Developing a medical informatics education program to support a statewide health information network*

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The Florida Health Information Network (FHIN) was established in October 1989 to provide biomedical information services to the University of Florida Health Science Center (HSC) and to health professionals throughout the state—especially the northern thirty-nine counties of the state. FHIN services are available to all affiliates of the HSC and by annual subscription to nonaffiliates. At present, FHIN services include database access, circulation services, document delivery, and information services. Training network users has been an objective since the inception. Training has targeted both the HSC Library staff and HSC users and now is expanding to include remote users. Because many users have had insufficient experience with computers, the library has to teach the mechanics of access and network use and to instruct users regarding applications and database searching. This paper describes the development and implementation of the medical informatics education program. Topics include library staff training; educational offerings for HSC faculty, staff, and students; development and implementation of the remote training program; and organizational and budgetary implications for the construction of such a program.

In an effort to improve access, retrieval, and management of the biomedical literature, the director of the University of Florida Health Science Center (HSC) Library approved the establishment of a medical informatics computer laboratory in 1989. This computer laboratory provides access to medical databases and an expanding number of applications in teaching and research. “Integrating the skills of end user searching of the medical literature into traditional course content” is a well-established teaching method [1]. Further support for this approach comes from the fact that when students are “taught the skills of accessing MEDLINE by computer, they can formulate a question, retrieve current information, critically review relevant articles, communicate effectively, and use these skills to contribute to patient care” [2]. It also has been documented that “use of a network for medical information has made medical students more at ease with computers, has connected those students with remote teaching sites and rural practices, and has served as a catalyst for investigation of computer applications to support health care delivery” [3]. And, finally, “Computer technology, information retrieval modalities, and teleprocessing between remote locations has been viewed as a partial solution to the issue . . . of the information explosion and geometric growth of knowledge in medicine” [4]. For all these reasons, the director had determined that the medical informatics computer laboratory would greatly improve the educational component of the library’s services. In addition, this improvement would forge stronger links with the colleges whose staff members and students are in the primary users of the HSC Library. These colleges include medicine, nursing, pharmacy, dentistry, health-related professions, and veterinary medicine.

The HSC Library established the Florida Health Information Network (FHIN) to provide biomedical

information services to health professionals in northern Florida who are not affiliated with the university, as well as faculty members not physically located on the Gainesville campus. FHIN services are available to all affiliates of the HSC and by annual subscription to nonaffiliates. Users may access FHIN either in the medical informatics laboratory or from a remote location outside the laboratory using a modem or through the campus computer backbone. FHIN is available twenty-four hours a day, seven days a week (Figure 1).

FHIN was implemented incrementally. Phase 1 began in October 1989, with on-site access in the medical informatics laboratory. Six personal computers provided access to MEDLINE and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) on a CD-ROM network operating under the library's Novell network. Phase 2 began in June 1990, with the addition of eleven workstations (for a total of seventeen) for on-site searching. By November 1990, FHIN services were expanded in the laboratory to include word-processing, spreadsheet, and educational or simulation programs. The medical informatics laboratory now has eighteen IBM-compatible personal computers and seven Macintosh computers.

In June 1990, FHIN implemented remote telephone access to the CD-ROM databases. Initially, this access was offered only to campus users outside the laboratory, in order to give the library systems staff experience supporting access to the available databases.

In February 1991, FHIN became accessible over the HSC computer backbone HEALTHNET and, a year later, over the campus backbone UFNET. In December 1991, the library began to market access to FHIN on a subscription basis to remote users not affiliated with the University of Florida, such as physicians in rural areas and private companies.

In fall 1992, medical informatics laboratory space was expanded to provide a classroom area with ten personal computers connected to the library network. This enabled the expansion of the MEDLINE teaching program, providing additional workstations for more students.

In November 1992, FHIN services were extended to physicians and students participating in the North Florida Area Health Education Center (AHEC) program. Figure 2 shows the resultant dramatic increase in network use.

FHIN remote services include access to the library's CD-ROM network of databases, including MEDLINE, CINAHL, AIDSLINE, TOXLINE PLUS, HEALTHPLAN, CLINPSYC, GRANTS, Physicians' Desk Reference (PDR), and MERCK MANUAL (Figure 3). Campus users in remote sites also may access Current Contents. Currently under development is an electronic mail component, which will provide electronic document delivery, information services, and bulletin board information. The extent to which these services can be successfully provided remains to be determined.

**STAFFING OF THE MEDICAL INFORMATICS LABORATORY**

To support network activities for the HSC Library and the public, the library established a new admin-
istrative division called Library Information Systems. Responsibilities of this new division include systems support, the public services function of operating the medical informatics laboratory, and FHIN development and technical support. Personnel included one full-time librarian as division chief, one half-time librarian for program development, and one full-time librarian as laboratory manager. Paraprofessional staff included one full-time network support person and sixty hours of student assistance. During fall 1992, an additional full-time laboratory support position and an additional twenty hours of student help were added.

