is available through IUSD’s server and is a superior way to access dental information because graphics can be vital to understanding the text. In addition, participants were exposed to a variety of teaching techniques, from presentation software to an interactive lecture built as a home page, all of which may be applicable in their own teaching.

The presenters enjoyed working together on an innovative project and distinguished themselves in the campus community as being "in the know" about information technology. The workshop was an excellent way to showcase cooperation among IUSD personnel and recognize the unique yet complementary missions of the three presenters’ departments.

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Faculty involvement in problem-based library orientation for first-year medical students*

By Martha F. Earl, M.S.L.S.
Head of Reference and Instructional Services

Kelly Hensley, M.S.L.S.
Computer Services Librarian

Janet S. Fisher, M.L.S.
Library Director and Assistant Dean for Learning Resources

Mary Jane Kelley, Ph.D.
Section on Medical Education

Daniel Merrick, M.D.
Internal Medicine

East Tennessee State University
James H. Quillen College of Medicine
P.O. Box 70,693
Johnson City, Tennessee 37614

The curriculum for undergraduates is in transition at the Quillen College of Medicine, East Tennessee State University (ETSU). The Medical Student Education Committee (MSEC) has assigned subcommittees to revise the curriculum and created a list of objectives that undergraduates are to achieve before graduation. Among other objectives, students are to acquire problem-solving and lifelong-learning skills. Although ETSU has no formal problem-based learning (PBL) curriculum, an increasing number of faculty members use PBL techniques informally. This paper reports on a 1993 PBL module designed to introduce first-year medical students to library research skills.

Problem-based learning techniques have been used in library bibliographic instruction since the 1980s. For example, Watkins summarized a 1991 self-study of librarians affiliated with institutions with formal PBL curricula tracks and described library faculty responsibilities and user needs unique to PBL. She emphasized that librarians may fulfill many roles—as traditional service providers, as resource persons, as faculty, or as tutors or facilitators. In particular, the

role of the librarian as a faculty member is strengthened by PBL curricula [1].

The trend toward PBL in medical school curricula means that library instruction must change to meet increasing information demands. Rankin concluded that PBL students used the library more frequently than did students in conventional classes and utilized resources that supported the independent learning process [2]. The sooner library skills are learned in the medical school education, the more effective the physician’s independent learning skills, so Rankin advised librarians to provide resources to support the preclinical as well as the clinical years [3]. Marshall also found that PBL students used the library more than traditional students did. Most students involved in PBL curricula had acquired information-seeking skills prior to enrollment or during the first year of medical school [4]. Watkins stressed that a comprehensive library orientation emphasizing how to access the collection is imperative, because students select resources on their own and use a wide variety of them. All of the libraries in the PBL self-study had added formal orientations for first- and second-year students [5].

Other librarians have worked with nonlibrarian faculty to train first-year medical students in library skills. At the University of New Mexico, all first-year students participate in a library instruction module using a PBL approach mentored by librarians [6]. At Meharry Medical College, Hamberg and Nichols used a PBL approach to train first-year medical students with librarians as facilitators [7]. At ETSU the only required library orientation consisted of a tour and computer demonstrations for first-year students during orientation week. The library requested additional time from the Student Affairs orientation coordinator in order to add the PBL component.

THE PROJECT

By adding a PBL component, ETSU librarians tried to impress upon students the fact that there is a strong relationship between the use of library resources and the acquisition of lifelong skills for solving clinical and scientific problems. The involvement of nonlibrarian faculty would demonstrate the importance of library resources for practicing physicians and scientists. Librarians also wanted to strengthen the relationship between library and nonlibrarian faculty acting as co-educators, in order to incorporate library instruction into the curriculum effectively.

The information-seeking habits of physicians suggest that faculty facilitators should be used to improve library instruction. Physicians looking for information turn most often to other physicians [9]. Rankin showed that medical students, whether in PBL or traditional curricula, select colleagues first for clinical questions, then textbooks or other written resources, then faculty members [10]. Two useful articles related to project design were found in the literature. Saunders explained the interaction of librarians with faculty facilitators and the resources needed [11]. Barrows detailed the organization of PBL sessions and case studies [12].

After reading Barrows, librarians realized that they needed help from a clinician to write the cases. A faculty member in internal medicine volunteered to write the cases and train the other facilitators. Librarians also worked closely with another faculty member familiar with PBL techniques, who helped coordinate components into a standard problem-based model. A librarian wrote the facilitator’s guide. Facilitators met for an hour before the orientation began. All faculty members who volunteered to help with the orientation were familiar with small-group facilitation techniques.

