

Christina M. Hull. An Analysis of Information Literacy Instruction in the Virtual Reference Service of a Public Library System. A Master's Paper for the M.S. in L.S. degree. April, 2004. 61 pages. Advisor: Jeffrey Pomerantz

This study describes a content analysis of virtual reference transcripts taken from the Charlotte Mecklenburg County Public Library virtual reference service. The analysis was performed in order to determine whether and how information literacy instruction is performed in the virtual reference setting. A codebook of instances of instruction was used to identify occurrences of information literacy instruction in the transcripts.

Ninety-one chat sessions out of 104 demonstrated instances of information literacy instruction. The majority of this instruction involved the finding and retrieval of information. Little instruction dealt with the use of information once retrieved. Most instruction in this setting seems to happen implicitly, as the librarian performs a search or uses a source. The study indicates that, while instruction is occurring in the virtual setting, many more opportunities to offer instruction exist and should be explored.

#### Headings:

Information literacy

Instant messaging software

Reference services -- Automation

Public libraries -- North Carolina

Public libraries -- Reference services

Use studies -- Reference services

AN ANALYSIS OF INFORMATION LITERACY INSTRUCTION IN THE VIRTUAL  
REFERENCE SERVICE OF A PUBLIC LIBRARY SYSTEM

by  
Christina M. Hull

A Master's paper submitted to the faculty  
of the School of Information and Library Science  
of the University of North Carolina at Chapel Hill  
in partial fulfillment of the requirements  
for the degree of Master of Science in  
Library Science.

Chapel Hill, North Carolina

April 2004

Approved by

---

Jeffrey Pomerantz

## Table of Contents

Introduction.....	3
Literature Review .....	4
Methodology.....	9
Results.....	17
A. Codes for instruction in the nature and extent of information needed.....	18
B. Codes for instruction in how to access needed information effectively and efficiently .....	20
C. Codes for instruction in how to evaluate information and its sources critically and incorporate selected information.....	29
D. Codes for instruction in how to use information effectively .....	30
E. Codes for instruction in how to use information ethically and legally.....	31
F. Codes for instruction in technical issues .....	32
G. Other.....	34
Missing Instances of Instruction .....	36
Discussion.....	37
Further Research.....	42
Conclusion .....	44
Appendix A.....	46
Appendix B.....	50
Appendix C.....	55
List of Works Cited.....	58

## **Introduction**

Virtual reference has become a strong presence in libraries. Tenopir and Ennis state that “By the beginning of the first decade of the new millennium there is no going back – reference departments are now transformed and sometimes reorganized, digital resources and related digital reference services are the rule” (“Decade of Digital Reference” 265). Libraries across the country are eager to join the movement and begin to offer their reference services online. Enthusiasm for the movement, however, is not enough to make the digitization process successful. Though many of the same services offered in the physical environment can also be offered in the virtual environment, they may not necessarily be able to be offered in the same way.

One of the primary services traditionally found in the public library reference setting is information literacy instruction, the act of teaching people how to use and find information. As the librarian finds and uses material, he/she ideally demonstrates and explains strategies and materials in such a way that the patron can make use of them in their own future information searches. With the advent of virtual reference, reference practitioners need to discover if and how well this instruction service carries over into the virtual setting. Instruction is a well-recognized and established service in the physical realm. The virtual reference setting is different enough from the physical setting to make research into how instruction is and can be performed in the virtual setting imperative. Differences in communication alone create a need for research in this area; no visual or

audio clues exist in the virtual setting to facilitate the reference interview (Ellis and Francoeur 2; Hodges 159).

Many guidelines have been written to direct reference services in the physical setting. Few guidelines exist for the new virtual setting. Before guidelines can be written, however, existing practices need to be examined in order to determine the current state of affairs. The purpose of this study is to discover how virtual reference is being used by librarians in the public setting to carry out the instruction aspect of reference services.

### **Literature Review**

Information literacy instruction is the process of teaching patrons to find and use information. It is often used synonymously with the terms bibliographic instruction, library instruction, and library skills instruction (Snively and Cooper 10). In the Presidential Committee on Information Literacy's "Final Report," the American Library Association defines the information literate person as the person who is "able to recognize when information is needed and ha[s] the ability to locate, evaluate, and use effectively the needed information." The issues and definitions surrounding the term information literacy are discussed in depth elsewhere and will not be dwelt on here (see Rettig [1995], Snively and Cooper [1997], Plotnick [2000], and McCutcheon and Lambert [2001]). For the purposes of this study, information literacy instruction (ILI) is performed when librarians teach patrons how to find and use information or, in other words, enable patrons to be information literate. In the reference setting, as is being examined here, ILI encompasses a broader range of activities than it does in the classroom setting. In the reference setting, and therefore in this study, something as

simple as informing a patron of the existence of a database is considered ILI, whether the database is explained or not.

Ultimately, the goal of reference is “to resolve or solve the inquirer’s information problem by providing an answer to his or her question” (Richardson 215). This goal is commonly considered to have an instructional element. Bernie Sloan writes that “reference librarians frequently play a major instructional role, teaching users to be better able to navigate through the maze of information resources” (124). The *Encyclopedia of Library and Information Sciences* describes the instruction role of the reference librarian in its entry on “reference services and libraries”: an “emphasis is on helping the user to help himself, on instruction in how to use books and libraries rather than on delivery of information” (Galvin 217). Instruction is one of the basic practices of reference services.

Information literacy instruction is a central pursuit in the public library realm. ILI has repercussions for all life settings; being able to find and use information “fosters career success, responsible citizenship, and lifelong learning in general” (Ellis and Francoeur 3). Instruction has always been seen as a role of the reference arm of the public library: “in the case of the public library, the rationale for this view is found in the 19th-century concept of that institution as the ‘people’s university,’ a resource provided by the community for the self-education of the citizenry” (Galvin 217). Most instruction in the public realm occurs in the reference setting, when the patron has an immediate need for information (P. Wilson 26). In their survey of public library users, Diehl and Weech found that the majority of patrons who want instruction want it in the reference transaction, so they can both learn how to use resources and have their information need satisfied at the same time (32).

Increasingly, reference services in the public library realm are moving online, with great success, as displayed in the following examples. In 2000, the Suffolk Cooperative Library System began an online chat reference service for the public libraries of Suffolk County, New York. The success of the pilot service prompted the libraries to create a permanent chat reference service in March 2001 (Hoag and Cichanowicz 41). In 2001, the Cleveland Public Library System joined forces with other regional libraries to start a live Web reference service (Carterette and Feldman 95). The service's traffic in the first months of its existence was sufficient to warrant its continuation (Carterette and Feldman 101). The Public Library of Charlotte and Mecklenburg County have found that the questions received at their virtual reference service are the same as those received at their physical reference desk, indicating that patrons are familiar with the service and comfortable using it (Herzog 153).

Virtual reference, also known as digital reference, real-time reference, chat reference, real-time chat reference, and live reference, uses software and the Internet to allow patrons and librarians to interact from a distance (Lankes 302). Virtual reference encompasses a wide range of technologies, including e-mail, instant messaging, and video-conferencing. For the purposes of this study, virtual reference (VR) refers to a type of instant messaging which uses software that permits the librarian and patron to exchange text messages synchronously, or in real time (Francoeur 191, 192; Lankes 307). The software observed in this current study also allows the librarian and the patron to "push" Web pages to each other's screens, a process known as "collaborative browsing" or "cobrowsing" (Francoeur 192). Further, the software allows both the librarian and the patron to fill out online forms which they can both view at the same time in their

individual browsers (Francouer 192). Thus the software greatly facilitates the abilities of both the patron and the librarian to work together.

It is argued that “the basic practices and methods of digital reference are founded in traditional reference” (Hodges 158). Instruction, is, then, a likely practice to find among the increasingly-popular VR services. Tenopir and Ennis, in their survey of VR, mention “library instruction” as one of the services reference services offer (“Decade of Digital Reference” 265). Kasowitz, Bennett, and Lanke note:

To some extent, digital reference can borrow from traditional reference in terms of identifying quality characteristics of reference service. The same basic goal applies to both forms of reference – helping users meet information needs – and many of the same processes and characteristics are considered important, including [. . .] instruction to users on finding information independently [. . .] (355).

In Johnston’s study of the University of New Brunswick’s digital reference service, she found that “60 percent of queries contain some instructional element” (31). Thus, virtual reference’s potential and use as a vehicle for information literacy instruction has been well-noted.

Not only has virtual reference’s potential for instruction been noted but also its ideal format for instruction. With VR, users are no longer bound by time, space, or distance in satisfying their information needs (Hodges158). Because the patrons have this freedom, they can be met at their point of need and “keep the momentum going in their quest for information” (Ellis and Francoeur 5). DR provides a convenient environment for reference, and thus a convenient environment for ILI.

In addition to being convenient, DR is also a particularly appropriate form of reference for current information needs. DR is occurring at a time when more and more resources are being digitized. The point of need now is often when the user is engaged

with electronic materials. As “libraries provide more and more electronic resources for their patrons to access, users are getting more bewildered about where to begin searching or how to maneuver in each database” (Francoeur 196). Further, “as portals or gateways to resources become more sophisticated” librarians will have to focus on helping patrons with “the formulation of research questions and the selection, evaluation, and synthesis of information resources” (Von Elm, Trump, and Dugan 34). Library users, when faced with the growing amount of online databases (and thus the vast amount of articles which they contain), need help evaluating and choosing what is appropriate for their research (Christian, Blumenthal, and Patterson 24). A great need exists, therefore, for instruction to be performed online as resources continue to be made available online.

A multitude of literature surrounds the rise of virtual reference services, but most of this literature deals with evaluating the cost or the technology of the services. Little deals with the way librarians are actually using the technology to provide reference services to patrons of the services. Those studies which do look at the service being offered in virtual reference, for the most part, deal with virtual reference in general, incorporating, among others, e-mail, videoconferencing, and web contact software (see Kasowitz, Bennet, and Lankes [2000] and Ellis and Francoeur [2001]) or with e-mail (Diamond and Pease [2001] and Hodges [2002]). Other analyses of virtual reference deal with it in primarily nonlibrary settings, such as Marilyn Domas White’s study “Digital Reference Services: Framework for Analysis and Evaluation” (2001). White looks at virtual reference as practiced in AskA services (with the exception of the Library of Congress’s American Memory Collection Project), online services where people can ask questions on a focused topic, such as Ask Dr. Math or LawGuru. A great need still exists,

then, for research into the practice of library virtual reference. In 2004, R. David Lankes notes that the central research need for VR is: “[h]ow can human expertise be incorporated effectively and efficiently into information systems to answer information seekers’ questions?” (303). This current study seeks to advance research into one aspect of the use of human expertise in VR systems. The focus of this study is to discover how librarians are using VR to help the public library carry out the mission to provide ILI in reference services.

