Evidence Based Library and Information Practice

Article

A Virtual Standoff – Using Q Methodology to Analyze Virtual Reference

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Abstract

Objective - To develop an exploratory understanding of reference librarians' perceptions of virtual reference.

Methods - Q methodology was used to uncover points of view about virtual reference. Thirty-four librarians sorted 28 statements covering a wide range of opinions about virtual reference. Factor analysis was used to analyze the Q-sorts and factor scores were calculated to aid the task of understanding and interpretation.

Results - The factor analysis revealed three attitudinal typologies: Technophiles, Traditionalists, and Pragmatists. Each factor represents a group of reference librarians who think similarly about virtual reference.

Conclusion - This type of analysis provides data on the actual range of feelings and attitudes about providing virtual reference services. The factor analysis demonstrates that there are still a variety of strongly held viewpoints concerning virtual reference. Convergence towards either acceptance or rejection does not appear to be forthcoming.

By using this type of analysis and the resulting data as a basis for decision making, administrators could staff services more efficiently and with the resulting better fit between librarians and their positions, possibly increase morale.

Introduction

Virtual reference is a service through which patron and librarian communicate in real time using a computer and communications technology. This research focuses its investigation on virtual reference from the perspective of academic reference librarians who provide this service as a part of their job. Is there broad consensus among academic reference librarians with regards to their attitudes and beliefs toward virtual reference? Or are there diverse opinions and perceptions of this relatively new service? If there are divergent points of view, what are they? There is an expectation that there are competing viewpoints or perspectives toward virtual reference and that they need to be revealed and better understood. As we seek to understand the long term viability of virtual reference and, for that matter, other technology-enhanced services, it is also necessary to understand librarians' attitudes toward this service. If there is a contingent of reference librarians that do not find value in virtual reference, what does this say about the future development of this service? How important are consensus and shared values among reference librarians as they examine ways to exploit information technologies in their traditional work? This research is a step towards developing a better understanding of how reference librarians think about virtual reference. The findings may also be of more general interest as the roles of librarians continue to be shaped by information technologies.

Literature Review

As digital reference services become more ubiquitous, practitioner reports have proliferated. This can be seen through a search of the literature. Bernie Sloan's "Digital Reference Services Bibliography," last updated in 2004, includes over 700 entries on digital reference services. Searching just on the subject term "electronic reference services" in the Library, Information Sciences and Technology Abstracts (LISTA) database returned over 390 articles, and the numbers continue to grow as more is written on the topic. However, despite the abundance of articles, empirical scholarly research on the subject has lagged. Of those 394 articles, less than 9% (34) used quantitative research based on an analysis of their abstracts.

This study is grounded in two bodies of literature. The first consists of articles describing how reference librarians interact with digital and networked technologies. This has been an issue since the late 1990s when digital reference services were becoming more common. A survey of 68 academic libraries in 1998 found that librarians at that time reported increased satisfaction from providing digital reference services but were also overwhelmed by the constant changes and felt that they needed more instruction to be effective (Tenopir and Ennis). Support staff echoed these sentiments in a study on perceptions and opinions of technological change in 1999 (Jones). They felt the need to keep up with change was challenging, and desired more training. However, they also felt that technology gave them more control over their workday, which is especially important in a support staff position.

As more and more libraries began to provide virtual reference, librarians reported feeling that the context of reference has changed (Wilson). Library users now

have different values, attitudes and beliefs regarding information, and reference service providers will have to change to meet the users' new needs and expectations. One aspect of these changes is the perceived loss of the reference interview. Janes and Hill reported that although librarians were generally happy with the questions they received through digital reference, they felt the evolving practice of reference involved trade-offs between traditional reference (including a face to face reference interview) and the new practices online. Overall, studies continued to find librarians generally positive about the impact and reach of digital reference. It is felt that reference is now more accessible and also more interesting and challenging to the profession (Janes). Based on these findings, there seems to be a good amount of research citing librarians that are positive about digital reference, but what about those who are not?

