This article considers strategies for promoting information literacy other than classroom instruction. Library services, such as the creation of pathfinders, excellent reference practices, and provision of user-friendly Web pages, are considered in terms of how they might be useful in supporting an information literacy initiative.

When we discuss the importance of information literacy and the ways of promoting these very important skills, classes are the first vehicle that comes to mind. Discussion focuses on appropriate teaching strategies and the debate over whether such instruction should be integrated into course content or taught as a separate course. While course-related instruction is far more popular and the Earlham model has been accepted by many as the standard, Edward Owusu-Ansah makes a very compelling argument for a separate course which would eventually become part of the general education requirements.

What librarians sometimes overlook is that information literacy, unlike bibliographic instruction, embraces skills and concepts which are learned over time, both in and outside the library. Kuhlthau describes the information search process as consisting of different stages and discusses the importance of uncertainty in the process. These stages and the steps from uncertainty cannot take place in the common one-hour, one-shot bibliographic instruction session.

Even when classroom instruction takes place, reinforcement and more active learning experiences are needed. Librarians need to strive for the ideal in the future, but live and work in the present, with its limitations. Therefore, librarians cannot afford to overlook out-of-class opportunities to promote and support information literacy.

Any librarian who works at a reference desk experiences the frustration of meeting students who have been given class assignments for which they lack the information literacy skills. Faculty also note the failure of students to use appropriate scholarly materials in their research assignments. While we wish that teaching faculty would consider including library instruction in their courses, the reality is that some faculty members have a variety of excuses for not scheduling library instruction for their classes. In some cases, they refuse to acknowledge that their students lack information literacy skills. Others, as Hardesty notes, say that they are unable to spare a class session for library instruction.

We do not want to see our students turning to “google.com” as their only research tool. Several alternative tools for promoting information literacy are available. We wish to consider the opportunities offered by library pathfinders, individual instruction at the reference desk, instruction in the virtual reference environment, and library Web pages.
**Library Guides and Pathfinders**

Library guides and assignment-specific pathfinders function as a tool for students who need guidance in using the library to complete assignments. The use of pathfinders and the benefits of point-of-use instruction are documented in library literature dating back to the 1970s\(^8\) when they were used in Project INTREX at Massachusetts Institute of Technology.\(^9\)

Students benefit from course or assignment-specific pathfinders in that they are provided with a model for proper research techniques. The advantage of guides and pathfinders over one-shot library instruction is illustrated in the account of the support given to students at the University of Waikato who were working on required history papers on New Zealand history. The librarians had tried classes and exercises to assess student competencies but found that the *Green Guide* and various other library guides were much more effective in promoting students’ search for and use of library materials.\(^10\)

Another study of information-seeking behavior among students at Manchester Metropolitan University\(^11\) reveals that students who, for a variety of reasons, did not seek assistance from the librarian would use a library guide for assistance in use of library resources.

User guides or pathfinders allow the student to learn to use different resources (reference books, the library catalog, databases, and periodicals) at their own pace. They provide some of the features of the information retrieval system sought by Kuhlthau\(^12\) when she asks, “Can systems be designed that do not close the person down too quickly—that are sufficiently open to accommodate exploring and formulating?” Students who are using a pathfinder have a variety of resources set out for them and they can work through the various stages of the information-seeking process at their own pace.

The importance of making pathfinders or subject guides relevant to specific courses or assignments cannot be overlooked. As Shirley Wilbert\(^13\) reported in 1981, Addison Wesley’s attempt to distribute pathfinders commercially failed because the generic pathfinders did not match individual library collections. More recently, Reeb and Gibbons\(^14\) cite studies where Web-based general subject guides were ignored because they did not address the user’s specific information needs.

Although making pathfinders available on the Web has obvious advantages in that distribution and updating are easier, one study by Magi\(^15\) at the University of Vermont revealed that students in a business course found online guides somewhat confusing, but they expressed great satisfaction with using a print pathfinder. Dahl,\(^16\) in her study of pathfinders at Canadian universities, also found that creators of electronic pathfinders were more likely than creators of print pathfinders to overlook the generally accepted recommendations for creating useful pathfinders. Pathfinders need to be readable, address a specific need, and be accessible (i.e., not hidden on a library’s Web site).

