

Evolution of an End-User Training Program

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ABSTRACT

The University of Illinois at Chicago Library of the Health Sciences has taught end-user classes on the MEDLARS system since early 1985. Registration, class composition, and, most importantly, class organization evolved continuously during the first year of operation. Several feedback mechanisms were used. An examination of the past training and specialization of participants helped to determine teaching examples and pace; a more varied group of participants necessitated a broader range of examples and increased explanations. Participant evaluation forms and oral comments helped define scheduling, agenda, and the need for additional equipment and practice time. Further evaluation will center on the searching done by the program's alumni.

IN SEPTEMBER 1984 the National Library of Medicine sponsored a seminar entitled Teaching MEDLINE to the Health Professional: A Workshop for Search Intermediaries. Its purpose was to introduce the National Library of Medicine's health professional training manual, *The Basics of MEDLINE: A Guide for the Health Professional*, and to provide information and materials for trainers conducting end-user workshops. Many alumni of this or subsequent "training the trainer" workshops have now begun to train health professionals or students in their own institutions and communities. However, there is little descriptive or evaluative published information on end-user MEDLINE training specific to the MEDLARS system. This

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paper describes one institution's MEDLINE training for health care professionals and includes an evaluation of the workshops.

LITERATURE ON END-USER TRAINING

The literature on medical end-user searching focuses primarily on BRS Colleague, miniMEDLINE, Knowledge Index, PaperChase and other commercial user-friendly, menu-driven systems. The recent introduction of Grateful Med by the National Library of Medicine is a further attempt to offer end users a less hostile alternative to the native Elhill search commands. There are, however, some examples in the literature of end users' being trained on native systems.

Lancaster's 1971 study of *Abridged Index Medicus* via the Teletypewriter Exchange Network (AIM-TWX) indicated that biomedical practitioners who had had only an introduction to the system and minimal training conducted effective searches, with a 63% precision rate and a 67.6% recall rate [1]. Lancaster also found that the "interactive capabilities of the system are comparatively little used" and that searchers have a tendency to remain wedded to their original search strategy. Olson later studied the MEDLINE searches of nonlibrarians, primarily graduate or medical students, again with regard to the number of online modifications to search strategy made by the end user [2]. Olson's users were trained with a printed user guide, "lessons" from a reference librarian, guidance from another user, or a combination of these. Students who were taught to search by a reference librarian and combined this with some other means of learning about the system had the best results: a high number of search statement modifications and a relatively low percentage of error.

The training methods Sewell and Bevan employed to teach MEDLINE and TOXLINE to pathologists and pharmacists at the University of Maryland Library of the Health Sciences were limited to two-hour lecture demonstrations covering basic operations [3]. However, because the training was optional, only one third of the actual end users attended these sessions and the authors question their usefulness. Sewell and Bevan assert that most of the end users learned the system in individual training sessions at library terminals, by simply sitting down at the terminal and learning by doing, or from each other. Although these authors were skeptical about formal training, a 25-page minimanual on MEDLINE and TOXLINE was eventually prepared to assist in training. Like Ege-land [4] and almost every other writer who has studied non-user-friendly systems, Sewell and Bevan emphasize the need for some mechanism to help infrequent end users who are unable to remember basic commands and the intricacies of the system. Sewell and Teitelbaum followed up with an eleven-year study that compared end-user searching on MEDLARS by pathologists and pharmacists to searching by other end users [5]. They found convenience and speed to be the primary justifications for end-user searching; performance of the system was of less importance. They reaffirm the need for one-on-one training with an easily understood manual as a supplement.

It is commonly suggested that end users should restrict their searching to "quick and dirty" searches. Training for this type of searching was attempted by Leipzig, Kozak, and Schwartz at American Critical Care [6]. Scientists were trained on MEDLINE through the use of NLM slides and hands-on practice. That the scientists searching eventually dwindled from six to only one was explained by unavailability of terminals, infrequent searching, and the convenience of an attractive alternative to end-user searching (an information services department that began providing mediated searches).

End users clearly represent an important market for the major vendors. Some of the vendors now offer not only an established menu-driven system but, in varying degrees, more user-friendly native systems. DIALOG's Seminar for Medical Professionals limits enrollment to nonlibrarians involved in health care delivery. Snow reports on such educational concepts as sequencing, and she recommends training methods that are modular in nature, with stand-alone units [7]. Both Snow and DIALOG address the problem of follow-up by

suggesting materials for independent study to be used after the initial training.