## **Methodology**

In order to research this question, the current study applies content analysis to a series of VR chat session transcripts. The chat sessions analyzed in this study come from the VR service provided by the Public Libraries of Charlotte and Mecklenburg County (PLCMC), North Carolina. Their chat service was launched in February 2002. The service is provided 7 days/week, 24 hours/day, through a service called 24/7 Reference. 24/7 Reference is a service which provides a set of tools and software that enable libraries to engage in chats with patrons. The service has a nationwide cooperative which allows librarians from around the country to answer questions for all libraries within the cooperative. Thus, PLCMC can have a 7 days/week, 24 hours/day service without having to staff it with PLCMC librarian all of the time. Librarians from the PLCMC libraries staff the service 2 hours/day (2-4 pm), 5 days/week (Monday-Friday). Seven librarians from PLCMC staff the service, and they do so from the main branch of the library system, in downtown Charlotte. The target audience for the service is the residents of Charlotte & Mecklenburg County, but anyone can log in to the service and be served.

The chat sessions for this study are taken from the beginning of February 2002 through the end of January 2004, a two-year period. From this period, only the chat sessions served by the PLCMC librarians are used. With this sample frame in place, the study included 326 chat sessions. Of these, 104 chats were deemed usable for the study. The unusable chats fall into the following categories: 184 test chats, 17 disconnected chats, 19 chats which involved minors (patrons under the age of 18), and 2 which fell outside of all of these categories. One of these 2 was a personal chat. The other of these 2 was a chat from a librarian in another library system inquiring about the VR system itself.

Figure 1 shows the fields which accompany each chat. The values in these fields are automatically recorded by the 24/7 application. The set of valid values for each field can be set up by the individual service (in this case the PLCMC libraries) within the 24/7 service.

“Test” chats were chats in which a PLCMC librarian was posing as a patron for the purposes of giving other librarians practice. Chats were deemed to be “test” chats if the Category field was labeled: “PLCMC\_TEST” or if the Resolution Code field was labeled “TEST.” Test chats were also ones in which the Email field had an address with an @plcmc.org extension.

Disconnect chats are chats in which the patron or the librarian disconnects before the chat is completed. In this study, some disconnect chats were considered usable and some weren't. For the purposes of this study, a “disconnect” chat is one in which the

Transcript #
Start Time:
Category:
Resolution Code:
Email:
Librarian:
IPADDRESS:
LEVEL:
LIBRARY CARD:
QUESTION:
REFERER:
Patron:
Browser:
ZIP CODE:

Figure 1

librarian and patron were disconnected before the librarian and patron had a chance to interact. If the librarian and patron interacted to the extent that the librarian had acknowledged the patron's question and had begun either question negotiation or searching, the session was considered usable, even if the librarian and patron were disconnected before the session was completed. The purpose of this study is to analyze information literacy instruction, and instruction can occur whether or not the session is completed. At times, the librarian would continue to seek the answer to a patron's query and send messages about their search even after the patron had disconnected. The 24/7 Reference application automatically emails a transcript of the chat session to the patron, so searching after the patron has disconnected is still worthwhile. Instruction can occur in this post-disconnect searching.

Chats were deemed to be "minor" if the Level field (see Figure 1) was labeled "elementary," "middle school," or "high school." The other options for the Level field are "college" and "general." Some content analysis was necessary, too, to determine whether the chat involved a minor, for some chats which were labeled as being "college" or "general" seemed to be from minors. For instance, a certain patron, whose question was labeled at the "general" level, asked a question about whether their parents needed to have a library card before they could check out DVDs. Questions such as these were deemed to be from minors. Chats involving minors were not used due to the permissions needed in studies involving minors. It is possible that some questions from minors were labeled as "general" or "college" and went undetected as being from minors. However, if the chat does not indicate the patron is a minor, it was used for this study.

In order to determine the ways in which ILI is occurring in the PLCMC virtual reference service, this study employed content analysis to analyze and categorize the PLCMC libraries' chat sessions. NVivo, a content analysis software, was used to code the transcripts. The coded passages were then gathered and compared for analysis.

The unit of measure for analysis is "instance of instruction" (IOI). An IOI is any portion (word, phrase, sentence, paragraph) of a librarian's chat message which could be considered instructive. This includes instances which are not overtly instructive, such as the librarian asking the patron whether they want genealogical or biographical information. Such an instance would be potentially instructive, for the patron may learn from the question that these two major avenues of research exist for his area of interest. Further, it is impossible to tell whether the session is actually instructive, unless the patron comments on this. For instance, if the librarian tells the patron that he/she needs a library card number in order to place an interlibrary loan request, will the patron learn that this information is needed each time they wish to place a request? Whether the patron learns from this or not, the instance is still potentially instructive, and is coded. A passage is determined to be an IOI not, then, by whether it actually is instructive, but by whether it has the potential to be.

IOIs are not mutually exclusive: the same portion of a chat can be coded as two different instances of instruction. A message relating to accessing an online book could be regarded as both "information retrieval" and as a "technical issue," if the librarian must explain how to use passwords, configure their browser for access, etc. This overlapping of categories violates one of the classic rules of hierarchical classification, that a given entity can belong to only one class, or, in this case, code (Kwasnik 26).

However, the object of these categories is to be as comprehensive as possible in determining the types of instruction which take place in these transcripts. Hierarchical classification is the ideal, but it is acknowledged that an entity may belong to multiple classes based on the circumstances (Kwasnik 29-30). In conversation, as in these transcripts, one speech act may serve multiple functions. In addition to this, each instance in which instruction occurs is counted. Thus, a passage in which a librarian is teaching a patron how to use a database could have multiple instances if the librarian explains different features of the system.

In this study the content of the chat messages was analyzed and classified into various IOI. In order that the IOI might be selected and classified in a systematic way, a codebook of “instances of instruction” was developed (see Appendix A). The codes were developed by comparing and combining information literacy material from many sources, primarily journal articles discussing the uses of VR technology. Suggestions and experiences on what should be taught or what is being taught in the VR setting were gleaned from these articles. Christian, Blumenthal, and Patterson, for example, list “basic competencies of computer searching”: “introducing effective screening tools and search limits such as subject discipline; time period; [ . . . ] language; scholarly versus popular materials; population studied; [and] fields within the bibliographic record” (25). Other skills include “using help screens, Boolean operators, truncation, and the use of thesauri to focus research” (Christian, Blumenthal, and Patterson 25). The codebook documented with attributions to these sources can be seen in Appendix B below.

Despite the fact that this study is geared towards the public library setting, the Association of College and Research Libraries’ (ACRL) *Information Literacy*

*Competency Standards for Higher Education* were consulted as well in the creation of the codebook. They are the premier set of information literacy standards and, therefore, a good foundation for any set of information literacy instruction guidelines. Further, no comprehensive set of information literacy standards can be found for users in the public library setting. Granted, these standards are focused on assessing the patron's information literacy skills and not on assessing the librarian's instruction skills. However, what the user needs to be able to do implies what the librarian needs to teach. These standards were used as supplemental material, to aid in insuring that the codebook covers a wide range of instruction.

These standards were also used to structure the codebook. The ACRL standards fall into five categories; these same categories were used to organize the codebook. These categories were used because they provided a way of grouping the codes into a helpful chronological scheme of how information seeking and use occur. With the codes grouped in this way, it is easier to determine which part(s) of the information seeking process require the most frequent instruction in the PLCMC virtual reference setting. The ACRL standards' categories are: codes for instruction in how to determine the nature and extent of information needed, codes for instruction in how to access needed information effectively and efficiently, codes for instruction in how to evaluate information and its sources critically and incorporate selected information, codes for instruction in how to use information effectively, and codes for instruction in how to use information ethically and legally. Not every code in the codebook falls under the same category as it does in the ACRL standards. Codes were shifted and rearranged as the transcripts were analyzed. The codebook reflects the practice observed in the VR transcripts more than the

prescription outlined in the ACRL standards. The influence of the ACRL standards on the codebook can be seen in Appendix B.

In order to balance the higher education slant of the ACRL standards, the codebook was compared to the standards put forth in the document *Equipped for the Future Content Standards: What Adults Need to Know and Be Able to Do in the 21<sup>st</sup> Century* by Sondra Stein. This document is produced by the National Institute for Literacy and describes those skills that will equip adults for “lifelong learning” (Stein 1) the same goal proposed in the *Information Literacy Competency Standards for Higher Education*. The standards spelled out in this document were found to correspond nicely to the ones in the *ACRL Information Literacy Competency Standards* and in the other sources consulted. Where they supplemented the codebook or changed the existing wording of the codebook can be seen in Appendix B.

In order to insure the usability of the codebook, it was evaluated by three separate sources. The first source is the supervisor for this project, who gave advice on how to structure the codebook. The second source is the PLCMC librarians themselves. They were satisfied with the codebook but anticipated that many of the IOI outlined in it would not be found among their transcripts. The third source which analyzed the codebook is an instruction librarian. She found that it was satisfactory overall, but she made a few suggestions (such as where categories overlap) which were taken into account in finalizing the codebook. Thus, in addition to reflecting the knowledge of experts in the field (represented by their published literature), the codebook reflects the knowledge of researchers and practitioners.

The codebook continued to evolve as the transcripts were analyzed. Observing actual practice enabled the refinement of broad categories such as “search strategy” or “information location.” Many of the decisions which guided such refinement can be seen in the “guidelines developed while coding” (see Appendix C). In addition to the refinement of existing codes, the emergence of new codes occurred while the transcripts were analyzed. These were not all necessarily ILI but were considered to be interesting items to note in relation to ILI. Two new codes reflect areas where the librarian either didn’t explain the search strategy used (how he/she was looking for information to meet the patron query) or didn’t explain it clearly enough for the patron to follow: “search strategy used but not given” and “vague search strategy.” These codes note instances which were ripe for instruction but which were not taken advantage of.

