

**Annotated Bibliography: Digital Reference**  
Casey Hoeve  
INFO 522: Information Access and Resources  
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**Introduction and Scope:**

The following bibliography covers the topic of digital reference in libraries and information science. Articles highlight how the reference profession is currently using digital reference technology, particularly focusing upon new technologies and evaluation, educational methods, and professional competency. Several articles researched current digital technologies, discussing the variety of tools that are emerging and available for library use. These articles were frequently yoked with empirical evaluation, analyzing the benefits and complications of each service. Additional articles and books discussed the education and implementation methods of digital reference, demonstrating educational techniques for improving digital reference comprehension. The third set of articles discussed competency standards for librarians, serving as a checklist to gauge current skills, and the need for continuing education. The articles were published from 2003 to 2009. Recent articles were given more consideration, to place greater emphasis upon new research and technologies, as the topic of digital reference is continually evolving. The predominant number of articles in the bibliography were published in the United States, and one article was published in China.

**Description:**

Digital reference is a more recent aspect of reference service offered by libraries, becoming increasingly more popular with the invention of the Internet and high speed data transfer. The term “digital reference” is synonymous with “virtual reference”, “electronic reference,” and “automated reference service,” demonstrating the evolution of technology that has occurred in the field of library and information science. Digital reference is understood as any electronic service used to provide reference service” (Grodzins Lipow 2003). In order to properly understand digital reference, three areas must be explored: technologies and evaluation, educational methods, and professional competency. As newer technologies emerge, verdant and senior librarians alike, experience difficulties with understanding what is available, how the tools can serve patrons, and what knowledge is required to operate these emerging services.

**Summary of Findings:**

Research on digital reference is plentiful on the microscale level. Libraries frequently conduct user studies on electronic reference services, to indicate utilization statistics in specific institutions. On the macroscale level, research is more limited, but available in the areas of emerging technology, educational methods, and professional competency. Research studies have demonstrated that the

variety and capabilities of virtual reference are nearly as diverse as the user populations they serve.

Digital reference services in libraries originated with the use of the telephone; however, most researchers concentrate upon digital services offered through computers and the Internet. Ellis (2008) discussed the use of email and instant messaging services in digital reference. In conjunction with Maness' (2006) research on reference guides, these types of services are considered the most basic type of virtual reference. The most popular instant messaging services were embed programs, such as Meebo, and popular messaging clients like AOL instant messenger; reference guides are traditionally considered be websites or web pages based on text-instruction or resource lists. Luo (2007) analyzed the interactive virtual services of QuestionPoint and the Tutor.com virtual reference kit. These interactive digital services provide co-browsing technology, which allow users to interact with a librarian as virtual reference is conducted. Maness (2006) additionally highlighted the use of RSS feeds and social networking sites as tools for digital reference, as well as library use of video recordings to provide instruction via the world-wide web. The most novel approach to digital reference was researched by Godfrey (2008), who explored the use of digital reference services in virtual video game worlds, specifically through Second Life.

McGlamery, Francoeur, and Miller (2009) provided a succinct analysis of the most recent digital reference technologies. Specific technologies included QuestionPoint co-browsing, Twitter, multiple language reference services, text messaging, instant messaging, video chat, voice over IP (VoIP), and Google Wave. They conducted a presentation of their finding over the Webjunction Webinar system, demonstrating the new capabilities of reference service and education.

As innovative and convenient as many digital reference services may seem, these technologies are not without difficulties. Problems occur on both the technological and human level. Ellis (2008) concluded that email had several negative aspects, in that it lacked the elements of a reference interview: questions could not be clarified, and email transactions resulted in long periods of time between the initial inquiry and answer (105). Stormont's (2007) research on virtual reference discovered numerous difficulties with newer technologies. It was found that co-browsing technologies could be incompatible with certain Internet browsers (115), and security settings could cause co-browsing systems to malfunction when pop-up blockers and firewalls are used (115). Additional problems occurred when patrons did not possess Internet speeds fast enough to handle programs used by libraries (116).

With reference in the virtual worlds, Godfrey (2008) showed that most problems arose with the issue of multitasking. Librarians not only had to provide digital reference to patrons using standard

digital means, but also had to learn how to play video games, such as *Second Life*; this involved a complicated balance of interaction between two different worlds, which possessed different rules of social etiquette (531). Additionally, in order to run the video games, libraries would suffer the added expense of constantly upgrading and installing computer components (531). These distractions divert librarians from focusing on technical skills, such as database and resource knowledge.

Moyo (2006) concluded that accidental glitches can be problematic for digital reference. This could involve inconsistent Internet service, which disconnects users from digital reference services, such as instant messaging or co-browsing technologies (227). However, one of the largest impediments in digital services were proprietary restrictions. The inability to use certain resources, severely limited the capabilities of providing digital reference to patrons (227).

The work of Hirko and Ross (2004) provided the following essential core competencies for providing digital reference: the ability to derive personal satisfaction from digital reference; keyboarding proficiency; communication skills and etiquette required for chat, email, and other online interactions; the ability to conduct effective reference transactions; internet searching skills; the ability to demonstrate searching skills; knowledge of licensing restrictions for provided materials; the ability to conduct co-browsing search sessions (10). Mon et al. (2008) listed the following competencies necessary for reference operations as: [knowledge of] service community; information resources; human information behaviors; privacy, copyright, and intellectual freedom; library policies; [skill in] communication; technology use; critical thinking; marketing/outreach; program evaluation; [commitment to] community service; information access; active professional membership; diversity; education/instruction (188).

Luo's (2008) research on digital reference chat identified the professional competencies as: the ability to conduct an effective reference interview; knowledge of referral methods and techniques; knowledge of standard print and electronic sources and the primary subject field of users served; communication and interpersonal skills; technological skills; instructional skills; ability to apply library policies and procedures; critical thinking; commitment to user services (299). Gilbert et al. (2006) additionally documented that digital reference competencies included reliability, responsiveness, tangibles, assurance, and empathy (152).