Sixty-two first-year students attended the 1993 library orientation. They were divided into four groups with at least two facilitators per group. Within each group, the facilitators distributed the four cases. The cases were purposely simple because the author did not want to assume any advanced medical knowledge on the part of students. (See Appendix A for one of the cases.)

The groups met for thirty to forty-five minutes to distribute the case assignments and note the times that librarians and faculty were available for assistance. A librarian observer and consultant stayed with each group and led a library tour in conjunction with the assignment.

The groups worked informally on the exercise, using lists of resources provided by the library. Then groups met again for an hour to discuss the case. A spokesperson from each group presented the case. Students and facilitators completed a formal evaluation to determine if the commencement objectives were met. The student evaluation form is shown as Appendix B.

RESULTS

All sixty-two students and thirteen of sixteen facilitators (including librarians and consultants) participated in the evaluations. Appendix B shows student and faculty responses.

The involvement of nonlibrarian faculty in a library PBL orientation for first-year students achieved the goals that librarians and project organizers had set. The first goal (demonstrate the actual lifelong learning process) was well modeled for students. Each facilitator noted the tools that he or she regularly consulted. Students saw clinical and basic science faculty directing them to use the library to solve a real
clinical problem. Both faculty and students agreed that the exercise achieved the commencement objectives for lifelong-learning and problem-solving skills.

Since orientation, the library staff has observed increased use of the library by the first-year students involved in the orientation, compared to previous classes. Both faculty and students agreed that the library was a good place to extend the limits of their knowledge.

Faculty involvement in the orientation clearly strengthened the connections between librarians and other faculty. Ten of thirteen facilitators rated the library staff as good or excellent. Faculty felt even more strongly than students that the exercise achieved commencement objectives. All of the nonlibrary faculty agreed to participate again the next year.

Much of the rest of the evidence for the improved standing of librarians in the eyes of faculty is anecdotal. Librarians have been selected to serve on MSEC curriculum subcommittees concerned with communication skills and computer literacy. The MSEC members saw the need to emphasize computer literacy skills, including MEDLINE searching, throughout the four-year curriculum. They also recommended that the library be the focus of computer education for medical students.

Several project facilitators have contacted librarians for traditional reference assistance more often than they did in the past. Some facilitators have increased the amount of time they devote to teaching information-seeking skills, particularly during clinical clerkships. In addition, project faculty have linked more assignments to the use of the library and library technology. One facilitator used the library’s cases to develop his own PBL case for microbiology students and invited a librarian to serve as a facilitator.

The problem-based library orientation was scheduled as a continuing project. Students involved with the first orientation proclaimed its worth, especially as the curriculum changed to include additional clinical and problem-based learning in the first two years of medical school. Students and administrators chose a librarian to serve on the college-wide orientation planning committee.

Faculty action to incorporate assignments utilizing research skills further demonstrates the value they assign to students learning the skills taught by the PBL exercise. With the increasing pace of technology advancement, the focus is on strengthening analytical skills. The American Medical Association statement on physician commitment to lifelong learning stressed that knowledge advances so quickly that it is impossible to offer competent medical care without ongoing medical education. Although reading the literature provides the foundation for continuous learning for most, physicians must be selective [13]. Faculty at ETSU recognized that students can begin to learn these information-seeking skills in the first year of medical school.

CONCLUSION

The involvement of faculty in a problem-based library orientation demonstrated to medical students the importance of library resources in meeting the information needs of physicians and scientists. The exercise raised the standing of the library as a resource for lifelong learning and achieved College of Medicine commencement objectives. Faculty involvement modeled information-seeking skills, enhanced relations between faculty and librarians, improved student learning skills, and demonstrated the value of retaining the PBL exercise for future orientations.

REFERENCES


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APPENDIX A

Case 3
A fifty-three-year-old white female presents with a chief complaint of headache and swelling of the face and arms. This patient notes she was in her baseline state of fair health until one week ago when she noticed the gradual and progressive onset of swelling of her arms and head. The process has worsened and now is associated with a severe headache which has prompted this evaluation in your office.