Three new categories have to do with the use of the library: “library policies”, “library usage”, and “vague library usage.” Library policies reflect instances where the librarian teaches the patron a specific policy of the library, such as interlibrary loan. Library usage concerns instances where the librarian discusses how and/or where to use library-specific items, such as CD burners. Vague library usage would be instances where the librarian could explain how to use the library’s amenities but doesn’t, such as when the librarian looks up a patron’s borrowing record instead of directing him/her as to how they can look it up themselves. Another new category dealt with instances where the “patron prompts ILI”, the patron actually asked for instruction to take place. Certain codes that were created before the analysis began were not found. They remain in the codebook, to demonstrate the ways in which practice does not meet expectation. In

addition, these codes may appear in other virtual reference settings and thus still be part of ILI in the virtual reference setting.

## Results

The following tables show approximate numbers for the IOI. The left-hand column gives the name of the code/category. The second column shows how many chat sessions contained passages for each code/category. The third column shows what percentage of the total chat sessions each code/category appears in. The final column shows how many passages total, across all chat sessions, were found for each code/category. Before dwelling on what types of instruction occurred, it should be noted that instruction took place in 91 or 87.5% of the usable chat sessions. Only 13 or 12.5% of the chats exhibited no IOI. The first table gives an overall idea of how the IOI fell into the major codebook categories:

Category	Total # of Chat Sessions in Which Category Appears	% of Total Chat Sessions in Study (104)	Passages in Which Category Appears
Nature and extent of information needed	45	43.27% <sup>1</sup>	68
Access needed information effectively and efficiently	86	82.69%	429
Evaluate information and its sources critically and incorporate selected information	4	3.85%	4
Use information ethically and legally	4	3.85%	7
Technical issues	10	9.62%	20
Other	45	43.27%	73

<sup>1</sup> Percentages are rounded to the nearest hundredth.

Once the transcripts had been coded, the first step in analysis was looking for patterns and anomalies among the coded passages. The patterns found in the various passages are outlined below. The analyses are laid out according to the structure of the codebook. Tables detailing how many passages were found for each individual code are given for each category.

#### A. Codes for instruction in the nature and extent of information needed

Code	Total # of Chat Sessions in Which Code Appears	% of Total Chat Sessions in Study (104)	Passages in Which Code Appears
<b>Nature and extent of information needed</b>	<b>45</b>	<b>43.27%</b>	<b>68</b>
Definition	36	34.62%	46
Information production	1	0.96%	1
Relevance	1	0.96%	1
Scope	8	7.69%	9
Where have you looked?	11	10.58%	11

The 46 instances of “definition” occurred, more often than not, to help the librarian understand what the patron was looking for. However, defining the patron’s query is potentially instructive to the patron. The patron could learn more about the context of the question or discover an alternative source. For instance the defining question “were you looking for a copy at a specific branch?” could inform the patron of the simple fact that the library has more than one branch. The question “Is it a tribe of people living today or in ancient times?” may cause the patron to think more in depth about the topic. The question “Is the summer reading list you are talking about school’s summer reading lists, or the libraries’?” may inform the patron that the library has a summer reading list.

One chat session included a mention of “information production.” The librarian told the patron that “Parade Magazine was published with the Charlotte Observer,” informing the patron of how the information will appear in the PLCMC libraries’ collection. This is in response to the patron explaining that they are looking for an issue of *Parade Magazine* which they can identify only by the cover of the issue. The librarian does not inform the patron of how *Parade Magazine* was published in order to instruct the patron. The librarian is explaining that it may not be possible to see the cover (because the magazine may not have a separate cover, being produced with the *Charlotte Observer*) and thus to identify the issue the patron wants from the cover. However, instruction takes place, though unintentionally.

Only 1 chat occurred in which the librarian mentions/instructs in “relevance.” The patron is seeking books to put into a bibliography. The librarian responds “It’s always best to actually look at the books you’re putting into a bibliography.” Granted, this is minimal instruction, but the librarian makes the patron aware that not just any selection of books will do; books must be related to the person’s topic.

In 9 instances the librarian discusses “scope.” Like “definition,” the librarian discusses the scope in order to know how to begin the search. Again, however, such questions have the potential to instruct the patron. Questions such as “are you looking for a lot of information such as a place to find magazine articles? Or just a few facts?” help the patron to think about their need and to focus their goals. The librarian can instruct in such instances without even intending to.

A similar category to “definition” and “scope” is the “where have you looked?” category, which occurs 11 times. “Where have you looked?” covers any questions in

which the librarian probes to find out where the patron has already looked for information for his query. This category is similarly instructive to “definition,” because the question can give the patron an idea of places to look or reinforces that they had been looking in the right place. For example, “have you tried UNC-Charlotte?” or “have you tried any of our online databases?” Not every instance is helpful, such as “Have you been to any library location?” In each these instances the librarian is trying to ascertain where they should start their own search, but there is the potential for instruction to take place.

### **B. Codes for instruction in how to access needed information effectively and efficiently**

Code	Total # of Chat Sessions in Which Code Appears	% of Total Chat Sessions in Study (104)	Passages in Which Code Appears
<b>Access needed information effectively and efficiently</b>	<b>86</b>	<b>82.69%</b>	<b>429</b>
Information location	52	50%	73
Information retrieval	30	28.85%	40
Information retrieval systems	23	22.12%	55
Referral	31	29.81%	39
Search strategy	39	37.5%	62
Search strategy used but not given	35	33.65%	42
Vague search strategy	25	24.04%	34
Search terms	9	8.65%	9
Sufficiency of results	4	3.85%	5
Tools	11	10.58%	19
Web navigation	23	22.12%	51

The largest amount of instruction (73 instances) involved “information location.” This IOI occurs in exactly 50% of the chats. The interesting thing to note in this category is the type of sources the librarians direct the patrons to. The information locations fall into the following media: 24 websites, 12 internet-based library resources (such as the

library catalog), and 17 physical library resources (microfiche, books, videos, etc.).

Patrons were directed to branches of the Charlotte public libraries 26 times. Eight of these instances mentioned specific locations within the Charlotte public libraries, such as the reference desk or the business center. The North Carolina Room (located at the Main branch of the PLCMC libraries) appeared as 5 of these instances.

When the librarian did provide the answer to a question (and not just a location to try), he/she often gave the source, a simple but necessary form of instruction. There were a few instances, however, where the librarian failed to state where the resource itself is located. For instance, a librarian noted that information was found in the *Statistical Abstract of the United States*, but did not mention where this source is located. The patron learns that the tool exists, but does not learn how to retrieve it. This category also includes instances where the librarian stated that information is definitely not at a location, such as “If you were hoping to rent film from the library we no longer offer that service since we have gone to videotape and DVD.” Where information is not can be instructive to the patron in that it helps the patron refine the search strategy.

The IOI dealing with “information retrieval” numbered 40. Fourteen of these instances dealt with retrieving information online. This instruction involved helping the patron know how to access online resources remotely and primarily consisted of informing the patron that his/her library card number was necessary to retrieve the information. In 3 “information retrieval” instances, the librarian discusses monetary access of information. In only one of these instances does the librarian reveal a free or less costly alternative but only when prompted by the patron. The patron wanted to know if the *Oxford English Dictionary* were available online. When the patron found he would

have to pay to use it this way, he asked if there were a print version at the library, which, the librarian informed him, there is.

The largest amount of instruction in “information retrieval” focused on interlibrary loan (18 instances). Often the librarian would instruct the patron in how to put a book on hold, which seems, by the context of the chat, to be part of the interlibrary loan process. In 11 of these instances, the librarian asked the patron to place the interlibrary loan request themselves by either calling the library or going to the library and making the request. In 2 instances, the librarian offered to place the request. In the remaining instances, the librarian merely suggested or commented on the service. In the 11 instances where the librarians ask the patrons to place the request themselves, they are requiring more of the patron. However, these instances offer more of an opportunity for training the patron to become an independent user of the library and its services. Due to the frequency of instruction in interlibrary loan, perhaps it would be helpful to have a tutorial on this subject linked from the library homepage.

A heavy amount of instruction takes place in “information retrieval systems,” 55 instances. There were 21 instances which concerned databases; these include any instances where a librarian gives a database name, location, or instruction on how to search the database. The databases in these IOI include: Reference USA, WorldCat, Gale’s Business & Company Resource Center, Business Source Elite, Academic Search Elite, and Health Source Nursing/Academic Edition. In 15 instances the librarian mentioned and/or explained the use of an internet based-searching tool, such as Google, Bizlink, or EBay. The library catalog was used and/or explained in 13 instances.

Reference USA and Bizlink, both dealing with business, are utilized often, indicating one of the primary areas of interest among the PLCMC virtual reference patrons.

Concerning “information retrieval systems,” the librarians often describe how to use databases, such as to type in search words or to search by some limiting factor. With web search tools, however, such as Google or EBay, there are few instances where the librarian offers instruction on how to use the system. These web search tools are usually only suggested; that patrons will know how to use them seems to be assumed. The library’s catalog is treated similarly. Librarians suggest keywords to use or may suggest using a subject keyword or an author search. Often, however, the catalog is merely suggested and/or used by the librarian, with no explanation as to how the librarian is using it. One chat occurs where the librarian does give a more detailed explanation of how to use the catalog: “You may search by title using the drop down box. Once titles are displayed you may again use the drop down box to limit your search to videotapes.” However, this detail is in response to the patron’s very specific request for training in using the catalog: “howcan [sic] i do a search through the onine [sic] catalog for videos on north carolina?” The use of the library’s catalog and of internet retrieval systems is generally assumed, while the use of databases usually gets more explanation. Even just mentioning a database or search engine name or using the catalog is considered instruction, for the librarian is making the patron aware of its existence. It would be ideal if the librarian explained how to find and/or use the information retrieval system in each instance, but, in the reference setting, it is a start that the system is mentioned.