From the aforementioned research, the most common theme was communication and interpersonal skills, demonstrating that etiquette remained a necessary competency, among both digital and face-to-face instruction (Desai and Graves, 2006). The second most essential competency was knowledge of licensing. This involves overcoming proprietary restrictions discussed by Moyo (2006),

and understanding what materials may be accessible to certain students, based on geographical location and institution affiliation. The third most important competency for digital reference was the possession of searching skills. This aspect focuses upon technical understanding of search methods and database function, and the capabilities to use those skills in combination with digital reference technology. The fourth most common competency was knowledge of information sources. This indicated that librarians should possess a more comprehensive understanding of the academic field in which they are assigned to represent. The fifth most common competency for digital reference was instruction. This covered the need for librarians to pursue opportunities for continuing education, and the ability to provide instruction to students, on how to search for information in digital and non-digital repositories.

The concept of digital reference education can be broken down into two categories: (1) librarian instruction on the implementation and use of digital technologies, and (2) librarian education for teaching digital reference use to patrons. Hirko and Ross (2004) developed an itinerary for educational training in the utilization of virtual reference services. The program lasted for a period of five weeks, and focused upon orientation, information literacy, the reference interview, evaluation, and policies and procedures (35). For the education of librarians, Hirko and Ross found that the most important area of education was online behaviors (74). These behaviors included question clarification (78), simulation of the search for the patron (80), providing authoritative information (82), and follow up questions (84). Grodzins Lipow (2003) added that librarians should avoid the Einstellung Effect (53) of ending their education at good enough, and should strive diligently to learn advanced features of digital reference tools. For patron education, Grodzins Lipow (2003) suggested that librarians focus on empathetic educational methods, learning to place themselves in the role of the patron. The mindset of the patron was described as desiring information and systems that were personalized, convenient, simplistic, timely, accurate, accessible, affordable, efficient, and trustworthy (29).

Moyo's (2006) research focused upon the prevalence and types of digital reference questions asked by patrons. Occurring in descending order, her study found that the majority of questions regarded the navigation of library resources, search tips, database recommendations, and bibliographic citation (225). Yi Jin et al. (2006) researched the benefits of collaboration in virtual reference services. They found that several collaborative models are available, such as the symmetric model, the tree, the ring, and the irregular model (734). It was determined that librarians must possess educational skills in working with collaborative technologies, in order to accommodate the necessity of providing 24/7 digital reference service. This demonstrated that digital reference often requires libraries and librarians to expand services beyond their traditional target population, through participation in digital reference

consortia (739). .

Ellis' (2008) research stressed the importance of teaching transferable knowledge, indicating that librarians must actively strive to pass their own seeking behavior onto students. Similar to Yi Jin (2006), Ellis discussed the need for collaborative instruction and educational methods, providing instruction through active learning and participation (16). Miller and Pellen (2004) compiled numerous essays from experts in the field, to address advanced questions in improving digital reference service. Their research found that library instruction should be centered upon participation and collaboration (5). It was also found that web tutorials worked as an effective means of providing reference instruction to students, as long as active participation was a key component (51).

## **Bibliography:**

### **Entry 1:**

Desai, C.M., & Graves, S.J. (2008). Cyberspace or face-to-face: the teachable moment and changing reference mediums. *Reference & User Services Quarterly*, 47(3), 242-254.

**Abstract:** This article considers the teaching role of reference librarians by studying the teachable moment in reference transactions, and users' response to that instruction. An empirical study of instruction was conducted in both virtual and traditional reference milieus, examining the following three services: Instant messaging (IM), chat, and face-to-face reference. The authors used the same criteria in separate studies of all three services to determine if librarians provided analogous levels of instruction and what factors influenced the likelihood of instruction. Methodologies employed included transcript analysis, observation, and patron surveys. Findings indicated that patrons wanted instruction in their reference transactions, regardless of medium, and that librarians provided it. But instructional techniques used by librarians in virtual reference differ somewhat from those used at the reference desk. The authors conclude that reference transactions, in any medium, represent the patron's point-of-need, thereby presenting the ideal teachable moment.

**Annotation:** Stephanie Graves is a humanities librarian at the University of Southern Illinois, and Christina Graves is a reference librarian at the University of New Mexico. This article compared virtual reference to traditional face-to-face reference. IM, chat, and reference desk interviews were examined, analyzing digital reference services for the utilization of modeling, resource suggestion, term suggestion, leading, and lessons. This article focused on the aspect of instruction, advocating the inclusion of patrons in the virtual reference interview, and the search process, to aid information retrieval competency.

### **Search Strategy:**

I used the [www.google.com](http://www.google.com) advanced search engine. In the one or more of these words search box, I used the keywords "virtual reference" Or "digital reference." Within the search results, I found the site titled, "Virtual Reference Library at Rutgers School of Communication." From

there, I browsed through the list, and found the article. I then located the article in Library Literature and Information Science Full Text [Wilson Web], by typing in the author's last name in the search box [all smart search], and 2008 from the year to year box.

**Database:** N/A

**Method of Searching:** Keyword Search/ Subject bibliography searching

**Search String:** “Virtual Reference” Or “Digital Reference”  
Referenced in:  
Rutgers School of Communication, Information, and Library Studies  
(2009). *Virtual Reference Bibliography*. Retrieved from  
<http://vrbib.rutgers.edu/>  
“Desai”  
“2008”

**Entry 2:**

Ellis, L.A. (2004). Approaches to teaching through digital reference. *Reference Services Review*, 32(2), 103-119.

**Abstract:** As “teaching libraries,” many academic libraries are committed to teaching not only in classrooms but also at the reference desk. As reference has expanded to include digital modes of e-mail and chat, reference librarians are prompted to consider approaches to teaching in these new reference venues in ways that are meaningful to the user. A promising approach to teaching through digital reference is the application of the ACRL Information Literacy Competency Standards. This paper presents some challenges and benefits of teaching via digital reference. Practical methods for promoting self-directed learning by examining online instruction, and suggestions for effectively advancing a pedagogy based on the ACRL Information Literacy Competency Standards, are offered.

