The Missouri planning grant for the education and training of health sciences librarians*

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The planning grant at the School of Library and Informational Science (SLIS) at the University of Missouri has two aims: (*a*) developing a model curriculum for health sciences librarianship at the master's level and (*b*) developing materials that can be delivered by alternative instructional methods. To accomplish the first aim, the faculty will investigate the possibility of offering courses in other disciplines, such as health care administration, educational technology, adult education, and medical sociology. In addition, the SLIS faculty will investigate the development of new kinds of placement for the students' practicum experience. To reach the second aim, the SLIS faculty will investigate alternative means of delivering both graduate and continuing education. Three instructional modalities will be evaluated. Some material will be delivered via satellite broadcast, some material will be made available via the World Wide Web and some will be presented in an intensive seminar. The outcome of the planning grant will be two distinct plans. The first will be a plan for the curriculum in health sciences librarianship at the master's level. The second will be a plan for offering instruction through alternative methods, both for graduate education and for continuing education.

The announcement of the availability of planning grants for the education and training of health sciences librarians came at an opportune time for the School of Library and Informational Science (SLIS) at the University of Missouri-Columbia (MU). The faculty had just concluded a revision of the curriculum, and many of the pieces that would be desirable for an innovative plan were already in place.

The MU SLIS has offered a specialization in health

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Figure 1
Schema of the Missouri plan

Aim 1: Development of a model curriculum for health sciences librarianship at the master's level
  Activity 1: Exploration of courses in other disciplines, such as health care administration, educational technology, adult education, and medical sociology
  Activity 2: Exploration of alternative practicum experiences
Aim 2: Pilot project with the delivery of instruction via three modalities
  Activity 1: Satellite broadcast on May 17, 1996
  Activity 2: Instruction via Internet during the summer of 1996
  Activity 3: Intensive four-day seminar

sciences librarianship since the early 1970s. It has, therefore, the history of having a successful program with at least one full-time faculty member with expertise in the area. During many years there have been two faculty members with this expertise. In addition, the director of the health sciences library has been an adjunct member of the SLIS faculty since the inception of the school. The latest addition to the SLIS faculty holds a joint appointment with the Medical Informatics Group (MIG) of the School of Medicine. Given its history in health sciences librarianship, the MU SLIS was positioned to maximize the benefits of a planning grant for the education and training of health sciences librarians.

The MU planning grant will address two specific aims. Figure 1 delineates the aims and the activities of each aim. The first aim of the MU planning grant is to develop a model curriculum for health sciences librarianship at the master's level. Two areas will be explored as part of the model curriculum: courses in other disciplines and alternative practicum placements. SLIS faculty will collaborate with the faculty in Health Services Management (a program offered in the School of Medicine that offers an accredited degree in health care administration) to identify curricular strengths and overlapping interests. Courses in educational technology, adult education, and medical sociology will also be explored. In addition, as part of the development of the model curriculum, the SLIS will investigate the possibility of making alternative placements for the students' practicum experience. A number of activities on the MU campus, such as the work in rural health in the School of Medicine and recent activities in telemedicine, offer opportunities beyond those available in the usual practicum experience.

The second aim of the planning grant is to investigate alternative means of delivering both graduate and continuing education. Three different methods of delivering instruction will be studied. Some material will be delivered via satellite broadcast; some material will be made available via the World Wide Web; and some will be presented in an intensive, face-to-face seminar. The SLIS will test the market for distance education in health sciences librarianship and the effectiveness of the alternative methods of delivery of instruction through a three-credit pilot course.

Changes in health care delivery and rapid developments in technology have placed new demands on health sciences librarians. Documents from the Medical Library Association support this notion. For example, *Platform for Change* [1] lists seven areas in which health sciences librarians need some knowledge and skills:

- health sciences environment and information policies,
- management of information services,
- health sciences information services,
- health sciences resource management,
- information systems and technology,
- instructional support systems, and
- research, analysis, and interpretation.