The patient’s past history is notable for Crohn’s disease. She has severe and chronic diarrhea as a result of the short bowel syndrome (caused by multiple resections of the small bowel for obstruction and perforation secondary to complications from her Crohn’s disease). She is on intravenous fluid and magnesium replacement (to correct the deficits caused by the diarrhea).

Two months ago she had a Hickman catheter placed for administration of the intravenous supplements.

A superior-vena-cava flowogram showed complete occlusion of the superior vena cava. Consultation was sought from a vascular surgeon and a hematologist, neither of which had confronted a superior vena cava syndrome secondary to massive thrombosis of the vena cava. You remember that the MEDLINE database is available at the library, so you quickly search through the world’s literature for case reports on such catastrophes.

We suggest you seek the guidance of a librarian experienced in searching the MEDLINE database.

1) What can we do to help this patient?
A) Please consult the Dorland’s or Stedman’s medical dictionaries for any terms that you do not know. Use the Magellan online catalog to find the call numbers of the books.
B) Do a MEDLINE search on thrombolytic agents and superior vena cava syndrome. Use the thesaurus on the computer (the F9 key) to find the appropriate medical subject headings.
C) Can you explain how this treatment works? Look in Harrison’s or Cecil’s textbooks of medicine or Williams’ textbook of hematology for more information. Ask Magellan for the call numbers.

APPENDIX B

Problem-based learning exercise student evaluation form

Please rate according to the scale below the following statements as to how the medical library orientation exercise affected your abilities to:

5—Improved my skills greatly 4—Improved my skills 3—No effect 2—Worsened my skills 1—Worsened my skills considerably

1. Recognize your personal limits in knowledge and experience.
   Student: N = 62 Mean = 3.97 SD = .652
   Faculty: N = 11 Mean = 4.27 SD = .467
2. Rectify the gaps in your information-seeking knowledge.
   Student: N = 62 Mean = 4.05 SD = .664
   Faculty: N = 11 Mean = 4.45 SD = .522
3. Seek assistance and information from appropriate sources, including the medical library.
   Student: N = 62 Mean = 4.27 SD = .632
   Faculty: N = 10 Mean = 4.60 SD = .516
4. Apply acquired knowledge appropriately.
   Student: N = 62 Mean = 3.94 SD = .569
   Faculty: N = 11 Mean = 4.00 SD = .632
5. Organize and present self-acquired information.
   Student: N = 62 Mean = 3.81 SD = .698
   Faculty: N = 11 Mean = 4.36 SD = .505
6. Demonstrate new skills to faculty and colleagues.
   Student: N = 62 Mean = 3.76 SD = .645
   Faculty: N = 11 Mean = 4.18 SD = .603
7. Read relevant literature.
   Student: N = 62 Mean = 4.02 SD = .665
   Faculty: N = 11 Mean = 4.27 SD = .647
8. Realize that medical education involves lifelong learning.
   Student: N = 62 Mean = 4.29 SD = .753
   Faculty: N = 11 Mean = 4.27 SD = .786
9. Seek new approaches for acquiring medical knowledge.
   Student: N = 62 Mean = 4.19 SD = .698
   Faculty: N = 11 Mean = 4.55 SD = .688
10. Recognize and clearly state problems which exist.
    Student: N = 62 Mean = 3.92 SD = .635
    Faculty: N = 11 Mean = 4.27 SD = .467
11. Define the complexity and extent of problems.
    Student: N = 62 Mean = 4.02 SD = .587
    Faculty: N = 11 Mean = 4.27 SD = .467
12. Focus on issues having the greatest impact.
    Student: N = 62 Mean = 3.87 SD = .614
    Faculty: N = 11 Mean = 3.91 SD = .539
13. Examine problems from different points of view and suggest appropriate solutions.
    Student: N = 62 Mean = 4.13 SD = .614
    Faculty: N = 11 Mean = 4.09 SD = .539
14. Consider opinions and concerns of others with differing points of view.
    Student: N = 62 Mean = 3.97 SD = .701
    Faculty: N = 11 Mean = 3.82 SD = .751
15. Consider potential beneficial and adverse effects of a plan.
    Student: N = 62 Mean = 4.06 SD = .650
    Faculty: N = 11 Mean = 3.91 SD = .701
16. Collect and integrate relevant information.
    Student: N = 62 Mean = 4.05 SD = .638
    Faculty: N = 11 Mean = 4.45 SD = .522
Participants understand . . .