**Annotation:**

Lisa A. Ellis is an Assistant Professor and Information Services Librarian at Baruch College. Ellis suggests that librarians must change their comprehension of digital reference, and understand that “libraries are remote, rather than the user.” The article advocated using digital reference as a means to re-engaging users, listing several benefits, including convenience (immediate access), anonymity, sense stimuli preference, and reduction of user anxiety. Topics include multi-format digital reference, such as email, chat, and user guides. Negative aspects of digital reference are also covered, citing problems of break downs in the reference interview, and problems for patrons who lack technological skills. Methods of teaching are also incorporated, stressing the need to educate librarians in digital reference techniques, to bridge the gap between the remote library and the users.

**Search Strategy:** I used Library Literature and Information Science Full Text because it contains articles specifically relevant to information science and digital

reference. Because I was unsure if “digital reference” or “virtual reference” were included as formal terms in the database, I went to the thesaurus tool. Digital reference did not produce any results, but virtual reference led to the term “Reference Services/Automation.” I clicked on this term, and searched through relevant articles, in which, I found Ellis' article. To access the full text, I used the SFX full text option, and located the article in the Emerald Publishing group database

**Database:** Library Literature and Information Science Full Text [Wilson Web]

**Method of Searching:** Controlled Vocabulary Search

**Search String:** Digital reference  
Virtual reference  
Reference Services/Automation

**Entry 3:**

Gilbert, L.M., Liu, M., Matoush, T., & Whitlatch, J.B. (2006). Assessing digital reference and online instructional services in an integrated public/university library. *The Reference Librarian*, 46(95), 149-172.

**Abstract:** In spite of the explosion of interest in virtual reference and instruction, assessment of digital reference remains relatively uncharted territory in the library literature. What standards exist for online reference and instruction and how can they be used to assess the innovative new merged online reference environment at the Dr. Martin Luther King, Jr. Library? Led by co-unit heads from the former San Jose Public Library Main Branch and the San Jose State University Clark Library, the merged reference unit is a unique testing ground for perceived differences between public and academic reference service. Evaluation of both the online and the live merged reference environment is crucial and will be necessary to determine what is working and what is not. This paper will discuss plans for current and future assessment of digital reference including e-mail, live online reference, and online instruction.

**Annotation:** Mengxiong Liu, Toby Matoush, and Jo Whitlach are librarians at San Jose State University. Lauren Miranda Gilbert is a librarian at the San Jose Public Library. This article seeks to provide instruction for assessing online reference methods not previously covered by information science literature. Email reference services are analyzed by SERVQUAL and RUSA guidelines, and live online reference is analyzed by ACRL competency standards. The production of online tutorials are covered, listing examples from reputable universities, and teaching methods from Nancy Dewald, a librarian at Penn State University, who has published numerous scholarly papers.

**Search Strategy:** I used the [www.google.com](http://www.google.com) advanced search engine. In the one or more of these words search box, I used the keywords “virtual reference” Or “digital reference.” Within the search results, I found the site titled, “Virtual Reference

Library at Rutgers's School of Communication.”From there, I browsed through the list, and found the article. I then found the article in Library Literature and Information Science Full Text [Wilson Web], by typing in the author's last name in the search box [all smart search], and 2006 from the year to year box.

**Database:** N/A

**Method of Searching:** Keyword Search/ Subject bibliography searching

**Search String:** “Virtual Reference” Or “Digital Reference”  
 Referenced in:  
 Rutgers School of Communication, Information, and Library Studies (2009). *Virtual Reference Bibliography*. Retrieved from <http://vrbib.rutgers.edu/>  
 “Gilbert”  
 “2006”

#### Entry 4:

Godfrey, K. (2008). A new world for virtual reference. *Library Hi Tech*, 26(4), 525-539.

**Abstract:** Purpose – This paper aims to examine the emerging field of reference in virtual worlds and attempts to determine its place among existing reference services. The virtual world of Second Life is the focus for these virtual world services. Advantages of virtual world reference are highlighted and drawbacks are discussed. Design/methodology/approach – The paper examines two existing virtual world reference projects in an attempt to determine both the feasibility of virtual world reference and the level of need for such a service. Practical implications – The paper outlines the steps of creating a collaborative and institutional virtual world reference service, including training and implications.

**Annotation:** Krista Godfrey, of McMaster University, explores new areas of virtual reference services that have not previously been researched. This article examines virtual reference in simulated worlds, such as Second Life, demonstrating new areas of need where virtual reference and librarians can serve. It provides a useful introduction to virtual worlds, for those new to the subject, and describes in detail how libraries have implemented reference in virtual worlds. Both positive aspects and drawbacks are explained, providing a critical analysis of virtual world reference.

**Search Strategy:** I went to [www.dialogclassic.com](http://www.dialogclassic.com), and typed in “Infosci.” to the command line. “I used the controlled vocabulary terms of “virtual reference” and “digital reference.” I then narrowed the results by unique items, descriptor, and title. I selected Godfrey's article, and found the article in Library Literature and Information Science Full Text [Wilson Web], by typing in the author's last name in the search box [all smart search], and 2007 from the year to year box.

