Pathfinder
A Canadian Journal for Information Science
Students and Early Career Professionals

Chat Reference: A Review of Question Types and Its Implication to Staffing and Communication Strategies

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Abstract

Chat reference services have become increasingly important in libraries providing remote reference assistance to users. The success of these services depends on several factors, including staffing and training. This literature review examines the relationship between question types, the staffing model, and the areas of improvement related to these issues. It draws on various sources, including qualitative and quantitative studies on chat transcripts from different types of academic libraries. Regarding question types, chat reference services are best suited to straightforward and factual queries, while more complex or subjective questions may require other assistance. Chat reference providers should also know the medium's limitations, such as difficulties displaying images or lengthy texts. In order to provide high-quality service, chat reference providers should ensure that staff have the necessary skills and knowledge, as well as appropriate levels of support and supervision. The review explores the advantages and disadvantages of student staffing in particular. Clear and effective communication strategies are also essential, including managing user expectations, providing timely responses, and following up as needed. Overall, this review provides a comprehensive overview of the literature around best practices for chat reference service providers, highlighting the importance of careful planning, implementation, and ongoing assessment.

Keywords: chat reference, chat GPT, academic librarianship, academic libraries, librarians

E ver since chat reference became a component of library services at the beginning of the twenty-first century (Ford, 2002), libraries have become aware of the variety of challenges that have risen alongside the benefits of the service. Digital reference, sometimes known as "chat reference," is the term used to

describe reference services that are requested and delivered online, typically by e-mail, instant messaging ("chat"), or Web-based submission forms and are usually handled by chat reference librarians (ODLIS, 2022). The emergence of chatbots has prompted an interest in the role and effectiveness of chatbot services in libraries (Bilal & Chu, 2021). While chatbots can offer a potentially cost-effective and scalable solution to providing reference assistance, the literature shows many users value a more human touch in chat reference interactions. Even without the nonverbal components of face-to-face conversation, the chat medium is rich in context (Matteson, Salamon, & Brewster, 2011).

This literature review explores the current research on chat reference in academic libraries with a focus on best practices for chat reference staffing in different academic settings and question types. Literature discussing the difficulties in communication and solutions follows, providing suggestions for training content. Finally, the review covers common themes among chat reference providers and users in academic libraries.

Method

A background search was performed to identify the scope of the topic. Reitz's *The Online Dictionary for Library & Information Science* (ODLIS, 2022), the *Encyclopedia of Library and Information Sciences* (McDonald & Levine-Clark, 2017) and *The Virtual Reference Handbook: Interview and Information Delivery Techniques for the Chat and E-mail Environments* (Kovacs, 2007) provide the definitions terminologies for the discussion of chat reference. These resources also identified the three key issues in chat reference: staffing, question types and communication.

Basic keyword search and known-item search were used to generate relevant journal articles from Library Literature & Information Science Full Text (H.W. Wilson) (LibLit) and Library and Information Science Abstracts (LISTA). To refine the search results and structure the search, synonyms and alternative expressions are found for each concept in the LISTA thesaurus and combined with OR to create a search block. Each block went through an individual search (Appendix A).

Three combined block searches were conducted by combining the search histories of "chat reference" and "academic libraries" with the search history of "staffing",

"question", and "communication" using AND in the advanced search (Appendix B). Searches were limited to peer-reviewed publications of the past 20 years written in English.

Analyzing Question Types

Categorizing the questions asked by patrons during the chat reference can provide information around patrons' needs and the major tasks of chat reference operators. Currently, there is no standardized categorization method for these questions, but the literature shows two common categorization methods, complexity and professional expertise.

Complexity

Complexity is shown in the types of information requested. Meert-Williston & Sandieson (2019) classified questions by complexity to show the implications on staffing and while the Phelps (2017) focussed on the impact of proactive chat. Other earlier studies examined the question asked in reference transactions as a starting point. Katz (2002) identified four primary library reference transaction question types: directional, ready reference, specific search, and research. Ware, Fennewald, Moyo and Probst (2002) further classified questions into instructional and technical. Marsteller and Mizzy (2003) added policy or procedural into the category of directional questions and expanded a new category of available items.

