

# Course Integrated Instruction: Metamorphosis for the Twenty-First Century

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*Abstract.* Bibliographic instruction in health sciences libraries is on the verge of another major transformation. The force behind this is computerization interacting with repercussions of the Matheson report and a recent Association of American Medical Colleges report, both of which should be instrumental in providing guidelines for bibliographic instruction. Comparisons are made between the health sciences and general settings for bibliographic instruction and the health sciences literature after 1975 is reviewed. Information from an informal telephone survey is presented and issues of concern to health sciences librarians are described. Descriptive summary statements are made regarding the perceived state of the art and areas for future activity are outlined.

## Introduction

Bibliographic instruction (BI) in health sciences libraries is on the verge of another major transformation as was encountered when librarians began teaching the process of information seeking rather than the detailed characteristics of the tools used in this process. The cascading force behind this metamorphosis is computerization which is seen as having supernatural qualities by both advocates and those who are less enthusiastic. There are other converging forces, however, interacting with the spread of computer applications to have an impact on bibliographic instruction programs. This impact is reflected in wider use of the phrase, information management education, to describe BI activities. Literature on the effect of the Matheson report on health sciences libraries has already appeared and there will be much discussion on the implications of the report on the General Professional Education of the Physician (GPEP) as well.<sup>1 2 3 4</sup> Schwartz gave an excellent presentation, "The Matheson Report and Beyond—Implications for Library Use Instruction and Information Management Education," at a recent Midwest

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<sup>1</sup> Matheson, Nina W., and Cooper, Jon A. D. "Academic Information in the Academic Health Sciences Center: Roles for the Library in Information Management." *J Med Educ* 57 Part 2 (October 1982):1-93

<sup>2</sup> Bell, Jo Ann. "Health Sciences Personnel and the Academic Information System: User Requirements." *Bull Med Libr Assoc* 71 (October 1983):420-422

<sup>3</sup> Braude, Robert M. "Academic Information in the Academic Health Sciences Center: Overview," *Bull Med Libr Assoc* 71 (October 1983): 405-409.

<sup>4</sup> Association of American Medical Colleges. "Physicians for the Twenty-First Century: Report at the Project Panel on the General Professional Education of the Physician and College Preparation for Medicine." *J Med Educ* 59 Part 2 (November 1984): 1-208

Chapter Meeting.<sup>5</sup> There are tremendously exciting opportunities available for instructional librarians who thoughtfully draw upon the concepts and recommendations in these reports to further their instructional efforts.

For the purposes of the following discussion, the phrase, course integrated instruction, has been defined as instruction which meets at least three of the following four criteria: (1) faculty outside the library are involved in the design, execution and evaluation of the program, (2) the instruction is curriculum-based, in other words, directly related to the students' course work and/or assignments, (3) students are required to participate, and (4) the students' work is graded or credit is received for participation. There was occasionally a fine line between what was considered course integrated and what was not. In cases in which the published literature did not provide sufficient information to make this determination, a conservative approach was taken and the program was not included. Some examples of programs which did not qualify are those described by Gondek and Romanos;<sup>6</sup> Haycock, Carrol, and Krasner;<sup>7</sup> and Martin, Marcotte, and Baxter.<sup>8</sup>

The observations and conclusions presented here are based upon the following: review of the literature; the author's experiences; and informal telephone interviews with instruction librarians who are for the most part, affiliated with academic medical libraries. Although the focus of discussion was narrowed to the academic medical setting, the implications for other types of health sciences libraries can be seen. Nonmedical programs are described to provide comparison and contrast. It was also felt that the trends perceived in medical education reflect changes which are, or will be, occurring in all health sciences education. As Muller has stated, the results of the GPEP report are generally applicable.<sup>9</sup>

## Purpose of this Article

Two recent reviews of bibliographic instruction programs in health sciences libraries are the ones by Loftin<sup>10</sup> and Martin, House, and Chandler.<sup>11</sup> Several of the programs cited by these authors appeared to be course integrated according to the criteria outlined previously and these will be discussed more fully in a later section of this article. Renford reported on a survey she conducted of BI activity in health sciences libraries in which course-related and formal credit courses were enumerated.<sup>12</sup> This article focuses more specifically than these prior studies on programs which are already closely aligned with

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<sup>5</sup> Schwarz, Diane G. "The Matheson Report and Beyond—Implications for Library Use Instruction and Information Management Education." Presented at the Midwest Chapter/Medical Library Association Meeting, "The User-Centered Library." October 25-27, 1984, Cedar Rapids, Iowa.

<sup>6</sup> Gondek, Valerie A., and Romanos, Vasso M. "A Basic Program of Bibliographic Instruction in a Health Sciences Library." *Med Ref Serv Q* 2 (Fall 1983):83-89.

<sup>7</sup> Haycock, Laurel A.; Carroll, Diane J.; and Krasner, Faye M. "Medical Record Administrators and Management of the Rural Hospital Library." *Bull Med Libr Assoc* 66 (January 1978):61-63

<sup>8</sup> Martin, Jess A.; Marcotte, Joan M.; and Baxter, John E. "PLATO in the Library." *Southeastern Librarian* 31 (Spring 1981): 14-15

<sup>9</sup> Association of American Medical Colleges, "Physicians for the Twenty-First Century." p.1.