INITIATING THE PROGRAM

The Library of the Health Sciences of the University of Illinois at Chicago began offering MEDLINE Workshops for Health Professionals in January 1985. A letter was sent to department heads in the U.I. College of Medicine and other selected units in the university to advertise the initial classes. This was followed by letters, flyers, and registration forms sent to all faculty members and residents in these departments. An attempt was made to target departments whose search needs could be sufficiently met by searching the MEDLARS databases rather than those by BRS, DIALOG or other vendors. A direct mailing was necessary only for the first three classes. Subsequent classes filled through word of mouth, articles in the university newspaper, and posters displayed in the library and in various campus buildings.

When the library eventually agreed to train health professionals not affiliated with the university, it was included in the referral list compiled by the Greater Midwest Regional Medical Library Network Management Office. Consequently, the library has had a waiting list for training since the inception of the program.

The nine classes held in 1985 were attended by ninety-four health professionals. Participation in the workshop was restricted to health professionals and health professional students who had access to a terminal or microcomputer. Secretaries and administrative or graduate assistants who would act as intermediaries were excluded. Class size ranged from nine to twelve. An upper limit of twelve allowed adequate table space, a complete three-volume set of MeSH tools per student, and more supervised online time. The first three classes were limited to participants from the University of Illinois at Chicago. Subsequent sessions were open to health care professionals from outside the university. Seventeen health professionals (18%) not affiliated with the University of Illinois were eventually trained.

The course was separated into seven sections: Introduction/Communications, Author Searching, MeSH Terms and Tools, Textword Searching, Printing, Other Commands, Practice Time. The first six parts were rotated among the three instructors. Each instructor eventually taught each section. Online Practice Time was supervised by all the instructors to provide maximum attention. The

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course was scheduled either for one full day or two consecutive mornings.

PROFILE OF PARTICIPANTS

Important concerns in developing the course were the interests, educational level, and subject expertise of those attending. These factors would affect the content and pace of instruction, influence the choice and number of examples, and determine the amount of technical explanation necessary. Background information was collected through the "Profile of Participants" designed by the National Library of Medicine. The ninety-four participants were classified into six health-related occupational groups (Table 1). The physicians were further identified by area of specialization (Table 2).

The researchers were subclassified as clinical pharmacists, nutritionists, and postdoctoral fellows. The professions subsumed under "Other" were biomedical engineer, chemical technologist, laboratory technician, librarian, medical technologist, pharmacist, administrator, and graduate student. There were more nonphysicians than expected. (Physicians account for 35% probably only because the first three classes were limited to the Department of Medicine.) With such a wide variety of participants it was not possible to tailor examples to a specialty or assume understanding of specialized terminology.

EVALUATION FEEDBACK

Because this was a new program, taught by instructors with no previous experience in training end users, the designers of the program felt it was important to refine the content and structure of the course based on user feedback. Each participant was asked to complete a course evaluation form. Eighty-one forms (86%) were returned. Table 3 shows the questions and the results. The overall content of the course was rated good or excellent by 100% of the participants. All of the participants also rated the manual and the instructors good or

TABLE 1
PARTICIPANTS BY OCCUPATIONAL GROUPS (N = 94)

Profession	Number	Percentage
Physician	33	35
Nurse	8	9
Medical student	1	1
Dentist	3	3
Researcher	31	33
Other	18	19

TABLE 2
SPECIALTIES OF PHYSICIAN PARTICIPANTS (N = 32)

Speciality	Number	Percentage
Allergy and immunology	1	3
Internal medicine	11	34
Neurological surgery	1	3
Obstetrics and gynecology	3	9
Ophthalmology	2	6
Pathology	4	12
Pediatrics	4	12
Physical medicine and rehabilitation	1	3
Surgery	5	15

excellent. In their evaluation of the seven parts of the course, participants were most positive about Author Searching (78% excellent) and least positive about the MeSH Term portion (53% excellent). There is no information on whether this discontent was due to the subject matter itself or the way it was taught. The majority (84%) felt the course was relevant to their needs. Of the eighty-one respondents, 88% said they intended to apply for their own password. Many of the remaining 12% already had their own personal or departmental password; they were taking the course to increase their proficiency in searching. All of the participants indicated they would recommend the course to a colleague.

The comments provided on the evaluation forms also had an impact on course development. Twenty-three of the questionnaires (28%) included generally positive comments ranging from "They were great" and "Really a good job" to "For an \$11.00 fee, this is a fantastic course." Sixteen participants (20%) asked for additional practice time. There was a strong desire that hands-on access be made available after each segment of the workshop. Nine participants (11%) expressed their confusion with MeSH terms, major/minor terms, tree structures, and explode commands. Individual comments included a complaint about insufficient time spent on journal searching, a suggestion that Boolean operations be explained at the beginning of the course, a preference for two half-day workshops, and a recommendation that participants read the manual before they attend the workshop.