Arnold and Kaske (2005) separated policy and procedural questions from directional questions and added a new category, holdings. Clanton, Stags, and Williams added training or demos and extended reference. Studies by Bravender, Lyon and Molaro (2011) and Rawson, Davis, Harding and Miller (2013) followed suit. Armann-Keown, Cooke, and Matheson (2015) classified questions by type of assistance, for example, search strategy, services, copyright, contact information and collections.

Level of Professional Expertise

The READ Scale (Gerlich, Karr and Berard, 2010; Ward and Phetteplace, 2012) defines six levels of expertise, with levels 1-2 the least skill needed, level 3 requires some time and effort for instruction, specific reference and searching, level 4-6 requires complex, cooperative, interdisciplinary searching and referencing skills. Level 1-2

questions included directional, ready reference and borrower services. Level 3 questions included specific search, instructional and technical questions. Level 4-6 questions included research and extended reference. These categories are not mutually exclusive; for example, questions related to policies and procedures can be ready reference questions or, specifically, borrowing policies under borrow services.

Maloney and Kemp (2015) classified the difficulty level by the role of the chat reference operators: non-professional or student, generalist and librarian level. "Non-professional" questions are directional, technical and policy questions; "generalist" questions are simple reference questions involving searching, ready reference and citations; "librarian" questions involve subject expertise and copyright issues. Bishop (2011) defines location-based questions as appropriate for lower-levels of staff expertise when comparing the service quality of independent and consortium chat reference services (Bishop 2012, 2013). Blizzard's (2018) categorization helps summarise the type of information and assistances chat reference operators offer, which are strong research skills and a deep understanding of library services and policies. There are four main categories: reference, borrower services, directional and technology help and each with subcategories. However, these categories highlight the question types instead of the complexity of the questions.

Questions can vary from one academic library to another. Future studies should consider revising and summarizing the questions recorded in previous studies. For instance, examining how question types and complexity influence other variables, such as staffing and communication strategies (Appendix C).

Frequency of Types of Questions Asked

While recognizing that sample sizes, the size of each academic library, and the duration of the studies affects the analysis of the frequency of question types being asked, an overview of the most asked question types over the past 20 years still gives a general sense of how chat reference services were used and can be used in academic libraries. The literature shows that reference operators would more likely encounter levels 1-2 and 3 questions and these questions are more likely to be non-reference questions.

On average, 35% of the questions were location-based (Berry et al., 2003; Bishop, 2011, 2012; Bishop & Torrence, 2008; Coté, Kochkina, & Mawhinney, 2016; Hyde & Tucker-Raymond, 2006; Kwon, 2007). Marsteller (2003) found that technical problems were the most asked questions (32%), while the second highest was directional or policy questions representing 17% at Carnegie Mellon University's academic libraries. Arnold and Kaske (2005) found that most questions were policy-related (41%) at the academic libraries of the University of Maryland (UM) College Park. DeGroote, Dorsch, and Collard (2005), Goda and Bishop (2008), and Rourke and Lupien (2010) also showed that policy questions were asked most frequently.

Research conducted at Penn State University in 2002 (Ware, Fennewald, Moyo, and Probst) showed that the most asked questions were instructional (39%), while 32.5% were research related. Findings by Morais and Sampson (2010) (64%) at the Georgetown University Law Library and by Bravender, Lyon, and Molaro (2011) (35.5%) at Grand Valley State University Libraries showed that the most frequently asked questions were ready reference, instructional or extended reference, essentially level 2-3 questions. However, Cabaniss (2015) found that only 23.3% were reference questions. Rawson, Davis, Harding and Miller (2013) found that the most asked question type was specific search (52%), which is supported by Maloney and Kemp's (2015) findings (44%) in terms of the level of expertise. Nearly half of the level 3 and 4 questions were related to topic exploration (Maloney & Kemp, 2015). Mungin (2017) found that reference accounted for the most asked question type (39.6%). While Meert-Williston and Sandieson (2019) showed that service questions were most frequently asked (51%); of these 67% were informational and 3% were directional. 25% of all questions were reference-related (ready reference 67%; in-depth 16%; instructional 6%). Skaggs (2020) found that research was the most-asked question type (37%) at West Chester University. These results show that chat reference operators should be mindful of policy, reference, and research questions, which requires higher skill levels for searching techniques.