<sup>10</sup> Loftin, Jane E. "Library Orientation and Library Instruction for Medical Students." *Bull Med Libr Assoc* 71 (April 1983):207-209.

<sup>11</sup> Martin, Jess A.; House, David L.; and Chandler, Harold R. "Teaching of Formal Courses by Medical Librarians." *J Med Educ* 50 (September 1975):883-887.

<sup>12</sup> Renford, Beverly L. "Bibliographic Instruction in Medical Libraries: Results of a Survey." *Med Refer Serv Q* 1(Winter 1982):33-45.

the curriculum of the institution. The following survey, therefore, offers some perspective on how these programs have evolved and will evolve, particularly in the light of developments in medical education.

Increasing interest in BI programs on the part of members of the Medical Library Association is evidenced by efforts to obtain section status for this interest group.<sup>13</sup> This effort culminated in approval last year of provisional status for a Reference Services Section. Renford's survey was initiated by the interest group to ascertain the extent of activity in bibliographic instruction and to encourage communication among the health sciences librarians involved.<sup>14</sup> The "User Education Column" in this journal was launched with a similar goal.<sup>15</sup> This article then, is another exchange in this continuing dialogue regarding bibliographic instruction. As a result, it is hoped that this article also will help librarians avoid unnecessary duplication of effort which others have bemoaned.<sup>16</sup>

## Similarities and Differences with General BI Programs

A great deal of emphasis in the recent BI literature has been placed on integrating information seeking skills as a required component within the existing curriculum, a logical extension of the course integrated approach.<sup>17 18</sup> Curriculum integrated programs attempt to sequence the students' learning over the course of study by teaching increasingly complex information seeking skills within the planned course of study. Another emphasis in the general BI literature has been teaching the information seeking process versus the tools or product of the search.<sup>19</sup> Even though this trend has been reflected in health sciences instruction programs,<sup>20</sup> as Brassil has noted, there are differences in the non-health setting which make it difficult to transfer general theory, practices, and observations to the health environment. These differences center mainly on the characteristics of the biomedical literature, the patron's accountability for the information, the demands for formal continuing education, and the demographics of the student population.<sup>21</sup> On the whole, the health sciences' student population seems to be more highly motivated than undergraduate students as a result of the self-selection process.

A point upon which there may be more divergence between the two settings in the future will be whether the BI component is required or elective. The current philosophy in medical education seems to be one in which students govern their own attendance at instructional programs. There is more tendency in the other health professions curricula for required student attendance. This latter situation is similar to that in general undergraduate education. As a result of the Association of American Medical Colleges Project Panel's recommendations to reduce the number of hours devoted to lectures and the

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<sup>13</sup> Ibid., pp. 33-35.

<sup>14</sup> Ibid., p. 44.

<sup>15</sup> Brassil, Ellen C. "User Education Column." *Med Refer Serv Q* 1 (Spring 1982):101-104

<sup>16</sup> Wiggins, Marvin E. "The Development of Library Use Instructional Programs." *College and Research Libraries* 33 (November 1972):479.

<sup>17</sup> Pearson, Lenari. Curriculum-Integrated Library Instruction. *Liberal Education* (Winter 1980):402.

<sup>18</sup> Farber, Evan Ira. "Bibliographic Instruction at Earlham: A Cooperative Course-Related Approach." In *Library Instruction and Faculty Development: Growth Opportunities in the Academic Community*. Edited by Nyal Z. Williams and Jack T. Tsukamoto. Library Orientation Series, no. 11. Ann Arbor, Mich.: Pierian Press 1980, pp. 37-66.

<sup>19</sup> Mellon, Constance A. "Process Not Product in Course-Integrated Instruction: A Generic Model of Library Research." *College and Research Libraries* 45 (November 1984) 471-478

<sup>20</sup> Allen, Stephanie M.; Mahan, J. Maurice; and Graham, Irene. "The Implementation of a Large-Scale Self-Instructional Course in Medical Information Resources." *Bull Med Libr Assoc* 67 (July 1979):303.

<sup>21</sup> Brassil, "User Education Column," p. 102.

amount of scheduled instruction time,<sup>22</sup> the emphasis will be moving increasingly away from requiring attendance and scheduled class time and toward more electives and independent learning opportunities.

Other areas in which the BI setting for medical students diverges from general BI settings are linked to the nature of the traditional E medical school curriculum. "Dense-pack education," universally agreed to be just too much for the students to learn,<sup>23</sup> is compounded by the roller coaster effect of repeated transitions from regimentation to independent learning. The student rides this roller coaster from premedical studies through post-graduate medical education.<sup>24</sup> Even though librarians in other disciplines have complained about the lack of opportunity to incorporate BI into basic courses,<sup>25</sup> the problem seems to be exacerbated in the medical school curriculum. This is because of the elimination of opportunities by placing a heavy dependency on required reading to the exclusion of independent work.<sup>26 27 28</sup>

## Course Integrated BI in the Recent Literature

The following course integrated programs have appeared in the literature since 1975. A brief description of each one is provided. They are reported here in chronological order from 1977 forward.