**Database:** DIALOG OneSearch File 1:ERIC 1965-

2009/Sep; File 2:INSPEC 1898-2009/Oct W4 File 6:NTIS 1964-2009/Nov W2; File 7:Social SciSearch(R) 1972-2009/Oct W4; File 35:Dissertation Abs Online 1861-2009/Sep; File 47:Gale Group Magazine DB(TM) 1959-2009/Oct 19; File 121:Brit.Education Index 1976-2009/Q4; File 148:Gale Group Trade & Industry DB 1976-2009/Oct 14; File 437:Education Abstracts 1983-2009/Sep; File 438:Library Lit. & Info. Science 1984-2009/Sep

**Method of Searching:** Controlled Vocabulary

**Search Strings:** ? s digital(w)reference and ?s virtual(w)reference  
 ? s s6/de  
 ? s s6/TI  
 ? s s7 and s8  
 ? t 9/3,k/all

### Entry 5:

Hirko, B., & Ross, M.B.(2004). *Virtual reference training: The complete guide to providing anytime anywhere answers*. Chicago: American Library Association.

**Abstract:** From the nuts-and-bolts consideration of online communication and Internet searching skills to actual feedback from learners who have used it, *Virtual Reference Training* provides the guidance for building a program that will help all librarians develop confidence and finesse at the virtual desk.

**Annotation:** Buff Hirko, the Washington State Virtual Reference Project coordinator, and Mary Bucher Ross, the manger of staff training and development at the Seattle Public Library, provide an essential manual for virtual reference training and instruction, including competencies, curriculum, and training exercises. It is a great introduction piece for librarians learning the ropes of virtual reference, or for organizations wishing to set up a formal training program. This particular book focuses heavily upon training users in the art of conducting an effective virtual reference interview, but does not provide critical assessments of virtual reference systems.

**Search Strategy:** I went to [www.dialogclassic.com](http://www.dialogclassic.com), and typed in “Infosci.” to the command line. “I used the controlled vocabulary terms of “virtual reference” and “digital reference.” I then narrowed the results by unique items, descriptor, and title. I selected Hirko and Ross' book, and found the full-text at Grand Valley State University Library, by searching in the catalog under “Hirko” under author, and “2004” under date of publication.

**Database:** DIALOG OneSearch File 1:ERIC 1965-2009/Sep; File 2:INSPEC 1898-2009/Oct W4 File 6:NTIS 1964-2009/Nov W2; File 7:Social SciSearch(R) 1972-2009/Oct

W4; File 35:Dissertation Abs Online 1861-2009/Sep; File 47:Gale Group Magazine DB(TM) 1959-2009/Oct 19; File 121:Brit.Education Index 1976-2009/Q4; File 148:Gale Group Trade & Industry DB 1976-2009/Oct 14; File 437:Education Abstracts 1983-2009/Sep; File 438:Library Lit. & Info. Science 1984-2009/Sep

**Method of Searching:** Controlled Vocabulary

**Search Strings:** ? s digital(w)reference and ?s virtual(w)reference  
 ? s s6/de  
 ? s s6/TI  
 ? s s7 and s8  
 ? t 9/3,k/all  
 “Hirko” and “2004”

#### Entry 6:

Grodzins Lipow, A. (2003). *The virtual reference librarian's handbook*. Berkley: Library Solutions Press.

**Abstract:** Today, libraries are aggressively catching up. They are asking a new question: not “How can we get our clientele to come to the library to use the wonderful services we have for them?” but “How can we bring those services to wherever our users are?” In particular, “How can the reference desk be where the users are when they have a question?” Their answer is, “By offering a virtual reference service.” By moving their reference desks and themselves onto the Web, pioneering reference librarians are playing a central role in enabling their libraries to achieve the goal of getting the right information to the right person at the right time.

**Annotation:** Anne Grodzins Lipow is a former Director of Library Instructional Services at the University of California Berkeley Libraries, and renown as a leading expert in the field of reference services. This book aims at instructing readers on benefits and problems of virtual reference, available technologies for virtual reference, policies and competencies, and reaching users through active advocacy. This is a comprehensive book, containing exercises and contributions from experts in the field of library and information science. It additionally offers diagrams, charts, margins for note-taking, and a supplementary cd-rom.

**Search Strategy:** I went to [www.dialogclassic.com](http://www.dialogclassic.com), and typed in “Infosci.” to the command line. “I used the controlled vocabulary terms of “virtual reference” and “digital reference.” I then narrowed the results by unique items, descriptor, and title. I selected Grodzins Lipow' book, and found the full-text at Grand Valley State University Library, by searching in the catalog under “Grodzins Lipow”

under author, and “2003” under date of publication.

**Database:** DIALOG OneSearch File 1:ERIC 1965-2009/Sep; File 2:INSPEC 1898-2009/Oct W4 File 6:NTIS 1964-2009/Nov W2; File 7:Social SciSearch(R) 1972-2009/Oct W4; File 35:Dissertation Abs Online 1861-2009/Sep; File 47:Gale Group Magazine DB(TM) 1959-2009/Oct 19; File 121:Brit.Education Index 1976-2009/Q4; File 148:Gale Group Trade & Industry DB 1976-2009/Oct 14; File 437:Education Abstracts 1983-2009/Sep; File 438:Library Lit. & Info. Science 1984-2009/Sep

**Method of Searching:** Controlled Vocabulary

**Search Strings:** ? s digital(w)reference and ?s virtual(w)reference  
 ? s s6/de  
 ? s s6/TI  
 ? s s7 and s8  
 ? t 9/3,k/all  
 “Grodzins Lipow” and “2003”

### Entry 7:

Luo, L. (2007). Chat reference evaluation: a framework of prospectives and measures. *Reference Services Review*, 36(1), 71-85.

**Abstract:** Purpose – This paper aims to provide a holistic view of the current practice of chat reference evaluation and to suggest a framework that could help reference practitioners evaluate chat reference services in multiple contexts. Design/methodology/approach – A thorough review of the literature on chat reference evaluation is conducted and the evaluation studies are grouped by their evaluative perspective and measures. Based on the literature review, a framework of perspectives and measures for chat reference evaluation is proposed. Originality/value – This paper fills the need to provide reference practitioners with both a critical view of current chat reference practice, and a tool that could help them design and develop a chat reference evaluation project.