The SLIS at MU can provide a program at the master's level that addresses these areas and prepares the beginning health sciences librarian for the changing world which those in the profession face. In addition, the SLIS can serve those already in the profession by updating knowledge and skills through alternative instructional delivery methods.

BACKGROUND

The sequence in health sciences librarianship at MU was established in the early 1970s. While the specific contents of the courses changed as the field changed, the general areas to be covered remained stable. For example, the first course suggested for those wanting to enter the field was called "Medical Subject Analysis." During the 1994/95 academic year the course was redesigned and renamed "Information Resources in the Health Sciences." In addition to focusing on the language and the tools of health sciences librarianship, with emphasis on MeSH and MEDLINE, the course will cover other languages and coding schemes, including the Systematized Nomenclature of Medicine (SNOMED) and International Classification of Diseases (ICD). There will be at least one assignment using the Metathesaurus of the UMLS (Unified Medical Language System) [2]. The coverage of the course will also be broadened to include other information sources with an emphasis on those which are computerized. Since the course has not yet been taught in this form there is considerable leeway in designing it to address the new roles of health sciences librarians.

In the past, the second course in the health sciences librarianship sequence was Health Sciences Librarianship and Bibliography. That course focused on the management of health sciences librarianship and basic reference tools. The third course in the sequence, The Biomedical Community, focused on the users of health sciences libraries and the trends in the field.

As a first step in curricular revision, the SLIS faculty with knowledge of health sciences librarianship recommended that graduates have a solid introduction to medical informatics by taking the course Computer Applications in Health Services. This course was developed by the faculty of the Medical Informatics Group (which includes the principal author). The multidisciplinary team of faculty who form the core of the medical informatics training grant faculty designed and teaches the course. The class is now part of the three-course sequence in health sciences librarianship.

The other classes in health sciences librarianship had to be reevaluated in the light of this new addition. The faculty recognized that increasing the total number of hours in the sequence would be difficult, and decided to keep the sequence to three courses. As a result, the existing courses were restructured. The course Health Sciences Librarianship and Bibliography was eliminated and the appropriate material incorporated into the other two courses. The material on appropriate tools from the original course was added to the renamed Information Resources in the Health Sciences, and the management materials were added to The Biomedical Community, leaving space in the sequence for the new third course, Computer Applications in Health Care.

REVISION OF THE SLIS GENERAL CURRICULUM

The SLIS faculty recently began a serious exploration of the contents of the curriculum and how such contents prepared, or failed to prepare, the graduates for a career in librarianship in the twenty-first century. Many papers and documents describing the needs of the profession became part of that review, including the Medical Library Association's *Platform for Change.*

The new curriculum, which is scheduled to begin in the fall of 1997, expands the curriculum to forty-two hours from the current thirty-six hours. There are eight requirements instead of the current six; these new requirements are

- Introduction to Information Technology,
- Information Services and Society,
- Organization of Information,
- Cataloging and Classification or Abstracting and Indexing,
- Reference Sources and Services,
- Managing Collections and Access,
- Management of Information Agencies or Administration of School Media Centers, and
- Research.

In addition every student will be required to take one elective from those offered by the department of information science (one of the two departments in the SLIS).

Students will still have eighteen hours of elective courses and be able to specialize in a number of areas, including health sciences librarianship. As part of the curricular review process all electives were examined, several new ones were proposed, and several that had not been offered recently were eliminated.

The plan described below is part of this curricular effort, but focuses on the needs of those wishing to concentrate on health sciences librarianship. It essentially moves the general revision described here forward into a more collaborative and innovative area.

STUDY DESIGN

Three committees were created to ensure that the plan resulting from the grant would be one which would reflect the role of health sciences librarians today. The basic planning committee consists of seven members: three faculty from the SLIS, the director of the health sciences library, two faculty from the Medical Informatics Group, and the director of the program in Health Services Management. This committee meets regularly to review progress and to allow members to contribute their particular expertise to the plan.