The second body of literature on which this research is based is more normative, examining the nature of reference in this increasingly digital world? These studies also look to the future and consider how reference is evolving. Here more dissatisfaction with digital reference services emerges. In 2000, Campbell reported that librarians were in denial about the decline of reference, particularly face to face reference services. The trend toward digital reference is seen as another fad that is adopted, rather than insisting on good service through face to face reference (Bridges). Bridges also compared contemporary university library policies with current consumer values, (i.e. giving customers what they want). Anhang and Coffman went so far as to debate the future of traditional reference librarians in their article in *American Libraries*. While Anhang cited statistics showing a continuing decline of in-person reference, coupled with little success in online reference (at that time), Coffman countered

with arguments about the strengths of librarians in providing free reference services and access to materials not available online. This debate has continued throughout the literature, including a "manifesto" written by Jackson in 2003. He contends that librarianship is still a vital profession and has much to contribute. The fact that instruction sessions have continued to increase at many US Association of Research Libraries (ARL) libraries and that question complexity is also on the rise indicates a need for librarians' services in his view.

Coffman & Arret wrote a two-part series on virtual reference in 2003. The first installment discussed the history of virtual reference and how the services had changed since their introduction in the late 1990s. The demise of commercial on-line reference services is also discussed as a menace that came and went "virtually" unnoticed. The second article in the series examined the state of current virtual reference services and made suggestions for their improvement, including some radical ideas such as eliminating chat reference altogether and emphasizing phone and email reference as alternatives. The difficulty of getting good usage statistics is also mentioned, although it is agreed by all that in-person usage seems to be declining, however it is measured. They go onto discuss online reference services operated by library consortia, some of which have been successful ("KnowItNow" in Ohio), and others less so.

So what does this tell us? Virtual or digital reference seems to be a part of the modern academic library, regardless of its usage or popularity. While some librarians have been largely positive about it since the beginning, others still bemoan the loss of the reference interview and traditional face-to-face reference service. Studies of librarians'

views about online reference after providing the service for a few years are lacking.

Q-*Methodology*

Q-methodology is a fully developed method for the systematic investigation of human subjectivity (Brown, "Q Technique and Method" 57). Subjectivity in this context refers to the communication of a person's own point of view about some topic. As such, Q is particularly well suited to developing an exploratory understanding of librarians' perceptions regarding virtual reference. Most typically, a Q study involves three basic procedures. First, a set of opinion statements about some topic of interest are collected. Next, individuals read the statements, react to them, and sort them along a continuum of preference (usually from "agree" to "disagree"). This operation is known as a Q sort. It is the ranking of the statements from an individual's own point of view that brings subjectivity into the picture. Lastly, once viewpoints are modeled in Q-sorts, data are analyzed, most often using a statistical technique called factor analysis. Unlike survey research which is concerned with patterns across variables, Q is interested in patterns across individuals. Factors that emerge from the analyzed Q sorts indicate segments of subjectivity and represent points of view. Factor scores are calculated to aid the task of understanding.

Q methodology was introduced in 1935 in a letter to *Nature* written by William Stevenson, a British physicist and psychologist. Today, Q methodology is being widely adopted in the social sciences, most notably in the fields of communication, political science, and health sciences. According to the International Society for the Scientific Study of Subjectivity, a Q bibliographic database maintained at Q-Method, a website devoted to the practice of Q, has over 2500 entries. In recent years, the Q technique and its methodology has broadened its appeal and been applied in a number of intellectual fields, including marketing, religion, and women's studies (Brown, "History and Principles of Q"). In the field of academic librarianship, however, Q methodology is relatively unknown, except for one study that reports how a Q sort was used as a technique to prioritize journal titles as candidates for possible cancellation (Dick and Edelman).

With the small sample sizes required and equally small costs associated with it, Q methodology is well suited to the field of library research.   The ability to get at subjective opinions but yet still analyze them in a quantitative manner also uniquely suits the field, where anecdotal evidence is more often obtained rather than hard data. While it is often assumed that subjectivity – a person's point of view – is impossible to study systematically and with any degree of precision, Q methodology provides researchers with a systematic and quantitative means for examining subjectivity. This study uses Q methodology to address the following questions. Is there broad consensus among academic reference librarians with regards to their attitudes and beliefs toward virtual reference? Or are there diverse opinions and perceptions of this relatively new service? If there are divergent points of view, what are they? Once this information is obtained, it can be used for practical purposes such as improving staffing decisions and utilizing staff more effectively, while at the same time improving morale and perhaps even increasing staff retention.

