the school of public health; support from other schools and divisions within the university structure; compatibility with existing programs; and funding. The importance of having the support of the administration within the school of public health was voiced by four of the five respondents. Specifically, the schools named the dean's office, the actual dean, department chairs and others administrators, and the faculty and staff. As one respondent said, "We were fortunate to have that support from the dean and various chairs of the departments at the school." The dean's support was important to programs in a number of ways, including access to funding, fostering faculty support, and lending the prestige of the office to clear bureaucratic roadblocks.

All schools agreed that "you need champions who will carry the banner forward, because of the extraordinary barriers and issues that you need to overcome in this." Faculty buy-in was essential to the success of the programs. "We got the early adopters who really saw the advantage of having distance education and saw the effectiveness of the distance education program." Support from the university outside of the school of public health also proved to facilitate the implementation of the programs. This support was seen in registration, library and computer services, overall administration, and strategic planning to support distance education throughout the university. Other facilitators to implementing the programs were attempts by the schools to make the distance education program fit within the existing structure. One participant explained that in working to fit the program into the existing structure, they also had to emphasize that the only difference between the distance program and the traditional program was in how it was delivered. A final facilitator for distance education program development mentioned by all schools dealt with the allocation or award of funds for program development. As one participant very succinctly said, "Funding was crucial."

Barriers : Participants identified a number of barriers to distance education programs, including money needed for program costs; the attitudes, skills, and workload realities of faculty and staff; and issues related to student technology. While having funding was seen as a facilitator, all of the

participants also identified the cost of developing and implementing a distance education program as a barrier. In planning to develop the distance education programs, they realized that they would need to bring in instructional designers and other staff and the economics of distance education were very different from traditional, classroom education. In distance education, schools noted that 95% of course costs are incurred before the class begins, in contrast to traditional courses, where costs accrue throughout the course.

Another barrier was lack of support due to the attitude and/or suspicions of faculty and staff regarding distance education. Suspicions and fear of the efficacy of distance education were cited by several schools as barriers and were perceived as keeping faculty from participating:

T he other big [barrier] was the fear on the part of many of the faculty that courses taught [at a] distance would not have the same rigor as the classes conducted on site . . . those who were suspicious of it probably did not get involved.

For the staff, faculty, or students not inhibited by negative attitudes toward distance education, another potentially daunting barrier was unfamiliarity with technology. One school said, " Faculty, staff, students all have to learn a new set of skills. That's a huge, a huge barrier, both perceived and real." One school found "that students routinely, wildly, overestimated their technical ability." When talking about this lack of technological skills, schools explained that another problem lay in faculty's lack of formal training in teaching, saying that " relatively few professors are even trained in teaching. People in higher education are hired because they are subject matter experts in a specific kind of field."

Schools also found that while many junior faculty have the skills and the desire to participate in distance education, the tenure and promotion policies are not designed to reward this participation. In fact, junior faculty may have problems achieving tenure if they spend too much time in distance education activities. Another issue regarding faculty and workload was how senior, tenured faculty could fit a new endeavor, such as developing and teaching a distance education course, into their already filled schedules.

Finally, f our of the five schools cited aspects of learner technology as a problem in distance education. Schools noted that students often lacked access to email and/or the internet either at home or at work. Another problem posing serious challenges to student participation was found with older computers, leading schools to develop minimum technology requirements.

Changes in SPHs: Schools of public health changed in various ways in order to accommodate the distance education programs. These changes were in the administration of the school itself; in support for faculty; in the creation of new positions and divisions; and in the development and enhancement of student services.

Administration changes included those within policies and contracts, strategic plans, and funding models. These changes were more often the result of learning through experience, not from planning. For example, policies regarding ownership of course materials became an issue the first time an instructor left the school.

Funding and financial issues continued to be a concern for these schools. With funding acting as both a facilitator and barrier to program development and implementation, schools identified strategies for harnessing or overcoming these financial issues. The schools addressed

sustainability through strategic planning and development of responsive funding models. Several schools were established on a receipts-basis. As one school stated their program was “designed to be self-funded.” Another school indicated that for the dean to continue to support and approve their business plan that the program had to “stay within the appropriate budget and show appropriate return of the investment.”

