Planning for a Pandemic Influenza Outbreak: Roles for Librarian Liaisons in Emergency Delivery of Educational Programs

Lisa McGuire

ABSTRACT. In February 2006, two librarians at the University of Minnesota's Bio-Medical Library were asked to participate in a task force at the University of Minnesota's School of Public Health (SPH). The charge from the dean of SPH was to determine how the school could continue to deliver its educational programs in the event of a pandemic influenza outbreak. This paper will outline the work of the task force, discuss its recommendations, and offer ideas on how other librarians can work with their liaison areas to plan for a similar project.

Author. Lisa McGuire, MLIS (lmcguire@umn.edu) is Assistant Librarian, Reference & Instructional Services, Bio-Medical Library, University of Minnesota, 505 Essex Street SE, Minneapolis, MN 55455.

INTRODUCTION

In February 2006, two librarians from the University of Minnesota's Bio-Medical Library were asked to participate in a task force at the School of Public Health (SPH). The School of Public Health is part of the University's Academic Health Center, which also includes the Medical School, School of Dentistry, School of Nursing, College of Pharmacy, College of Veterinary Medicine, and other allied health programs. The charge by the dean of SPH for the task force was to determine how the school could continue to deliver educational programs in the event of a pandemic influenza outbreak. The planning done at SPH could potentially be used as a model by other academic units at the University. This paper will outline the work of the task force, discuss its recommendations, and offer ideas on how other academic health sciences librarians can work with their liaison areas to plan for a similar project.

BACKGROUND ON PANDEMIC INFLUENZA OUTBREAKS

The impetus for this project is the ongoing public health concern over a future pandemic influenza outbreak. In the past 300 years, there have been 10 pandemics of influenza type A viruses, three of which occurred in the 20th century.[1] Of these three outbreaks, the deadliest was the 1918-1919 outbreak, which is known as the "Spanish flu." Estimated mortality rates from the 1918-1919 pandemic are stated to be as high as 100 million people. Less deadly pandemics occurred in 1957-1958, which became known

as the Asian flu, with approximately one million worldwide deaths,[1] and the "Hong Kong" flu in 1968-1969, with approximately two million deaths worldwide.[2]

Public health experts have studied these 20th century pandemics and noted the following:

- Pandemics are unpredictable. No one can say with certainty who will get sick, how ill someone will be, and how the virus will spread.

- Viruses tend to spread in waves with an initial wave of infection that is often followed by one that is more severe.

- Influenza pandemics frequently originate in Asia where millions of people live in close quarters with their poultry and livestock (e.g., swine).

- We still do not know what kind of effect any potential vaccines will have against the next pandemic, although the countries that have vaccine production capabilities (Australia, Canada, France, Germany, Italy, Netherlands, Switzerland, United Kingdom, United States) will probably be first in line for any vaccine that is produced.[1]

Recent fears about a potential pandemic have centered on a deadly avian pathogenic virus called H5N1. At this point in time, H5N1 has shown itself to be virtually endemic within Asian wild bird populations and is an efficient killer in domesticated birds raised for livestock such as chickens, ducks, and geese. No one can predict if H5N1 will become easily transmissible among humans, yet H5N1 remains a serious concern for these reasons[1]:

- H5N1 spreads rapidly in poultry flocks and the potential for infection between people and animals remains high, especially in Asia and Africa.

- H5N1 causes severe disease in humans. Approximately 50% of people who have been infected with H5N1 have died.

- H5N1 has genetic mutations that may make it easier for the virus to adapt to infecting people.

Currently, the World Health Organization (WHO) phase of pandemic alert is at level 3 (with a range of 1 to 6, where level 1 means a new virus has been discovered in animals but low risk of human cases, to a level 6, which means that the world is in a pandemic with constant human-to-human transmission). Level 3 means no or extremely limited human-to-human transmission of a virus.