Methods

The statements selected for a Q sort are drawn from what is called a "concourse." A concourse can be understood as the volume of discussion on any topic. It is the task of Q methodology to reveal the form and structure of a concourse. There are a

number of ways to capture a concourse. Typically, interviews are undertaken to collect views on a topic. This study took a slightly different approach: gathering close to 100 statements from a number of different sources including essays, discussion groups, blogs, and conference presentations where people expressed opinions about virtual reference. Statements were not edited. From this collection of statements about virtual reference service, 28 were chosen that sample the diversity of opinions on virtual reference. There are two basic techniques for selecting statements to be used in a Q sort, structured and unstructured sampling (McKeown and Thomas 28). This study selected statements based on unstructured sampling, a process where statements presumed to be relevant to the topic of investigation are chosen without undue concern that coverage of all possible sub-issues are exposed. From the initial sample of just under 100 statements, the researchers determined that 28 statements adequately represented the diversity of opinions about virtual reference without favoring some to the exclusion of others. Additional statements could have been added to the Q-sample, but the researchers were concerned that a larger number of statements would deter participants from completing the Q-sort.

Q is an intensive form of analysis and involves small numbers of subjects. As such, it makes no claims about being statistically representative of some larger population. Its purpose is to present a picture of the types of thinking that exist in relation to a specific topic or issue. It does not tell what proportion of the population subscribes to a particular way of thinking. To answer this question, a traditional, large n-sample survey would need to be administered (McKeown and Thomas 37).

The intent of this research was to draw a sample that represents a cross-section of academic reference librarians from three sizes of libraries: large, medium, and small. To this end, data from the 1998 Integrated Postsecondary Education Data System (IPEDS) survey of academic libraries was used to create a list of libraries ranked by the size of their professional staff (National Center for Education Statistics, USA). From this list of over 3,000 libraries, 37 libraries were selected. The researchers initially selected 42 libraries (12 from each size of library), but it was determined via an investigation of the libraries websites that not all libraries selected for the study provided a virtual reference service.

In the spring of 2005, reference librarians from the 37 libraries were contacted by mail to participate in the Q study. Librarians were encouraged to give the Q study to another colleague if they were unable or unwilling to participate in the study. Included in the mailing was a letter describing the study, a consent form to be signed and returned, and a deck of 28 statements about virtual reference (see Appendix 1). Also included in the packet was a step-by-step guide for how to sort the statements (known as a "condition of instruction") and a score sheet to record the order of the statements. (See Appendices 2 and 3, respectively). They also completed a short questionnaire about their demographic information and time spent doing reference.

Data Analysis
Using PQMethod, a statistical program tailored to the requirements of Q studies, each Q-sort was intercorrelated with the others and a 34 x 34 correlation matrix was factor analyzed using the Principal Component method (Schmolck). Three unrotated factors were extracted and rotated using a varimax rotation. McKeown and Thomas provide an excellent description of the statistical procedures used in Q methodology.

Factor scores were then computed for all three factors to reveal clusters of opinion. In this context, a factor represents a group of academic reference librarians who have Q-sorted the 28 statements essentially the same, thus demonstrating a distinct point of view toward virtual reference.

Results

A total of 34 librarians sorted the 28 statements according to their degree of agreement or disagreement into a forced distribution grid that resembles a normal bell-shaped curve. In some cases, more than one librarian per institution completed the Q sort. Librarians were encouraged to share the study with a colleague; in some cases this happened, while in other institutions no librarians completed the survey.

Rotated factor matrix

Table 1 presents the rotated factor matrix and suggests that the three factor solution is adequate given the fact that 29 of the 34 Q-sorts loaded significantly on only one factor. A factor loading is a measure of how saturated a subject is on a given factor. Loadings in excess of ±.49 are significant at the .01 level and are placed in parentheses for convenience. While the authors can make no claim that the three factors brought to light here are exhaustive of all possible points of view, they do represent three distinctive ways of thinking that exist among reference librarians. As presented in Table 1, 14 librarians loaded significantly upon Factor 1, nine upon Factor 2, and six upon Factor 3. Five librarians did not load significantly on any factor. As Table 1 reveals, four confounded sorts were identified, which loaded significantly upon two sets of factors. These sorts were not used to define the factors, but their sorts were viewed by the authors (alongside each idealized Q-sort) as part of the interpretative process in describing the factors.

