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Design and Development of an MPH Program for Online Delivery

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Abstract

The Master of Public Health (MPH) degree is growing in popularity and is now delivered fully online by a large number of highly respected, fully accredited universities. This paper offers an overview of program design and development strategies that promote successful online delivery of MPH programs. Design and development challenges are discussed in terms of new accreditation standards, student demand, faculty development, user needs, course content, and plan of study. The development of an online MPH program at Utah State University with a concentration in health education and promotion is used to highlight and consider various aspects of this important but challenging process.

I. Introduction

The Master of Public Health (MPH) degree is experiencing increased demand throughout the world as the need and expectation for high-quality public health services continues to grow (Lane, 2000). Growing health inequities among diverse populations and expanded responsibilities for public health workers has resulted in higher demand for public health services even as resources for public health education are diminishing in many settings (Alexander, Igumbor, & Sanders, 2009; Bell & MacDougall, 2013; Shalauta, Burke, Gordon, Stern, & Tran, 1999). As such, it is important to find effective educational strategies that can reach a broader audience in raising the competence of public health workers.

In many public health disciplines, new educational methods that go beyond traditional classroom experiences are needed to help current practitioners, and new students carry out core public health functions, update skill areas, and achieve broad

public health objectives (Dodds, Laraia, & Carbone, 2003). As a result, distance education delivery methods are being evaluated as possible avenues for bringing MPH training to diverse populations of public health workers and new students who may otherwise not have access to training (Cannon, Umble, Steckler, & Shay, 2001; Jimbo, 2002; Laraia, Dodds, Benjamin, Jones, & Carbone, 2008; Schwimmer, 1999; Umble, Shay, & Sollecito, 2003).

Various distance education strategies have been evaluated for content delivery in a large number of public health disciplines, including epidemiology (Patel, 2000; Treloar, 1998), maternal and child health (Polhamus, Farel, & Trester, 2000; Steckler et al., 2001), public health nutrition (Dodds et al., 2003; Laraia et al., 2008), preventive medicine (Khonsari & Fabri, 1997; Lane, 2000; Mackenzie, 1983), occupational hygiene (Vincent, 2005), biostatistics (de Jong, Verstegen, Tan, & O'Connor, 2013; Gemmell, Sandars, Taylor, & Reed, 2011), qualitative research methods (Steckler et al., 2001), and tobacco control (Leatherdale, Viehbeck, Murphy, Norman, & Schultz, 2007). These evaluations have taken place in culturally-, economically-, and geographically-diverse settings including countries such as Mexico (The Working Group of the Innovation Program in Health Systems and Professional Training, 1995), Brazil (Buss, 1999), Latin American countries (Members of the European Latin American Public Health Network, 2001), Hungary (The Tempus Consortium for a New Public Health in Hungary, 1992), Poland (Szosland & Marcinkiewicz, 2004), other European countries (Members of the European Latin American Public Health Network, 2001), various African nations (Alexander et al., 2009); and the United States (Davis, Sollecito, Shay, & Williamson, 2004), Canada (Bell & MacDougall, 2013), and Australia (Treloar, 1998).

Throughout the U.S., a large number of institutions are beginning to offer an MPH degree via distance education methods (Best Colleges, 2018; Woodhouse, Auld, Livingood, & Mulligan, 2006). The Kinesiology and Health Science (KHS) Department at Utah State University (USU) is currently in the early stages of developing and offering an MPH program in health education and promotion for online delivery at the main campus in Logan, and throughout USU's Regional Campus system.

The goal of this paper is to:

- briefly review the literature in relation to key outcomes of distance-delivered MPH programs;

- outline steps for determining program need, student demand, and institutional readiness;
- consider theoretical and curriculum design strategies in the context of evolving accreditation demands; and
- propose a meaningful process for designing, developing, and implementing an MPH program via online delivery given a number of challenges.

II. Key Outcomes of Distance Delivered MPH Programs

In a 2000 publication, Birnbaum and Greenhalgh argued that we "should proceed with caution and systematic evaluation" as we move toward the delivery of distance education programs which offer both "rewards and pitfalls" (Birnbaum & Greenhalgh, 2000). Perhaps in response to this call for caution and systematic evaluation, a number of rigorous evaluations have since demonstrated the effectiveness of distance education methods for delivering high-quality MPH instruction in a number of disciplines and in a variety of settings. Distance education MPH programs, in particular, have been shown to positively impact student academic achievement, career success, knowledge, attitudes, practices, and satisfaction (Davis et al., 2004). In most cases the outcomes achieved through distance education are comparable to traditional face-to-face, on-campus programs (Davis et al., 2004; de Jong et al., 2013; Galway, Corbett, Takaro, Tairyan, & Frank, 2014; George et al., 2014; Liu et al., 2016; Riley & Anderson, 2006; Treloar, 1998; Umble et al., 2003).