Staffing Models

Independent and Collaborative services

In Walker's survey (2007), 39% of the library staff stated that recruiting and retaining staff to operate chat reference services takes much work. Staffing issues were a crucial reason for chat reference services to be discontinued. Several studies have argued that relying on professional librarians alone to staff a reference desk or chat service is cost-ineffective (Bracke et al., 2007; Ryan, 2008). Bravender et al. (2011) found that in a medium-sized academic institution, answering a library chat question can cost between $37 and $439 USD. The literature shows two ways for libraries to make chat reference cost-effective: consortia arrangements (Coffman & Arret, 2004b; Peters, 2002; Powers, Nolen, Zhang, Xu, & Peyton, 2010) and through tiered staffing model that involves students (Brenza et al., 2015; Stevens, 2013).

A collaborative virtual reference service or consortium, such as the Ontario Council of University Libraries (OCUL), provides services by forming a virtual network of libraries with the collective local knowledge and collections. At the same time, an independent chat service provides services within a single location (Shaw & Spink, 2009). There are disadvantages to using a consortium. Several studies on consortium service reported frequent referrals by consortium staff (Hyde & Tucker-Raymond, 2006; Bishop, 2011; Bishop, Sachs-Silveira, & Avet, 2011). There are also difficulties in answering real-time and local questions (Kwon, 2007), affecting the quality of service the consortium staff provides (Meert & Given, 2009). Barrett & Pagotto (2019) found there was a correlation between institution mismatch and user dissatisfaction, an area that needs more research.

Student staffing

Around 39% of academic libraries hired paraprofessional staff, such as part-time workers, undergraduate students, or library school students to manage consortia chat reference services (Devine, Bounds Paladino, & Davis, 2011). Meert-Williston and Sandieson (2019) suggested that "for a large institution with a large number of staff with varying levels of expertise, having staff with a mid-level of expertise may prove to be the most effective and efficient way to staff the service" (p. 58). However, they did not

define what "mid-level" of expertise is and why it is the most beneficial. Academic libraries tend to use this tiered staffing model; library assistants send search strategy-related questions to a second-level librarian and specific subject-related questions to a third-level specialist (Strong, 2006).

Barrett & Greenberg (2018) believe that with training in communication, in-depth reference interview techniques and ongoing evaluation, student staff can provide high service quality for chat reference. Student staff received positive feedback from chat reference users regarding satisfaction with approachability and helpfulness, comparable to librarians' performance (Stevens, 2013; Faix, 2014). Lux and Rich (2016) found that student staff offered quality assistance in 88% of Bowling Green State University chat reference transactions. Less user dissatisfaction rate is found in a consortium staffed by MLIS graduate students (Barrett & Pagotto, 2019).

One study found that student staff members were good at providing step by step instructions and explaining the process (Keyes & Dworak, 2017). Canuel et al. (2019) also showed that 66% of the time graduate student staff used instructional methods, such as step-by-step guides to find information needed (modelling), resource and search strategy suggestions, and library instruction on research concepts, when providing reference services. However, Wharton and Mann (2020) revealed that the confidence rate of non-librarian staff has decreased; only 38% said they were confident in providing chat reference services. Another study found that student staff answered fewer research questions (35%) than librarians (43%); (Baumgart, Carrillo & Schmidli, 2016). This suggests that student staff are equipped with the instruction techniques to answer the questions that require higher research skills, but confidence may be an issue that hinders student staff from answering more research questions.