Factor Analysis

The factor analysis of the 34 reference librarians revealed three factors or attitudinal typologies: Technophiles (Factor 1), Traditionalists (Factor 2), and Pragmatists (Factor 3). Labels are attached to the factors to enhance understanding of each groups' attitudes toward virtual reference. A description of each group is given below. Each factor represents a group of reference librarians who think similarly about virtual reference. These descriptions and their labels were derived by looking at the Q sorts that help define each factor. To further aid in the interpretative process, an idealized Q-sort can be computed for each factor that represents how a hypothetical individual loading 100% on a factor would order the 28 statements. In Table 2, the authors report the scores of all 28 statements in the idealized Q sort for each of the three factors (Factor 1, Factor 2, and Factor 3). This table reveals in a general way how reference librarians of that type think about virtual reference. An idealized Q sort is used in the interpretative process to help compare and describe the distinctive ways of thinking about virtual reference; it allows researchers to view how Q-items are distinguished from each other across the factors. In interpreting the three factors and their respective points-of-view, it is important to understand that this examination is not done simply by pulling out statements with extreme scores on each factor. Researchers need to take into account how the statements are placed in relation to one another in each factor and the comparative placement of statements in different factors. When analyzing the data, the researcher "listens to the data" and tells the story using a qualitative process. Some items do not add up at the individual statement level, but when looked at more holistically, they do make sense. The narrative below aims to capture this.

Participant	Gender	Year MLS or equivalent degree	Hours per typical week doing reference questions	Factor Loadings		
				Factor 1	Factor 2	Factor 3
1	Female	1996	7	.41	(.69)	.03
2	Male	1993	6	.32	(.55)	.21
3	Female	1996	10	.35	(.62)	.42
4	NR	NR	NR	(.73)	.04	.39
5	Female	1998	10	(.56)	.34	(.50)
6	Male	1979	12	(.53)	.05	(.62)
7	Female	2004	10	(.69)	.23	.30
8	Male	2001	5	.41	-.03	.48
9	Female	1973	10	(.73)	.02	.11
10	Female	1982	5	(.62)	.08	.07
11	Female	2002	12	.44	(.71)	.11
12	Male	2004	15	(.82)	.15	.31
13	Female	1978	2	.48	.25	(.51)
14	Female	1976	6	.06	.34	(.64)
15	Female	1977	12	-.37	(.73)	.13
16	Female	1994	8	-.23	(.73)	-.03
17	Female	2001	12	.29	(.57)	.26
18	Female	1998	8	(.76)	.07	.43
19	Female	1987	40	.46	.12	(.59)
20	Male	2004	8	(.72)	.25	.40
21	Female	1999	4	(.64)	.26	-.05
22	Male	1974	12	-.30	.28	(.55)
23	Female	2002	10	(.77)	.18	.17
24	Female	2004	10	(.83)	-.20	.01
25	Female	1995	5	(.50)	(.53)	.21
26	Female	1989	12	(.57)	.45	.34
27	Female	2004	10	(.73)	.20	.46
28	Female	1991	6	.24	-.05	(.74)
29	Male	1973	10	.23	.16	(.73)
30	Female	1996	12	(.71)	-.13	.48
31	Male	1991	12	-.42	(.74)	.12
32	Female	1992	4	(.61)	(.55)	.19
33	Female	1984	11	.15	(.84)	-.02
34	Female	1976	14	(.79)	-.01	.46

Table 1. Rotated Factor Matrix

Note: Loadings placed in parentheses are significant (p < .01).

Factor 1: Technophiles

Technophiles believe that virtual reference is a necessary and valuable new service. To their thinking, "reference is reference, regardless of format." There is no *one* way to do reference, and perhaps more importantly, one format is not necessarily any better than another. They perceive virtual reference as a creative solution to putting librarians in touch with their users for whom communicating online is a way of life. It is their opinion that for many students the choice is between asking a question online and not asking a question at all, and reference librarians have a professional responsibility to find ways to do their jobs in this kind of environment.