DEVELOPMENT OF THE MODEL CURRICULUM AT THE MASTER'S LEVEL

The first aim is to develop a model curriculum that could be adopted by others offering the master's degree with a specialization in health sciences librarianship. The model curriculum proposed would offer graduates the following background:

- an understanding of the basic principles of librarianship and of libraries as social and cultural institutions
- a familiarity with current information systems and sufficient conceptual background to adapt to new kinds of systems as they develop
- an understanding of the principles of, tools for, and trends in health sciences librarianship
- an understanding of the health sciences library as part of institutions associated with health care
- an awareness of the need for a commitment to lifelong learning.

The sources for this kind of background will be the core and required courses in the new curriculum, the three-course sequence in health sciences librarianship, electives within the SLIS, and electives taken in other disciplines.

This composite of courses will include instruction in all of the areas described in the "Ingredients for the Curriculum of the Future," Appendix 4 of the

Report of the Planning Panel on the Education and Training of Health Sciences Librarians [3]. It will also cover six of the seven areas listed in the Medical Library Association's *Platform for Change.* The seventh area, "Instructional Support Systems" is an option for those who want to develop this area, since courses in the area are offered on the campus.

Exploration of alternative courses in other disciplines

The model program in health sciences librarianship will build on the new SLIS curriculum. In addition, students wanting that specialization would take the three-course sequence within the program:

1. Information Resources in the Health Sciences,
2. The Biomedical Community, and
3. Computer Applications in Health Services.

The student would then have nine possible hours of other electives. One other possibility is allowing these students to take Methods of Health Services Research in place of the SLIS required course, Research. Faculty from the program in Health Services Management have committed to studying this possibility. If further investigation indicates that the substitution is likely to be feasible, then the students in health sciences librarianship will have the opportunity to take an additional elective course.

The SLIS's location on a multi-program campus provides opportunities to experiment with a number of alternatives to the traditional curriculum. Courses from other departments on campus and a judicious selection of electives from within the SLIS curriculum could effectively be combined to provide a program that will prepare the graduates for the changing role they will face in the years ahead.

One logical affiliation is the inclusion of some courses in Health Services Management as part of the master's program in librarianship. There are two reasons why collaboration between the Health Services Management program and the SLIS is appropriate for those in health sciences librarianship. First, the courses in medical informatics are offered through this program. Second, courses in health services management could give the SLIS students a broader perspective on the role of information management in health care institutions. For example, courses in Health Services Management would prepare librarians to work better with other health information managers in such activities as accreditation visits of the Joint Commission on the Accreditation of Healthcare Organizations. At the same time, the students in the health services management program could learn more about the role external information can play in the institutions where they will work.

Topics in the Health Services Management curriculum that might be of value to the SLIS student wanting to specialize in health sciences librarianship include health care systems, design of health and human services, administration of health care organizations, human resources management in health care organizations, and contemporary issues in health care policy.

Since many librarians teach health care professionals to do their own searching and to use libraries, courses from the College of Education are another option. For example, the College of Education offers a program in instructional technology and another in adult education.

Evaluation of exploration of courses in other disciplines

The easiest aspect of this exploration to evaluate will be the possibility of the substitution of the research course in Health Services Management (HSM) for that offered in the SLIS. The faculty members who teach the course for the SLIS will give the students several research papers in library and information science to read and critique. They will also read the proposals, written by the SLIS students, for the course in HSM. With these two pieces of data the faculty can judge whether equivalent skills and knowledge bases were involved.

Students will not yet be able to indicate how courses taken in other disciplines affected their careers. Tracking their careers would provide indications of the success of the program. Anecdotal information from those students, however, will lead to some conclusions about the value of these courses in the short term.