A. Student Achievement

A study that compared graduates from a traditional MPH program against students from a distance education MPH program found that course grades and grade point averages were similar for both programs as determined by the Fisher exact test (Laraia et al., 2008). The authors concluded that distance education strategies were suitable for delivering an MPH curriculum (Laraia et al., 2008). An Australian study of distance education instruction found that completion rates and grades did not differ between on- and off-campus programs. Qualitative data confirmed that

distance education was as successful as on-campus teaching in providing clinical epidemiology programs at the postgraduate level (Treloar, 1998).

One study that evaluated the impact of a satellite training program for public health professionals concluded that the broadcast created a statistically significant gain in knowledge, improved attitudes about the importance of public health activities, and follow-up actions that were recommended in the broadcast (Peddecord et al., 2007). Another study found that a year-long web-based module targeting maternal and child health workers resulted in higher levels of self-efficacy and perceived skill level in performing functions covered in the six-unit training module (Steckler et al., 2001). Students in a third study reported that enrollment in a distance education MPH program resulted in increased knowledge, perspective, skill, technical facility, confidence, and job performance in relation to improving job performance in leadership and career advancement (Umble et al., 2003).

B. Career Success and Student Satisfaction

Using pre- and post-test measures, one study of mid-career professionals found that 75% of graduates from a distance education MPH program in the U.S. had developed new professional affiliations and 31% experienced job promotions (Davis et al., 2004). A similar study used post-graduation interviews to conclude that all graduates from a distance education MPH program experienced advancement in the workplace (Laraia et al., 2008).

A study conducted at the University of North Carolina, Chapel Hill, found that 97% of graduates from a distance education MPH program would recommend the program to others, and 75% said that their overall opinion about the program had improved since graduation (Davis et al., 2004). Other studies have also reported high levels of student satisfaction for MPH programs delivered via distance education (Peddecord et al., 2007; Umble et al., 2003).

Different delivery modes for distance education MPH programs that have been evaluated include: web-based courses (Polhamus et al., 2000), video courses (Leatherdale et al., 2007), satellite broadcast (Peddecord et al., 2007), internet (Jimbo, 2002), and computer conferencing (The Tempus Consortium for a New Public Health in Hungary, 1992). In general, distance education MPH programs using these delivery modes have been found to be accessible, affordable, acceptable, and

appropriate for working professionals, and, in most respects, equivalent to residential programs (Umble et al., 2003). Based on these types of findings, several authors have argued that distance education will be a key component of MPH program delivery in the future, especially if we are to meet the demand for a more competent public health workforce in an age of diminishing resources (Buss, 1999; Lane, 2000; Leatherdale et al., 2007; Shalauta et al., 1999; Umble et al., 2003; Vincent, 2005).

III. Determining Program Need, Demand, and Institutional Readiness

A. Program Need

Prior to receiving institutional approval to offer an MPH degree program at USU, a thorough market analysis was conducted to identify unmet public health training needs for several geographic regions in Utah with a focus on rural and underserved regions (Dodds et al., 2003). Data collection included an assessment of public health workforce readiness, job demand, pay levels, and an analysis of available training and educational programs already in place. Much of the workforce data was found to be available through federal, state, and local public health departments, the Bureau of Labor Statistics, and the Utah Department of Workforce Services (Bureau of Labor Statistics, 2018; Department of Workforce Services, 2018). Additionally, candid conversations were held with colleagues at the University of Utah (the only other public institution in Utah that offers an MPH program) to understand unique program goals and avoid duplication of offerings. Unlike the program at the University of Utah, the MPH program at USU will be delivered fully online with an emphasis on meeting the public health needs of rural and underserved areas. Because of that unique fit, support from the University of Utah was strong.

B. Public Health Job Market

It was determined that students seeking an MPH degree with a health education and promotion emphasis in Utah can pursue a wide variety of high-demand and high-paying occupational options—including (but not limited to) epidemiologist/statistician, disaster and emergency specialist, medical and health

services managers, public health educator, public health nurse, and medical social workers (Bureau of Labor Statistics, 2018).