**Annotation:** Lili Luo is a professor of Library and Information Science at San Jose State University. This article demonstrated how chat reference services are evaluated, using previous research in the field of library and information science. Reference service was analyzed by record logs, recorded in electronic services, such as Question point or the Tutor.com virtual reference kit. The content is focused upon cost, productivity, and quality of answers. Evaluation criteria include: provided citations, quality of sources and directions, follow-up, courteousness, and successful reference interviews. User perceptions and preferences of electronic chat technology are additionally addressed.

**Search Strategy:** I used the [www.google.com](http://www.google.com) advanced search engine. In the one or

more of these words search box, I used the keywords “virtual reference” Or “digital reference.” Within the search results, I found the site titled, “Virtual Reference Library at Rutgers's School of Communication.” From there, I browsed through the list, and found the article. I then found the article in Library Literature and Information Science Full Text [Wilson Web], by typing in the author's last name in the search box [all smart search], and 2007 from the year to year box.

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| <b>Database:</b>            | N/A   |
| <b>Method of Searching:</b> | Keyword Search/ Subject bibliography searching  |
| <b>Search String:</b>       | <p>“Virtual Reference” Or “Digital Reference”<br/> Referenced in:<br/> Rutgers School of Communication, Information, and Library Studies (2009). <i>Virtual Reference Bibliography</i>. Retrieved from <a href="http://vrbib.rutgers.edu/">http://vrbib.rutgers.edu/</a><br/> “Luo”<br/> “2007”</p> |

### Entry 8:

Luo, L. (2008). Toward sustaining professional development: identifying essential competencies for chat reference service. *Library & Information Science Research*, 30, 298-311.

**Abstract:** This study identifies the essential chat reference competencies to enhance the professional preparation of reference personnel. A survey was conducted to examine practitioners' perceptions of chat reference competencies reported in the literature. A prioritized competency list was produced based on the survey results. The investigated competencies could be divided into four categories: media-independent core reference competencies, reference competencies highlighted in the context of chat reference, reference competencies specific to chat reference, and reference competencies not as important in chat reference. Competencies in the first three categories received ratings higher than 5.5 (out of 7) and can be defined as the essential competencies requisite for chat reference practice. Findings from this study can be used as the basis to design and implement training and education programs to enhance the professional preparation of chat reference librarians.

**Annotation:** Lili Luo is a professor of Library and Information Science at San Jose State University. This article covered new research on validating chat reference service, providing a history of general and specific electronic reference, including literature citations on instruction. Comprehensive surveys provide statistics on areas of electronic reference educational competency, such as instant messenger (IM), commercial software, and home-grown applications. Comparable competencies are directed at librarians, to assess levels of competency in electronic reference.

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| <b>Search Strategy:</b>     | I used the <a href="http://www.google.com">www.google.com</a> advanced search engine. In the one or more of these words search box, I used the keywords “virtual reference” Or “digital reference.” Within the search results, I found the site titled, “Virtual Reference Library at Rutger's School of Communication.”From there, I browsed through the list, and found Luo's (2007) article. While looking for the article in Library Literature and Information Science Full Text [Wilson Web], by typing in the author's last name in the search box [all smart search], and 2007 from the year to year box, Luo's 2008 article was discovered. |
| <b>Database:</b>            | Library Literature and Information Science Full Text [Wilson Web]  |
| <b>Method of Searching:</b> | Browsing   |
| <b>Search String:</b>       | “Luo” and “2007”   |

**Entry 9:**

Maness, J.M. (2006). Library 2.0: the next generation of web-based library services. *Logos*, 17(3), 139-145.

**Abstract:** The Web is evolving into a much more interactive, multimedia-driven place. Tim O'Reilly along with Dale Dougherty of O'Reilly Media recently pointed out that the companies, services and technologies that survived the 1990s technology-sector market crash all shared certain characteristics: they were collaborative, interactive and dynamic, and the line between the creation and consumption of content was blurred (users created content in these sites as much as they consumed it). O'Reilly and Dougherty called these developments "Web 2.0," where personal Web pages evolve into blogs; encyclopedias into Wikipedia; text-based tutorials into streaming media applications; taxonomies into "folksonomies"; and question-and-answer email customer support into instant messaging (IM) services.

**Annotation:** Jack Maness is a recipient of the American Library Association's Marshall Cavendish Scholarship, and is a librarian and bibliographer of computer science at the University of Colorado at Boulder. This article advocated practices for digital reference, including user centered design, multimedia enabled technology, social networking websites, RSS feeds, and instant messaging. Maness lists PRIMO as a popular virtual instruction tool. Negative aspects of social sites are addressed, as well as some drawbacks of current IM and co-browsing technology.

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| <b>Search Strategy:</b> | I used the <a href="http://www.google.com">www.google.com</a> advanced search engine. In the one or more of these words search box, I used the keywords “virtual reference” Or “digital reference.” Within the search results, I found the site titled, “Virtual Reference Library at Rutger's School |
|-------------------------|---|

of Communication.”From there, I browsed through the list, and found the article. I then found the article in Library Literature and Information Science Full Text [Wilson Web], by typing in the author's last name in the search box [all smart search], and 2007 from the year to year box.

**Database:** N/A

**Method of Searching:** Keyword Search/ Subject bibliography searching

**Search Strings** “Virtual Reference” Or “Digital Reference”  
 Referenced in:  
 Rutgers School of Communication, Information, and Library Studies (2009). *Virtual Reference Bibliography*. Retrieved from <http://vrbib.rutgers.edu/>  
 “Maness”  
 “2006”

**Entry 10:**

McGlamery, S., Francoeur, S., & Miller, A. (2009). *Digital reference summit: Be where your users are* [PDF document]. Retrieved from the WebJunction Digital Reference Summit Website: <http://www.webjunction.org/virtual-reference/-/articles/content/82380665>

**Abstract:** After a decade of adjustment, libraries are reaffirming their role as key information providers in this digital age. Call it what you will, libraries are providing digital reference, chat reference, virtual reference, online reference, synchronous reference, and now text message reference as part of their library's suite of services. Join us for this special 90 minute webinar archive to hear the latest implications, trends and tips in digital reference with a panel of special guests including: Stephen Francoeur, Information Services Librarian, Baruch College (NY); Susan McGlamery, 24/7 Reference Cooperative Director; and Alison Miller, Internet Public Library.