Hall, Krautheim, and Hansra describe a series of slide-tapes covering the card catalog, reference books, current periodicals and periodical indices which are a required assignment for an introductory course in pharmacy at Ohio State University College of Pharmacy. The slide/tapes are accompanied by a manual (which includes the script of the tape) and a library assignment. The course instructor includes questions from the tape in the course's final examination.<sup>29</sup>

A ten-week 1 1/2-hour credit course for nursing baccalaureate candidates at Duke University Medical Center is described by Walser and Kruse.<sup>30</sup> The program received sponsorship and approval from the nursing faculty with a pass/fail grading system and consisted of shared didactic presentations, review of homework and bibliographies, in-class exercises, online demonstrations, discussion, and individual consultations. The final grade was based on a literature search for a concurrent class as well as a combined objective and essay test.

In 1979, Allen, Mahan and Graham described a multi-format self-instructional program required of almost 300 freshman and sophomore medical students at the Rowland Medical Library, University of

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<sup>22</sup> Association of American Medical Colleges, "Physicians for the Twenty-First Century." pp. 11-12.

<sup>23</sup> Wallis, Claudia. "Med School Heal Thyself." *Time* 121 (May 23, 1983):54

<sup>24</sup> Tosteson, Daniel C. "Science, Medicine, and Education." (Alan Gregg Memorial Lecture) *J Med Educ* 56 (January 1981):14

<sup>25</sup> Pearson, "Curriculum-Integrated Library Instruction." p. 403.

<sup>26</sup> McClure, Lucretia W. "Required Reading for Students." *Bull Med Libr Assoc* 66 (July 1978):361.

<sup>27</sup> Tosteson, "Science, Medicine, and Education." p. 13.

<sup>28</sup> Association of American Medical Colleges, "Physicians for the Twenty-First Century." p. 12.

<sup>29</sup> Hall, Virginia B.; Krautheim, Daniel; and Hansra, Baljit S. "A Slide-Tape Program for Beginning Pharmacy Students: Effects on Learning." *Bull Med Libr Assoc* 65 (October 1977):443-445.

<sup>30</sup> Walser, Katina P., and Kruse, Kathryn W. "A College Course for Nurses on the Utilization of Library Resources." *Bull Med Libr Assoc* 65 (April 1977):265-267.

Mississippi Medical Center.<sup>31</sup> It consisted of an audiotape, a videotape, a self-instructional booklet, a practical test, and an evaluation of the course.

A different audience was targeted by a continuing education course in the postgraduate school curriculum at the Page and William Black Post-Graduate School of Medicine.<sup>32</sup> Continuing education credits were approved by the dean of the postgraduate school for a two-hour course emphasizing the analysis of information needs and selection of resources in the clinical setting.

Sewell et al, describe what they state is the first published article on integrating bibliographic skills in a series of courses in a pharmacy school curriculum.<sup>33</sup> Instruction at the University of Maryland School of Pharmacy revolves around eleven basic skills, which are incorporated in assignments for three courses. These include an orientation course, a pharmaceuticals course, and a pharmacognosy course. Experiential learning, based on "real life" examples and practice using various information sources, is emphasized.

The University of Tennessee Center for the Health Sciences Library offers a required formal course for credit as part of the medical record administration curriculum.<sup>34</sup> The library instruction is reinforced by the faculty in their teaching. The two-part library course consists of a library skills component and a hospital library management workshop. An orientation program comprised of a printed library guide, audiotape guided tour and a computer assisted instruction lesson, is combined with lecture/labs using in-class hands-on exercises and in-class assignments. A term paper bibliography is evaluated by the library instructor. The workshop consists of discussion, case study exercises and lecture/labs on resource materials.

Sarkis and Hamburger describe the implementation of an education program for third-year medical students starting a docent team rotation at the University of Missouri-Kansas City School of Medicine.<sup>35</sup> Formal classes incorporate the use of a videotape and hands-on exercises on *Index Medicus* to answer clinical questions. Their program has expanded to include a library skills class for first-year medical students.

Third-year Department of Community Medicine clerkships at the Mount Sinai School of Medicine of the City University of New York are used as a vehicle for bibliographic instruction.<sup>36</sup> A slide presentation is used to prepare students to complete a specific problem-based review of information for the clerkship. This has led to a program for Department of Medicine clerkships.

Information Services staff at the University of Cincinnati Medical Center Libraries participate in a required College of Pharmacy course, "Drug Literature Evaluation." The course presents several lectures

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<sup>31</sup> Allen, "Large-Scale Self-Instructional Course." pp. 302-307.

<sup>32</sup> Port, Jane S. "Continuing Education for Information Retrieval Techniques for Clinicians." *Bull Med Libr Assoc* 68 (Apr 1980):238-240.

<sup>33</sup> Sewell, Winifred; Speedie, Marylyn K.; Knapp, David A.; and Cunningham, Patricia. "Integrating Library Skills Teaching into the Pharmacy School Curriculum." *Am J Pharm Educ* 44 (February 1980):65-70.

<sup>34</sup> Marcotte, Joan M., and Graves, Karen J. "Library Instruction within the Medical Record Administration Curriculum." *Bull Med Libr Assoc* 69 (April 1981):240-246.

<sup>35</sup> Sarkis, Jeanne, and Hamburger, Stephen. "The Impact of the Clinical Medical Librarian on Medical Education." *J Med Educ* 56 (October 1981):860-862.