Factor 2: Traditionalists

Traditionalists believe that traditional reference, that is to say, face-to-face and over the phone, is the best kind of service libraries can offer to their patrons. They view virtual reference as a mistake because it fails to offer a quality reference service – it is impersonal, inefficient, and sub par. Traditionalists view virtual reference as an expensive, trendy service that is pushed by individuals who do not understand reference. From their perspective, virtual reference is fast-food reference promoted in the name of good customer service.

Factor 3: Pragmatists

Pragmatists believe that virtual reference will never equal the potency and effectiveness of on-site, face-to-face reference. In this regard, they have common ground with Traditionalists. They feel strongly that face-to-face reference is the most effective way to meet users' information needs. But unlike the Traditionalists, they believe virtual reference is a valuable service. Like the Technophiles, Pragmatists are keenly aware that younger people habitually communicate online. And unlike the Traditionalists, they are not willing to penalize those who use online communication tools just because there is a better, more effective reference service model (i.e., face-to-face). Taken as a whole, Pragmatists are less likely to do something just because it is easier for library users. In this regard, they are somewhere in between the "give 'em what they want" approach supported by Technophiles and the "we know what is best" approach supported by Traditionalist. While all three groups agree that not every librarian has to do it all, it is clear that Traditionalists believe that some librarians should not be required to staff virtual reference services, while Pragmatists are less likely to support a service model that splits virtual reference among those librarians that enjoy it and those that do not.

		Factors		
		1 Technophiles	2 Traditionalist	3 Pragmatists
1.	I like providing digital reference service more than other kinds of reference.	-1	-3	-3
2.	I have found myself debating whether to tell someone how to do something online, which would mean a lot of typing, or just pushing the results of what I've done for them.	0	+1	-1
3.	We now have an entire generation of young people for whom text messaging is a primary means of communication. If we ignore that, we risk marginalizing ourselves.	+2	-2	+2
4.	The idea for real-time, computer based	-3	+2	-3

	reference assistance rarely comes from reference librarians who must deliver this service.			
5.	Librarians should spend their resources on making it easier for patrons to find information on their own.	+1	-1	0
6.	I have anxiety over whether I am spending too much time or not getting answers back fast enough.	-1	-2	0
7.	Everyone has different learning styles, so we shouldn't try to force one way of doing reference on every student.	+2	+1	+1
8.	Virtual reference is just another way to communicate with human reference librarians, along with email, phones, and paper mail.	+3	+1	+3
9.	Instead of spending time and money developing and running chat services, we should spend it on improving our websites and information systems.	-1	0	-2
10.	For all of the hype about reaching out in extraordinary ways and in unusual times, virtual reference fails our users. It doesn't meet their information needs efficiently, and it doesn't deepen their research capacities.	-3	+2	0
11.	Add it all up and you can see that virtual reference built on chat technology is a pretty expensive proposition, especially if we ever came close to getting the thousands and thousands of questions many of us expected.	-2	+2	-1
12.	Quick factual questions are the best because we don't have the body; anything that has depth should be a consultation.	0	0	0
13.	I worry about a new breed being great online but having no face-to-face skills at all.	-2	-1	-2
14.	We need to meet the patron where they are and with the methods they use.	+3	+1	-2
15.	Most people don't like chat for serious information because they have other and less costly reference options, namely email and telephone.	-1	-1	-1
16.	For many students the choice may be between asking a question virtually or not asking it at all.	+2	0	+1
17.	Only occasionally is it necessary to engage in back in forth to get a good idea of the question.	-2	-2	-2