**Annotation:** This webinar is a great resource for identifying the most current uses of virtual reference services, and technology available to libraries. The webinar is presented by three authoritative sources: Susan McGlamery, Stephen Francoeur, and Alison Miller, who are involved in information services and virtual reference, such as the Internet Public Library, and the 24/7 Reference Cooperative. This webinar is relevant to information professionals who wish to update their knowledge of current reference technologies, and learn how they have been implemented in the library. This is a wonderful resource for the hearing or visually impaired, as they may view a recorded presentation, or listen to the recorded audio in mp3 format.

**Search Strategy:** I used the [www.google.com](http://www.google.com) advanced search engine. In the one or

more of these words search box, I used the keywords “virtual reference” Or “digital reference.” Within the search results, I found the site titled, “Virtual Reference: be where your users are.” the full-text was available on the site.

**Database:** N/A

**Method of Searching:** Keyword search

**Search Strings:** “virtual reference” OR “digital reference”

### Entry 11:

Miller, W., & Pellen, R.M. (Eds.). (2004). *Improving internet reference services to distance learners*. New York: Haworth Information Press.

**Abstract:** Taken together, the articles in this volume show that librarians naturally look for opportunities to cooperate with other entities as the seek to provide and improve services for distance learners. The service orientation of the profession shows itself in their outreach, not only to the users themselves, but also to the other entities both within and beyond their own organizations. We can all be proud of such efforts.

**Annotation:** William Miller is the Director of Libraries at Florida Atlantic University, and the 2004 ACRL Instruction Librarian of the Year. Rita M. Pellen is the Associate Director of Libraries at Florida Atlantic University, and has served on the committees in the ACRL. This book is unlike most instructional books, containing a collection of professional articles from experts in the field. It is a good supplementary book for those with intermediate knowledge of virtual reference services, focusing on more difficult tasks of providing reference to users with geographic barriers, such as completely digital libraries, and online students. Subjects covered include marketing services, barriers of use, implementation, self-assessment, and delivery technologies.

**Search Strategy:** I went to [www.dialogclassic.com](http://www.dialogclassic.com), and typed in “Infosci.” to the command line. “I used the controlled vocabulary terms of “virtual reference” and “digital reference.” I then narrowed the results by unique items, descriptor, and title. I selected Grodzins Lipow' book, and found the full-text at Grand Valley State University Library, by searching in the catalog under “Grodzins Lipow” under author, and “2003” under date of publication. While searching for Grodzins Lipow's book, I found Miller and Pellen's book in the same section.

**Database:** N/A

**Method of Searching** Browsing

**Search Strings:** ? s digital(w)reference and ?s virtual(w)reference  
 ? s s6/de  
 ? s s6/TI  
 ? s s7 and s8  
 ? t 9/3,k/all  
 “Grodzins Lipow” and “2003”

**Entry 12:**

Mon, L., Abels, E.G., Agosto, D.E., Japzon, A. Most, L., Masnik, M., & Hamann, J. (2008). Remote reference in U.S. public library practice and lis education. *Journal of Education for Library and Information Science*, 49(3), 180-194.

**Abstract:** The state of remote reference services in the United States was assessed by surveying remote reference availability at 100 U.S. public libraries, examining remote reference in the syllabi of American Library Association (ALA)-accredited library and information science (LIS) courses in the U.S., and analyzing national competencies and guidelines. Findings indicated that the telephone was the most common medium in use for remote reference services at public libraries, followed by e-mail and chat. In teaching, however, syllabi at LIS programs addressed digital remote reference media far more often than the telephone. Reference standards and guidelines primarily focused on general practices applicable to both remote and face-to-face reference work, rather than on specifics relevant to differing remote reference media types. Included in this study are recommendations to address this apparent disconnect among reference practices, teaching, and professional guidelines.

**Annotation:** Lori Mon, Eileen Abels, and Denise Agosto are professors of information science at Florida State and Drexel University. Linda Most and Andrea Japzon are doctoral candidates at Drexel and Florida State University. Michael Masink and Jeanne Hamman are graduates of library and information science graduate programs. This article analyzes remote reference use in libraries, skills covered in LIS graduate programs, and competency standards. Remote reference services listed include webpages, telephone, email, and chat reference services, including a table of usage results. This article explains education in graduate programs, and builds upon virtual education and competency standards necessary for librarians, exposing educational gaps in traditional LIS education.

**Search Strategy:** I used Library Literature and Information Science Full Text because it contains articles specifically relevant to information science and digital reference. Because I was unsure if “digital reference” or “virtual reference” were included as formal terms in the database, I went to the thesaurus tool. Digital reference did not produce any results, but virtual reference led to the term “Reference Services/Automation.” I clicked on this term, and searched through relevant articles, in which, I found Mon's full text article in the database.

**Database:** Library Literature and Information Science Full Text [Wilson Web]

**Method of Searching:** Controlled Vocabulary Search

**Search Strings:** Digital reference  
Virtual reference  
Reference Services/Automation

**Entry 13:**

Moyo, L.M. (2006). Virtual reference services and instruction. *The Reference Librarian*, 46(95), 213-230.

**Abstract:** This paper assesses the incorporation of instruction in library virtual reference services (VRS), and explores whether the rate, and nature of instruction provided to patrons during VRS sessions is different than that provided during face-to-face reference. The Penn State VRS was used as a case study in this assessment. An analysis of a sample of archived Penn State VRS transcripts was conducted to assess the nature and quantity of instruction provided based on the presence of defined instructional elements incorporated in the sessions. The paper discusses the similarities and differences in approach to instruction during VRS and face-to-face reference, and how these relate to overall instructional services in academic libraries. The paper also reviews findings of some similar studies cited in the literature.