PANDEMIC PREPAREDNESS AT THE SCHOOL OF PUBLIC HEALTH

Pandemic planning is beginning to occur across all levels of society, including higher education. The Academic Health Center's Office of Emergency Response is charged with ensuring that public health issues that affect the University of Minnesota, Twin Cities campus community are dealt with in a timely and efficient manner, as well as utilizing the expertise available on campus. The University has an Emergency Operations Plan in place to deal with campus emergencies. Due to the many complicated issues that surround a potential pandemic outbreak in a campus community, the AHC Office of Emergency Response has been instrumental in developing plans on how the University would deal with this potential threat. The current dean of the School of Public Health, John R. Finnegan, Jr., is one of the faculty advisors to the Academic Health Center's Office of Emergency Response. Dean Finnegan convened a task force that specifically

looked at how the School could continue to deliver educational programs in the event of a pandemic.

Early in 2006, the current and past librarian liaisons to SPH were asked to serve on the pandemic planning task force on educational delivery of programs at SPH. Other members of the task force consisted of faculty from the epidemiology and environmental health divisions of the school, as well as information technology staff and support staff.

At the task force's initial meeting in February 2006, Dean Finnegan described two scenarios for the group to consider when developing its recommendations:

- Scenario 1: What if the pandemic struck in the middle of a semester and the campus was closed for a few weeks or for the remainder of that semester?

- Scenario 2: What if a longer period of school closure was needed to curb an outbreak (e.g., 9 to 18 months)?

These two scenarios utilize social distancing to slow the spread of infection during a pandemic. Social distancing can include more personal measures such as maintaining a three-foot distance between persons during a pandemic, or more wide spread usage such as avoiding large groups of people at places of worship, shopping areas, or schools. The task force began by making some assumptions about the application of social distancing in the event of a pandemic outbreak. The first assumption was that any periods of social distancing would be shorter and intermittent, rather than of longer duration. Another assumption was that most of the faculty and students of SPH would remain healthy. And finally, that basic infrastructures including phone and computer networks would remain functional and that faculty members of SPH would have varying comfort levels with utilizing educational technology.

The librarians on the task force initially thought that their contributions would incorporate general reference skills. "Typical" librarian contributions to such a group would include doing a literature review to find out what other colleges and universities were doing in terms of this type of planning. Additional roles could also include the creation of pathfinders or tutorials on remote access to library resources, or strengthening the Bio-Medical Library's FAQ offerings as a way to serve patrons in the event of a pandemic. The librarians also discussed the possibility of adding additional digital reference services such as Instant Messaging, or expanded use of the University Libraries' current chat software from DocuTek as a way to deliver services during a pandemic.

In reality, however, after a few meetings of the task force, it became clearer that these "traditional" librarian tasks would not be needed for this assignment. At the first meeting of the task force, the group considered what questions would need to be answered as the task force developed options. Some of the major questions included:

- What information needed to be communicated to students by faculty in order to continue or complete a course?

- How will information be communicated back and forth?

- What courses currently had an online presence and which ones did not?

- What courses cannot be completed electronically? (e.g., practicum, field work)

- How does continuing the educational programs differ over a shorter period of time versus a longer one?

- What are the software/hardware needs of faculty and students in SPH?

- What are the training needs of faculty and students in SPH?

- Who are essential personnel in the event of a pandemic in terms of continuing educational programs?

- What infrastructure needs to be maintained? By whom?

- How do faculty, staff, and students in SPH "practice" the plan?

- How much time is needed to put the plan into place?

- What are the costs of implementing the plan?

For the librarians on this task force, it became evident that other expertise or experience would be more valuable to the group. Specifically, expertise or knowledge of e-learning systems (such as WebCT and Blackboard), emerging educational use of technologies (especially Web 2.0 tools), and content management systems all played an important role in shaping the work of the task force and are reflected in the final report.