Librarians referred patrons to another source 39 times. The IOI “referral” includes any instance in which a librarian suggested that the patron look for their answer by

consulting a different person or institution, whether that person or institution is another librarian, a specialist, or anyone or institution more knowledgeable about the subject or better able to handle a request. Referral took place in 31 chats, which is 29.81% of the total usable chats. Patrons were referred to PLCMC services such as interlibrary loan, the North Carolina Room (local history collection at Main Library), Virtual Village (computing services at Main Library), and the reference department's Small Business Information Center. Outside services which were recommended include: the North Carolina Department of Health and Human Services, Duke Power, the UNC-Charlotte department of history, the law library of Mecklenburg Country, the library for the Milliken corporation, and a local art gallery called the Light Factory among others. In many instances, these referrals are due to the librarian's lack of resources. Others, it seems, are due to a lack of time. For example, one librarian referred the query to another librarian, saying: "I'm going to let [another librarian] handle it, since 24/7 is busy today [ . . .]." In either case, the patron is being instructed by learning of other sources he/she can use to satisfy their query.

The second most common IOI was "search strategy" (62 instances). This type of instruction can be divided up into two major categories. The first is instances where the librarian informs the patrons of the steps that the librarian is using to find information; this type occurs 14 times. The second category is instances where the librarian suggests a strategy for the patron to follow; this type occurs 48 times. The finding that there are more instances where the librarian suggests rather than performs a strategy indicates that, overall, the librarians consider VR a tool for quick or ready reference-type answers; in depth research does not occur here. If in depth research is needed, the librarian gives the

patron a search strategy, not the outcome of an involved search which the librarian has performed. In 11 of this latter type the librarian recommends that the patron come to the library to look for information. With a patron who is looking for small business loans, the librarian asks, “[B]esides online resources, is there anyway you can come to the library downtown?” When a patron asks for information on Michelangelo’s nephew’s diary, the librarian responds: “[Y]ou might need to come into the library to search some of the reference sources we have.” Another librarian tells a patron that “the best thing you can do is to come into the library and look in books that deal with Ancient African or Kenyan history.” These statements indicate that long-distance research is not yet ideal for all information needs.

A number of instances occurred where the librarian was obviously using a search strategy but did not tell the patron what it was; these instances, called “search strategy used but not given,” occurred 42 times. That the librarian is searching is assumed from statements such as “Let me check on that for you. Just a moment, please.” Or “Ok, I’ll check a few things and be right back with you.” In each of these instances, the librarian never explains what they were doing. Many explanations can be thought of for why the librarian did not explain what they were doing: lack of time, inability to communicate a complicated process well through typing, or belief that the patron just needs the answer. (Or, the librarian could just be stalling for time. The librarian may need to think or finish something he/she is in the middle of. The VR medium allows for this type of delay.) However, in each instance, if the librarian had simply explained what keywords they had used in Google or what paper source they were looking in, he/she could have been instructive. It should be noted, however, that these instances where the librarian did not

discuss a search strategy (42 instances in 35 chats or 33.65% of the total chats) occur less frequently than those in which he/she did either suggest a strategy or tell the patron what was happening in the search process (62 instances in 39 chats or 37.5% of the total chats).

In 34 passages the librarian gives a “vague search strategy.” The librarian mentions that an action is being performed such as using the web or checking the list of periodicals. However, the librarian does not give enough context for the patron to be able to repeat the search. The information may give the patron an idea of where to start, such as Google or “our list of periodicals,” but not enough information is given for the patron to effectively follow the strategy if they were not familiar with it before. The patron is given only a general idea of what the librarian is doing.

Librarians suggested/taught the use of “search terms” in 9 instances. These instances include search terms used in databases, the library’s online catalog, and online retrieval systems, such as EBay and Google. In none of these instances does the librarian discuss Boolean operators, truncation, proximity, or suggest indexes or thesauri. The librarian instead either reveals which terms they used or suggests terms the patron should use. The instruction in this area is, therefore, minimal.

In 5 chat sessions the librarian discuss the “sufficiency of results” retrieved for the patron. These are instances where the librarian is describing why the information he/she has retrieved is insufficient or sufficient: “this book is not helping, it seems to only list “technician” type of schooling opportunities,” “Unfortunately, none of them tell me whether they offer evening classes,” “I found only one title that discussed the Catawba tribe at your library, and it is Young Adult Non Fiction,” “Of course it [web site] may not give births long ago,” and “I have seen the occurrence referred to in several articles but

none have attached a name to it.” This type of instruction does not take into account instances where the librarian asks for the patron’s opinion on whether the information is sufficient, such as “does this completely answer your question?” Rather, this IOI category deals with instances where the librarian draws the patron’s attention to the insufficiency of the information retrieved.

In 19 instances the librarian introduced the patron to a tool. The passages that fall into the category of “tools” are any in which the librarian even mentions a tool, whether the librarian is using it or suggesting it. For instance, in one instance, the librarian states “I think we may need to look in the College Handbook for this” without stating what it is, how to use it, or where it’s located. The justification for considering this to be an IOI is that the librarian is introducing the tool by mentioning it. This gives the patron the opportunity to ask what the tool is or to remember it for future interaction with a librarian. Granted, it is not thorough instruction if the librarian does not explain what it is or how to use it. For the purposes of this study, however, it suffices that the librarian mentions it.

Eight of these tools are print resources, such as *The College Handbook* or *The Political Risk Yearbook* series. Three of these tools are electronic, such as a list of clubs and organizations which the PLCMC libraries have put on their website or an online research page for local history. With 2 of the tools, the *Statistical Abstract of the United States: 2001* and the *Encyclopedia Americana*, it is impossible to tell from the context whether they are physical or electronic versions. Both resources exist in both forms. The encyclopedia is most likely electronic, for the librarian cuts and pastes a large entry from

the encyclopedia into the chat. Often, the librarian does no more than give the title. In only 4 chat sessions does the librarian describe the use of a tool or explain what it is.

“Web navigation” occurs 51 times and is the fourth most commonly-occurring IOI. That web navigation is a large category is not surprising, given that the reference transaction is taking place on the internet. In 23 of these instances, the librarian gives the patron specific directions to maneuver through the internet. The patron is asked to do the clicking, scrolling, etc. In 22 instances, the librarian does the maneuvering and “pushes” pages to the patron. In almost all of these instances the librarian explains where, how, and why he/she is taking the patron to a particular web site. In 8 instances, the librarian directs the patron’s attention to a particular location on the web site.

It is interesting to compare these instances of “web navigation” to instances where the librarian suggests a web site, but does not give the patron any direction regarding it, such as leading the patron to it or giving advice on how to navigate it. These latter instances occur 31 times. In 23 of these instances the librarian does give the URL. The 31 instances were culled from the “information location” and the “search strategy” categories. Only 11 of these instances occur in “search strategy.” This is expected, for, it is natural for the librarian to take the patron directly to the web site when they are already online themselves, as they are in the VR environment.

**C. Codes for instruction in how to evaluate information and its sources critically and incorporate selected information**

Code	Total # of Chat Sessions in Which Code Appears	% of Total Chat Sessions in Study (104)	Passages in Which Code Appears
<b>Evaluate information and its sources critically and incorporate selected information</b>	<b>4</b>	<b>3.85%</b>	<b>4</b>
Evaluation	4	3.85%	4

Passages for only one code were found in this category. These will be discussed in more detail below, but it is worth speculating here on the reason this category is so sparse. It probably is related to the fact that evaluation and incorporation of resources happens after the initiation of research. Virtual reference seems to be a tool used as people are initiating a search for a specific piece of information or as they are frustrated in being unable to find this information. Perhaps patrons do not use virtual reference to guide them in the use of information once it has been found. Perhaps this is true in face to face desk reference as well?

The exception is evaluation. Evaluation can take place only after material is found and thus after the initiation of research. However, evaluation is often necessary in determining whether further research is needed or in deciding which material to look at from a wealth of sources. Therefore, this code is not too surprising to find in this setting. Librarians instructed in the “evaluation” of resources in only 4 instances which occurred in 4 different chat sessions. The evaluation IOI does not include instances where the librarian states merely “this is a good source” or something to that effect. These IOI deal with instances in which the librarian tells or at least implies why the source is a good or

poor source. These all dealt with evaluating web resources. In the first instance, the librarian did not explicitly explain the basis for evaluation but merely gave a judgment: “I would not simply do a search on the web, the information is to [sic] unreliable.” In two instances, the librarian implies that educational and governmental products have good authority: “Look for web sites that end in .edu for educational institutions or .gov for government agencies. These should be good resources” and “The official site of the British monarchy has a good site devoted to [Princess Diana]”. In the last instance, the librarian implies that comparison can be used as an evaluation tool: “Even this Korean site seems to say the same thing”. The librarian had performed a Google search to answer the patron’s question. The librarian checked another site which had been retrieved in the Google search (a Korean pop music lyrics site) to confirm what had been discovered on the first site visited. Each of these instances is notable because the librarian did go beyond simply answering the patron question and sought to give either extra guidance in a search or confirmation for an answer. The evaluation goes beyond merely answering the patron’s query.

#### **D. Codes for instruction in how to use information effectively**

No IOI were found for the category: “codes for instruction in how to use information effectively.” This is not surprising. This type of instruction probably occurs in follow-up work, where the librarian checks on the patron’s progress or the patron asks for help with the sources they have found. Virtual reference offers little opportunity for follow-up, the patron would have to remain connected or initiate a new session, actions which the librarian has no control over. The librarian can encourage the patron to remain

connected while they use a source, such as a database, but this is usually not a feasible option at a busy public reference desk.

The lack of IOI in this category also indicates how patrons are using VR. They are usually looking for new resources; they are not asking questions about resources they have already found. This category may see more implementation in the academic library setting. However, the *Equipped for the Future Content Standards* which identify adult information literacy needs, does state that adults should be learning to “integrate new ideas and experiences gained from reading, listening, and viewing into own thinking” (Stein Appendix A). Thus, even if patrons in the public library setting are not asking for help with using the information they have found, librarians should be making the extra effort to offer such help. The VR setting may not be the best for this type of instruction to occur. However, the findings here may have an impact on practice at the face to face desk setting.