**Annotation:** Leslie Moyo is the Director of Library Research and Instructional Services at Virginia Tech University. This article is useful for demonstrating librarian utilization of virtual reference, to promote patron research independence. Highlighting both positive and negative aspects of instruction and listing specific VRS tools, such as LSSI Virtual Reference toolkit and AOL instant messenger, virtual and face-to-face reference are compared. This information can be used in conjunction with Stormont (2007), to critically evaluate virtual reference systems. Elements of instruction are discussed, providing beneficial methods to libraries for purposes of implementation and education. It additionally integrates previous studies on virtual and face-to-face reference services from experts in the field.

**Search Strategy:** I used the [www.google.com](http://www.google.com) advanced search engine. In the one or more of these words search box, I used the keywords “virtual reference” Or “digital reference.” Within the search results, I found the site titled, “Virtual Reference Library at Rutgers School of Communication.” From there, I browsed through the list, and found the article. I then found the article in Library Literature and Information Science Full Text [Wilson Web], by typing in the author's last name in the search box [all smart search], and 2006 from the year to year box.

**Database:** N/A

**Method of Searching:** Keyword Search/ Subject bibliography searching

**Search Strings:** “Virtual Reference” Or “Digital Reference”  
 Referenced in:  
 Rutgers School of Communication, Information, and Library  
 Studies (2009). *Virtual Reference Bibliography*. Retrieved  
 from <http://vrbib.rutgers.edu/>  
 “Moyo”  
 “2006”

**Entry 14:**

Pomerantz, J., Mon, L., & McClure, C. (2008). Evaluating remote reference service: a practical guide to problems and solutions. *Libraries and the Academy* 8(1), 15-30.

**Abstract:** This paper identifies key methodological issues affecting quality of data in the evaluation of remote reference services. Despite a growing number of studies in this area, no comprehensive effort has been made to identify potential problems and suggest solutions. The strategies proposed in this paper offer practical ways in which libraries can improve the overall quality and usefulness of data gathered in remote reference evaluation studies.

**Annotation:** Jefferey Pomerantz is a professor of Library and Information Science at UNC-Chapel Hill, and Lori Mon and Charles McClure are professors of Information at Florida State University. This article identifies the concept of remote reference, as an inclusive terms yoking, together synchronous and asynchronous technologies, providing examples of data forms to improve remote reference interaction. This article can be used in conjunction with virtual reference education, to demonstrate what information should be collected about users, to improve virtual reference service, and increase the success of the reference interview. This article can also be combined with Stormont (2007), to further understand strategies to overcome technical challenges for collecting user data.

**Search Strategy:** I used Library Literature and Information Science Full Text because it contains articles specifically relevant to information science and digital reference. Because I was unsure if “digital reference” or “virtual reference” were included as formal terms in the database, I went to the thesaurus tool. Digital reference did not produce any results, but virtual reference led to the term “Reference Services/Automation.” I clicked on this term, and searched through relevant articles, in which, I found Mon's article in the database. While trying to find Mon's full-text article at a later date, I typed in “Mon” and “2008,” in which, I additionally located Pomerantz's full-text article.

**Database:** Library Literature and Information Science Full Text [Wilson Web]

**Method of Searching:** Browsing

**Search Strings:** Digital reference  
 Virtual reference  
 Reference Services/Automation

“Mon”  
 “2008”

**Entry 15:**

Stormont, S. (2007). Looking to connect: Technical challenges that impede the growth of virtual reference. *Reference & User Services Quarterly*, 47(2), 114-119.

**Abstract:** Virtual reference has been around for at least twenty years and has grown in popularity, with more and more libraries offering some version. As librarians evaluate their chat services, a consistent question is, "Why aren't more people using this service?" There is abundant evidence that millions of teenagers and young adults are using commercial chat and instant messaging (IM) services regularly, but that isn't translating to the library realm.' A lot of discussion focuses on increased marketing and promotion efforts as the way to increase use of VR services. Little has been written, however, about the influence technical barriers have had on VR and how those issues have impeded VR's acceptance and growth.

**Annotation:** Sam Stormont is the Digital Reference Services Coordinator and Communications Subject Specialist at Temple University Libraries. This article examines problems associated with virtual reference (VR) and VR implementation in libraries. Co-browsing technology problems covered include multiple browser incompatibility, security blocks, pop-up blockers, firewalls, connection speeds, cookie enabling, and bookmarking. The author cites Tutor.com, QuestionPoint, and Docutek as the main companies providing co-browsing VR technology. Embedded IM technologies mentioned include MeeboMe and Chatango. Problems with IM services are also discussed, mentioning the issues of archiving difficulties, and the inability to serve multiple patrons.

**Search Strategy:**

I went to [www.dialogclassic.com](http://www.dialogclassic.com), and typed in “Infosci.” to the command line. “I used the controlled vocabulary terms of “virtual reference” and “digital reference.” I then narrowed the results by unique items, descriptor, and title. I selected Stormont's article, and found the article in Library Literature and Information Science Full Text [Wilson Web], by typing in the author's last name in the search box [all smart search], and 2007 from the year to year box.

**Database:**

DIALOG OneSearch File 1:ERIC 1965-2009/Sep; File 2:INSPEC 1898-2009/Oct W4 File 6:NTIS 1964-2009/Nov W2; File 7:Social SciSearch(R) 1972-2009/Oct W4; File 35:Dissertation Abs Online 1861-2009/Sep; File 47:Gale Group Magazine DB(TM) 1959-2009/Oct 19; File 121:Brit.Education Index 1976-2009/Q4; File 148:Gale Group Trade & Industry DB 1976-2009/Oct 14; File 437:Education Abstracts 1983-2009/Sep; File 438:Library Lit. & Info. Science 1984-2009/Sep

**Method of Searching:**

Controlled Vocabulary

**Search Strings:**

? s digital(w)reference and ?s virtual(w)reference

? s s6/de  
 ? s s6/TI  
 ? s s7 and s8  
 ? t 9/3,k/all

### Entry 16:

Westbrook, L. (2006). Virtual reference training: the second generation. *College & Research Libraries*, 67(3), 249-259.