One of the most important contributions the librarians made to the work of the group was to set up a place for task force members to share their work. Since the membership of the task force was made up of people from SPH and the Bio-Medical Library, there was no shared virtual space that task force members could all easily access to collaborate effectively. The librarians introduced the task force to a product called Basecamp <http://www.basecamphq.com>. Basecamp is a Web-based project management tool that is available by subscription. Basecamp offers file-sharing and document versioning, tasks, milestones, and to-do lists in a very compact and easy-to-learn system. The librarians set up a Basecamp account for the pandemic planning project, which proved to be the task force's primary way of sharing documents and marking project completion tasks and milestones.

EDUCATIONAL TECHNOLOGIES MATRIX

Another major contribution that the librarians made to the task force was to compile a matrix of different educational technologies that could be implemented by faculty in order to continue to deliver their coursework electronically. Educational technologies within the matrix included:

- WebCT/Blackboard – The University of Minnesota uses WebCT for e-learning environments. WebCT can host files, hold online discussion groups, and faculty can create and administer quizzes via WebCT.

- Breeze Presenter – Breeze Presenter is used to host prerecorded presentations that can be downloaded. Presentations can include audio and/or video components and PowerPoint presentations, which can be delivered within Breeze Presenter.

- Breeze Meeting – A tool to conduct multi-party meetings online with the possibility of sharing PowerPoint slides and/or live-screen sharing. Like Breeze Presenter, Breeze Meeting can also incorporate audio components into a meeting.

- Wikis – Web sites that allow modification by parties who can access a particular wiki. Wikis can be useful for any type of collaborative or group project.

- Blog (or Web log) – A type of Web site that encourages collaboration by posting messages and comments about content on the blog.

- Bulletin boards – A useful facilitation tool for large volumes of online discussions. Often, bulletin boards are incorporated into e-learning systems such as WebCT or Blackboard.

- Portal software – Software that may be used by colleges and universities to aggregate information from a variety of sources for easy access by the whole educational community. The University of Minnesota uses open source portal software called MetaDot that is customized to particular groups of users on campus.

- Camtasia – Camtasia is popular software for creating animated training videos that can then be streamed online, e-mailed, or converted to CD or other digital video formats.

- Podcasting – A method for distributing audio (or video) for playback on portable devices such as an audio or video iPod.

For each of these technologies the task force considered the primary use of the technology, training requirements for faculty and students, communication potential, level of support available (either through the University or via a third party), accessibility, cost, bandwidth requirements and finally, flexibility and ease of use.

In terms of training requirements, the task force considered how steep the learning curve for faculty (or staff) would be when adding or maintaining course content, and consequently, training requirements for students on how to utilize course materials through the different technologies. The task force discovered that all of the technologies on the matrix had support from various groups on campus. Regardless of the type of technology, the ability to communicate effectively during a pandemic would be of paramount importance; therefore, the group considered what kind of potential each technology had for communication between either faculty to student, student to faculty, or between students.

The level of available technical support for any kind of technology plays a critical role in the decision to purchase and implement a new technology or software. External bulletin boards, Camtasia, and podcasting are all examples of non-enterprise (i.e., non-University) level software that require external (e.g., from a third party) support.

Accessibility of software was also a key consideration. Everything on the matrix is Web-based, with the exceptions of Breeze (available for PC or MAC with the latest Flash player), Camtasia (currently PC only), and podcasting, which requires an audio/video player with speakers and/or headphones.

The cost of purchasing any of the software on the matrix depends on the technology itself. Some require a dedicated server (such as Breeze), while others may be free (such as open source wiki software) but implementation may be done through a proxy server. The cost of many of these vary considerably, depending on such things as the need for an individual copy versus a site license (Camtasia), or whether additional production and/or editing software may be required in order to effectively use a resource (podcasting). Bandwidth requirements for each of these technologies vary, but most are preferable with a broadband connection.

SPH FACULTY SURVEY

The next step in the task force's work was to consider how faculty and students of SPH currently use technology. The task force developed a matrix of educational technologies that faculty could employ in the event of a pandemic, but if students or faculty didn't have the proper hardware or software (or access to it), then it would not

matter which technologies faculty ultimately chose to create online course content. Therefore, the task force decided to conduct a survey of SPH faculty and students to determine their accessibility, utilization, and comfort levels with various educational technologies. The librarians on the task force took the lead in developing many of the survey questions, provided access to the survey tool, Survey Monkey <http://www.surveymonkey.com>, as well as compiled the survey results.