Communication Issues

Technical limitations and reliance on text-based communication can lead to misunderstandings and require clarification and restatement to ensure that the librarian and patron are on the same page during chat reference. The chat duration can be short; Watson (2023) found that most chat interactions last around ten minutes. Few simple questions and answers come into chat simultaneously, requiring both chat reference

operators and users to address the related topics clearly (Zemel, 2017). This ability is hampered by chat's technical limitations, where users can only use alternate lines to reply to messages individually (Fagan & Desai, 2013).

In contrast, the question type analysis has shown that the complexity of questions can go as high as level 4, which requires time and effort to instruct and research specific topics. Shaw and Spink (2009) also pointed out that the questions received from the chat often need to be more clearly defined and require more time for interactions between the chat reference operators and patrons before reaching a complete answer, which results in prolonged conversations. Answer accuracy is correlated with overall service time and the gaps between chat reference operators' chat responses (Matteson, Salamon & Brewster, 2011).

At the same time, students' frustration and struggle to find adequate sources are recognized by librarians (Jacoby et al., 2016). RUSA (2013) suggests librarians should "acknowledge user questions promptly" (2.3.1) and "respond in a timely fashion to remote queries" (1.3.2), but the acceptable waiting time is unknown. It is suggested that chat reference operators should check in with users' patience (Fagan & Desai, 2013). How chat reference operators effectively manage users' expectations is not extensively covered in past literature and is an area that requires more study.

Student Staff Communication Concerns

The literature identifies two communication-related improvements for student staff providing chat reference: courtesy and information literacy. The need for courtesy appears in much of the literature. Keye and Dworak (2017) found there was a significant association between courtesy and different types of chat reference operators, with students being the least courteous (73%) among staff (88%) and librarians (76%). These results reflect Lux and Rich's (2016) research which showed that student desk assistants offered a greeting only 50% of the time, compared to 66% for librarians. Indeed, some chat transactions may need to be longer to express greetings appropriately. It is also reported that student staff communicated in an overly informal style (Barrett & Greenberg, 2018; Langan, 2012). Although some research concluded that the quality of service was not impacted by inadequate greetings (Zhou, Love, Norwood, and Massia, 2006), informal chat reference operators were perceived as

young and inexperienced (Waugh, 2013). Hence, maintaining formal language can help to students preserve a professional image in chat references.

Quality of Chat Reference

Three critical components of improving the quality of chat references for all levels of staff have been identified in the literature: formality, instruction, and the reference interview. Student library staff must improve their information literacy skills to provide and locate accurate user resources. Keyes and Dworak (2017) found that student staff have the lowest rate of providing sources among staff and librarians. Student staff are also less likely to conduct searches for the users (71%) than regular staff (90%) and librarians (81%). Student staff should also be trained to conduct complete reference interviews (Barrett & Greenberg, 2018; Langan, 2012). The literature suggests that training in the future should raise the awareness of customer service skills, search strategies and reference interview techniques to ensure student staff members can provide the information needed successfully.

Lux and Rich (2016) found that when referrals were needed, student staff only did so 53% of the time, contrasting with librarians who did so 80% of the time. Moreover, they also found that in 47% of the cases where referrals were needed, student assistants referred the case inappropriately or did not refer the case at all. It is suggested that librarians, who have a higher level of expertise, should respond to chat reference questions first when both a librarian and student assistant are on duty (Baumgart, Carrillo, & Schmidli, 2016).

While confidence could be one factor affecting student library staff's perception of chat reference, training could help non-librarian staff triage complex questions. Moreover, the desire for feedback on the performance in chat reference from the coordinators was reflected in Wharton and Mann's study (2020). Additionally, "secret shopper" or transcript review would also provide good practice opportunities (Luo, 2009).