A preliminary evaluation after the first three classes resulted in several changes. During the initial workshops, hands-on practice time was scheduled at the end of the sessions because access to search equipment was not convenient. Beginning

TABLE 3

SUMMARY OF EVALUATIONS: MEDLINE WORKSHOPS FOR HEALTH PROFESSIONALS, LIBRARY OF THE HEALTH SCIENCES, UNIVERSITY OF ILLINOIS, 1985
(N = 81 RESPONSES)

	Excellent (%)	Good (%)	Fair (%)	Poor (%)
1. Rate the contents of the guide <i>The Basics of Searching MEDLINE</i> .	80	20	0	0
2. Rate the following portions of the course:				
Introduction/Communications	68	31	1	0
Author Searching	78	22	0	0
MeSH Terms	52	45	3	0
Textword Searching	66	32	1	1
Print Commands	73	24	3	0
Other Commands	58	38	4	0
INTROMED (Practice Searching)	63	37	0	0
3. Rate the instructors on the following:				
Knowledge of subject	91	9	0	0
Easy to communicate with	82	18	0	0
Willing to stop and clarify points	94	6	0	0
Presented material effectively	79	21	0	0
4. Rate the overall content of the course.	74	26	0	0
	Very relevant	Moderately relevant	Not relevant	
5. To what extent were the contents of the course relevant to your needs?	84	16	0	
		Yes	No	
6. After this one-day workshop, do you intend to apply for your own access code to MEDLARS?		88	12	
7. Would you recommend this course to your colleagues?		100	0	
8. Would you be interested in attending monthly or bimonthly lunch-hour workshops? Searching problems and techniques, more advanced searching methods, and additional databases will be discussed.		88	12	

with the fourth workshop, arrangements were made to move six terminals, borrowed from a variety of sources, to the training room. By the seventh class the library had purchased three additional CRT-keyboard/modem/printer combinations (Esprit 6310/Volkmodem 12/Epson 800) for use with the three library-owned PC/modem/printer combinations. The ready availability of terminals allowed hands-on practice to be scheduled after the author and MeSH sections, in addition to a large block of time at the end of the day or half day.

Although the evaluations of the MeSH portion of the course were not negative, they did display a weakness. Consequently, the time spent on this section was extended, a number of audiovisual aids were added, and practice time was scheduled immediately after that lecture. Because trainees

requested access to the manual before the workshop, a note was added to the registration form stating that the manual could be picked up as soon as registration fees were paid.

Although both trainers and trainees felt that two half-day sessions worked best, some all-day classes were still planned, to accommodate those traveling long distances and those who found it easier to free one whole day in their schedules.

Several oral comments indicated that some trainees had no plans to apply for their own password or search for themselves. Nevertheless, the instructors did not begrudge the time spent on or the space occupied by these individuals, because *all* participants became more educated users of search services. Even those who do not perform their own searches are now better at requesting online searches. They often find appropriate MeSH

terms before approaching the search analyst, and they have more realistic expectations for the searches they request.

Because of the volume of post-class telephone calls concerning the NLM Online Services Application Packet, approximately five minutes is now spent during the introduction discussing the most common questions. The MEDLARS Management Section information number is recommended as a source of help with problems. The instructors' availability to answer questions and assist with search strategies is stressed. Most requests for assistance come a few weeks after attendance at a workshop. Due to the time lag between attending class and receiving a password, several users needed a "refresher" tutorial to get started. A few sessions of this kind given individually were found to be very effective.

The evaluation of the workshops provided useful information regarding the classes' format, content, printed materials, and instructors. The next step will be to provide a follow-up or evaluation of searches performed by the end users. Lancaster has stated that there is a need for evaluating (1) the amount of searching done by end users, and (2) the quality of their searching (determined by precision, recall, cost-per-relevant-citation and similar performance measures) [8]. The difficulty is that such an evaluation can be extremely time-consuming for both the library and the end user. For health professionals, the time investment necessary for analytic, cooperative evaluation of their searching may defeat its oft-stated purpose—saving time.

Little doubt remains that end users can do basic searching. There is no question that they are interested in searching. Whether that interest can be sustained in the face of frustration with the inevitable "searches gone wrong," whether they will search regularly enough to retain basic commands and an understanding of the system, and whether they are willing to invest sufficient time in their end-user education are all still somewhat in doubt. After one year, most of these health professional students were doing well; a formal analysis of how well is in process. Most of the clinicians who were

trained still call the library to request searches on complex topics. This may indicate not only a lack of experience, but also a lack of time.

The role of librarians and information scientists is continuing to change. As Dalrymple stated in 1984, "Increasingly, the librarian will serve as a source of information and counsel about the capability of online systems, and will exercise professional judgment as to which systems and services are appropriate to the library's clientele" [9]. Professionals will use their knowledge not solely as searchers, but also as teachers of searching and as advisers on specific databases and systems.

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Received August 1986; accepted September 1986.