The job outlook for an epidemiologist during 2014-2024 is projected to grow at an annual rate of 6% with median pay in 2015 of $69,450 per year, and typically requiring a master's degree for an entry-level position (Bureau of Labor Statistics, 2018). Detailed data for an epidemiologist position in Utah does not exist. However, the salary range for a statistician in Utah (a similar job category) is $50,250-$117,830 with a 10-year projected growth rate of 42% (Department of Workforce Services, 2018).

Utah based health educators can expect an annual growth rate of 3% (higher than the national projection of 1.9%). In Utah, the median salary for public health workers who have a bachelor's degree is $42,300. Medical and health service managers who live in Utah and have a bachelor's degree earn a median salary of $85,330 (the annual change rate for 2012-2022 is 3.5%, which is higher than the national rate of 2.3%).

Healthcare social workers in Utah earn a median salary of $54,890 with a master's degree. Utah data for healthcare social workers show that the annual change rate for 2012-2022 is 4% (higher than the national rate of 2.7%). Emergency management directors in Utah have a projected annual change rate of 2012-2022 of 1.6% as compared to the US at .8%. The annual median salary for 2014 in Utah was $64,230 with a bachelor's degree.

It appears that the demand in Utah for public health professionals will exceed the projected national growth rate. It is also expected that employers will seek out applicants who have advanced training and education (i.e. a MPH degree, which is more desirable than an MS degree in the health education profession).

C. Student Demand Analysis

Once it was determined that public health training needs were substantial, job demand was high, and unique training needs could be met through an online MPH program, a detailed analysis of student needs and demand was conducted (Dodds et al., 2003; The Working Group of the Innovation Program in Health Systems and Professional Training, 1995). Student interest surveys were conducted among undergraduate health education and promotion students on the USU Logan campus

and among working professionals at established distance education sites throughout Utah.

A total of 62 health education and promotion undergraduate students completed the MPH interest survey. The majority planned on pursuing a graduate degree within 1-2 years of graduation (55%). When specifically asked about their intent to pursue an MPH (anywhere, in any format), 36% of the respondents indicated that "Yes," they would be interested in pursuing this type of degree, and 48% indicated that they "Might" be interested in doing so. In terms of delivery format, the majority of current undergraduate students were interested in a blended/hybrid format (40%). Students' motivation to obtain an MPH degree include increased skill set (84%), increased salary (69%), and the ability to apply to new professional positions (63%).

A total of 108 health education professionals responded to the survey with 78% indicating they were full-time employees at the time of the survey. Most worked in either a public health setting (29%) or health care/clinical setting (37%). Of the 108 responding, 36% were interested in obtaining an MPH degree (n=40) while 27% indicated they were maybe interested (n=30). Both online only (46%) and blended/hybrid delivery (46%) were of most interest. Over half of the professionals indicated that their employer would offer tuition assistance (51%). Health professionals were interested in the MPH degree to increase their salary (71%) and earning potential (70%), broaden their skill set (70%), and increase their ability to qualify for new professional positions (75%). If an online USU program were available, 43% noted they would be extremely likely to apply, and 38% noted they would be somewhat likely to apply.

D. Program Infrastructure

An important and challenging step is to assess and ensure an appropriate program infrastructure that takes into consideration available online delivery technologies, cost of delivery, availability of student support services (recruitment, registration, advising, testing, mentoring, supervising, etc.), course scheduling and sequencing (that can accommodate student needs), faculty workloads, and other functions that will support the program. Utah State University already has a well-established distance education/online infrastructure that utilizes web-based instruction and interactive video conferencing, and that has numerous student support systems already in place. Conceptualizing an appropriate infrastructure that solves course scheduling

challenges, faculty workloads, and student mentoring and supervision has entailed close collaboration between the originating department (KHS), the Regional Campus system, and Academic and Instructional Services at Utah State University. An MOU has been put in place that details financial relationships and the respective responsibilities of each entity.

E. Faculty Resources and Development

An important step in designing the program infrastructure was an analysis of faculty resources related to instructional needs (The Working Group of the Innovation Program in Health Systems and Professional Training, 1995). Based on market and student analyses, including anticipated student demand, it was determined that two new faculty lines would be required to support instructional delivery of the new MPH program. Upper administration at USU was convinced of the value of the new MPH program and committed two new faculty lines to the KHS department, one based on the Logan campus, and one at a USU Regional campus. Training for faculty to successfully transition from teaching traditional face-to-face courses to fully online courses with new technology was also an important component provided by Academic and Instructional Services at USU on a course-by-course contract basis.

