

A Study of Web-Based Interactive Reference Services via Academic Library Home Pages

This study addresses the strategic issue of access and policy in developing Web-based interactive reference services via academic library home pages. It examines the current status of Web-based interactive reference services in the United States through a national survey. The study finds that less than one-half of the surveyed institutions (67 of 143 or 46.9 percent) use Web-based interactive reference as an extension of their traditional reference services. Web-based interactive reference services are primarily used to provide brief factual information, basic guidance in conducting library research on a topic, and to answer questions about library resources, services, policies, procedures, and facilities.

The widespread availability of the Internet has expanded the possibilities for librarians to provide reference services to their users. Gray states that ". . . reference service has the longest history of networked delivery, first by telephone and now through the Internet. . . . Most of these virtual services operate through electronic mail, but some experiments have also been undertaken using video-conferencing, shared work spaces, mail lists, and chat rooms in an effort to create interactions more closely approximating those that take place in a face-to-face reference transaction."¹ The need for reference serv-

ices has even caught the attention of the CNN news media. Larry Keller of CNN.com/career writes, "With seemingly infinite research data at the fingertips of everybody linked to the Internet, you might think reference librarians are doomed to go the route of door-to-door salesmen and elevator operators. Instead, many Internet users have found the information glut daunting and confusing. And frequently, it's a reference librarian they turn to make sense of it."² The problem that today's reference librarians face is to discover and explore the impact and implications that the Internet holds for delivering library reference services.

In light of the recognition of the need for these services, the author has conducted a study to learn the current status of Web-based interactive reference services provided through academic library home pages in the United States. The two research questions under investigation are the following: (1) What is the percentage of academic libraries providing Web-based interactive reference services through their home pages? and (2) How do academic libraries provide Web-based interactive reference services through their home pages?

For the purposes of the study, Web-based interactive reference services are defined as reference services in which librarians and users are able to interact

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using e-mail, videoconferencing, a discussion forum, or a chat room during the virtual reference interview process. Because reference resources and reference guides posted by librarians on their library home pages represent one-way communication only, the listings of these resources and guides are not included as a part of this study.

The research is further based on three assumptions: (1) an academic library may or may not provide Web-based interactive reference services through its home pages; (2) an academic library may provide Web-based interactive reference services differently through its home pages; and (3) Web-based interactive reference services may not be the same as face-to-face reference services in terms of the clientele served.

The significance of this study is that it addresses the strategic issue of access and policy in developing Web-based interactive reference services through academic library home pages. The findings of this study will prove useful to academic libraries planning to initiate or to improve existing Web-based interactive reference services. This article is timely in that it reports on a national survey conducted in the year 2001.

Review of the Literature

This review of the literature focuses on the concept of access and policy relating to issues of reference service and the Internet. "Access and policy" address the question of how librarians should provide Web-based reference services. The author has drawn the conceptual framework of this study from "Guidelines for Information Services" and "Guidelines for Medical, Legal and Business Responses," which were approved by the board of directors of ALA's Reference User Services Association (RUSA) in July 2000 and June 2001 respectively.³ In section 3.0 Access, the "Guidelines for Information Services" state, "The library should support state-of-the-art communications methods for access to information resources for all its users. . . . This includes communications hardware and software to receive and answer queries for information from users." In section 1.0 Services, the same guidelines state "The library should develop and make available to the public a statement of its reference service policy." In section 3.0 Information Service Responses for Off-site Users, "Guidelines for Medical, Legal and Business Responses" state: "Special care must be taken with off-site requests for assistance since it is easy to misinterpret voice messages, and text-based communication may need explanations or interpretation."