Quality Concerns for Other Staff and Librarians

Research by Logan, Barrett and Pagotto (2019) showed that closing behaviours such as satisfaction checks and invitations to return are associated with less

dissatisfaction among patrons. However, the chat transcript analysis by Keyes and Dworak (2017) showed that chat reference operators included a sign-off only 56% of the time. Lux and Rich (2016) also reflected the everyday use of closing-off behaviors. The possible choices were "No closing," "Basic closing," "Closing with confirmation that question has been answered and/or with offer to return if needed," and "Chat ended abruptly; no chance to offer closing." Librarians (15%) were slightly more likely than students (11%) not to offer a closing; librarians who did offer a closing were also more likely (31%) to invite invitation users to come back and seek confirmation that they addressed users' questions.

Formality

Formality consists of several elements: language, professional tone, actions, and communication style. When typos and poor grammar characterize the use of language, it leads to misunderstandings, which harm librarians' credibility and undermines user trust (Fagan & Desai, 2013; Koshik & Okazawa, 2012; Waugh, 2013). In contrast, emoticons -absent of these language problems- exaggerated typographical elements, and abbreviations, can, according to Fagan and Desei (2013), offer an informal, professional, and welcoming tone. Moreover, if a librarian's actions convey a professional demeanour and an interest in or empathy for a patron, it elicits increases patron satisfaction (Logan & Barrett, 2018; Logan, Barrett & Pagotto, 2019). User's opinions of the conversation style and the level of service satisfaction may be positively impacted by a more casual approach; in some studies unsatisfied faculty members preferred an informal approach (Logan & Barrett, 2018; Logan, Barrett & Pagotto, 2019). For example, librarians can start with a friendly and empathic conversation to ease faculty members' anxiety over their research obstacles.

This informality may lessen some of the dangers to a librarian's reputation that come with giving advice. For instance, face-saving techniques for librarians and clients include fostering a supportive and empathetic relationship (Owens, 2013). The concept of "face" means "the respectability and/or deference which a person can claim for himself from others, by virtue of the relative position he occupies in his social network and the degree to which he is judged to have functioned adequately in that position as well as acceptably in his general conduct" (Ho, 1976, p. 883; after Hu, 1944). "Face" is

"saved" when an individual "satisf[ies]" the minimum requirements society has placed on him" (p. 872) by the actions of others. Research suggests that humour is another common face-saving technique (Koshik & Okazawa, 2012; Fagan & Desai, 2013; Owens, 2013). The formality of librarians, on the other hand, can make patrons feel inferior (Waugh, 2013; Koshik & Okazawa, 2012); if patrons mitigate their formality, however, librarians will follow suit, a method called "syntactic mirroring," a practice encouraged by Fagan & Desei (2013) and Mawhinney & Hervieux (2022).

Reference Interviews

The question posed raises yet another communication challenge. Although reference or research queries are one of the most common types of chat questions, virtual reference users mistakenly believe that chat can only answer simple questions; yet reference interviews occur in conversations fewer than half the time (Mawhinney & Hervieux, 2022). Open-ended queries are frequently used in chat references, but in the investigated conversation transcripts, only 33% of the total queries were open-ended (Radford, Connaway, Confer, Sabolcsi, & Kwon, 2011). Open-ended inquiries are encouraged (Matteson, Salamon, & Brewster, 2011) but they could also make people uncomfortable about being "interrogated" and confused with the broad scope (Avery et al., 2016; Fagan & Desei, 2013, p.143).

Radford, Connaway, Confer, Sabolcsi, and Kwon (2011) have identified questions raised by patrons and librarians that aid in clarification, including those that relate to search history (librarians: 20%; users: 14%), extent/depth of the information needed (librarians: 11%; users: 20%), type of resources (librarians: 11%; users: 9%), verifying understanding (librarians: 20%; users: 15%), and follow-up questions (librarians: 50%). Before signing off, a librarian can ask follow-up questions, offer a satisfaction survey, and invite the patron to return; these methods can enhance accuracy but do not correlate with user satisfaction (Logan, Barrett, and Pagotto, 2019). No evidence exists, then, that suggests a connection between the frequency of open-ended inquiries and user happiness.