<sup>36</sup> Port, Jane, and Meiss, Harriet R. "Teaching Library Skills in Third-Year Clerkships." *J Med Educ* 57 (July 1982):564-566.

and uses a self-instructional workbook and graded library assignments.<sup>37</sup> Materials and lectures from this course have been adapted and integrated into three College of Nursing courses, as a result.

Koff et al. at the Boston University School of Medicine have incorporated a seminar, "Hepatitis and the Process of Information Retrieval and Use," in a required seminar series for fourth-year medical students.<sup>38</sup> The case method is used to formulate questions and discuss concepts of information retrieval in four weekly sessions. Performance in the seminars and evaluation of a log of information seeking activity form the basis for the student's grade. Hands-on demonstration of the Hepatitis Knowledge Base<sup>39</sup> and a search of MEDLINE with a librarian as intermediary are also incorporated. Nonlibrary faculty teach the seminar and additional offerings of the seminar will be made available to students based on its popularity.

The Library at the University of Tennessee Center for the Health Sciences offers a two-credit ten-week course both as an elective for all graduate students and as a required course for graduate orthodontic program students.<sup>40</sup> Varied methods employed to teach the course have included an audiotaped tour, a computer assisted orientation program, lecture/labs, a commercially available slide-tape program, MEDLINE demonstrations, and hands-on exercises. Assignments and a bibliography prepared by the student are the basis for the course grade.

Landau and Rosenberg present information on a required sixteen-hour drug information center rotation for fifth-year baccalaureate pharmacy students at the Arnold and Marie Schwartz College of Pharmacy and Health Sciences.<sup>41</sup> Students spend two consecutive days at the center with an instructor, during which time they work independently using audiovisual aids, written exercises, information sources, and computerized tests. A MEDLINE demonstration is observed and several hours are kept unscheduled to allow a choice of optional activities. Students are graded on the written exercises and a final exam, which reflect material covered in the rotation.

Staggered sessions of library skills coaching are used with internal medicine and family practice residents at MacNeal Memorial Hospital in Berwyn, Illinois.<sup>42</sup> These consist of problem-based questions used to introduce appropriate information resources. Identification of problems to address, demonstration of standard tools, location of local community resources, and computerized literature searching are part of the patient management conference program. The instruction is handled on an individual basis with library staff. The librarian attends the conference programs as a member of the coaching team.

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<sup>37</sup> Anthony, Susan Shelly, and Harmony, Stepheana. "Bibliographic Instruction for Pharmacy Students." *Med Refer Serv Q* 1 (Winter 1982):71-75.

<sup>38</sup> Koff, Raymond S.; Schimmel, Elihu M.; Siegel, Elliot R.; and McCahan, John F. "Hepatitis and Information Retrieval and Use: A Seminar for Fourth-Year Medical Students." *Bull Med Libr Assoc* 70 (July 1982):323-324.

<sup>39</sup> Bernstein, Lionel M.; Siegel, Eliot R.; and Goldstein, Charles M. "The Hepatitis Knowledge Base: A Prototype Information Transfer System." *Ann Intern Med* 93 Part 2 (July 1980):165-181.

<sup>40</sup> Graves, Karen J. "Bibliographic Instruction for Graduate Students in the Health Sciences." *Med Refer Serv Q* 1 (Fall 1982):73-83.

<sup>41</sup> Landau, Janet, and Rosenberg, Jack M. "A Required Mini-Rotation in a Drug Information Center for Baccalaureate Level Pharmacy Students." *Am J Pharm Educ* 46 (Summer 1982): 158-161.

<sup>42</sup> Ben-Shir, Rya. "Library Instruction Integrated with Patient Management." *Bull Med Libr Assoc* 72 (July 1984):310-311

A program which was reported in the literature prior to 1975 is well worth mention here because of its developers' foresight. Lunin and Catlin describe a pilot program offered in 1970 at the Johns Hopkins University School of Medicine.<sup>43</sup> A series of ten lectures and ten tutorials, open to all members of the biomedical and health related professions, was developed for the first-year medical students. Jointly organized by faculty, which included an information scientist, the sections covered information management issues such as ". . . Search Strategy for Current Information; Credibility of the Information; Questionnaire Design: Its Influence on Eliciting and Compiling Information; Personal Index Files: the Intellectual Organization of the Material (Software);" and ". . . Personal Index Files: Equipment and Procedures (Hardware)."<sup>44</sup> As these authors stated, "Because systems change and new services come into existence, a course on information should emphasize principles for a problem solving approach as well as details on the use of current systems. The mixture of the theoretical and the practical provides the student with the approach he needs to use today's systems and to help plan tomorrows."<sup>45</sup> This observation is just as applicable today, fifteen years later!

Although specific data are not presented, another aspect of this program which is of interest is a questionnaire sent to participants a year after the course was held. The authors reported that the responses reflected favorable alterations in behavior patterns. Another starting point of this article is the suggestion the authors make regarding other ways to present the course: integrated with other course structures, as a multi-media program in conjunction with faculty presentations in a library or independent learning center or as the responsibility of a medical information science department which would be responsible for ". . . all aspects of information and communication: principles, techniques, application, research."<sup>46</sup> This is a foreshadowing of one of the GPEP recommendations for incorporating information sciences.<sup>47</sup>

Some observations can be made regarding the more unusual aspects of the programs just described. These observations fall into the categories of promotion, content, formal, faculty, and evaluation techniques.