Schools were challenged to develop strategies and ways to assist and support faculty to increase and improve their participation. As one school asked, “How do we get these professors who have been teaching for decades and allow them to interact and present materials to profess over the web?” The strategies to address the challenge of engaging faculty included various forms of professional development, incentives, and differing uses of teaching assistants. In addition, most of the schools adopted a team approach for the creation of their courses and programs. They realized that faculty were the content experts and should not spend their time learning the many technological tasks and skills necessary to develop effective distance-based materials and programs. Schools created new positions and divisions for their distance education programs (e.g., program directors/coordinators, instructional designers, and graphic designers).

As the schools changed policies and as faculty and new staff began to work together to make distance education a reality, students encountered challenges as they attempted to register for courses, go through advisement, and access other resources, including library services from a distance. As was seen in other changes within the school, the changes in student services took place through an extended process as problems arose.

Changes in Distance E ducation : Just as changes were made within the organizations, refinements were also made to the innovation of distance education, including changes in technology and facilitation of student learning. One school clarified that the *concept* of distance education had not changed, but that the *delivery* of distance education had. This was seen in changing software, improvements in technology, and changing from one medium to another, as from video-based to internet-based. “The technology was still the internet, but we kept improving the application of the technology to the delivery overtime, with better technology.”

Refinements and changes to student support included educational resources that introduced students to online learning and programs that assessed whether or not the students' computer met minimum requirements and if the student possessed requisite technology skills.

In response to student challenges, schools developed various tools and resources that were available to students online. These tools and resources allowed students to self-diagnose their technology and computer skills. When skill gaps were identified, the programs pointed the students to tutorials. In helping the students to help themselves, the schools also benefited as the number of technical support calls decreased dramatically.

So what we found when we instituted that skills test, our support calls dropped almost to zero instantly. Students could do that self-assessment. They could figure out where their skill deficiencies were and they were highly motivated to address them. And we had all of the tools there to allow them to do it and they could move on and get on with their education.

Impact of Distance Education : In developing and implementing these distance education programs, an unexpected effect was reported by several schools: the schools' curricula improved overall. “I think . . . that the digital revolution is really provoking us and stimulating us to think

in very, very different ways about teaching and, most importantly, about learning." Another school described how the traditional curriculum was improved as a result of developing the distance education program:

We did address some of the curricular issues, probably more successfully than [they] had ever been addressed. There had been many years of complaints by students and faculty that these courses were in academic silos. That they did not relate to what these students found in what they were doing out in the field. So they didn't see the practical benefits of taking these core courses. So what they did is they took the opportunity of putting them online as an exercise in asking some questions: "So what?" "Why is this important?" "Why do we do it this way?"

Future of Programs : When asked to describe the future of distance education within their schools of public health, participants overwhelmingly agreed that their programs would expand in some capacity. New or expanded programs included more distance master degrees, certificate and other continuing education programs, and even doctoral degrees. Expansion of existing programs included not only increasing the number of students, but also the number and types of programs and maintaining and/or improving quality with the growth. Several respondents also alluded to changes in concepts of education in general.

Ideally, I want to get to a point where we no longer think of traditional education and distance education as offering it in two categories. What we would like to move toward, philosophically, is a more integrated view and an integrated understanding of learning. . . . Distance education has helped us to get away from the idea of education as something we *do to* people to thinking of learning as a process that we *go through with* people.

Discussion

Implications: One purpose of this research was to identify, from the experiences of others, strategies to advance the innovation of distance education in schools of public health relative to the stages of diffusion. In this section, implications for best practice within each stage of diffusion are identified.

Initiation: Agenda-setting

Agenda-setting occurs when a school identifies a perceived need or a performance gap. For a school of public health, this need may be a discrepancy between a school's mission to serve practitioners and the practitioners' inability to participate in traditional programs due to location and/or obligations. Activities that would advance distance education as a means to bridge this gap include the following:

- Ensure that distance education is clearly included in the school's strategic plan as a mechanism to reach practitioners.

- Gather evidence of practitioners' needs through workforce assessments. Possible data elements include national and state data on the low number of practitioners who have academic training in public health; the geographic distribution of practitioners in relation to the location of the school of public health; and the school's capacity to accommodate additional learners.