AHEC AND ITS RELATIONSHIP WITH FHIN

Concurrently with the development of FHIN, the University of Florida College of Medicine received a grant to establish the AHEC program. Its mission is to improve access to quality health care in medically underserved areas. The AHEC service area includes thirty-seven counties in northern Florida encompassing more than 26,000 square miles, nearly half of the state’s total area. This area contains the most rural and most impoverished sections of the state. The AHEC program required library support in the form of access to medical information for students during their rotations with community-based primary care physicians and for their clinical faculty. This need meshed nicely with the library’s outreach initiative through FHIN, especially because AHEC officials did not want to establish a separate library system. FHIN provided an excellent vehicle for supplying library services to community-based physicians serving as AHEC preceptors, and to community health centers and public health units serving as additional student
training sites. At this writing, one hundred AHEC physicians and twelve community health centers and public health units are being served through FHIN.

An administrative reorganization was needed to accommodate the AHEC library program. Reflecting the belief that AHEC library services are linked inextricably with FHIN, the FHIN program development librarian was designated the AHEC library program director.

EDUCATION OF HEALTH SCIENCE CENTER USERS

The successful implementation of FHIN created a call for training and education programs to meet the growing needs of users. Users need training on two levels: the general mechanical aspects of using a computer and a network and use of the specific databases and other applications offered over the network. Currently, the latter level consists of database search training in SilverPlatter MEDLINE.

The HSC Library’s educational efforts are concentrated in four areas:

- Each new password registrant receives individual training by the paraprofessional staff member on duty. Training includes basic keyboard orientation, log-in procedures, and simple search mechanics. Initial sessions average about five minutes, although the staff is often asked to answer questions as the user proceeds.
- Reference librarians are scheduled in the laboratory during peak times to assist users. Instruction usually includes in-depth training and can cover the use of Medical Subject Headings (MeSH) and the development of search strategies. While these point-of-use instructional sessions are effective educationally, they are very labor intensive.
- SilverPlatter MEDLINE instruction is offered by librarians twice a week in the laboratory space designated as the classroom. Twenty individuals can be accommodated in the classroom, which contains ten workstations. Classes require no advance registration and are conducted regardless of the number of users attending. Most classes average three to six users and seem effective educationally. The major problem is lack of attendance by the students, staff, and faculty of the six colleges served by the HSC Library.
- SilverPlatter MEDLINE instruction has been incorporated into the basic educational program, which also includes training on the automated library catalog, introduction to the use of print indexes, and a tour of the three-story facility. New faculty, staff, and students are encouraged to participate in this program, which usually is offered at the beginning of every term but may be held whenever requested. Some bibliographic instruction sessions have been lengthened to provide time for MEDLINE instruction. The MEDLINE portion of the session lasts typically thirty minutes, with fifteen minutes for demonstration and fifteen minutes for hands-on experience.

Some course instructors are so enthusiastic about their students receiving MEDLINE instruction that they allow the library extra time with their classes. The first-year medical students, for example, now come to the library for two separate one-hour classes: one for general library instruction and one for MEDLINE instruction. Other instructional methods (i.e., computer-assisted instruction) are under development.

EDUCATION FOR REMOTE USERS

The expansion of FHIN access to remote users and the implementation of the AHEC program further complicated the demands on the HSC Library’s education program. How were remote users to receive the training necessary to access FHIN and perform effective database searches without additional outreach staff? This question has influenced the development of an educational strategy capitalizing on use of existing organizational library structures, both internal and external, while maximizing remote library support services. The FHIN training program, still in its evolutionary stages, follows a four-pronged approach: train librarians to serve as trainers, expand the library’s existing education program, train at remote locations, and provide telephone support.

Training the trainers

The library was approached by two groups of librarians who asked for training in accessing and searching FHIN databases. One group represented science librarians from another campus library who wanted to offer training to users who accessed FHIN either by telephone or through the campus network. The HSC Library offered training programs to this group in the informatics laboratory classroom and provided training materials they could distribute to users. This fortuitous development enables some of the training burden for remote campus users to be shifted from the HSC Library staff.

Borland Health Sciences Library serves as the medical library for the academic programs of the University of Florida Health Science Center in Jacksonville (the urban campus) and as headquarters for the Jacksonville Area Health Information Libraries (JA-HIL) consortium, a network of hospital libraries in the greater urban area. Administratively, Borland Library is a branch of the HSC Library. In spring 1993, Jacksonville faculty were connected to HEALTHNET, allowing access to FHIN. Borland librarians requested FHIN training so they would be able to assist their users. At the same time, Borland was interested in
offering another MEDLINE option to consortium members through FHIN. Consequently, a new subscription package was developed for JAHIL and for the Borland Library Associates Program. Subscribers may select the new package with access to FHIN for a slightly higher fee than the old package. The Borland librarian serving as the JAHIL library consultant received additional FHIN training in telecommunications in order to assume the role of FHIN trainer for this special user group.