Concerning promotion, the suggestion to personally visit the departmental chairman with one's library director to present the program could be used quite effectively, particularly for launching a new program.<sup>48</sup> In regard to content, very few programs mentioned incorporating information on the Biomedical Communications Network,<sup>49</sup> access to translations,<sup>50</sup> conference proceedings, meeting directories, patient education materials<sup>51</sup> or to expert systems or knowledge bases.<sup>52</sup> More distinguished formats included a multimedia self-instructional program,<sup>53</sup> individualized coaching,<sup>54</sup> self- instructional

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<sup>43</sup> Lunin, Lois F., and Catlin, Francis I. "Teaching Information and Communication in a Medical Center." *J Med Educ* 47 (August 1972):658-660.

<sup>44</sup> *Ibid.*, p. 659.

<sup>45</sup> *Ibid.*

<sup>46</sup> *Ibid.*, p. 660.

<sup>47</sup> Association of American Medical Colleges, "Physician for the Twenty-First Century," p. 13.

<sup>48</sup> Graves, "Bibliographic Instruction for Graduate students," p. 74.

<sup>49</sup> Allen, "Large-Scale Self-Instructional Course," p. 303.

<sup>50</sup> Martin, "Formal Courses," p. 885.

<sup>51</sup> Port, "Retrieval Techniques," p. 238.

<sup>52</sup> Koff, "Hepatitis and Information Retrieval," p. 323.

<sup>53</sup> Allen, "Large-Scale Self-Instructional Course," p. 303.

<sup>54</sup> Ben-Shir, "Library Instruction," p. 310.

workbook,<sup>55</sup> rotation in a drug information center,<sup>56</sup> and a sequenced, "building block" integration with an established curriculum.<sup>57</sup> Few course integrated programs were conducted by nonlibrary faculty.<sup>58</sup> A different approach to course evaluation was having the students write their objectives for the course on the first day of class and utilize these at the end of the course as a basis for program evaluation.<sup>59</sup> As for evaluating students' performance, they adopted the unique approach of using a student log to record time required for an information search, sources checked, and the sequence followed.<sup>60</sup> A final conference with students to discuss performance and to compare results of pre and post tests was also used.<sup>61</sup>

## Information from the Telephone Survey

Twelve libraries were contacted by the author to participate in an informal telephone survey lasting from twenty to forty-five minutes in length. The selection of libraries was based on personal contacts and referrals from librarians who have had several years experience in health sciences bibliographic instruction programs and who were known to be active in this area. A scientific sample was not attempted as this was meant to serve as an information sharing, "pulse taking" way to exchange information. In order to preserve the confidentiality of the respondents, the results of the survey are reported in general terms without references to institutions or librarians.

Interesting points that were brought out during the interviews expand upon some of the aforementioned topics. Although most of the librarians interviewed have incorporated online search training into their programs for medical students, other groups of students are being taught as well, particularly in nursing and pharmacy. Few programs were going beyond online searching, but at least one program was integrating other uses of microcomputers: word processing, database management and spreadsheet applications. This particular program was offered at the graduate nursing student level. The use of a computer projector linked with one of the student's terminals while teaching the class was a useful technique. One point brought out by these librarians was that, in spite of all the claims for search software as being "user friendly," they do not make searching as easy as one would like. It would be interesting to compare students' experiences learning BRS/Colleague or DIALOG's Knowledge Index programs with those who are learning command languages such as in the National Library of Medicine's training programs.

Librarians involved in instruction appear to be making inroads with their institutions' curriculum committees. This group of librarians heavily stressed the need for this type of interaction with other teaching faculty. Several stated that subgroups of their curriculum committees had been formed to address the issue of incorporating library skills or information management education within the curriculum. The librarians urged attending administrative conferences to present information on bibliographic instruction and volunteering to assist with medical instructional programs. For example, one might participate in teaching interviewing skills in the history-taking and physical exam units.

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<sup>55</sup> Anthony, "Bibliographic Instruction," p. 73.

<sup>56</sup> Landau, "A Required Mini-Rotation," p. 158.

<sup>57</sup> Sewell, "Integrating Library Skills," pp. 65-70.

<sup>58</sup> Koff, "Hepatitis and Information Retrieval," p. 324.

<sup>59</sup> Marcotte, "Medical Record Administration Curriculum," p. 242.

<sup>60</sup> Koff, "Hepatitis and Information Retrieval," p. 323.

<sup>61</sup> Walser, "A College Course," p. 266.



Another suggestion was to obtain status as a consultant to the curriculum committee if one was unable to serve on the committee. Nonlibrary faculty's involvement in bibliographic instruction ranged from being part of the curriculum approval process and providing input on course goals and objectives to being team teachers. None of those interviewed indicated that there were programs in which the nonlibrary faculty taught the library skills components without the librarian. Typical of the material that nonlibrary faculty were likely to teach was critical evaluation of the literature. At least one librarian was receiving compensation for the time devoted to instruction in the way of paid membership and travel expenses to the meeting of the major professional organization in that subject area. As this was not addressed by the author's survey, it is not known to what extent this is being done by others.