18.	Yes, I give better service face-to-face, and I dislike the limitations of chat. But time and convenience is very important to the students and I'd rather provide half-a-loaf than nothing at all.	+1	0	0
19.	The reference interview is not as necessary in the digital reference setting.	-3	-3	-3
20.	In-person, genuine real time reference involves moral and emotional elements that are essentially unattainable through disembodied online interaction.	-2	0	-1
21.	I have absolutely no regrets about enhancing our reference services through chat.	+1	-3	+2
22.	Virtual reference can never equal the potency and effectiveness of on-site, in-house, in-place, and wholly interactive traditional reference practice.	0	+2	+3
23.	Traditional reference – face-to-face interaction and over-the-phone discussion – still provides the best all around service to our patrons?	0	+3	+2
24.	Why do we wish to penalize those who have adapted to the online world and its technologies by lamenting the fact that they don't use the old technologies?	0	-1	+1
25.	I'm glad to have the opportunity to assist our students in whatever manner they choose to contact us. I'm here to provide reference – and reference is reference – regardless of format.	+3	0	+3
26.	One of the problems with trying to conduct a good reference interview in a chat session is that the patron is often in a great hurry.	0	+3	0
27.	A basic knowledge of how to instant message or chat is an essential skill held by and needed in our librarians.	+1	-2	+2
28.	The institution should offer the gamut of reference service/contact – I'm not sure that means every staff member has to be able to do it all.	+2	+3	+1

Table 2. Statement Scores for Each Factor

From the demographic profiles of the respondents (Table 1), it can be seen that over three-quarters (n=26) of the librarians involved in the study were female. The length of time since the respondents had received their degrees in librarianship

varied from just a few years to over 30, so a wide range of experience was included. There was also a wide ranging response to the questions regarding how much time each respondent typically spent answering reference questions in all formats (in-person, virtual, telephone, etc.). This varied from 2 hours per week to 40. Taking these aspects into account, the results show the strength of the differing viewpoints and how they continue to differ even at this point in the process. Thus, not all newly credentialed librarians think one way versus those with more experience automatically fitting into another factor. Caution should be taken to avoid reading too much into the demographic profile, however. As an intensive form of analysis, Q helps present a picture of the types of thinking that exist about a given issue; it does not tell us though what proportion of the population subscribes to a particular way of thinking. A suggestive pattern might be seen that may make sense from a theoretical standpoint, but further study would be required.

Virtual reference has been around in some form or another in many institutions for 10 years or more, making it a standard part of many library positions. However, despite (or perhaps because of) the length of time virtual reference has been in existence, it can be seen that there are still definite feelings and arguments for and against this service. This range of attitudes from Technophiles to Traditionalists, shows no signs of narrowing; in fact, it may be growing, as librarians spend more time providing this service and observing its successes and failures.

The common wisdom is that when a new service like this is started that the "early adopters" will get it going and then they will win over the majority of their colleagues, eventually achieving a critical mass or at the very least, "buy in." This may not be the case. Not all reference librarians think alike. However, the fact that

all participants in the study provide virtual reference services, despite their feelings or attitudes says something as well. Even traditionalists have been required or at least strongly encouraged to staff virtual reference, despite their feelings to the contrary. This may or may not be a good idea. Making square pegs fit into round holes is inefficient and can result in poor service and poor morale and high staff turnover.

Discussion

Most of the research on virtual reference services has focused on the patron end and their level of satisfaction. Few researchers have looked at those performing the service, the librarians themselves. A recent study by Steiner and Long did look at librarians' opinions about using Instant Messaging (IM) to provide virtual reference and found mixed opinions on the subject. Other research found that reference librarians were optimistic and positive about the impact and reach of digital reference overall (Tenopir and Ennis 84). However, our study reveals more of a diversity of opinion. While this can be seen as a natural outcome of surveying a variety of individuals, this type of analysis goes beyond the reporting of attitudes and provides data on the range of subjective feelings and opinions about providing digital reference service.

Based on our findings, we can surmise that some librarians (the Traditionalists) are performing a balancing act (one of many performed each day, probably) between their own opinions about virtual reference and the need to be a team player and assist their colleagues with staffing the service. In other cases, Technophiles may feel unduly constrained by those around them that do not share their enthusiasm for this latest piece of technology. By providing data that can be used as a basis for making staffing decisions, this type of analysis could go a long way toward relieving librarians of at

least some aspects of their balancing acts. More research into librarians' opinions and attitudes concerning virtual reference would be helpful to add to the findings.