The faculty survey was delivered via e-mail to 153 full-time faculty, of which 135 responded for an 87% participation rate. The first group of survey questions asked about access to the Internet. The vast majority of SPH faculty has Internet access at home (98%), with most of the faculty having a broadband connection (85%). If they did travel, over 60% said they would remain in the Twin Cities metropolitan area versus traveling to another location. In the event that faculty did travel to another location, the vast majority reported that they would still be able to access the Internet (91% indicated that they would still have Internet access).

The second group of faculty questions concerned educational technologies currently in use by faculty for their courses along with which technologies they felt they would be able to use in the event that their course would be moved to a completely online format. Almost 70% of SPH faculty reported that they currently use WebCT for their courses. However, the majority of the faculty reported that they *did not* personally know how to use WebCT for functions such as posting syllabi (63%), administering quizzes (82%), using the discussion board (53%), accessing the class e-mail list (51%), or knowing how to accept a completed student assignment that was uploaded to the WebCT site (74%). The high rate of faculty who do not know how to use the basic functions of

WebCT is an important result of this survey. This indicates that many research and teaching assistants in SPH are the ones who are actually responsible for site creation and maintenance. In fact, the faculty on the task force seconded the survey's findings by acknowledging that they were often too busy with writing or working on grants to do many of the tasks associated with their teaching requirements.

If the University of Minnesota, Twin Cities was closed due to a pandemic influenza outbreak, faculty at SPH said that they would use the following kinds of technology to teach their courses:

- E-mail (97%)

- Electronic handouts (90%)

- Post class material online (69%)

- Use online discussion boards (56%)

Technologies that SPH faculty indicated that they were not likely to use include:

- Live teleconferencing (56%)

- Record oral presentations or post video online (44%)

- Use live oral presentation w/simultaneous class discussion (50%)

The vast majority of SPH faculty indicated that they had not taken any of the courses available to them on how to use educational technologies. This ranged from 82% to 100% of survey respondents.

SPH STUDENT SURVEY

After the faculty survey was completed, the task force surveyed SPH students in order to gauge their use of educational technologies. The survey was delivered to 1,028 SPH students via e-mail lists, with 15% responding.

The first group of survey questions closely mirrored the faculty questions. Over 96% indicated that they had a computer at home, with 88% indicating high speed access to the Internet.

In the event of a pandemic, slightly over half (54%) indicated that they would remain in the Twin Cities metropolitan area, 10% indicated that they would travel to another location in Minnesota, 18% indicated that they would travel out of state, and 19% indicated that they did not know what their plans would be in the event of a pandemic outbreak. If students were to travel out of state, 85% indicated they would be able to access a computer, and 76% indicated that they could get to the Internet with a high speed connection.

The next set of questions asked students about their use of educational technologies in the classroom. Sixty-one percent indicated they had taken a college-level online course. Students noted using these technologies in their online courses: WebCT/Blackboard, downloading files, online bulletin boards, and PowerPoint presentations. This important finding indicates that the majority of SPH students are familiar with digital learning environments.

Students were then asked to rate their comfort levels using the educational technologies on the task force's matrix. Of these, students felt most comfortable using e-mail (93%), PowerPoint (86%), WebCT (71%), and instant messaging (49%). The

technologies that students knew the least about or had minimal contact with included wikis (83%), Breeze (71%), portals (55%), and podcasts (49%).

Most importantly, students indicated that their preferred ways to communicate with faculty were via e-mail, phone, and e-mail group lists or listservs. This was the same result for student-to-student communication as well. Instant messaging was noted by the students as a technology that they felt comfortable using; however, it was not mentioned by the students as a preferred communication device.