IV. Theory and Curriculum Design

Table 1 outlines theoretical concepts, curriculum design, and competency mastery outcomes that can guide the development of MPH programs delivered online.

A. Theoretical Foundation

Equivalency Theory represents an approach to distance education that is built on the concept of 'equivalence of learning experiences' between local learners and distant learners (Simonson, Schlosser, & Hanson, 1999). Building upon existing educational theories, Equivalency Theory posits that the more similar the learning experiences, the more similar the outcomes will be (Simonson et al., 1999). Given advances in technology that provide various modes of distance learning, this theory may be an appropriate beginning point for considering the design and development of an MPH curriculum for online delivery (Simonson et al., 1999).

As noted in Table 1, Equivalency Theory has five key elements that can inform curriculum design: (1) Equivalency: learning experiences should be designed that provide experiences with equal value for learners; (2) Learning Experience: students in different locations at different times may require a different mix of learning experiences; (3) Appropriate Application: availability of learning experiences should be proper and timely; (4) Students: students should be defined by their enrollment in the course rather than their location; and (5) Outcomes: outcomes should be similar for learners regardless of location. These five elements provide a sound theoretical basis for beginning the process of curriculum design (Simonson et al., 1999).

TABLE I: Design and Development of the MPH Distance Curriculum

Equivalency Theory

1. Equivalency
2. Learning experiences
3. Appropriate application
4. Students
5. Outcomes

Curriculum Design Process—Backward Design

1. Identify desired results (competency driven)
2. Determine assessment evidence
3. Plan learning experiences and activities
4. Let go of book driven course design, duplicating existing course, using old syllabus

Plan of Study for Competency Mastery

Health Education/Promotion Competencies	CEPH Foundational Competencies
1. Health needs assessment	1. Evidence-based approaches to public health
2. Program planning	
3. Program implementation	2. Public health and health care systems
4. Program evaluation	3. Planning and management to promote health
5. Administer health ed programs	
6. Serve as health ed resource person	4. Policy in public health
7. Communicate and advocate for health ed	5. Leadership
	6. Communication
8. Systems thinking	7. Inferprofessional practice

B. Curriculum Design

Previous research has identified a number of elements for the successful design of distance education MPH programs that have proven effective (Dodds et al., 2003; The Working Group of the Innovation Program in Health Systems and Professional Training, 1995). However, with the release of new accreditation criteria by the Council on Education for Public Health (CEPH) in 2016, the educational focus has changed from an orientation-based approach (covering core topics) to demonstrated achievement in foundational competencies (Council on Education for Public Health, 2018a). This change in orientation has opened the door to curriculum development that is based on a "backward design" that starts with delineating the competencies to be mastered, followed by the design of assessment evidence, and finally the development of appropriate learning activities (Arcari & McMillan, 2018; Bowen, 2017).

Foundational competencies are mapped to appropriate courses (Council on Education for Public Health, 2018b) that are then backward designed to develop learning activities and experiences that can be assessed in ways that clearly demonstrate mastery of competencies. For programs entrenched in the earlier topical approach, the reinvestment in curriculum design focused on competencies can pose significant challenges (Bowen, 2017).

C. Competency Mastery

The 2016 CEPH accreditation criteria revolve around competency mastery. Specifically, CEPH has delineated 23 foundational competencies, clustered into eight thematic areas, that must be met by all accredited MPH programs. In addition, at least five concentration competencies must be established for each program. The health education and promotion concentration within the MPH program at USU has developed six concentration competencies that have been assigned to specific courses that align with the professional practice of health promotion.

D. Management of Field Work and Practical Experiences

Online education can pose unique challenges for courses that require supervision and mentoring of practical or field-based experiences. Fortunately, best practices in online education related to the design, development, and implementation of practicum and field-based public health experiences in diverse settings are beginning

to be defined in the literature (Jung, Galyon-Keramidas, Collins, & Ludlow, 2006; Knapczyk, Hew, & Frey, 2005; Sachau, 2009). At USU, best practices are being used to craft two online courses that can support high-level learning outcomes related to Applied Practice Experiences (APE), Inter-professional Practice Experiences (IPE), and Integrative Learning Experiences (ILE) as required by CEPH in the new accreditation criteria for MPH programs (Council on Education for Public Health, 2018a).