Alternative placements for practicum students

The SLIS recommends that, before they graduate, students who have not worked in a library complete a practicum, i.e., a supervised placement in an information center or library. In recent years, students in health sciences librarianship who wanted the practicum have usually worked in the J. Otto Lottes Health Sciences Library or combined that experience with work at either the Boone Hospital Center library or the library in the Harry S. Truman Memorial Veterans Administration Hospital, both in Columbia. Other sites that have allowed practicum students include the library at Washington University School of Medicine and hospital libraries in the Kansas City and St. Louis areas. The director of the practicum experience works with each student to find a placement which fits her or his needs. For health sciences librarianship the faculty member who teaches the courses in the sequence is usually consulted. All of the sites used in recent years have provided successful experiences for SLIS students.

There are three possible options for students interested in an alternative practicum placement. For students interested in working in rural health care, for example, there is a possibility of testing a program in which students might work with multidisciplinary teams of health care students (students from medicine, nursing, physical therapy, and occupational therapy) who are placed in communities in rural areas. This experience would be similar to a circuit-rider librarian's experiences. The faculty member who supervises the six-month rural track in the School of Medicine has indicated that because the program has a heavy problem-based learning focus, the addition of a student who could provide library services would be an asset. The faculty who oversee the course have expressed a willingness to investigate this possibility.

Second, the School of Medicine has received a grant to establish telemedicine links with nine sites in rural Missouri: the hospitals in Unionville, Milan, Brookfield, Macon, Keytesville, Fayette, Boonville, and, Fulton and one academic institution, the Kirksville College of Osteopathic Medicine (KCOM). This network of rural hospitals could provide another kind of alternative practicum. None of the hospitals currently has a librarian (although KCOM does) so the addition of a student from SLIS could add real value to the network.

A third possibility for a nontraditional placement for the SLIS students is with the small groups of students in the problem-based learning curriculum in the School of Medicine. Professional librarians have been involved in the planning for and the implementation of this curriculum. They have served as facilitators for some of the student groups. The SLIS students might serve a different role; as students they could work closely with both the students and those health sciences librarians who are involved in the new curriculum.

Since any of these alternative practicum experiences would require the student to be familiar with health sciences libraries, students would begin the practicum experience by working in a traditional setting. That is, the first sixty hours of the practicum would be spent in one of the health sciences libraries in the area. Then, with this experience behind them, the students would spend the remaining 120 hours of the practicum in one of these alternative settings. The librarians who supervised the first sixty hours would continue to supervise the practicum in these nontraditional areas.

Evaluation of alternative practicum experiences

There are a number of logistical problems that will be encountered in implementing the alternative placements for the practicum. Since SLIS students will most likely be taking other classes at the time they are doing their practicums, scheduling could be difficult.

If students choose to work in rural health, the ease or difficulty of removing SLIS students from the campus for a day or two when they are taking other classes needs to be investigated. The cost of sending students to these places is also a factor to be discussed. Many of the sites are easily within a day's drive, but some would require that the student spend the night near the site. What will be the costs for the student? Should the SLIS expect students to pay for such costs or are there sources within the school's purview that could be used to cover some of these expenses? Another issue is the identification of the resources needed to support the student. The health sciences students will all be provided with laptop computers. Does the SLIS student also need a laptop computer? What other resources would such students need? For those choosing the practicum experiences in a rural setting, the ease or difficulty of being the only professional librarian in this setting should be investigated.

Students currently keep a journal during their practicum experience and the journal could provide qualitative data for analysis. For each kind of alternative practicum a set of questions will be developed to be answered by both the student and the supervising librarian. Tracking the careers of these students will, of course, provide information about long-term significance.

ALTERNATIVE METHODS OF DELIVERING INSTRUCTION

The SLIS will test the combination of three kinds of instruction (satellite delivery, Internet-based delivery, and an intensive seminar) for a three-credit course in health sciences librarianship. This course can be taken either for graduate credit or for continuing education units. The course will be Seminar in Information Science: Libraries, Medical Informatics and Health Care, and will be offered in the summer and fall of 1996. The course will combine satellite delivery of instruction in May, Internet-based delivery of instruction during the remainder of the summer (via the World Wide Web, a listserv, and electronic mail), and an intensive four-day seminar in September. Thus, the students will become familiar with both the instructor (who will be part of the broadcast) and the material before coming to the seminar. The course can be taken as a whole or the first two parts can be taken singly or combined as continuing education units.