#### **E. Codes for instruction in how to use information ethically and legally**

Code	Total # of Chat Sessions in Which Code Appears	% of Total Chat Sessions in Study (104)	Passages in Which Code Appears
<b>Use information ethically and legally</b>	<b>4</b>	<b>3.85%</b>	<b>7</b>
Citations	1	0.96%	4
Information ethics	3	2.88%	3

The use of “citations” was discussed in only one chat session (but in 4 instances within that session). The patron asked specifically for help with citations, thus the instruction was not instigated by the librarian. The librarian gave the patron an exact answer and also gave the source used to find out information about citations. In no chat

sessions does the librarian mention the need to cite the information they give to the patron.

Only 3 separate chat sessions involved instruction in “information ethics.” Two of these instances dealt with legally obtaining information. In one instance, the librarian was being asked for legal advice. The librarian responded that he/she could not be considered the proper source for such information, not being a lawyer or law librarian. It is noteworthy that the librarian explained this; he/she could have just said that they could not give the information. In the other instance, the librarian informed the patron that music could not be downloaded or burned at the library. Interestingly, the librarian did not mention copyright. Perhaps this would have been seen as an infringement on the privacy of the patron’s need for the information? The final instance involved the institutional policies which had been set in place to insure privacy. None of the chat sessions contained discussion on plagiarism. Again, this may be due to the librarian wishing to allow the patron to keep their needs private.

#### **F. Codes for instruction in technical issues**

Code	Total # of Chat Sessions in Which Code Appears	% of Total Chat Sessions in Study (104)	Passages in Which Code Appears
<b>Technical issues</b>	<b>10</b>	<b>9.62%</b>	<b>20</b>
Explaining virtual reference	6	5.77%	6
General technical issues	6	5.77%	14

Due to the electronic medium of VR, it was anticipated that much instruction would occur in the area of “technical issues.” Surprisingly, only 14 passages dealt with technical issues, which occurred in 6 chats, or 5.77% of the total number of chats.

Perhaps those patrons who are technically-minded enough to use VR do not need help with technical matters. It was anticipated, however, that patrons would need help with technologies which may be new to the general public, such as databases or pdf files. Because patrons would encounter these technologies while online, it was anticipated that they would seek online help, such as VR.

A subcategory of “technical issues” which occurred often enough to justify its own category is “explaining virtual reference.” This type of instruction is necessitated by the new technology. Thus, it was surprising how little this type of instruction occurred, merely six times (in 6 chats), which is only 5.77% of the total chats usable. Two of these instances described the page-pushing technology; the librarian wanted to prepare the patron for the web page to change. In four of these instances the librarian explained that the patron would receive an email of the transcripts from the chat session.

A session from September 2003 proved to be an especially difficult instance of implementing the VR technology. The librarian did not wish to co-browse, fearing that the patron might be forced out of the chat session (perhaps there had been technical problems with this earlier). The patron found it difficult to follow the librarian’s instructions regarding using the internet. The librarian asked the patron to open up another browser, so that the librarian could talk the patron through how to get to a certain journal article. The patron could not figure out how to do this, and the librarian had a difficult time explaining. The librarian finally asked the patron (very kindly) to call her at the reference desk. No other transcripts were encountered in which the patron had extreme difficulty with using the internet. Because chat technology, co-browsing, page-pushing, etc. is still fairly new, more chats in which patrons had difficulty with or

commented on the technology were expected. However, it is not possible to determine the demographics of the users of the VR service, for privacy reasons. Perhaps the users are familiar with chat services.

### G. Other

Code	Total # of Chat Sessions in Which Code Appears	% of Total Chat Sessions in Study (104)	Pages in Which Code Appears
<b>Other</b>	<b>45</b>	<b>43.27%</b>	<b>73</b>
Library policies	23	22.12%	34
Library usage	2	1.92%	3
Vague library usage	9	8.65%	10
Patron prompts ILI	17	16.35%	26

A major code which was added during the analysis of the transcripts is “library policies.” Instances where the librarian gave rules relating to the library buildings and materials were common. Library policies are considered IOI, because they concern how the library is accessed and used and thus bear on how information is accessed and used. Interestingly, the reasons behind the policies are never explained; the policies are merely given. It would be interesting to note if library policy instruction occurs more frequently in the public than in the academic realm. Library policies were given/taught in 34 instances. Most of these have to do with fines and with which media can circulate and how. The interesting point to note here is the relatively few chat sessions in which library policies are mentioned; the 34 instances occur in a total of 23 chat sessions. Given 104 chat sessions in the study, library policies are taught in 22.12% of the chat sessions. This indicates that VR is being used not just as a type of receptionist service for the library but as a source of general information.

A similar code which was added is “library usage.” This code deals with instruction in how to use the PLCMC library’s resources. Examples would be how to use the library website to look up a borrowing record or finding out which PLCMC libraries have CD burners. Library usage was taught 3 times. Two of these dealt with the computing equipment the libraries have, but both of these instances occurred in the same chat. In the other instance the librarian relates that information can be photo-copied from books in the libraries.

A number of instances occurred where the librarian could have taught library usage, but did not; these instances are called “vague library usage” and occur 10 times. The most common of these were instances where the patron needed to know about his/her borrowing account. The patron can look up his account information through the PLCMC libraries’ web site. However, librarians never taught patrons how to do this themselves; they looked up the information and gave patrons an exact answer to their queries.

One of the more interesting findings in this study was that patrons, at times, prompted information literacy instruction. The patrons would ask the librarian for more information on a resource which the librarian had mentioned. (Simply asking for information was not prompting instruction; in these instances, the patron wished to know more about something the librarian had already presented.) This happened in 26 instances, within 17 separate chat sessions (16.35% of the total chat sessions). Two patrons in particular had no hesitation in asking for more direction.

One can only speculate on these findings. They could indicate that the librarians are, for the most part, giving adequate instruction, eliminating the patron’s need to probe for help. On the other hand, these findings could indicate that patrons are usually too shy

to ask for further help or do not know enough to know how or what to ask. Perhaps the motives of patrons who use virtual reference (as opposed to face-to-face reference) inhibit them from further questioning. They may see virtual reference as a source for a quick response. Further, one of the characteristics of virtual reference is that it allows the patron a great deal of anonymity. The patron may feel that asking more questions would, in some, way diminish their anonymity. If they want to find out more, they can come in to the library and talk to a librarian.

### **Missing Instances of Instruction**

Another key area to note in the analysis of the coded transcripts is what is missing. As noted above, certain IOI which are in the codebook were not found in the transcripts. The entire “codes for instruction in how to use information effectively” category is absent, as discussed above. Other IOI which did not occur include: “types/genres/formats of information sources,” “value of information,” and “information structure.” Librarians mentioned formats of information (microfiche, journal, video, etc.), but they did not elaborate on these formats. They simply informed the patron of which format the information existed in; no instruction occurred regarding what the format was or how it can be used.

Similarly, librarians mentioned the cost of information in a handful of instances. However, these instances dealt with the fact that it would cost money to retrieve the information desired. No instances dealt with why information is charged for and how to retrieve information in the most cost-effective manner. Thus, no IOI dealt with “value of information” as defined in the codebook.

It is a bit surprising that no IOI dealt with “information structure.” Databases were taught, but the difference between journals and articles was never raised. Catalogs were taught, but how to read a citation listed in one (or in a database) was never discussed. Librarians often gave call numbers with books they suggested, but they never explained what they meant or in what location of the library the call number could be found. Even more surprising than the lack of mention of these things is the lack of patron questions concerning them. Of course, most of the IOI where catalogs or databases were taught were ones in which the librarian used it or directed the patron to use it. Few instances occurred where the librarian walked the patron through using these search retrieval systems.

It must be noted that, for the most part, the observations made on these transcripts are just that, observations. Nothing is known about the circumstances under which each chat session occurred beyond what is evident from reading the transcripts, such as when the librarian states that another patron is waiting or something to that effect. The observations made here as to the librarian’s and the patron’s purposes are based on limited evidence.

## **Discussion**

Due to the limited number of librarians (7) and the limited number of libraries (1) used in this study, the findings are not widely generalizable. They are, however, indicative of the virtual reference services offered in a large metropolitan public library system. The findings are also indicative of the large number of VR services which use the 24/7 reference service. Twenty-eight libraries offer the 24/7 Reference service in 24/7’s

nationwide cooperative, and 20 libraries offer the service in private cooperatives. These libraries are located throughout the United States and Canada, from Hawaii to Vancouver. Information literacy instruction does take place in virtual reference in the public library setting. The analysis of these transcripts indicates that instruction is not seen as one of the primary goals of this virtual reference service. The most commonly occurring category, access needed information effectively and efficiently, encompasses the major thrust of reference services, to give information.

One major conclusion which emerged in analyzing these transcripts is that instruction, at least in the VR setting, often happens unintentionally. This was noted for many of the codes: definition, scope, where have you looked, information retrieval, information retrieval systems, search strategy, and referral, among others. Instruction happens in the natural process of assessing the patron's query and attempting to access the necessary information. This is probably typical of the reference setting in general, for it is not a strictly educational setting, though instruction is one of the service's ideals. This is not a negative observation; the more naturally instruction can be incorporated into the flow of the reference interview, the better. It is interesting to, note, however, that much instruction occurs (or has the potential to occur) without the librarian's conscious intention.

An obvious direction to take to follow up this study is to compare the instances of instruction found in this virtual reference setting to the instances of instruction found at the face-to-face desk setting. Unfortunately, it is difficult to find studies that focus on the latter. A survey of studies on the reference transaction does reveal some instances of instruction, which are delineated here. In a study of Maryland public libraries' reference

services, the investigators measured the “level of information received” (Dyson 286). Reference answers in which the librarian gave the source of the answer (“information location”) occurred more frequently than answers in which the librarian did not (Dyson 286). In this study, “information location” occurred in 52 out of 104 usable chats. Librarians gave the patron the source of an answer (whether the librarian gave the answer or directed the patron where to find it) in exactly half of the chats included in this study. “Information location” instruction, then, isn’t quite as common in the digital setting as it is in the physical setting. In the physical setting, it may be easier to give the location due to the fact that the patron can see the item actually being retrieved and used. In the digital setting, the librarian must take the extra step and type out where they found the information they are giving the patron.