Both print and electronic guides and pathfinders extend the library’s educational role when they are placed in a context and given an appropriate label so that students see them as tools for specific needs. The importance of proper labeling and specific issues having to do with Web-based pathfinders are discussed by Carla Dunsmore.\(^17\)

Pathfinders which only list resources without providing explanations of the type of information offered in different sources do not teach students to evaluate information. As Kuhlthau\(^18\) points out, “They have not formed new constructs during the search process and have not sought meaning from the information encountered as the search progressed. The ‘pile of sources’ does not necessarily lead to understanding and learning.” A well-constructed pathfinder includes some information about the type of source (e.g., reference book, government documents, periodical database) that is recommended and why it would be helpful.

Collaboration from faculty in providing assignments to the librarians on a timely basis is, of course, a prerequisite to the creation of useful pathfinders. At Kingsborough Community College\(^19\) in Brooklyn, New York faculty members who have used this service are very likely to request it again for different courses and assignments. Economics and English professors indicate that students who had an assignment-specific pathfinder were much more likely to use scholarly resources. The library has an ongoing effort to make the availability of this service better known to all faculty.

Different types of user guides are offered by some libraries, such as the University of Rhode Island library (http://www.uri.edu/library/instruction_services/infolitplan.html). These guides range from general guides that outline locations and services of the library and provide general information on using the catalog and finding periodical articles. Guides for individual databases are provided. Subject-specific guides delineate specific resources, both print and online, for particular subject areas. Finally, specific assignment guides are available if they are requested by the instructor. Guides include the advice that users can seek further assistance at the reference desk and assignment guides even include the name of the subject specialist librarian who can be contacted.

It is the hope of libraries offering guides and pathfinders that the practice in using appropriate materials for one course will be a model and that the students will try to use the same search skills for other assignments.

**Reference Interviews and Instruction at the Reference Desk**

Increasing concern among librarians about the tendency of students to go to a search engine rather than to the reference desk to meet information needs is certainly justified.\(^20\) Many, but not all, libraries report a decline in reference desk statistics.\(^21\)

While librarians are not to blame for the students’ failure to recognize their own lack of information skills, some measures can be taken to improve the reference desk as a place for learning. These remedies include attention to the reference encounter, roving reference and consciousness of the hidden difficulties in searching for information online.

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*“Increasing concern among librarians about the tendency of students to go to a search engine rather than to the reference desk to meet information needs is certainly justified.”*
As early as 1980 the American Library Association\textsuperscript{22} stated that instruction should be one of the primary goals of service in all libraries. Most librarians agree that students are more likely to use information skills when they learn these skills at the point of need. Reference librarians report that when patrons are aware of the wealth of resources provided by databases and other Internet sources, the reference desk can be busier than ever.\textsuperscript{23} Librarians do spend more time teaching those patrons who do come to the reference desk to use electronic resources.

Although Mabry\textsuperscript{24} cautions about giving only as much information as the user can handle and about being wary of the “glaze over,” librarians do need to see the reference encounter as a possible teaching moment. Small lessons in information literacy can be incorporated in nearly every reference encounter. In an academic library, imparting skills for lifelong learning is part of the librarian’s responsibility.

Fritch and Mandernack\textsuperscript{25} point out that reference encounters sometimes turn into mini-instruction sessions. During the reference encounter the librarian may have the opportunity to teach the student some general search skills. Students need to learn to examine the scope of the source, to frame a search, to employ Boolean operators, to use hypertext links, and to evaluate the information found.

Radford\textsuperscript{26} cautions about nonverbal behavior of librarians at the reference desk (such as long phone conversations, discussions among librarians at the desk, librarians who are very involved in their own projects). Such behavior has a definite impact on the student’s decision to approach the reference desk. Reference librarians need to be perceived as available and willing to assist students. This perception of availability is even more important when the student has the alternative of walking over to the computer and typing “google.” It is important to remember that no matter how many times the reference librarian has heard the same questions, the moment in time when the question is asked by a particular user is unique\textsuperscript{27} and the librarian should not express annoyance at being asked the same question for the tenth time.

Roving reference is another strategy suggested in library literature (Fritch and Mandernack,\textsuperscript{28} \textsuperscript{29} Huwe,\textsuperscript{30} Courtois and Liriano,\textsuperscript{31} and Kramer\textsuperscript{32}). Students may be reluctant to give up a seat at a library workstation to go over to the reference desk and ask for help, but a roving librarian would resolve that problem. Roving provides valuable point-of-need instruction. Huwe even recommends roving in the stacks and study areas with wireless technology.