This planning grant allows the SLIS to

- determine the market for lifelong learning for those in health sciences librarianship;

- gain experience in offering instructional materials over the Internet;
- create materials for alternative delivery of instruction that are both visually effective and pedagogically successful;
- explore the possibilities of offering graduate credit to those in other states; and
- explore the feasibility of offering graduate credit for instruction offered via a Web server.

The SLIS Office of Continuing Education has been approved to provide continuing education by the Medical Library Association on several occasions in the past and has again applied for such approval for this experimental course.

Adapting the executive track of the Health Services Management program

The MU SLIS has had a long history of teaching classes throughout the state and an increasingly successful continuing education program. While the SLIS is not prepared to offer the entire curriculum in a distance education format, the faculty are interested in experimenting with and evaluating one or two offerings.

The program in Health Services Management, on the other hand, is offering an entire curriculum via what is called the "Executive Track." This is a two-year program that requires participants to come to Columbia four or five times each semester for intensive four-day seminars. The program has set up computer conferencing and a bulletin board through CompuServe, and students and faculty communicate regularly between the on-campus meetings. The students are expected to come to the seminars with all materials read and to use computer conferencing to ask questions and get assistance. With these between-session activities, the time spent in the seminars is very productive. In addition, because the Health Services Management faculty feel that it is extremely important that their graduates be comfortable working in teams, they set up teams within each class for specific projects and the teams communicate via the CompuServe connection. The students pay for their own CompuServe access. The course for the planning grant has been modeled in some ways on the success of this program.

Alternative delivery of instruction via satellite

On May 17, 1996, a satellite broadcast originated on the MU campus. It was received in forty-seven states and at three Canadian sites. The topics of the broadcast were telemedicine and consumer health information, both trends which could result in new patrons and services for health sciences librarians. Mary Moore, Ph.D., of V-Tel, Inc., and the University of Texas–Austin, presented the information on telemedicine, and Dr. Joanne Marshall of the University of Toronto spoke on consumer health information. This broadcast was offered for continuing education credit if taken independently of all other activities. If it was combined with the other two opportunities, then it became part of the three-credit graduate course described below.

One of the staples of a successful satellite program is a local facilitator, especially if the student is to be tested or otherwise evaluated on what has been learned. Delivery of such programs out of state provides new challenges in finding and working with those who would be local facilitators. Those receiving the broadcast at facilitated sites received four units of continuing education and those at other sites two units. The planning grant allowed the MU SLIS faculty to explore methods of providing support for those who served as facilitators at remote sites. The satellite broadcast was videotaped and the tapes were sent to those who could not see the session at broadcast time, including librarians in India and Australia. Those who viewed the tapes could receive two continuing education units from the Medical Library Association.

Alternative delivery of instruction via the Internet

Four areas have been selected for delivery via Internet. Students will be given materials on the language of medicine, i.e., roots and endings, eponyms, and common abbreviations. Second, students will receive instruction on MeSH, and third they will learn to search MEDLINE. The fourth area to be covered via this modality will be instruction on the health care delivery system in the United States. Much of the material for the fourth area will come from the course Health Care Systems, offered through the Health Services Management program but adapted for students interested in health sciences librarianship. There will be four separate but interrelated modules on the health care system in the United States:

- introduction to the health care system;
- the government's role in health care services;
- types of health care; and
- information systems in health care.

The last module, information systems in health care, will be developed by a member of the faculty in medical informatics.

The Internet-based instruction will be developed as seven modules. The modules will be of varying length and, thus, will receive varying continuing education units. Each of the four modules on the health care delivery system will also have an exercise that uses MeSH and MEDLINE to access the latest information on the topics covered by the modules. Students will be responsible for their own access to the Internet, including the costs. Whenever possible access to MEDLINE will be offered free of charge. Supplementing the required materials will be a listserv available from early May until late September. This set-up will allow students, both those taking the instruction for graduate credit and those taking it as continuing education, to be in touch with SLIS faculty and others in the field.