Internet Reference Access

Sloan profiled a number of experimental cases that attempt to test the extension of traditional reference services into the electronic environment in academic libraries.⁴ The cases that experimented with videoconferencing technology include:

- ❖ UC-Berkeley's "See You See a Librarian" project⁵
- ❖ Japan's University of Library and Information Science's "Collaboration Support System" project⁶
- ❖ University of Michigan's Interactive Reference Assistance (IRA) project⁷
- ❖ UC-Irvine's Interactive Reference Service (IRS)⁸

The profiles of these experiments reveal mostly negative experiences, as the following examples show:

- ❖ The hardware and software resources in libraries were insufficient to reach a critical mass of participants.
- ❖ There was an inconsistent quality of the audio and video connections.
- ❖ There was insufficient bandwidth used to provide necessary levels of service.
- ❖ Reference videoconferencing workstations needed to be placed in a dedicated room to avoid disturbing other computer lab users.

A positive note in Sloan's profile was that desktop videoconferencing had an advantage over telephone reference service because of chat and whiteboard facilities.

McKiernan created a categorized listing of libraries that offer real-time library reference or information services.⁹ His listing provides access to Web sites for academic and research libraries, government, public, and special libraries. It also includes real-time digital reference technologies. About ninety academic libraries are listed in his *LiveRef: A Registry of Real-time Digital Reference Services*. Foley reported a pilot project conducted at the General Libraries of the State University of New York (SUNY) at Buffalo to assess the feasibility of providing reference through "chat room" format and America Online's Instant Messenger software.¹⁰ Staffing problems were identified in the conclusion. Tenopir found that "Libraries that offer real-time virtual reference are still experimenting with software."¹¹

Sloan also described cases involving electronic mail. Students at the University of Maryland used a "remote reference request form" that could be submitted via e-mail, fax, or regular mail. E-mail reference interviews were analyzed based on certain parameters, that is, interview analysis, message counts, subject and motivation, media used, and

student critiques. The study concluded, "On the basis of this project, it is clear that some substantive reference questions can be negotiated successfully via email."¹² Another study conducted at the University of Maryland revealed that there were both limitations and benefits to e-mail reference. The limitations included a "lost time between messages, loss of message richness, and system instability," while the benefits included an expanded access to reference service, greater convenience for users, and enhanced efficiency for staff due to the asynchronous nature of the medium.¹³

Fullerton reported a case study of e-mail reference experiences from Gelman Library at the George Washington University at the 67th IFLA Council and General Conference on August 20, 2001. The study found that making the service more visible on the library's home page and removing restrictions as to the type of questions that were permitted proved to be a success in increasing the number of online reference questions.¹⁴

Internet Reference Policies

The author's literature search found suggestions on how to support electronic reference services. Sloan points out that deciding which services to offer, and how to offer them, are key to the success of an electronic reference program.¹⁵ Sloan raises many questions about establishing policies for electronic reference services. These include: (1) How comprehensive will the service be? (2) Will service be limited to quick ready-reference and basic information queries? (3) Will reference librarians provide more in-depth answers? (4) Will librarians do library searches for users and provide bibliographies? and (5) Will services be Web-based or something simpler, such as e-mail? Sloan suggests that one goal might be to offer the same level of reference service that a user might expect if he or she were physically in the library.

Garnsey and Powell have proposed that librarians need to educate their e-mail reference patrons about the types of questions suitable for e-mail reference.¹⁶ Campbell has stated that if traditional reference services are to survive, librarians will have to transform them for the new age and prove their value.¹⁷ Other articles reviewed for this study propose redefining reference services, building a core Internet reference collection, exploring Web-based nonprofit reference service consortia, and Web-based commercial reference services.¹⁸

The above literature was selected for review based on the conceptual framework of access and policy of Web-based interactive reference services. The findings of this study will contribute to the emerging literature on these issues.