Initiation: Matching

Matching occurs once the school has determined that distance education is a suitable solution for an identified unmet need. Strategies to build support for distance education in the matching stage include building on existing infrastructure and/or curricular strengths, such as:

- Enhance/expand existing, older generation distance programs. An example would be modifying courses delivered via video satellite/broadcast to delivery via computer-based instruction.

- Align proposed programs with the current technology capabilities of the university, i.e., established satellite/broadcast system, computer emphasis, learning management systems, etc.

- Identify existing curricula which have high demand among practitioners.

- Identify potential internal and external funding sources.

Implementation: Redefining/restructuring

During implementation, new programs often place stress on existing institutional systems. Comprehensive program planning done ahead of time can help to ease such burdens and advance diffusion during the critical early stages of re-defining and restructuring the program. Programs should establish a planning group to include as many stakeholders as possible during this stage. Possible stakeholders include representatives from the faculty, dean's office, registrar, library services, student services, the graduate school, computer services, state/local level practitioners, and students. The following issues will need to be addressed:

What type of funding model will be utilized?

Where will the courses be housed (administratively and technologically?

How will students at a distance register for classes and access library resources?

The following are additional strategies which may be used to advance the diffusion of distance education through the redefining/restructuring phase:

- Utilize a team approach to course development. This strategy allows faculty to be content experts and other professional staff to be the technology and instructional design experts.

- Enable online student registration and distance advisement. Train staff on providing services.

- Develop a launch strategy which minimizes upfront costs. For example, by offering a limited number of core courses, the offered courses will have higher enrollment which offsets costs and has a secondary benefit of promoting cohorts and building community among learners.

- Address common questions and problems to promote students' problem-solving skills and to minimize the need for technical assistance. Provide online orientation, assessments, and remedial resources.

• Anticipate faculty resistance. Provide incentives to senior faculty to work on first courses and address tenure and promotion issues. Promote success and utilize champions.

• Build evaluation into all aspects of the program. Elements to measure include the number of students per course, satisfaction, technical assistance calls from students, grades, observations from both faculty and TAs, impact on job performance, etc.

Implementation: Clarifying & Routinizing

In distance education programs, clarifying and routinizing stages occur as the program is expanded and/or has greater enrollment and the faculty and staff of the school gain a common understanding of the programs. These programs then become regular components of the schools of public health. Strategies to encourage these stages would include those that increase the program's exposure, including:

• Provide regular updates on the program in faculty and administrative meetings.

• Include articles on the program in school publications/newsletters. This could include spotlighting a faculty member or student, program overviews, or extraordinary impacts of the program, such as new research opportunities.

• Submit manuscripts for publication in professional journals and abstracts for state and national conferences.

Recommendations & Conclusion

This study explored the diffusion process within schools of public health when implementing distance education programs. The research was never intended to represent a generalized snapshot of distance education programs in all schools of public health. The research results provide a clear rationale for surveying all of the schools to assess programs components, such as delivery methods and residency requirements, and program participants, such as age, gender, and profession. This information could supplement the program descriptions which are available on the Association of Schools of Public Health's website.

Additionally, this research did not attempt to evaluate the effectiveness or cost benefit of public health distance education programs. More research is needed to evaluate the long-term effectiveness of distance delivery of educational programs as they relate to practitioner competencies. This type of research is long-term, difficult to accomplish, and would require a significant funding resource. However, some research on the impact of distance education in the field of public health is necessary to support recommendations in various reports which view distance methodology as a solution to increasing the competencies of the public health workforce.

Findings also indicate a need for programs to encourage and grow professionals to lead the development of distance education programs for public health practitioners. For example, a fellowship program would allow scholars to study existing programs and build on the literature of distance education in public health. Additionally, a fellowship program could be used to harness the potential of improving existing curricula when developing distance education programs.

In conclusion, technological advances have changed the face and vision of higher education. While several schools of public health are realizing the potential of these technologies in developing and expanding distance education programs, many others have not. The schools seeking to begin or further distance education can benefit from other schools' experience better plan their programs to serve practitioners and achieve their educational outreach goals.

Note: A case-study of the Graduate Certificate Program mentioned in this article was published in the Spring 2005 (Volume VIII, Number I) issue of the Online Journal of Distance Learning Administration.

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