One of the benefits of alternative delivery of instruction, especially through the Internet, is that students can participate both at their convenience and from their own location. The staff of the planning grant will work with any potential students who cannot access the Internet to investigate alternatives. The commercial services, such as CompuServe and America On Line, are expanding the services they offer, and one or the other may be feasible.

Alternative instruction through the intensive seminar

From September 18 to 21, those enrolling in the course for credit, or those wanting the maximum number of continuing education units, will gather in Edwardsville, Illinois for an intensive face-to-face seminar. Classes will be held at the Lewis and Clark Library System, which has a state-of-the-art training facility with enough computers with Internet access so that no more than two students will share a computer. There will be a team of faculty headed by the principal investigator and a number of assistants to help students through the exercises. Lectures, exercises, demonstrations, and discussions will be the means of instruction. Topics to be covered during the seminar are searching MEDLINE and the Current Index to Nursing and Allied Health (CINAHL), trends and challenges in health sciences librarianship, professional clients and their impact on the services in health sciences libraries, medical informatics and Integrated Advanced Information Management Systems (IAIMS), problem-based learning, distance learning, and Internet sources.

Evaluating the alternative delivery methods

A tool for the evaluation of delivery of instruction via satellite has already been developed and used by the SLIS. For this project the additional variable of out-of-state facilitators will be added to the evaluation. The market for continuing education in health sciences librarianship can be judged by the number of people who choose to view the satellite broadcast.

The delivery of instruction via the Internet could be evaluated in several ways. Much of the information about the success or failure of the method will be garnered through anecdotal means. In addition, the number of people accessing and completing the seven modules will offer an indication of the success of this mode of delivering continuing education to practicing librarians.

There are several ways in which this project will be evaluated. To test the learning of the contents of the course, pre- and post-tests will be developed. Those viewing the satellite broadcast at a site with a facilitator will take the pre-test there. Those viewing it elsewhere or viewing the video by themselves will be requested to mail the test in a postage-paid envelope prior to the broadcast or the viewing. Then, at the end of the intensive seminar, all will receive the post-test. At the beginning of the course, all students will complete a form that will include information such as highest degree earned, type of library worked in, and type of position within that library. According to this information five to ten people who represent different types of background and levels of experience will be chosen. These people will be contacted after the project has been completed and interviewed to obtain their opinions concerning the success of the program. In addition, the staff will attempt to learn from those who, having made an inquiry, did not enroll, what factors influenced their decision not to participate. Finally, at the end of the intensive seminar, participants will be asked to fill out a form indicating other topics they would want to see offered in any of these forms.

OUTCOMES

At the conclusion of the planning grant, the SLIS will have developed two plans. One plan will be for a model curriculum in health sciences librarianship at the master's level and could include both courses in other programs and alternative practicum sites. The planning grant gives the SLIS the time to explore both of these possibilities in some depth and to have information on how difficult their implementation would be. The second plan will constitute offering both graduate and continuing education credit instruction through nontraditional methods. Satellite, Internet-based delivery, and an intensive seminar will have been explored, and the best from each kind of delivery can be incorporated into future curricula.

REFERENCES

1. MEDICAL LIBRARY ASSOCIATION. Platform for change: the educational policy statement of the Medical Library Association. Chicago, IL: The Association, 1991.
2. LINDBERG DA, HUMPHREYS, BL, MCCRAY AT. The Unified Medical Language System. Methods Inf Med 1993 Aug; 32(4):281–91.
3. NATIONAL LIBRARY OF MEDICINE. The education and training of health science librarians. (National Library of Medicine Long Range Plan, Report of Planning Panel on the Education and Training of Health Sciences Librarians) Bethesda, MD: National Institutes of Health, 1995.

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