**Abstract:** First-generation digital reference training centered on technology, policies, procedures, and basic online communication tactics. Recent research and theoretical developments in adult education, digital communication, cognitive psychology, and human-computer interaction can move digital reference training into its second generation. Synthesizing current interdisciplinary developments, this paper presents four overarching guidelines and essential training principles for each stage of the reference interview.

**Annotation:** Lisa Westbrook is a Senior Interaction designer of Seller Platform Performance for eBay Inc. This article provides advantageous methods for training and conducting virtual reference interviews according to second generation of virtual reference theory. This new theory incorporates psychology, education, communication, and human-computer interaction into the methodology of digital reference, to understand user needs on the personal level. The seven stages of the reference interview were analyzed, showing positive results for virtual reference in reducing patron anxiety; however, the research exposed a need for improving congeniality with regard to negative closure.

**Search Strategy:** I used Library Literature and Information Science Full Text because it contains articles specifically relevant to information science and digital reference. Because I was unsure if “digital reference” or “virtual reference” were included as formal terms in the database, I went to the thesaurus tool. Digital reference did not produce any results, but virtual reference led to the term “Reference Services/Automation.” I clicked on this term, and searched through relevant articles, in which, I found Westbrook's full text article in the database.

**Database:** Library Literature and Information Science Full Text [Wilson Web]

**Method of Searching:** Controlled Vocabulary Search

**Search Strings:** Digital reference  
 Virtual reference  
 Reference Services/Automation

**Entry 17:**

Yi, J., Min, H., Haoming, L., & Jing, G. (2006). Study on the collaboration mechanism of the virtual reference service. *The Electronic Library*, 25(6), 733-740.

**Abstract:** Purpose – As the virtual reference service (VRS) is becoming a standard service of the digital library, efficient collaboration among virtual reference services is also becoming more and more important for information exchange and sharing. This paper seeks to examine existing collaborative VRS systems with a view to achieving collaboration. Design/methodology/approach – This paper studies existing collaborative VRS (CVRS) systems and analyzes their structures, methods and functions for achieving collaboration. Originality/value – This paper proposes and concludes collaborative structure models, methods, functions and a reference model of CVRS. It should prove helpful for libraries wishing to provide CVRS, as well as for further research on CVRS.

**Annotation:** Yi Jin, Min Huang, Haoming Lin, and Jin Guo are graduate students of Information Technology at Shanghai Tong University, in the People’s Republic of China. This article analyzes the collaborative virtual reference approach of providing 24/7 reference service. Proprietary technologies mentioned include Virtual Reference Desk (VRD), QuestionPoint, and DCVRS. General virtual services mentioned include voice/video IP, application sharing, co-browsing, IM chat, and whiteboard. Collaborative models are presented, explaining the peer-to-peer, center, and mixture models of collaborative reference. Question routing, patron transfer, and knowledge base sharing are addressed as the primary means of directing reference inquiries. A helpful diagram of virtual reference service is provided, to aid in understanding the electronic model.

**Search Strategy:** I used the [www.google.com](http://www.google.com) advanced search engine. In the one or more of these words search box, I used the keywords “virtual reference” Or “digital reference.” Within the search results, I found the site titled, “Virtual Reference Library at Rutgers School of Communication.” From there, I browsed through the list, and found the article. I then found the article in Library Literature and Information Science Full Text [Wilson Web], by typing in the author's last name in the search box [all smart search], and 2006 from the year to year box.

**Database:** N/A

**Method of Searching:** Keyword Search/ Subject bibliography searching

**Search Strings:** “Virtual Reference” Or “Digital Reference”  
Referenced in:  
Rutgers School of Communication, Information, and Library Studies (2009). *Virtual Reference Bibliography*. Retrieved from <http://vrbib.rutgers.edu/>

“Yi”  
“2006”

### **Conclusion and Personal Statement:**

After completing the annotated bibliography, I have learned several important facts about the field of library and information science. The initial lesson learned was the diversity of technology available for digital reference. I was able to gain an important insight on what services are used, and the names of specific companies that produce them. This will prove useful as a future information professional, as I will have had previous experience with analyzing digital reference technology. Additionally, from the annotated bibliography, I have learned how to evaluate digital reference sources. After reading the research, I am able to view the technology from a computer science perspective, and critically evaluate the technical glitches that plague digital reference services. As a future information professional, this will help me to successfully develop the implementation of new technology, or help patrons troubleshoot complications, that prevent them from using digital reference services. Based on the technological demands of certain services, I will be able to evaluate the technical capacity of my service population, and provide them with the most compatible digital reference services.

The third lesson learned from the bibliography was the process of education and implementation needed for digital reference services. It was important to understand that both patrons and librarians will need to be educated when implementing new services. Within the educational field, it was additionally important to learn who the researchers in the field were, and what publications were publishing new findings on digital reference. This will help me as a future information professional, as I will now be aware of publications I should subscribe to, in order to remain current on the topics of digital reference and emerging library technologies.

The annotated bibliography also helped me to comprehend the competency standards for digital reference and education. These guidelines serve as a method of self-evaluation, to determine if continuing education is needed in a particular subject or skill. Lastly, the annotated bibliography taught me how to conduct in-depth research on a specific topic in library and information science. I learned how to find articles using a variety of methods, such as the Internet, proprietary databases, footnote chasing, browsing, and using integrated interface systems. I have been able to hone research skills, and better understand controlled vocabulary, truncation, and boolean searching. This will not only help me as a future librarian, but also for conducting research, if I decide to continue my education in a specialized field of the library, such as history or literature.