In Patricia Dewdney and Catherine Sheldrick Ross’s study on reference user satisfaction, they found that students appreciated librarians that “explained to [them] what she or he was doing and why” (224). They give no indication as to what extent this occurred. In this study, this type of instruction “search strategy,” occurs in 62 instances or 39 sessions. This is 37.5% of the usable chat sessions.

The articles mentioned just above are descriptive, describing types of instruction that occur in actual practice. Other articles are prescriptive, stating ideal instances of instruction in the reference setting. Lisa Powell Williams recommends that reference librarians give instruction in databases and focus particularly on search strategies which could be applied to a broad range of databases (21). Diehl and Weech’s 1991 survey of public library users found that “instruction is desired for the online catalog more often than for any other tool” (32). Being thirteen years old, this conclusion may not have

much relevance any more. Online catalogs are now the standard retrieval tool in libraries and probably better understood by patrons. However, information retrieval tools, such as the catalog and now databases and search engines, continue to become more elaborate and probably still need to be taught. In this current study, information retrieval systems (including databases and catalogs) were taught in 55 instances, but in only 23 chats. Information retrieval systems are taught in only 22.12% of the chats. In most of these instances, the librarian merely suggests a use for the system. In depth instruction on how to use the system is rare.

Jane A. Reilly, in her article on the reference desk query, notes a number of ways in which the reference transaction should be instructive. Teach the use of indexes (Reilly 139). Discuss the quality of various resources – compare and contrast (Reilly 139). Help patrons understand what a bibliography looks like, what's included in a citation, how to compile information (Reilly 141). Teach services such as how to use interlibrary loan (Reilly 141). Make patrons aware of the availability of further resources elsewhere (Reilly 143). In this current study, one instance occurred where the librarian compared sources to insure that the information he/she was giving was correct. Librarians did instruct about various library services and they did make patrons aware of other resources. Perhaps instructing in the use of indexes or in the structure of a bibliography is difficult when in the virtual setting. Librarians cannot simply flip through pages or point to parts of a citation. For the most part, however, librarians in the digital setting are providing instruction in the areas expected or desired in the physical setting.

Another observation that can be made regarding these transcripts is that librarians seem to assume that patrons know what the librarians are doing when they use a tool or

information retrieval system. For example, in the following transcript, the librarian is, most likely, using the catalog to search for the patron's answer:

“I'll check on this [ . . . ] / I did not find anything that contained television scripts. I did find several books on "how-to" write a television script. / South County has a book called "How to write for television". The catalog shows that it is "IN".” Note that the librarian does not mention using the catalog until he/she gives the circulation status of the book being looked for. Further, the librarian does not explicitly state that the catalog is being used to search for the book.

This analysis does reveal areas where heavy instruction takes place, areas in which the library may wish to develop online tutorials or create a FAQ page. Above was noted the frequency of instruction in interlibrary loan. A list of FAQs regarding interlibrary loan could be helpful to patrons as well as time-saving to librarians. The librarians also frequently answered questions using business resources and databases. That business is already acknowledged to be a major topic among the PLCMC clientele is obvious by the presence of Bizlink, an online business research site created by PLCMC. The site is referred to often in the chat sessions, indicating the heavy amount of instruction which occurs in this area. Because of this, the libraries might even consider providing a course in business research. Many questions dealt with North Carolina history or genealogical research. Librarians often responded by suggesting the Carolina Room, which has holdings of historical information for Charlotte, Mecklenburg County in particular and the eastern United States in general. Perhaps a link to information about this library could be placed in a prominent location on the PLCMC homepage. Or,

perhaps the homepage could have a link entitled “Historical Research,” which would lead to the Carolina Room and other relevant resources for finding historical material.

The most apparent conclusion that can be drawn from these findings is that VR is largely viewed, both by patrons and librarians, as a tool for a quick answer. Using VR should not be time-intensive. The transcripts reveal a high number of referrals, as noted by the interlibrary loan recommendations, the search strategy suggestions (rather than performing them themselves), and the “referral” category itself, indicating that the VR librarians see it as a tool for quick answers, not for in depth research. In depth research is farmed out to other sources or to the patrons themselves. Services which can be done by others, such as interlibrary loan, are put on those shoulders. There are more instances where the librarian suggests rather than performs a search strategy. Only 15 patrons sought to further the instruction experience, thus lengthening the chat time.

### **Further Research**

The current study, typical of most research, raises many more questions than it answers. What technical restraints prevent information literacy instruction? Are there aspects inherent in VR which prevent successful information literacy instruction? Because the transaction logs record the time of each transaction, one could possibly measure how long instruction takes. Based on the time an explanation takes, is there a form of instruction which is the most efficient? Is there an efficient way to teach databases via chat? Interlibrary loan? Is there a best practice for each IOI as far as time is concerned?

Further, more IOI research could be done focusing on the patron's terminology in the chat transcripts. Which questions prompt instruction? Looking at the corresponding patron responses to the noted instances of instruction may indicate how successful the instruction is, whether the communication medium is insufficient (i.e. whether more visual and audio cues would have been useful), or even whether the instruction is necessary.

Another avenue for further study would be to compare the IOI which occur in the VR services offered by various public libraries. It would be fruitful to note whether the same IOI occur or whether new categories arise. What factors contribute to any differences that may be found? Does the size of library affect the IOI? Would the navigability of the library's web site affect instruction?

Assessing current practices in VR instruction can, hopefully, lead to the development of best practices for information literacy instruction in the VR setting. If the types of answers given could be standardized and the most useful ones drawn out, novice librarians in the VR setting would have tested and tried examples to fall back upon. Further, time would be saved and more patrons could be served as librarians would not need to develop new instruction strategies for each interaction.

The establishment of best practices in the VR setting could lead to the refinement of best practices in instruction for the desk reference setting. The unique benefit of VR, as opposed to telephone or desk reference, is that it leaves a record of the entire reference transaction. It allows researchers to "capture the elusive reference process, analyze and quantify aspects of reference, and evaluate . . . levels of service" (Smyth 27). These "interactive technologies offer expanded opportunities for reference interviews as well as

new possibilities for assessment” (Goetsch, Sowers, and Todd “Conclusion”). An analysis of the services provided in the VR setting could, then, be helpful to the physical reference setting.

An extension of this study could be the development of a set of standards for information literacy instruction in general. Instruction which takes place in the classroom setting, while often geared towards the students’ needs, is still often taking place under artificial circumstances. Instructors are teaching in a setting apart from their students’ day to day need. Instruction in the reference setting happens, as noted above, at the point of need. Assessing how instruction occurs at this point of need can help librarians involved in classroom-based instruction to better adjust their lesson plans to their students’ needs.

## **Conclusion**

Virtual reference and information literacy instruction are major topics in the current library and information science field. Yet little research has been done on how ILI can take place in this new medium. That ILI is taking place is clear from the literature. That it will continue to take place is almost assured as patrons become more computer savvy and as library resources become increasingly available online.

The importance of research in this area should not be underestimated. Lankes asks the question, “What value does the ongoing inclusion of human expertise add to the system?” (Lankes 304). The answer to this question is valuable in a period in which librarians are wondering how digital technology will change their careers. Lankes provides something of an answer: the human is important in “[p]roviding instruction and restatement [and in offering] a wide range of information coding and depth that a system

may be unable to replicate [. . .]. [This includes the ability] to impart the methods of system operation to the user and relate that operation to some larger context or user pursuit” (Lankes 304). The human element is important in virtual reference. Valuable human contribution will not happen automatically, however. Reference practitioners must evaluate and shape reference practice in the virtual setting in order to insure that their contribution to virtual reference will be a success.

Appendix A: Instances of Instruction Code Book

A. Codes for instruction in how to determine the nature and extent of information needed

DEFINITION

Discussion which helps patron to identify/define the patron's exact query.

INFORMATION PRODUCTION

Discussion of how information is produced, organized, and disseminated.

RELEVANCE

Discussion of selecting and judging sources for their relevance.

SCOPE

Discussion of the scope of the patron's query and of how to limit/broaden scope.

WHERE HAVE YOU LOOKED?

Discussion to determine the resources the patron has already utilized.

B. Codes for instruction in how to access needed information effectively and efficiently

INFORMATION LOCATION

Discussion of

- Where information is or most likely is.
- Where information is not; narrowing choices for search.
- Where information is within a resource.

INFORMATION RETRIEVAL

Discussion of how to access an item, whether physically or virtually, including interlibrary loan; items that are needed to access information, such as library cards or money.

INFORMATION RETRIEVAL SYSTEMS

The scope, content, organization, and use of information retrieval systems such as library catalogs, databases, websites, etc.

INFORMATION STRUCTURE

Discussion of how information is organized, such as the intricacies of a bibliographic record, the difference between journal and article title, the use of call numbers.

REFERRAL

Discussion of

- Experts, practitioners, agencies, etc. that could provide more help in a certain search.

- Using a librarian in person or over the phone as opposed to virtually.
- People and/or web sites which can help with services such as interlibrary loan.

#### SEARCH STRATEGY

- Discussion of the series of steps taken to find the information the patron needed.
- Discussion/suggestions of strategy patron should use to look for information, including where to look for information, such as suggesting a specific source or location (including alternative libraries and/or agencies to search).
- Discussion/suggestions of where to look within a source for information.

#### SEARCH STRATEGY USED BUT NOT GIVEN

This occurs when the librarian is searching but gives the patron no indication of how or where.

#### VAGUE SEARCH STRATEGY

The librarian's strategy is given, but is not clear enough for the patron to repeat.

#### SEARCH TERMS

Discussion of search terms used and how/why combined, Boolean operators, truncation; proximity; suggestion of indexes or thesauri.

#### SUFFICIENCY OF RESULTS

Discussion of the quantity, quality, and relevance of the search results to determine whether alternative information retrieval systems or investigative methods should be utilized; looking for gaps in the information retrieved to determine whether the search strategy should be revised.

#### TOOLS

Discussion and/or suggestion of

- Tools used to find information, such as dictionaries, encyclopedias, databases, U.S. Code, Fedstats, etc.
- How tool is used and/or why it was chosen.

#### WEB NAVIGATION

Guiding patron through web links, whether on the library's homepage or elsewhere; instances where the librarian co-browses with the patron or pushes pages to the patron. Also, instances where the librarian helps patron to locate information on a web page.