There appears to be an increasing involvement on the part of librarians in the evaluation of the students' performance on library related assignments. Typically this is taking the form of evaluating bibliographies for research papers and search strategies for online searches. At least in the latter case, this may be related to health professionals' acceptance of librarians expertise in the area of online searching, credibility in this area having been established for some time. In any case, it sets a precedent for more involvement in the area of performance assessment of information seeking and information management skills. Another point brought out during these discussions, was that the librarian does not need to be involved in this consistently, but often enough to reinforce the students' belief that this is the case. For those with less time, the librarian could evaluate library related assignments on an occasional basis rather than in every instance. This would help to maintain student motivation.

Another point of discussion in the interviews was the use made of pre and post tests. These are utilized to provide guidance in revising programs, to plan the course of instruction, to serve as a basis for group discussion, and to demonstrate to students their progress and provide positive feedback to them.

Little publicity is being done for programs unless they are new and word-of-mouth was frequently mentioned as very successful advertising. The impression which was conveyed was that if the program is well planned and provides something of immediate value to the students, the informal network among students will provide the necessary publicity. Others mentioned not "advertising" because other faculty did not advertise their courses. A technique which was mentioned by one librarian was using the institutional newsletter to report on classes *after* their completion.

As far as instructional techniques, self-instructional devices were mentioned frequently as being favored by the students. This seems to be due primarily to two factors: (1) the varied levels of prior experience of the students and (2) the intense competition for students' time for instructional purposes. One innovative user aid mentioned was development of pocket cards as refreshers for students doing clinical work. An example given was sources for certain types of drug information.

Overall, there appear to be few thoroughly integrated bibliographic instruction programs where a sequence of information management education experiences have been built into the curriculum. Only one of the programs described in the survey had planned instructional contacts during all four years of medical school.

One of the more intriguing approaches to information management education has been built upon a study of information seeking habits of physicians, residents, and medical students done by Northup et

al.<sup>62</sup> Northup is Coordinator, Simulated Patient Program, Primary Care Curriculum at the School of Medicine at the University of New Mexico and she responded positively to this author's request to describe this particular approach. Northup is working with one of the medical school faculty to develop Information Searching Guides (ISG's) as simulation tools to teach students the process of identifying learning issues and finding information. Three ISG's are used in the first year and one in the second year of a problem-based medical curriculum. At least four other ISG's have been identified for future development and use later in the curriculum. The approach is problem-based with each ISG presenting a clinical problem necessitating that further information be sought. The guides simulate a variety of resources which might be available to the student, including personal libraries, faculty, community resources, and a medical library, among others. The students work independently to gather information necessary for the particular problem, recording established scores based on the time expended, the value of the information obtained and, when applicable, a monetary cost. After solving their information problem, the students meet in a tutorial group with Northup or the physician faculty member and discuss successes and failures and the most expeditious routes to information based on the type of information needed. The ISG's correspond to points in the curriculum in which similar information seeking will be demanded of the students. The tutorials and ISG's are designed to give students feedback on their information seeking skills, to acquaint them with a variety of resources, and to establish successful information gathering habits. Evaluation of the program is planned.

Northup's work is reported here as an example of a response to the instructional librarian's need to teach students how to analyze their information problems, identify appropriate resources, and evaluate results. This establishes a self-educational feedback loop for information seeking. This type of program could easily be incorporated with teaching other information management skills, such as the organization of personal information files. It also demonstrates the freedom librarians have to experiment and design alternative bibliographic instruction programs. This freedom, and the enthusiasm to exercise it, came through, without exception, in the interviews.

## Issues of Concern

The major concern for BI librarians seems to be trying to accurately meet the patrons' needs,<sup>63 64 65</sup> reflected by the emphasis given to evaluation. The increased accessibility of microcomputers has added another dimension. Along with the impetus to provide patrons with the skills to be life-long learners, librarians voiced concerns on how to integrate new technology with more traditional methods of access. There will continue to be those resistant to change, those without immediate access to the technology or those utilizing both traditional and innovative methods to obtain information. Addressing the instructional dimensions of these situations will require a firm grasp of information management principles as well as awareness of the expressed and unexpressed needs of users.<sup>66</sup>

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<sup>62</sup> Northup, Diana E.; Moore-West, Margaret; Skipper, Betty; and Teaf, Sallie R. "Characteristics of Clinical Information-Searching: Investigation Using Critical Incident Technique." *J Med Educ* 58 (November 1983):873-881.

<sup>63</sup> Allen. "Large-Scale Self-Instructional Course," pp. 302-307.

<sup>64</sup> Farmer, Jan, and Guillaumin, Beth. "Information Needs of Clinicians: Observations from a CML Program." *Bull Med Libr Assoc* 67 (January 1979):54.

<sup>65</sup> Bell, "Health Sciences Personnel," p. 420, 422.

<sup>66</sup> Brassil, Ellen C. "Information Management Education: Policies and Procedures for a Reference Department Manual." *Med Refer Serv Q* 2 (Winter 1983):57-59.