Instruction

Lux and Rich (2016) found that almost half the time, librarians provided instruction when needed. However, Fuller and Dryden (2015) found that 4% did not offer instruction when needed. Instruction questions were one of the most asked questions in chat reference. Users receiving instruction are slightly more satisfied than users who are not. This implies that instruction might play an important role in improving users' satisfaction (Barrett, Logan, Pagotto & Greenberg, 2020). Dempsey (2017) found a need to explain research guides. In their study, the current research guide is designed to list resources by format, but half the time, librarians were more likely to send students a link than to explain the content of the research guide and instruct them. Explaining the content of the resources in the research guide to students, especially first-time users, and how to use research guides can ensure that students would locate the relevant and valuable library collections to find what they need efficiently. Based on these findings, librarians may consider incorporating more instruction on search strategies in future chat references.

Research Gaps

Three potential research gaps exist, all concerning the lack of standardized evaluation measures for the effectiveness of different communication strategies in chat reference. First, the effectiveness of using open-ended questions in chat reference services to improve accuracy and user satisfaction needs to be examined. While open-ended questions are encouraged for accuracy, it is still being determined whether the frequent use of open-ended questions leads to more satisfaction or dissatisfaction. Second, whether informality negatively affects the professional image of librarians and patron trust is still being determined. Third, the effectiveness of face-saving communication strategies in chat reference services to build trust and rapport between librarians and patrons could be explored. While communication strategies have been identified that save face in chat reference services, their effectiveness in building trust and rapport between librarians and patrons still needs to be determined.

The impact of chat duration on the quality of chat references may be a valuable area for future research (Lux & Rich, 2016). It is more likely that chat reference operators would skip the reference interview because of the nature of the chat

environment. The user's expectations for a short and simple question and answer and their frustrations on finding accurate resources might contrast with chat reference operators' need to understand users' requirements. Gathering data about chat duration will help chat reference operators determine the need for reference interviews in chat transactions since currently, reference interviews help identify the users' needs and are deemed unavoidable. Moreover, whether reference interviews will bring user satisfaction is still being determined.

The study of institution scale and its relationship with question types will help analyze what staffing model is needed; resources in each academic library are different; hence the question types might vary. Topics include institutional mismatch and the cost-effectiveness of hiring student staff for chat reference services. For future research, the use of chatbots in academic libraries, their effectiveness in answering different question types, and the differences in communication between robots and humans in contrast with that between humans and humans are worth studying.

Conclusion

Chat reference is a valuable tool for librarians to connect with patrons and provide reference assistance. The literature shows that question types can help determine the staffing needs of an academic library and highlights the different factors affecting the quality of chat references, namely communication strategies. This review examined the complexity and the content of chat reference question types, two significant types of staff models, and the relationship between question types and staffing models. Drawing on both qualitative and quantitative studies of chat transcript analyses of different types of academic libraries, this paper provided information from the literature around independent and consortia reference models and the pros and cons of student staffing.

This review shows that with training, student staff can handle the more intermediate questions from the chat reference users. At the same time, they require training in identifying referral questions and maintaining a professional image. Chat reference providers should also be aware of the nature of chat reference, especially in gauging the patience of users and the duration of chat transactions. In order to provide

high-quality service, librarians and other staff should ensure that they balance informality with formality, conduct a reference interview whenever suitable, and provide teaching and instruction when possible. These strategies make the triage and the tiered staffing model work.

More research is needed, particularly around the use of chatbots in academic libraries. Limitations of this review include the limited database search and the problem of error deviation when comparing the data from different studies. Overall, the literature provides a comprehensive overview of the insights on question types, staffing and communication suggestions for chat reference service providers.