Method

The universe of this study is 1,402 institutions of higher education, ranging from doctorate-granting universities to baccalaureate colleges, which are listed in *A Classification of Institutions of Higher Education: A Technical Report*.¹⁹ The population was stratified by three institutional groups and six institutional strata, according to the Carnegie Classification:

- ❖ Doctorate-Granting Universities: These institutions offer a full range of baccalaureate programs and are committed to graduate education through the doctorate.²⁰
- ❖ Master's Colleges and Universities: These institutions offer a full range of baccalaureate programs and are committed to graduate education through the master's degree.
- ❖ Baccalaureate (Liberal Arts) Colleges: These institutions are primarily undergraduate colleges with a major emphasis on baccalaureate degree programs.

The 2000 edition of the Carnegie Classification, which replaced the 1994 edition, retains the basic structure that was established in 1971, with two major changes: it has reduced the number of categories of doctorate-granting institutions from four to two, and it has added a new category of baccalaureate colleges.

These three institutional groups are divided into six strata according to whether they are publicly or privately funded institutions. Every tenth institution in each stratum was selected and 143 institutions were included in this study. In *Descriptive Statistical Techniques for Librarians*, Arthur W. Hafner states: "Sample size is important, because a sample has to include a sufficient number of elements to reflect the population as a whole. . . . as a general rule, if a librarian's sample includes one hundred elements, the survey findings usually will yield reasonable results about the target population."²¹ The method of proportional allocation, combined with systematic sampling, was applied in selecting the number of institutions to be sampled from each stratum. Jaeger indicates that proportional allocation "guarantees that stratified sampling will be at least as efficient as simple random sampling. Proportional allocation has the additional advantage of simplicity."²² Hafner provides the following discussion of systematic sampling: "The technique is popular and effective and is used frequently by librarians. . . . Beginning from any place in the sampling frame, select every *k*-th item. That is, elements are identified by systematically proceeding down the list and selecting elements at the predetermined, regular interval of *k*. . . . If selection is begun

Table 1*Percentage of Home Pages Providing Web-Based Interactive Reference Services*

DPU n=16	DPR n=9	MPU n=28	MPR n=26	BPU n=9	BPR n=55	All n=143
68.8	55.6	75.0	42.3	44.5	27.3	46.9

Note: DPU = doctorate-granting public universities; DPR = doctorate-granting private universities; MPU = master's public universities; MPR = master's private universities; BPU = baccalaureate public colleges; BPR = baccalaureate private colleges.

Table 2*Percentage of Home Pages with Interactive Reference Links*

Level	DPU n=11	DPR n=5	MPU n=21	MPR n=11	BPU n=4	BPR n=15	All n=67
1st	45.5	—	42.9	90.9	50.0	60.0	52.2
2nd	45.5	40.0	52.4	—	50.0	33.3	37.3
3rd and down	9.1	60.0	4.8	9.1	—	6.7	10.4

Note: DPU = doctorate-granting public universities; DPR = doctorate-granting private universities; MPU = master's public universities; MPR = master's private universities; BPU = baccalaureate public colleges; BPR = baccalaureate private colleges.

toward the bottom of the population and the bottom is reached before the sample is complete, then selection continues from the top of the sample and goes on until all sample items are identified.²³ The author accessed a sample of university and college home pages and "virtually" visited each institution's library home page between March 16 and May 11, 2001.

Findings

Web-based Interactive Reference Services

Table 1 shows that, of the 143 institutions surveyed, 67 (46.9%) offered Web-based interactive reference services, 76 (53.1%) did not. When studying the institution's provision in each category, public (funded) doctorate-granting (68%) and master's (75%) universities were more likely to provide Web-based interactive reference services than private (funded) doctorate-granting (55.6%) and master's (42%) universities. Public (funded) baccalaureate colleges (44.5%) were also more likely to provide Web-based interactive reference services than private (funded) baccalaureate colleges (27%). Less than a half of the private (funded) master's universities and both public and private (funded) colleges provided Web-based interactive reference services.