Librarians sometimes fail to recognize certain difficulties inherent in searching for information online. Reference librarians sometimes overlook the fact that students do not distinguish between search engine results and scholarly, authoritative databases. For the student, the operation is the same—type some words into a search box and hope to get good results. Fritch and Mandernack remind us that “many of our users consider themselves experts at searching because they are slightly familiar with Web search engines (where almost all searches return many hits).”\textsuperscript{33} Becker notes that the failure of Internet users to evaluate Web sources is considered as a result of students’ lack of understanding of the organization of the Internet and of their failure to distinguish between using a search engine and a database.\textsuperscript{33}

Librarians need also to be concerned about their failure to treat free online sources as serious reference tools. When a reference librarian suggests to a student that he might go on the Internet to find an answer to his question, he is treating the Internet as something to be used independently. Librarians tend to treat the Internet as “the store next door” and not as part of the actual reference transaction.\textsuperscript{34}

“Librarians need also to be concerned about their failure to treat free online sources as serious reference tools.”

A particularly effective way of leading students to use the catalog and databases is mentioned by Devine and Egger-Sider in their article on the Invisible Web.\textsuperscript{35} They remind students who intend to go to Google for their information that about 80 percent of the information available online will be missed by Google and other search engines. Having piqued the students’ interest, they can then begin to teach how to use library resources and how to evaluate information.

It is the librarian’s responsibility to be attentive to the reference encounter and the opportunities for teaching presented in it, to guide the student to appropriate and valid online resources, and to teach the student to evaluate information found online.

**VIRTUAL REFERENCE**

As early as 1943,\textsuperscript{36} telephone reference was recognized as a means of giving service to patrons who, for various reasons, did not come to the library. Service to remote users has now expanded to include a virtual reference desk which may encompass e-mail reference, chat reference, and collaborative 24/7 reference. Although the literature still has a heavy focus on the technical and staffing issues involved in virtual reference and on questions regarding the viability of extending service hours via consortial arrangements, librarians are beginning to pay attention to the possibilities for promoting information literacy in the virtual reference environment.

Just as librarians in a face-to-face encounter with a patron often want to teach the user to find and evaluate information, librarians at a virtual reference desk are interested in teaching their patrons to become information literate. The online environment presents new challenges and some institutions have taken interesting steps.

The earliest work in virtual reference focused on ready reference (such as the Kansas State Virtual Reference Project\textsuperscript{37}) or provision of resources and referral (such as the Reference and Referral center at the University of South Florida, described by Smith, Race, and Ault\textsuperscript{38}). In these situations the emphasis was on providing a group of resources that would be available to all distance learners enrolled in public institutions and making remote access available to all. Although awareness of such services has grown slowly, students are beginning to recognize that they can access help with assignments from librarians who are familiar with the resources that they have available.

A case of more substantial librarian involvement with distance learners is described by Wheeler and Fournier.\textsuperscript{39} In the Master of Continuing Education program at the University of Calgary, distance learners are involved in a library sub-
Ellis43 cautions that promoting information literacy in the
users very open to learning in the chat reference situation.
learning at the point of need" and librarians have found
of chat reference sessions at Baruch 44 revealed that most
just as it would be employed at the reference desk. An analysis
development exercise is used frequently in virtual reference,
tutorials that can be sent to the user. At Baruch, a topic
reference need to be well prepared with "handouts" and
giving patrons the answers. Librarians who teach via virtual
importance of teaching at the reference desk rather than simply
online environment requires that the librarians be attuned to the
information-seeking behavior. Librarians need to acknowledge
that information skills are frequently learned and practiced at
point of need and that point may not take place in the library.

Library Web Sites
The library’s Web site should be an introduction to the library’s
services and resources. If the academic library has as one of its
goals the promotion of information literacy the library Web site
should provide a way for students to experience appropriate
information-seeking behavior. Librarians need to acknowledge
that information skills are frequently learned and practiced at
the point of need and that point may not take place in the library.

Library literature includes mixed reports regarding student
use of library Web sites. The OCLC White Paper on the
Information Habits of College Students45 reports that students
state that remote access to full text is either unavailable or too
difficult to use. Young and Von Seggern46 mention that students
need help in formulating search strategies, both in general and
for specific databases. Guides to using the site and to what can
be found on the site would be helpful. A usability study
conducted at the University of Illinois at Chicago47 revealed
that students were confused by library terminology. This
confusion prevented them from effectively using the menus
on the college library Web site. Instead they chose to use the
search engine on the Web site or sought human intervention.

Stephanie Willen Brown48 emphasizes the need to test and
edit library Web sites in order to eliminate library jargon and
use terminology that will be understood by students. In a study
at Western Michigan University, the Web site was found not to
be helpful to students who were asked to find periodical
articles. Cockrell and Jayne49 explain how steps were taken to
eliminate jargon and improve the Web site’s usability.