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Appendix A

Search Strategies

Search ID #	Concepts	Search terms/ blocks	Results in LibLit	Results in LISTA
S1	Chat reference	1. "Chat reference" or "online reference work," or "virtual reference," or "digital reference," or "electronic reference services" AND 2. "chat rooms," or "real-time communication," or "synchronized communication," or "computer-mediated communication," or "online chat," or "chat," or "instant messaging," or "chat rooms"	179	276
S2	Staffing	"Paraprofessional" or "students"	21,702	22,100
S3	Question	Question	12,069	13,599
S4	Communication	Communication	550	36,463
S5	Academic libraries	"Academic libraries" or "higher education"	22,424	24,178

Appendix B

Combined Search Strategies

Search ID #	Concepts	Search terms/ blocks	Results in LibLit	Results in LISTA
S6	Chat reference AND Staffing AND Academic libraries	S1 AND S2 AND S5	30	35
S7	Chat reference AND Question AND Academic libraries	S1 AND S3 AND S5	33	42
S8	Chat reference AND Communication AND Academic libraries	S1 AND S4 AND S5	15	23

Appendix C

Research Question Type & Complexity

RESEARCH CATEGORIES	Directional: 1. Hours 2. Facilities/Building related 3. Geographic directions 4. Non-Library 5. Library systems 6. Service 7. Contact Information 8. online catalog/my account	Borrower Service: 1. Circulation (including holds, renewals, fines) 2. Borrowing policies 3. Interlibrary loan	ready reference: 1. known-item search 2. policy and procedural 3. how do I cite? 4. Collection	Specific search: 1. miscellaneous	Instructional (information literacy): 1. search strategy 2. training/ demos 3. How do I?	technical: 1. "How-to" questions 2. Access to electronic resources 3. Troubleshooting 4. Computers, printers, and other hardware 5. Software such as Microsoft Office or Google Docs 6. Printing/Other Technology	Reference/ Rearch: 1. Open-ended research questions 2. Copyright 3. extended reference 4. referral
READ Scale (Gerlich and Berard 2010) (Ward and Phettplace 2012)	Level 1–2: Require minimal knowledge, skills and expertise. Directional inquiries, call number inquiries, item location, minor computer help, general library or policy information.		Level 3: Require some time and effort. Require specific reference resources, basic instruction on searching the online catalog, direction to relevant subject bases, more complex technical problems.				Level 4–6: Reference knowledge and skills needed, complex searches, services outside reference, consultation, more cooperative in nature, "false leads," interdisciplinary research, graduate research, and primary documents may be used.
Maloney and Kemp (2015)	Non-professional; student			Generalist			Librarian
Katz (2002)	directional	ready reference		specific-search			research
Ware, Fennewald, Moyo, and Probst (2002)		ready reference		instructional		technical	research or subject request
Arnold and Kaske (2005)	directional	holdings/do you own	policy and procedural	specific-search			research
DeGroote, Dorsch, and Collard (2005)	library hours/location, citation verification,	book holdings, Journal holdings, A/V/special collections holdings, collection suggestions	library policies/procedures	looking for articles on a specific topic, locate information on a specific topic factual, statistical, technical access,		database mechanics accessing e-resources accessing e-journals Web page errors,	research consultation / complaints/courtesies, and other
Clanton, Staggs, and Williams (2006)	directional	ready reference		training/ demos			extended reference
Rawson, Davis, Harding and Miller (2013)	directional	ready reference / "How do I cite?" / holdings/do you own	policy and procedural	specific search			research
Armann-Keown, Cooke, and Matheson (2015)	Library systems Services Contact information	Collections / Citations	Policy	miscellaneous	Search Strategy	Technology / Test	Copyright
Mungin (2017)	Directional/Policy	Known Items			Class Demo	System Test / Tech. Problem	Reference / Undetermined
Blizzard (2018)	1. Directional: Hours Facilities Geographic directions	2. Reference: Known-item searches Citation help Open-ended research questions	3. Borrower services Circulation (including holds, renewals, fines) Borrowing policies Interlibrary loan	4. Technology help: Troubleshooting Computers, printers, and other hardware Software such as Microsoft Office or Google Docs "How-to" questions Access to electronic resources			
Skaggs (2020)	Building related Hours Related Non-Library Service	Citation related Known Items Reserves	Circulation / Policy	How Do I		Printing/Other Technology	research