The naive response by users, who often perceive new technology to be devoid of weaknesses and a panacea for problems which are inherent in the traditional approaches, compounds certain problems. Users are more frequently found to be unaware of some of their most basic instructional needs. Consciousness-raising, therefore becomes increasingly more important. The concern, on the part of some, that users and librarians will be mesmerized by new technology, to the point of tunnel vision, is quite valid.<sup>67</sup>

Another primary concern for librarians is that the transferability of skills be conveyed to users. This has created a more common tendency to teach a process of information gathering as opposed to presenting printed tools.

Other concerns expressed were the lack of awareness on the part of faculty that students need to learn information skills, that librarians are not teaching out of missionary zeal or solely to satisfy their own needs, and that, because of the intense competition for students' time, courses must be required in order to reach the students who need the instruction.

## State of the Art

A summary of some of the characteristics of course integrated instruction in its current form are presented here:

- That integration has multiple levels, the most basic of which is at the subject or course content level. Another level is formal: the instruction exists as an appendage to a course, is interwoven into existing courses or is interwoven within the total curriculum in a sequenced fashion. Another level is the instruction: a librarian serves as teacher, the information is team-taught with the faculty member, or the faculty member presents the information as part of his/her own material. Programs existed at all of these levels, even the curriculum integrated level.
- That a need exists for better information management is generally recognized and is motivating experimentation with content and presentation of instruction. The "time of need" principle is now a pervasive guideline in developing programs.
- That critical evaluation of the literature is becoming a more frequent component of instructional programs. An excellent area for introducing a team-teaching approach with nonlibrary faculty, the difficult, yet important, nature of this material has inspired whole seminars.<sup>68 69</sup>
- That the distinctions among sources of information are commonly considered to be artificial, as librarians introduce a problem-based approach to information gathering. The tools of the librarian's trade serve a secondary role in instruction—as examples of items useful to patrons in the search for information. This evolution toward a problem-based or process-based approach takes time. The librarian needs time to realize and elucidate the concepts and processes; there are hard habits to be broken.
- That there is little long term follow-up done and little mention of formative evaluation

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<sup>67</sup> Lindgren, Jon. "Library Use Instruction and the Basic Learning Processes: Reasoning, Writing and Research." In *Bibliographic Instruction and the Learning Process: Theory, Style and Motivation*, edited by Carolyn A. Kirkendall. Ann Arbor, Mich.: Pierian Press. 1984, pp. 59-63.

<sup>68</sup> Inui, Thomas S. "Critical Reading Seminars for Medical Residents." *Medical Care* 19 (January 1981): 122-124.

<sup>69</sup> Gehlbach, Stephen H.; Bobula, James A.; and Dickinson, John C. "Teaching Residents to Read the Medical Literature." *J Med Educ* 55 (April 1980):365.

- That the use of CAI appears to be limited to library orientation thus far. No course integrated computer assisted instruction was reported.
- That a surprising number of programs are still initiated by faculty contacting the librarian, perhaps indicating a lack of needs perception on the part of librarians or a lingering tendency to play a reactive, rather than proactive, role in instruction.
- That the number of staff hours devoted to instruction can be considerable, especially in the initial phases of development.
- That the use of self-instructional workbooks or programmed texts in course integrated instruction is minimal, as was observed in Renford's survey.<sup>70</sup>
- That many librarians reported requests for instructional programs from other faculty as a result of an initial program, little advertisement of courses is being done and most librarians felt that "word-of-mouth" is the most effective mechanism for publicity. The general feeling conveyed was that required courses did not need to be publicized other than in course schedules.
- That most of the librarians interviewed stressed the importance of developing rapport with the faculty, cultivating good working relationships, and interacting with faculty in a variety of settings and at various levels. This was also stressed in the B1 literature.<sup>71 72</sup> An aspect of this was also mentioned frequently as the most difficult part of initiating a course integrated program: establishing the librarian's credibility with the faculty. This was mentioned as more difficult for those librarians who did not have faculty status. One reason given was that non-faculty are not permitted to offer courses for credit.

## Future Directions

Positive aspects of the medical education system cited by others are its ability to respond to social needs, the quality of its students and faculty, and its willingness to examine itself.<sup>73 74</sup> Librarians can be assured, therefore, of changes coming from the direction of the GPEP Report.<sup>75</sup>

One of the most fundamental implications for instructional librarians is the implicit directives for self-development. New skills will be needed, particularly in the area of evaluating literature and other information sources.

More familiarity with the subject matter will enhance this ability. An increased demand will be placed on the library to ensure quality control and to screen, filter and synthesize information. It is incumbent on librarians, therefore, to teach users these techniques, particularly as they pertain to development of personal information files.<sup>76</sup>

Instructional librarians also need to educate themselves further in the information seeking and communication habits, skills, and attitudes of health professionals. A few studies have been done which

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<sup>70</sup> Renford, "Results of a Survey," p. 43.

<sup>71</sup> Farmer, "Information Needs," p. 54.

<sup>72</sup> Martin, "Formal Courses," p. 886.

<sup>73</sup> Barondess, Jeremiah A. "The Future Physician: Realistic Expectations and Curricular Needs." *J Med Educ* 56 (May 1981):381.

<sup>74</sup> Association of American Medical Colleges, "Physicians for the Twenty-First Century," p. 3.

<sup>75</sup> *Ibid.*, pp. 1-208.