Interactive Reference Link

Table 2 shows that, of the 67 libraries providing Web-based interactive reference services, 35 (52.2%)

placed their reference links on the first level of the library home page, 25 (37.3%) on the second level, and 7 (10.4%) on the third level and down. Publicly funded institutions tended to be evenly split by placing the link either on the first or second level of the library home page. Privately funded institutions varied greatly in the placement of reference links on their library home pages. None of the five privately funded doctorate-granting institutions in the sample placed a reference link on the first level of the library home page. However, 10 of the 11 privately funded master's universities and baccalaureate colleges in the sample placed reference links on the first level of the library home page.

Many different wordings were used to describe the reference link. The most popular ones were "Ask a Librarian" (20 of 67 or 29.9%) and "Ask a Reference Question" (8 of 67 or 11.9%). Other variations include the following:

- ❖ Ask the Virtual Reference Librarian
- ❖ Electronic References
- ❖ E-mail a Librarian
- ❖ E-mail a Reference Question
- ❖ E-mail Reference
- ❖ E-Ref
- ❖ Information Desk
- ❖ Online Reference Form
- ❖ RDO (Reference Desk Online)
- ❖ Reference Request
- ❖ Reference by E-mail
- ❖ Reference Desk
- ❖ Reference Help
- ❖ Reference Inquiry Form
- ❖ Reference Librarian Online

Table 3
Percentage of Sites Providing Specific Web-Based Interactive Reference Services

Service	DPU n=11	DPR n=5	MPU n=21	MPR n=11	BPU n=4	BPR n=15	All n=67
E-mail link only	27.3	40.0	23.8	27.3	25.0	26.7	26.9
Reference request form	72.7	60.0	71.4	72.7	75.0	73.3	71.6
Nonworking link	-	-	4.8	-	-	-	1.5

Note: DPU = doctorate-granting public universities; DPR = doctorate-granting private universities; MPU = master's public universities; MPR = master's private universities; BPU = baccalaureate public colleges; BPR = baccalaureate private colleges.

Table 4
Percentage of Sites with Service Policies for Web-Based Interactive Reference Services

Service	DPU n=11	DPR n=5	MPU n=21	MPR n=11	BPU n=4	BPR n=15	All n=67
ID or password	9.0	-	-	-	-	-	1.5
State eligibility	45.5	40.0	38.1	27.3	25.0	33.3	35.8
No restrictions	45.5	60.0	61.9	72.7	75.0	66.7	62.7

Note: DPU = doctorate-granting public universities; DPR = doctorate-granting private universities; MPU = master's public universities; MPR = master's private universities; BPU = baccalaureate public colleges; BPR = baccalaureate private colleges.

- ❖ Reference Questions
- ❖ Requesting Assistance by E-mail

Methods of Providing Services

Table 3 shows that, of the 67 libraries using Web-based interactive reference services, 48 (71.6%) provided these services through a reference request form, and 18 (26.9%) through an e-mail link only. One library was found to have a reference discussion forum (posting questions and answers asynchronously) and a reference chat room (posting questions and answers synchronously). The reference discussion forum was not heavily used because there were only about fifty messages in the discussion forum between the eight-month period of September 2000 and May 2001. The chat room was available but never used based on what the author learned through a follow-up e-mail to the librarian in charge of reference services in that library. No videoconferencing method was found to provide Web-based interactive reference service among all the surveyed institutions.

Service Policies

Table 4 shows that, of the 67 libraries providing Web-based interactive reference services, 24 (35.8%) had a policy statement of eligible users and eligible

questions; whereas 42 (62.7%) had none. One library required an ID and password to open an online reference request page. There was no apparent pattern as to why a particular type of institution might have more restrictions than another.

The policy statements surveyed indicate that the priority users were students, faculty, and staff of the library's parent institution. Nonaffiliated users were less of a priority in terms of response time and depth of answers. Many libraries attempted to respond within twenty-four or forty-eight hours, except for weekends and holidays. The following types of query were found to be eligible for Web-based interactive reference services:

- ❖ *Brief factual or statistical information:* Checking incomplete citations; checking library holdings; finding a name or specific biographical information; locating addresses or telephone numbers; verifying information on a specific book or journal; identifying a historical date; finding a quotation, and finding specific statistical figures
- ❖ *Guidance about strategies or source of information:* Providing basic guidance in conducting library research on a topic
- ❖ *Questions about the library:* Learning about procedures, resources, services, policies, and facilities.