#### C. Codes for instruction in how to evaluate information and its sources critically and incorporate selected information

#### EVALUATION

Discussion of

- How to determine reliability, validity, accuracy, authority, timeliness, and point of view or bias of a source.

- The cultural, physical, or other context within which the information was created and the impact of context on interpreting the information.
- How to distinguish between fact and fiction.
- How to take into consideration the role and influence of the media.
- How to reflect on the underlying meaning of a source.

#### TYPES/GENRES/FORMATS OF INFORMATION SOURCES

Discussion of

- Scholarly vs. popular materials.
- Primary vs. secondary sources.
- Current vs. historical sources.
- Formats of sources (paper, electronic, books, journals, etc.).

#### VALUE OF INFORMATION

Discussion of

- Which information is charged for and why.
- Free/less costly alternatives.
- The availability of needed information and whether it is cost/time effective to broaden search beyond local resources.

#### D. Codes for instruction in how to use information effectively

#### QUERY SATISFACTION

Discussion of how to recognize if more information is needed.

#### SYNTHESIZING INFORMATION

Discussion of

- How to organize information from multiple sources.
- How information relates/contradicts/supports.
- How to recognize if information is present which supports all sides of the issue.

#### USE INFORMATION

Discussion of

- How to extract relevant information from a source.
- How to paraphrase a source.
- How to interpret information.

#### E. Codes for instruction in how to use information ethically and legally

#### CITATIONS

Discussion of

- What information is necessary for a citation.
- Ways to cite different sources.
- Different citation styles.

## INFORMATION ETHICS

Discussion of

- Plagiarism and how to avoid it.
- Issues related to privacy and security in both the print and electronic environments.
- Copyright.
- How to legally obtain, store, and disseminate text, data, images, or sounds.
- Institutional policies relating to information.

### F. Codes for instruction in technical issues

## EXPLAINING VIRTUAL REFERENCE

Discussion of how co-browsing works, what the patron will be emailed, etc.

## TECHNICAL ISSUES

Discussion of how to:

- Use the internet.
- Configure web browser to access information.
- Format a diskette.
- Download web pages.
- Use Adobe Acrobat.
- Retrieve/save information: emailing; saving to hard drive, floppy disc, CD, etc.; print.
- Access issues such as password-protected information.
- Hardware problems: printers, mouse, etc.
- Find library card number, physically or virtually.

### G. Other

## LIBRARY POLICIES

Discussion of library policies.

## LIBRARY USAGE

Discussion of how to use resources specific to libraries, such as CD burners.

## PATRON PROMPTS ILI

Patron asks for more information about a resource the librarian has introduced.

## VAGUE LIBRARY USAGE

The librarian gives an indication of how to use library resources, but it is not clear enough for the patron to repeat.

## Appendix B:

## Instances of Instruction Code Book

A. Codes for instruction in how to “determine [. . .] the nature and extent of information needed” (ACRL 8)

## DEFINITION

Discussion which helps patron to identify/define the patron’s exact query (Stein 49).

## INFORMATION PRODUCTION

Discussion of “how information is formally and informally produced, organized, and disseminated” (ACRL 8).

## RELEVANCE

Discussion of “selecting and judging sources for their relevance” (McCutcheon and Lambert 205).

## SCOPE

Discussion of the scope of the patron’s query and of how to limit/broaden scope.

## WHERE HAVE YOU LOOKED?

Discussion to determine the resources the patron has already utilized.

B. Codes for instruction in how to “access [. . .] needed information effectively and efficiently” (ACRL 9)

INFORMATION LOCATION (Tenopir and Ennis, “Impact of Digital Reference” 85-86)  
Discussion of

- Where information is or most likely is.
- Where information is not; narrowing choices for search.
- Where information is within a resource.

## INFORMATION RETRIEVAL

Discussion of how to access an item, whether physically or virtually, including interlibrary loan; items that are needed to access information, such as library cards or money.

INFORMATION RETRIEVAL SYSTEMS (Tenopir and Ennis, “Impact of Digital Reference” 85).

Discussion of the “scope, content, and organization [, and use] of information retrieval systems” such as library catalogs, databases, websites, etc. (ACRL 9).

INFORMATION STRUCTURE (Tenopir and Ennis, “Impact of Digital Reference” 85)

Discussion of how information is organized, such as the “intricacies of a [. . .] bibliographic record” (Johnston 32), the difference between journal and article title, the use of call numbers (Christian, Blumenthal, and Patterson 25).

## REFERRAL

Discussion of

- Experts, practitioners, agencies, etc. that could provide more help in a certain search.
- Using a librarian in person or over the phone as opposed to virtually.
- People and/or web sites which can help with services such as interlibrary loan.

## SEARCH TERMS

Discussion of search terms used (Kasowitz, Bennett, and Lankes 359) and how/why combined, Boolean operators (Tenopir and Ennis, "Impact of Digital Reference" 85), truncation; proximity; suggestion of indexes or thesauri (Christian, Blumenthal, and Patterson 25).

## SUFFICIENCY OF RESULTS

Discussion of the "quantity, quality, and relevance of the search results to determine whether alternative information retrieval systems or investigative methods should be utilized"; identifying "gaps in the information retrieved [to determine whether] the search strategy should be revised" (ACRL 10).

## SEARCH STRATEGY

- Discussion of the series of steps taken to find the information the patron needed (Kasowitz, Bennett, and Lankes 359).
- Discussion/suggestions of strategy patron should use to look for information, including where to look for information, such as suggesting a specific source or location (including alternative libraries and/or agencies to search).
- Discussion/suggestions of where to look within a source for information.

## SEARCH STRATEGY USED BUT NOT GIVEN

This occurs when the librarian is searching but gives the patron no indication of how or where.

## VAGUE SEARCH STRATEGY

The librarian's strategy is given, but is not clear enough for the patron to repeat.

## TOOLS

Discussion and/or suggestion of

- Tools used to find information, such as dictionaries, encyclopedias, databases, U.S. Code, Fedstats, etc. (Kasowitz, Bennett, and Lankes 359).
- How tool is used and/or why it was chosen.

## WEB NAVIGATION (Johnston 32)

Guiding patron through web links, whether on the library's homepage or elsewhere; instances where the librarian co-browses with the patron or pushes pages to the patron. Also, instances where the librarian helps patron to locate information on a web page.

C. Codes for instruction in how to “evaluate [. . .] information and its sources critically and incorporate [. . .] selected information” (ACRL 11)

EVALUATION (M. Wilson 54; Tenopir and Ennis, “Impact of Digital Reference” 85)  
Discussion of

- How to determine “reliability, validity, accuracy, authority, timeliness, and point of view or bias” of a source (ACRL 11).
- The “cultural, physical, or other context within which the information was created” and “the impact of context on interpreting the information” (ACRL 11).
- How to “distinguish between fact and fiction” (Stein Appendix A).
- How to “take into consideration the role and influence of the media” (Stein Appendix A).
- How to reflect on the underlying meaning of a source.

TYPES/GENRES/FORMATS OF INFORMATION SOURCES

Discussion of

- Scholarly vs. popular materials (Christian, Blumenthal and Patterson 25).
- Primary vs. secondary sources.
- Current vs. historical sources.
- Formats of sources (paper, electronic, books, journals, etc.).

VALUE OF INFORMATION (Tenopir and Ennis, “Impact of Digital Reference 86)

Discussion of

- Which information is charged for and why.
- Free/less costly alternatives.
- The availability of needed information and whether it is cost/time effective to broaden search beyond local resources (ACRL 8-9).

D. Codes for instruction in how to use “information effectively” (ACRL 12)

QUERY SATISFACTION

Discussion of how to recognize if more information is needed.

SYNTHESIZING INFORMATION (from Tenopir and Ennis, “Impact of Digital Reference 85)

Discussion of

- How to organize information from multiple sources (Stein 37).
- How information relates/contradicts/supports.
- How to recognize if information is present which supports “all sides of the issue” (Stein Appendix A).

USE INFORMATION

Discussion of

- How to extract relevant information from a source.

- How to paraphrase a source.
- How to interpret information.

E. Codes for instruction in how to use information “ethically and legally” (ACRL 13)

CITATIONS

Discussion of

- What information is necessary for a citation.
- Ways to cite different sources.
- Different citation styles.

INFORMATION ETHICS

Discussion of

- Plagiarism and how to avoid it.
- “[I]ssues related to privacy and security in both the print and electronic environments” (ACRL 13).
- Copyright.
- How to legally obtain, store, and disseminate text, data, images, or sounds (ACRL 14).
- Institutional policies relating to information (ACRL 14).

F. Codes for instruction in technical issues

EXPLAINING VIRTUAL REFERENCE

Discussion of how co-browsing works, what the patron will be emailed, etc.

TECHNICAL ISSUES (Tenopir and Ennis, “Impact of Digital Reference” 85-86)

Discussion of how to:

- Use the internet (Stein 55).
- Configure web browser to access information.
- Format a diskette.
- Download web pages.
- Use Adobe Acrobat.
- Retrieve/save information: emailing; saving to hard drive, floppy disc, CD, etc.; print.
- Access issues such as password-protected information.
- Hardware problems: printers, mouse, etc.
- Find library card number, physically or virtually.

G. Other

LIBRARY POLICIES

Discussion of library policies.

**LIBRARY USAGE**

Discussion of how to use resources specific to libraries, such as CD burners.

**PATRON PROMPTS ILI**

Patron asks for more information about a resource the librarian has introduced.

**VAGUE LIBRARY USAGE**

The librarian gives an indication of how to use library resources, but it is not clear enough for the patron to repeat.

## Appendix C: Guidelines Developed While Coding

### INFORMATION LOCATION

- If a location is given, such as the North Carolina Room, and the librarian knows or suspects the information the patron needs is there, the instruction is information location, otherwise, the location is a referral
- Information location does not include instances where the librarian gives the title of a book that the patron wants or the title of a book the patron might use to find information – this would be search strategy ex. “The books to look for are: Guts & borrowed money : straight talk for starting & growing your small business / Tom S. Gillis. 658.1592 Angel investing : matching start-up funds with start-up companies--the guide for entrepreneurs, individual investors, and venture capitalists / Mark Van Osnabrugge, Robert J. Robinson. 658.15224”
- For information location, if the location of the location is given – still code as one IOI, for example:

There is a book called "Hypnotism : your absolute, quintessential, all you wanted to know, complete guide." "It [this book] is in at the south county branch on Rea Rd." This passage should all be coded as one IOI of information location.