A multi-step process is being used to design and implement practical MPH experiences for online delivery through:

- A thorough review of the literature, professional association materials, and CEPH training guidelines to identify best practices in online-based practicum and fieldwork education.
- A site visit to at least one MPH program that has been identified by CEPH as excelling in online delivery of APE, IPE, and ILE experiences, and a visit with faculty and students at that site relative to their perspectives, outcomes, and recommendations.
- A one-hour consultation with CEPH staff during the American Public Health Association annual meeting in San Diego in November 2018 to gain further insights into accreditation expectations regarding online delivery of APE, IPE, and ILE learning activities and outcomes.
- A preliminary design of basic curriculum components for APE, IPE, and ILE experiences.
- A qualtrics survey of MPH faculty and students to get stakeholder input and refine curricular components and concepts based on feedback.

E. Plan of Study for Public Health Curriculum

The plan of study for MPH students at USU includes a two-year cycle of course offerings that reflect a balance between faculty workload constraints, the needs of working professionals attending part-time at regional campuses, and the needs of full-time students taking classes on the Logan campus. Per CEPH guidelines, the program requires a minimum of 42 credits. All but two courses are offered at least once per year—thereby providing students with maximum flexibility as they work with their

major professor to plan their course of study. (See Appendix A for a draft of the two-year MPH schedule.)

VI. Challenges

Numerous challenges must be addressed in designing and successfully delivering a distance education MPH program. Specific challenges cited by MPH distance education planners include the potential difficulty in attracting sufficient enrollment numbers over time to justify the initial and ongoing expense of developing and initiating a program (Buss, 1999). Others have found that distance education delivery demands intensive resources to sustain and support (Patel, 2000). It has been found that not all students are well suited for distance learning, which may require a higher level of motivation, and that field support of students is a key to success which places high demands on academic staff (Patel, 2000). Many of these challenges can be anticipated and addressed in the design process and have been carefully addressed in the design and development phase of the new MPH program at Utah State University.

VII. Conclusion

It seems clear that distance delivery of MPH programs represents an important avenue for addressing workforce training needs in public health. While such programs require careful planning and may incur higher resource costs, the end result is a broader dissemination of training that will help support the growth and development of public health professionals that would otherwise not have access to such training (Alexander et al., 2009; Bell & MacDougall, 2013; Cannon et al., 2001; Jung et al., 2006; Laraia et al., 2008; Liu et al., 2016; Umble et al., 2003). This paper has attempted to outline some of the key considerations and strategies for designing and developing a successful distance education MPH program.

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Appendix A: Two-year Degree Plan for MPH: Health Education and Promotion

YEAR ONE (24 credits)

Fall Semester	Credits	Faculty
HEP 6050: Foundations of Public Health (required for all students who did not graduate from a CEPH accredited undergraduate program)	3	Peterson
HEP 6020: Introduction to Biostatistics and Epidemiology	3	DasGupta Prerequisite: Pass on skills quiz
HEP 6800: Health Behavior	3	Waite
HEP 6200: Health Administration, Organizations and Systems	3	Hawks

Spring Semester	Credits	Faculty
HEP 6400: Policy, Leadership, and Advocacy in Public Health	3	Hawks
HEP 6000: Advanced Program Planning and Evaluation	3	DasGupta
HEP 6450: Research Methods in Population Health	3	DasGupta
HEP 6010: Health Communication for Public Health; or HEP 6650: Holistic Health	3/ offered alternating years (Both courses are required, take one each spring.)	Sulzer

Summer Semester	Credits	Faculty
IPE Experience	Capstone credits	Hawks
HEP 6120: Foundations of Global Health (study abroad option)	3/offered only once each year, either summer or fall. If taken in the summer a study abroad experience is required.	Hawks

YEAR TWO (18 credits)

Fall Semester	Credits	Faculty
HEP 6120: Foundations of Global Health (fully online option)	3/offered only once each year, either fall or summer. If taken in the fall the course is fully online.	Hawks
HEP 6550: Qualitative Methods for Public Health	3	Gast
HEP 6350: Social Determinates of Health	3	DasGupta

Spring Semester	Credits	Info and Notes
HEP 6150: Global and Maternal Health	3	Hawks
HEP 6600: Practicum or HEP 6970: Thesis	3	Chair approval needed
HEP 6850: Capstone in Public Health	3	Hawks
HEP 6010: Health Communication for Public Health; or HEP 6650: Holistic Health	3/ offered alternating years (Both courses are required, take one each spring.)	Sulzer

Summer Semester	Credits	Faculty
HEP 6600: Practicum or HEP 6970: Thesis	3 (if not completed in an earlier semester)	Chair approval needed