For queries requiring extended library research or instruction, users were advised to come in person to the library. One library listed these two questions

as examples of being ineligible for Web-based reference: "Please send me 20 citations on poetry criticism," or "What were the causes of WWII?"

Discussion

The findings reveal that Web-based interactive reference services are still in the early stages of growth and development. They are not as prevalent as people may think, considering the popularity of academic library home pages, since less than one-half of all surveyed institutions (67 of 143 or 46.9%) provided Web-based interactive reference services. In general, publicly funded institutions were more likely to provide Web-based interactive reference services than privately funded institutions. Doctorate-granting and master's universities were more likely to provide Web-based interactive reference services than baccalaureate colleges.

Concerning "access," the surveyed institutions as a whole tended to place a reference link on the first level of the library home page. There was no pattern as to the placement of a reference link on the library home page based on institution type. Even though a reference request form was a preferred method for providing Web-based interactive reference service, a significant number of libraries still used an e-mail link to communicate with their users. The author's opinion is that the "e-mail link only" method is easy to provide on the home page, but its limitation is that the user will not be able to e-mail questions to librarians unless his/her browser is properly configured for e-mail. Nonetheless, a user can use a reference request form to submit questions from any computer that connects to the Internet without having to configure a browser's e-mail functionality.

More research is needed to learn why the "discussion forum" and "chat room" methods of interactive reference services are underutilized. However, one reason that might explain the lack of popularity of these two Web communication methods is that the reference interview process is essentially an individual and private interaction between a librarian and client. These two methods tend to make a user post a question to a group of people. Also, the library administration may find it difficult to commit sufficient human resources to monitor a reference chat room all the time.

The author did not find that the videoconference method was used for interactive reference service by the academic libraries in the sample. This finding suggests that real-time video face-to-face reference services may still be in its experimental stage and may be limited by the current overall Web environment in their "virtual" applications. With the

improvement of communication speed (bandwidth) through the Web, academic libraries may eventually provide Web-based interactive reference services that will be more dynamic, multimedia, and a closer simulation of physically face-to-face reference services.

It is interesting and unexpected to discover that many libraries do not have a posted policy statement on their home page concerning their Web-based interactive reference services. Even those libraries that declared a statement of eligibility did not reject a query from a nonaffiliated user. Rather, their response time was usually a matter of priority in service. This could indicate academic libraries' willingness to provide reference service to users beyond their own institutions, whenever possible.

Conclusions

The following conclusions can be drawn from the findings of this study:

- ❖ Less than one-half of the surveyed institutions (67 of 143 or 46.9%) used Web-based interactive reference services as an extension of their traditional reference services.
- ❖ Web-based interactive reference services were considered important, since more than half the institutions (35 of 67 or 52.2%) providing the service placed this link on the first level of their library home page.
- ❖ The reference request form was the preferred method of access in providing Web-based interactive reference service.
- ❖ Posted policy statements show that affiliated students, faculty, and staff are given priority for Web-based interactive reference services. Nonetheless, the policies did not exclude nonaffiliated users from using the services.
- ❖ Web-based interactive reference services were used to provide brief factual information, basic guidance in conducting library research on a topic, and to answer questions about library resources, services, policies, procedures, and facilities.

This study may stimulate interests in conducting a further survey of reference librarians involved in Web-based interactive reference services. The following questions may be explored through such a survey: What do librarians perceive as the effectiveness, usefulness, and problems of Web-based interactive reference services? Why do librarians choose to use or not use the methods of chat room, discussion forum, or videoconference to provide Web-based interactive reference services? ■

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