### INFORMATION RETRIEVAL

- I was coding for interlibrary loan, but it is often hard to tell whether the librarian is suggesting it, so I decided to include interlibrary loan with information retrieval

### INFORMATION RETRIEVAL SYSTEMS

- If web link is for an online tool, such as Google or Ebay, this should be coded as a information retrieval system
- When using information retrieval system, do not use tool. Tool is implied.
- For information retrieval systems – when the name of a system is mentioned this is one IOI, if additional info. is given, such as how to use, this is additional IOI. For example:  
“For revenue volume if you go back to the online resources page and choose the database called "reference usa" you can search by sales.” This passage has two IOI of information retrieval systems

## REFERRAL

- If a physical location is given, such as the North Carolina Room, and the librarian does not know the information is there, the instruction is a referral
- Referral is search strategy only if librarian does not know if information is there

## SEARCH STRATEGY

- Where have you looked? can also be a Search strategy if location, such as catalog, is mentioned in the question
- Search strategy is discussion of some kind of steps taken to find information, whether they are the steps the librarian took or steps the librarian is suggesting to the patron

## SEARCH STRATEGY USED BUT NOT GIVEN

- Sometimes a tool is given, such as the Encyclopedia Americana, but the librarian does not say where or how the tool was retrieved – online, etc. This should not be coded, though, as search strategy used but not given. It is unfortunate that the librarian didn't elaborate more, however, this is too vague as to pinpoint as not good. Do use this code when a librarian says something like “I am searching” or “I will look” but does not give source or searching strategy.
- For search strategy used but not given, make sure the librarian does not give the strategy later in the chat

## VAGUE SEARCH STRATEGY

- Statements such as I'll check our catalog are vague search strategy
- A search strategy can be vague even if librarian tells which source used before; patron might not make connection – oh, he/she was looking in that source.

## SUFFICIENCY OF RESULTS

- For sufficiency of results, code if the librarian comments on *why* the source is sufficient/insufficient. This code is not for merely, “I have found your information” or “this information should help you.” It is more for when a librarian comments on why a source is sufficient or insufficient, such as “this source is for young adults.” Do not code if they comment on the sufficiency/insufficiency of a search strategy, such as “Sorry, I haven't found a web site I think is an authority on this subject. I'm going to check a magazine database.” Also, do not code if question to the effect of “does this answer your question?” is asked.

## WEB NAVIGATION

- Web navigation takes place only when the librarian is helping the patron get to a site or use a site

## WEB NAVIGATION / INFORMATION LOCATION

- If the information is on the site the librarian takes the patron to, the web navigation is also information location see 2002-07 #3
- If web link is just suggested, it is not web navigation – it is information location

## EVALUATION

- Evaluation is more than just saying “this is a good source” or something like that. Evaluation occurs if the librarian describes or indicates why it is a good source, such as in the following example, where the librarian mentions that the web site is an official web site:  
 “The official site of the British monarchy has a good site devoted to her:  
<http://www.royal.gov.uk/output/page151.asp>”

## TECHNICAL ISSUES

- Telling a patron he needs his library card # to access something online is a technical issue as well as information retrieval

## GENERAL

- Every time the patron asks a new query, new coding can take place; for ex. if librarian was coded as using vague search strategy before, this code can be used again for a new query within the same transcript see 2002-08 #2
- If an instance of instruction, such as web navigation, takes place over several lines, code as one unit, one instance of instruction
- If no ILI is done, code as no ILI; this is the case if codes are used such as search strategy used but not given or Definition or vague search strategy (see 2003-04 #3) (controversial one – 2002-12 #5) also, sufficiency of results may not necessarily mean that ILI occurs – see 2002-02 #1 Also, vague library usage means no ILI occurred.

## List of Works Cited

- American Library Association Presidential Committee on Information Literacy. "Final Report." *Association of College and Research Libraries*. 8 Apr. 2004.  
<[http://www.ala.org/Content/NavigationMenu/ACRL/Publications/White\\_Papers\\_and\\_Reports/Presidential\\_Committee\\_on\\_Information\\_Literacy.htm](http://www.ala.org/Content/NavigationMenu/ACRL/Publications/White_Papers_and_Reports/Presidential_Committee_on_Information_Literacy.htm)>.
- Association of College and Research Libraries (ACRL). *Information Literacy Competency Standards for Higher Education*. Chicago: ACRL, 2000.
- Carterette, Bob and Sari Feldman. "Implementing KnowItNow24X7.net in 90 Days – or Bust!" *Implementing Digital Reference Services*. Eds. R. David Lankes, Charles R. McClure, Melissa Gross, and Jeffrey Pomerantz. New York: Neal-Schuman Publishers, 2003. 95-102.
- Christian, Gayle R., Caroline Blumenthal and Marjorie Patterson. "The Information Explosion and the Adult Learner: Implications for Reference Librarians." *Reference Librarian*. 69/70 (2000): 19-30.
- Dewdney, Patricia and Catherine Sheldrick Ross. "Flying a Light Aircraft: Reference Service Evaluation from a User's Perspective." *RQ*. 34 (1994): 217-230.
- Diamond, Wendy and Barbara Pease. "Digital Reference: A Case Study of Question Types in an Academic Library." *Reference Services Review*. 29 (2001): 210-218.
- Diehl, Susan J. and Terry L. Weech. "Library Use Instruction in the Public Library: A Survey of User Preferences." *Research Strategies*. 9 (1991): 25-40.
- Dyson, Lillie Seward. "Improving Reference Services: A Maryland Training Program brings Positive Results." *Public Libraries*. 31 (1992): 284-289.
- Ellis, Lisa and Stephen Francoeur. "Applying Information Competency to Digital Reference." Presented at the *67th IFLA Council and General Conference, Boston, MA, 16-25 August 2001*. 1-6.
- Galvin, Thomas J. "Reference Services and Libraries." *Encyclopedia of Library and Information Science*. New York: Marcel Dekker, Inc., 1978.

- Goetsch, Lori, Laura Sowers and Cynthia Todd. "Electronic Reference Service: Executive Summary." *SPEC Kit 251. Association of Research Libraries*. 8 Apr. 2004. <<http://www.arl.org/spec/251sum.html>>.
- Francoeur, Stephen. "An Analytical Survey of Chat Reference Services." *Reference Services Review*. 29 (2001): 189-203.
- Herzog, Susan. "Integrating a New Service: One Library's Experience With Digital Reference." *North Carolina Libraries Online*. 61 (2003): 152-153.
- Hoag, Tara J. and Edana McCaffery Cichanowicz. "Going Prime Time with Live Chat Reference." *Computers in Libraries*. 21.8 (2001): 40-44.
- Hodges, Ruth A. "Assessing Digital Reference." *Libri*. 52 (2002): 157-168.
- Johnston, Patricia E. "Digital Reference as an Instruction Tool: Just in Time and Just Enough." *Searcher*. 11.3 (2003): 31-33.
- Kasowitz, Abby, Blythe Bennet, and R. David Lankes. "Quality Standards for Digital Reference Consortia." *Reference & User Services Quarterly*. 39 (2000): 355-363.
- Kwasnik, Barbara H. "The Role of Classification in Knowledge Representation and Discovery." *Library Trends*. 48 (1999): 22-47.
- Lankes, R. David. "The Digital Reference Research Agenda." *Journal of the American Society for Information Science and Technology*. 55 (2004): 301-311.
- McCutcheon, Camille and Nancy M. Lambert. "Tales Untold: The Connection Between Instruction and Reference Services." *Research Strategies*. 18 (2001): 203-214.
- Plotnick, Eric. "Information Literacy: Definitions/Perspectives." *Teacher Librarian*. 28.1 (2000): 27-29.
- Reilly, Jane A. "Library Instruction Through the Reference Query." *The Reference Librarian*. 10 (1984): 135-148.
- Rettig, James. "The Convergence of the Twain or Titanic Collision? BI and Reference in the 1990s' Sea of Change." *Reference Services Review*. 23.1 (1995): 7-20.
- Richardson, John V., Jr. "Understanding the Reference Transaction: A Systems Analysis Perspective." *College and Research Libraries*. 60 (1999): 211-222.
- Sloan, Bernie. "Service Perspectives for the Digital Library Remote Reference Services." *Library Trends*. 47 (1998): 117-143.
- Smyth, Joanne. "Virtual Reference and Transcript Analysis." *Searcher*. 11.3 (2003):

26-30.

- Snaveley, Loanne and Natasha Cooper. "The *Information Literacy Debate*." *The Journal of Academic Librarianship*. 23 (1997): 9-14.
- Stein, Sondra. *Equipped for the Future Content Standards: What Adults Need to Know and Be Able to Do in the 21<sup>st</sup> Century*. Washington: National Institute for Literacy, 2000.
- Tenopir, Carol and Lisa Ennis. "A Decade of Digital Reference 1991-2001." *Reference & User Services Quarterly*. 41 (2002): 264-273.
- Tenopir, Carol and Lisa Ennis. "The Impact of Digital Reference on Librarians and Library Users." *Online*. 22.6 (1998): 84-88.
- Von Elm, Catherine, Judith F. Trump and Robert E. Dugan. "Managing Technology: Maintaining the Mission in the Hybrid Library." *Journal of Academic Librarianship*. 27 (2001): 33-35.
- White, Marilyn Domas. "Digital Reference Services: Framework for Analysis and Evaluation." *Library & Information Science Research*. 23 (2001): 211-231.
- Williams, Lisa Powell. "Info 'nuts' vs. Info 'nots': Pondering How to Serve Both." *Library Mosaics*. 6.6 (1995): 21.
- Wilson, Myoung C. "Evolution or Entropy? The Changing Reference Culture and the Future of Reference Librarians." *Digital Reference Service in the New Millenium*. Ed. R. David Lankes, John W. Collins III, and Abby S. Kasowitz. New York: Neal-Schuman Publishers, 2000. 47-57.
- Wilson, Paula. "Teaching Library Skills Through Technology." *Public Libraries*. 42 (2003): 26-27.