<sup>76</sup> Bell, "Health Sciences Personnel," p. 421.

assist in gaining insight in these areas,<sup>77 78 79 80</sup> and librarians will need to familiarize themselves with future research. Trends in medical education should be monitored by regular reading of journals such as the *Journal of Medical Education* and publications of the Association of American Medical Colleges. Other areas of self-development are in applications of computer technology, management, and marketing.<sup>81</sup> Librarians need to become very familiar with, and evaluate and integrate, the information in the reports of the working groups and subgroups which prepared portions of the GPEP report. Particular focus should be given to the sections pertaining to fundamental skills.

Librarians need to conduct research in the area of information management, including long-term studies of programs teaching lifelong learning skills and the effect of such instruction on the health professional's ability to provide quality health care. The Reference Services Section of MLA would be an excellent forum for research discussions and for sharing methods used to integrate the recommendations of the Matheson and GPEP reports. With increased exposure to the utilization of computerized access devices such as online catalogs, librarians should play a more active role in development and evaluation of such systems and how they impact on users' information seeking behavior.

Changes in the curriculum, such as more emphasis on preventive medicine advocated by the GPEP report, will need to be reflected in information management education. Some information needs which will be generated will pertain to health care regulations, reimbursement, and materials and human resources for health promotion.<sup>82</sup>

The GPEP recommendation for reducing the number of hours of lecture and creating more opportunities for students to engage in self-directed learning will encourage more interactive forms of education, such as tutorial groups and laboratories, computer assisted instruction, individualized audiovisuals, and videodisk.<sup>83</sup> In addition, the report will very likely inspire further debate regarding required vs. elective bibliographic instruction. A more formalized and coordinated approach to applications of information science and computer technology will be seen as academic units are designated to provide leadership in these areas.<sup>84</sup> Librarians should involve themselves with these reorganizations in order to place the library in a more central position for information management. Relationships with existing medical computing or medical information science departments should be cultivated and enhanced.

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<sup>77</sup> DaRosa, Debra A.; Mast, Terrill A.; Dawson-Saunders, Beth; Mazur, John; Ramsey, Don E.; and Folse, J. Roland. "A Study of the Information-Seeking Skills of Medical Students and Physician Faculty." *J Med Educ*, 58 (January 1983):45-50.

<sup>78</sup> Northup, "Characteristics of Clinical Information-Searching," pp. 873-881.

<sup>79</sup> Stinson, E. Ray, and Mueller, Dorothy A. "Survey of Health Professionals' Information Habits and Needs." *JAMA* 243 (January 11, 1980): 140-143.

<sup>80</sup> Strasser, Theresa C. "The Information Needs of Practicing Physicians in Northeastern New York State." *Bull Med Libr Assoc* 66 (April 1978):200-209.

<sup>81</sup> Braude, "Academic Information," p. 409.

<sup>82</sup> Association of American Medical Colleges, "Physicians for the Twenty-First Century." p. 6, 16.

<sup>83</sup> *Ibid*, p. 12.

<sup>84</sup> *Ibid.*, p. 13.

Development of bibliographic instruction departments separate from other reference services may be an option for some libraries.<sup>85</sup>

Specific directions for information management education itself include more effective incorporation of expert systems, knowledge bases, and human resources as appropriate sources for certain types of information. In addition, teaching a healthy distrust of information technology is as necessary in bibliographic instruction as it is in patient care. There is “. . . an exaggerated expectation of benefit from technologically sophisticated services.”<sup>86</sup>

## Summary

There has been yet another shift in the language of library use instruction as we assimilate the realities of computer literacy, online searching by health professionals, and records management. The author has tried to refer consistently to bibliographic instruction to encompass the “old” concept with which most readers will be familiar. The author would prefer the term, information management education, however, because it is the more systems oriented and global term, and reflects present emphasis on the use of information and not just use of libraries.

Lindgren’s vision of bibliographic instruction, or “user education,” will provide a framework for librarians as they increase their scope to the whole of information management education:

*. . . (a) reflexive, rather than straightforward thinking; (b) process, rather than procedures; (c) concepts of library use, rather than mechanics; and (d) framing a question, rather than getting the answer to it.*<sup>87</sup>

Guskin, Stoffle, and Boisse describe the process of adopting innovation a relates to the implementation of bibliographic instruction and the teaching library.<sup>88</sup> The six steps—awareness, interest, evaluation, trial, adoption, and integration—are not only experienced by the faculty and students that are exposed to information management education, but by librarians implementing the instruction based on their own self-directed learning process. Despite the universally claimed success of existing programs, librarians appear highly motivated to find better ways to help users and to successfully utilize educational technology in the process. The future is, indeed, an exciting one!

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<sup>85</sup> Brassil, Ellen C. “Information Management Education Services as a Separate Library Department.” *Med Refer Serv Q* 3 (Fall 1984):95-96.

<sup>86</sup> McKay, David A., and Jensen, Eric W. “Beyond Biology: A Curriculum in Methods of Analysis for Clinicians.” *J Med Educ* 55(June 1980):521.

<sup>87</sup> Lindgren, “Basic Learning Processes,” p. 66.

<sup>88</sup> Guskin, Alan E.; Stoffle, Carla J.; and Boisse, Joseph A. “The Academic Library as a Teaching Library: A Role for the 1980s.” *Library Trends* 28 (Fall 1979):292-293.

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