- that medical education is lifelong
- how to seek and use new information

| Lifelong — Faculty | 0 | 0 | 2 | 4 | 5 |
| Lifelong — Student | 0 | 0 | 10 | 24 | 28 |
| Seek — Faculty | 0 | 0 | 0 | 4 | 7 |
| Seek — Students | 0 | 0 | 5 | 43 | 14 |

17. Identify, seek, and use new information necessary in problem solving.
   Student: N = 62 Mean = 4.15 SD = .539
   Faculty: N = 11 Mean = 4.64 SD = .505

18. Use a variety of sources for problem solving.
   Student: N = 62 Mean = 3.95 SD = .664
   Faculty: N = 11 Mean = 4.64 SD = .505

19. Appropriately use the team approach to problem solving.
   Student: N = 62 Mean = 4.19 SD = .623
   Faculty: N = 11 Mean = 4.45 SD = .688

20. Evaluate the effectiveness of actions.
   Student: N = 62 Mean = 3.74 SD = .603
   Faculty: N = 11 Mean = 3.82 SD = .751

Please rate the following components of the medical library orientation according to the following scale:
5—Excellent 4—Good 3—Fair 2—Needs improvement 1—Unnecessary

If you answer D or E for an item, please explain your response, so that we can make improvements for next year's class.
21. The time of day for the orientation
Student: N = 62 Mean = 3.31 SD = .916
Faculty: N = 13 Mean = 3.46 SD = 1.13

22. The days of the week
Student: N = 62 Mean = 3.50 SD = .937
Faculty: N = 13 Mean = 3.69 SD = .947

23. The tour
Student: N = 62 Mean = 4.05 SD = .777
Faculty: N = 13 Mean = 4.15 SD = .801

24. The handouts
Student: N = 62 Mean = 4.10 SD = .824
Faculty: N = 13 Mean = 4.15 SD = .801

25. The problem-based learning exercise
Student: N = 62 Mean = 4.08 SD = .911
Faculty: N = 12 Mean = 4.17 SD = .389

26. The faculty facilitators
Student: N = 62 Mean = 4.40 SD = .639
Faculty: N = 10 Mean = 4.20 SD = .632

27. The meeting rooms
Student: N = 62 Mean = 3.94 SD = .787
Faculty: N = 13 Mean = 3.08 SD = 1.19

28. The luncheon
Student: N = 61 Mean = 4.05 SD = .865
Faculty: N = 10 Mean = 4.60 SD = .516

29. The library staff
Student: N = 59 Mean = 4.59 SD = .561
Faculty: N = 13 Mean = 4.77 SD = .439

30. The follow-up sessions
Student: N = 58 Mean = 4.02 SD = 1.02
Faculty: N = 9 Mean = 4.33 SD = .500

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**Teaching roles of librarians in nursing education**

*By Karen L. Curtis, M.S.*

**Assistant Information Services Librarian**

**Library of the Health Sciences**

**University of Illinois at Chicago**

**1750 West Polk Street**

**Chicago, Illinois 60612**

The changing nature of librarians’ roles has been discussed at length in the library literature. In recent years, medical librarians have responded to the roles of the future described in 1982 in the Matheson and Cooper report [1]. Teaching is among the expanding roles. In 1993 Rankin and Sayre wrote, “Librarians are teaching information management, microcomputer basics, software packages, telecommunications, database searching, Internet access, research methods, and other related topics” [2].

Determination of the topics taught by librarians within particular disciplines and populations will assist librarians in shaping their future educational roles. The topics are many and varied. As Rankin and Sayre noted, “Because today, more than ever, health sciences librarians’ teaching roles are closely tied to institutional missions and curricula opportunities, the content and methods of instruction are tremendously varied among health sciences libraries” [3].

The librarian’s role as a teacher is carried out in a context of relationships with other teaching faculty. Who will teach information management and other computer-related skills in the future? Will it be faculty within each discipline, computer science faculty, librarians, or a new group of teachers to be defined in the future? Students are taught in several different educational settings; curricular courses, library classes, and workshops and seminars outside of the university all contribute to the students’ education.

This paper examines the teaching role of librarians in nursing education, in comparison to the roles of nursing and computer science faculty, in teaching computer skills and the use of electronic resources. By identifying what librarians and other professionals are teaching as well as what is not taught, librarians can make informed decisions about the development of classes for nursing students.

**LITERATURE REVIEW**

The nursing literature contains a number of studies that examine the use of computers in nursing curric-