TASK FORCE RECOMMENDATIONS

The final report of the task force was issued in May 2006. The task force identified four possible levels of interactivity that could be utilized while continuing courses in the event of a pandemic (note: higher levels incorporate all lower level components):

    (1) Very Basic: E-mail only (smaller classes)

    (2) Basic: Post class material online, administer exams, and use online discussion boards (using WebCT)

    (3) Interactive: Post pre-recorded oral presentations of lecture (audio with slides or video with audio)

    (4) Highly Interactive   Live audio presentations with simultaneous discussion

As noted in the final report, the task force recommends that all SPH courses should function at the Basic level using WebCT in the event of a pandemic which

necessitates social distancing. These specific recommendations would assist SPH in reaching this goal:

- SPH should request a WebCT site for all on-site SPH courses.

- All faculty members must be familiar with WebCT functionality for tasks that are needed to continue their courses at the Basic level. Faculty cannot assume that support staff or teaching assistants would be available to complete these tasks for them in an emergency situation.

- Every core SPH course should have at least two faculty members who can continue to teach the course in the event of illness.

- Training options for all SPH faculty should include several in-person training sessions that focus on Basic level functionality; Web site space for the main SPH page should indicate where training is available on campus and also contain downloadable support documents that summarize how to complete Basic tasks.

- The Dean's office should obtain written confirmation from each faculty member certifying that he or she has completed the required training sessions or show that he or she already possess the necessary skills to continue courses at the Basic level.

- Essential personnel include all individuals needed to maintain WebCT and the current infrastructure and networking services.

- SPH should develop a communications plan for faculty, staff, and students. Using the University of Minnesota, Twin Cities, portal software may be the best option for this, or an "Emergency" link on the main SPH Web site might

be created. A staff person responsible for both external and internal pandemic communications should be designated as essential personnel.

The recommendations of the task force prompted a larger discussion about the expansion of electronic course availability in SPH. The task force also recommended that SPH would have to implement long-term efforts to achieve success in this endeavor. Some of the recommendations for doing this include:

- Offer incentives to motivate faculty to use more technology for in-person courses or for developing online courses.

- Demonstrate educational technologies at regular faculty meetings or seminars.

- Technological experts should sit in on SPH classes and then work with faculty on skill building in order to incorporate more educational technologies into classes.

- Create a tool kit based on best practices that are already happening within SPH or other University of Minnesota, Twin Cities academic units.

The task force's recommendations have been included in the Pandemic Influenza Preparedness Workplan and Progress Report at the University of Minnesota, Twin Cities campus <http://www.ahc.umn.edu/about/admin/oer/pandemic/home.html>. An Academic Task Force on Pandemic Influenza was formed that met monthly from September 2006 to February 2007. At the time this article was written, this task force had not yet issued any recommendations on how academic units can prepare for a pandemic outbreak while still continuing to teach courses.

CONCLUSION

The participation of librarians from the University of Minnesota's Bio-Medical Library on the Emergency Planning for the Teaching Program Task Force in the School of Public Health is noteworthy for its contributions. The librarians created a virtual space for the group to do its work via Basecamp, Web-based project management software. The librarians also took the lead in creating survey questions regarding the use of educational technologies by faculty and students. In addition, the librarians were major contributors to the matrix of educational technologies that was considered in the final report.

The experiences of the librarians from the Bio-Medical Library during the SPH pandemic planning task force illustrate an emerging opportunity for academic health sciences librarians. Pandemic preparedness planning is happening at many institutions of higher learning. An important aspect of this planning process will be to determine how to continue the teaching and learning activities that form the core mission of colleges and universities nationwide. Librarians can play a major role in this process. They can initiate conversations with administrators and faculty regarding how courses would continue in the event social distancing is needed to slow the spread of pandemic influenza. As information professionals, librarians have experience and expertise in researching, developing, and creating new learning tools and objects that can be utilized by busy faculty who may rely on administrative support staff to maintain online course environments. Academic health sciences librarians should also continue to develop their own skill sets in educational technologies with an eye to providing the best possible service in the event of a pandemic outbreak.

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