On the other hand, several studies by Lubans50 report that
when students are aware of library Web sites, they do find them
useful as guides to appropriate sources for research. The
students surveyed liked subject access and help in navigating
their way to full text.

A study by Virginia Massey-Burzio51 at Johns Hopkins
University led her to conclude that libraries should concentrate
their efforts on making themselves more user-friendly, partic-
ularly by the improvement of their Web sites. The point-of-use
help that can be provided by a well-constructed Web site is
found to be preferable to classes which seem to focus on
making the students expert searchers.

Students and librarians can be frustrated by the results found
by using a search engine. As Waldhart52 points out, “these
Internet search systems have not yet demonstrated that they can
provide the kinds of selective, specialized access to high
good quality Internet resources in a way that institutions of higher
education both need and value.” A search engine frequently
yields too many results and students may have difficulty in
determining which results are of appropriate quality for college
level research. These problems can be remedied in some cases
by offering a portal on the library’s Web page. Waldhart53
suggests that “developing local strategies for identifying
Internet information resources of special value to the academic
community and using various methods to provide their clients
with efficient and effective access to those selected resources”
is one of the ways that libraries have endeavored to assist
patrons in effective use of the Internet.

“Librarians who teach via virtual reference need
to be well prepared with “handouts” and
tutorials that can be sent to the user.”

Instruction via chat reference is a prime example of
“learning at the point of need” and librarians have found
users very open to learning in the chat reference situation. Ellis43
cautions that promoting information literacy in the
online environment requires that the librarians be attuned to the
importance of teaching at the reference desk rather than simply
giving patrons the answers. Librarians who teach via virtual
reference need to be well prepared with “handouts” and
tutorials that can be sent to the user. At Baruch, a topic
development exercise is used frequently in virtual reference,
just as it would be employed at the reference desk. An analysis
of chat reference sessions at Baruch44 revealed that most
information literacy competencies were taught in the sessions.

“A well-constructed and carefully maintained
portal would be a good vehicle for breaking
down the border between the free Internet
resources favored by students and authoritative,
 scholarly databases not available via Google.”

Several Internet directories, such as Academic Info, Internet
Public Library, and Infomine, provide some direction to
academically suitable Web sites. However, Michael Adams54
recommends that academic librarians create and maintain their
own portals, using criteria having to do with scholarship,
appropriate language, design, and timeliness. A well-con-
structed and carefully maintained portal would be a good
vehicle for breaking down the border between the free Internet
resources favored by students and authoritative, scholarly
databases not available via Google.
Information literacy skills can be learned in a variety of ways. As Thomsen comments “there is no one solution to the problem of how to help students improve their research skills, library skills, or information literacy skills. . .academic librarians may need to use a combination of approaches and, above all, be persistent in their efforts to aid students’ information literacy.”

Classroom instruction, whether as a part of a course or as a stand-alone course, is valuable. The classroom situation forces the student to focus on the research process. However, the reality is that classroom instruction may not be possible or may not be sufficient. Library classes are frequently allotted so little time that the librarian is unable to facilitate the active learning that will lead to retention and incorporation of skills into the students’ ways of learning. Pathfinders and individual instruction at the reference desk (whether it is a physical reference desk or a virtual one) focus on teaching the student to deal with a specific information need. The student is given a model of the kind of information-seeking behavior that we want him to develop. Well-constructed and maintained library Web sites and portals enable students to navigate the Internet in an intelligent way. In some situations, these alternative strategies work better than formal instruction.

A study by E. Stewart Saunders reveals that classroom instruction actually increases the volume of questions at the reference desk. Once students become more sophisticated information seekers and users, they are more likely to try to improve their knowledge and use of resources. “Educating users to make full, judicious, and informed use of information is a fundamental responsibility shared by all librarians.” Whether this responsibility is met by classroom sessions, pathfinders, individual instruction at the reference desk, or library Web sites the goal remains the same. Librarians are responsible for creating habits which will support lifelong learning among our users.

### Notes and References


9. Project INTREX was a research project on computer-based information retrieval and transfer. Part of the project, the Model Library Program, is described by Katherine G. Cipolla in “M.I.T.’s Point-of-Use Concept: A Five Year Update,” Journal of Academic Librarianship 5 (January 1980): 326–329.


12. Kuhlthau, Seeking Meaning.


18. Kuhlthau, Seeking Meaning, p. 117.

19. The author is Chief of Reference and Bibliographic Instruction at Kingsborough Community College. She has established ongoing relationships with members of the Economics and English faculty who routinely request pathfinders to support their assignments.