Expanding the existing HSC Library education program

When FHIN services were extended to AHEC preceptors, community health centers, and public health units located in the most rural areas of Florida, the library’s training program was confronted with both its greatest challenge and its greatest opportunity. Because AHEC would be sending students on rotations to serve in these rural sites, it became clear that the key to the AHEC training effort was to focus on the students. Fortunately, all first-year medical students are required to attend two library classes on searching the library network during their first semester. These classes are tied to specific problem-solving assignments, requiring MEDLINE searching for solutions. Once students learn the usefulness of MEDLINE in completing their required assignments, they are quick to apply it to other academic and clinical situations. Because students can access FHIN from the informatics laboratory, their laboratories, and their homes, they are accustomed to using FHIN resources at any time of day. By the time they reach their rural rotation sites, they have thoroughly integrated MEDLINE and other FHIN databases into their clinical problem-solving processes.

Each AHEC preceptor has been enrolled as an FHIN member, so they receive a password to access the FHIN databases along with searching and telephone access guides. Preceptors also receive a brochure explaining library services that includes telephone numbers for document delivery, reference services, and computer searching services.

Each student is required to complete a library and information survey in consultation with the preceptor to ascertain existing information resources, skills, and needs, as well as computer and telecommunications abilities. In some cases, students have been assigned by preceptors to teach methods of accessing FHIN, including determination of hardware and software requirements. Students, therefore, perform an important role as information gatherers and library ambassadors.

As much as possible, staff members of the AHEC program office and regional centers are being trained in FHIN access and searching. The program office holds quarterly meetings with the three (soon to be five) regional AHEC center directors, and the AHEC librarian schedules FHIN training during these times. AHEC staff training sessions are held in the informatics classroom at the library, where users receive hands-on experience in searching and accessing FHIN by telephone. One person in each of the AHEC centers is the designated library contact, receiving extra training and telephone support. This model will be extended to community health centers and public health units as they are connected to FHIN.

Remote site training

While remote site training is the most expensive and time-consuming approach for the library, it is the most convenient for the remote user. Because the library does not have the financial and human resources to conduct one-on-one remote site training, every attempt is made to include as many people as possible in each session. Once again, our student programs provide the key to our training strategy.

The Program in Medical Science (PIMS) selects thirty students, usually from the Panhandle section of the state (Tallahassee and westward), to take first-year medical school classes at Florida State University in Tallahassee. These students also participate in the AHEC program. PIMS installed a telecommunications-capable computer in the student Learning Resource Center (LRC) after consultation with the AHEC librarian, who then conducted a group training session at the LRC demonstrating dial access, MEDLINE searching on SilverPlatter, downloading, and file transfer. The next day, the librarian held small-group sessions with students, providing the opportunity for hands-on experience with both mechanical aspects and searching. Subsequently, the AHEC librarian and library systems staff have provided telephone support for the PIMS user group. These students are then in a position to provide FHIN awareness and possible training for their community-based preceptors.

Additional group training opportunities for health professionals will be presented through AHEC-sponsored events held in rural communities. The AHEC program staff at both the central and regional level has been both supportive and enthusiastic in helping to develop these educational opportunities.

Telephone support

No amount of teaching or preparation will obviate the need to have staff close at hand to answer questions when users are on their own and attempting to access the system. For that reason, FHIN offers telephone support fifty-eight hours a week. Recently, telephone support was extended to include some weekend hours. This service is provided primarily by the systems staff and, when available, the AHEC li-
brarian. Most calls are related to telecommunications issues rather than database searching.

Under development is a monitoring system using software similar to PC Anywhere that will enable systems staff and a back-up librarian to monitor remote users’ search sessions and intervene when necessary. This capability could provide an effective and economical way to enhance remote users’ searching and access skills.

SUMMARY

The FHIN training program has been both the beneficiary of and catalyst for organizational change. The opportunities and demands presented by the technology utilized by FHIN provide the stimulus for the HSC Library to design an educational program to address user needs and reach an increasing number of clinicians. An important outcome of FHIN implementation has been the evaluation, reorganization, and strengthening of the basic library education program. The evaluation process has led to the creation of a curriculum committee, which reports to the library faculty group. This committee develops outstanding curriculum and training materials, which the FHIN training program can use with minimal adaptation.

FHIN has benefited tremendously from the concurrent development of AHEC, which has encouraged, facilitated, and provided resources for the development and implementation of the training program.

Finally, FHIN has benefited from the expertise and support of a highly skilled library systems staff, who provide remote assistance and continue to develop applications such as the online monitoring system that enhance the total educational product.

At present, AHEC is purchasing computers for the permanent clinical teaching sites that will be dedicated to accessing FHIN and other information resources. The computer workstation is to be located near the examining room, to enable easy access to information in the patient care setting. It is hoped that convenient access to medical information will result in improved diagnoses and treatment choices and improved overall patient care. It is also hoped that access to current medical information through FHIN will increase physician satisfaction in the community.

REFERENCES

2. Ibid., 642.

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