By using tools such as Q methodology, this data can be utilized by supervisors or library administers to make the most efficient and effective use of their staff. Once the factors are known and identified, staff can be queried as to their own opinions about the various forms of reference they provide. These can then be used to determine where they fit into the three groups (Technophiles, Pragmatists or Traditionalists) and these factors can in turn be taken into account when parsing out duties and responsibilities. After all, as Statement 28 puts it, "The institution should offer the gamut of reference service/contact – I'm not sure that means every staff member has to be able to do it all." An end result might include some form of job sculpting, where individuals are allowed to focus on their strengths and minimize their activities in areas where they feel less comfortable. This in turn could improve morale and perhaps even improve productivity by allowing persons to perform primarily those duties at which they are the most skilled.

The data can also be used to assess training needs and who would benefit most from training in specific areas. Again, the more supervisors or administrators can learn about their staff and their respective strengths and weakness (and likes and dislikes), the more effective staffing can be and the more smoothly the entire facility can be run. Playing to people's strengths is the ideal, but that can only be done once those strengths are known.

Specific ideas for further research include performing a similar study looking at groups of librarians within an institution and determining the range of attitudes

among colleagues. This same type of research could also be carried out at institutions not currently involved with virtual reference and seeing if their feelings fell into different categories or were more skewed one direction or another. Yet another idea would be to consider other types of technology (e-books, for example) and see if similar ranges of opinions exist and more interestingly to see if the same respondents as participated in this study were consistent in their opinions. Is a Technophile always a technophile? Is it more of a personality trait or is it situational in nature? Is there a progression from one perspective to the next? If so, does it only go in one direction?

Knowing more about people's attitudes and opinions can be a step towards an improved working environment and improved patron service. Librarians are unlikely to always think or feel in the same way, but technology and new ways of doing things are certainties. The better able we are to understand the range of feelings surrounding these changes; the better able we will be to work with them, no matter which Q factor we fall into.

Conclusion

This study used Q Methodology to develop an exploratory understanding of how reference librarians perceive or think about virtual reference. While previous research found librarians generally positive about virtual reference, the results presented here suggest that there are competing viewpoints toward virtual reference. This in turn raises the following questions. How important is consensus and shared values among librarians as they examine ways to exploit information technologies in their traditional work? Must everyone share the same values and more importantly the same roles? And lastly, can we use these findings to encourage administrators and librarians to work together to find the mix of roles and

responsibilities that work best for each individual?

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Appendix 1 – Q Sample

1. I like providing digital reference service more than other kinds of reference.

2. I have found myself debating whether to tell someone how to do something online, which would mean a lot of typing, or just pushing the results of what I've done for them.

3. We now have an entire generation of young people for whom text messaging is a primary means of communication. If we ignore that, we risk marginalizing ourselves.

4. The idea for real-time, computer based reference assistance rarely comes from reference librarians who must deliver this service.

5. Librarians should spend their resources on making it easier for patrons to find information on their own.

6. I have anxiety over whether I am spending too much time or not getting answers back fast enough.

7. Everyone has different learning styles, so we shouldn't try to force one way of doing reference on every student.

8. Virtual reference is just another way to communicate with human reference librarians, along with email, phones, and paper mail.

9. Instead of spending time and money developing and running chat services, we should spend it on improving our websites and information systems.

10. For all of the hype about reaching out in extraordinary ways and in unusual times, virtual reference fails our users. It doesn't meet their information needs efficiently, and it doesn't deepen their research capacities.

11. Add it all up and you can see that virtual reference built on chat technology is a pretty expensive proposition, especially if we ever came close to getting the thousands and thousands of questions many of us expected.

12. Quick factual questions are the best because we don't have the body; anything that has depth should be a consultation.

13. I worry about a new breed being great online but having no face-to-face skills at all.

14. We need to meet the patron where they are and with the methods they use.

15. Most people don't like chat for serious information because they have other and less costly reference options, namely email and telephone.

16. For many students the choice may be between asking a question virtually or not asking it at all.

17. Only occasionally is it necessary to engage in back in forth to get a good idea of the question.

18. Yes, I give better service face-to-face, and I dislike the limitations of chat. But time and convenience is very important to the students and I'd rather provide half-a-loaf than nothing at all.

19. The reference interview is not as necessary in the digital reference setting.

20. In-person, genuine real time reference involves moral and emotional elements that are essentially unattainable through disembodied online interaction.

21. I have absolutely no regrets about enhancing our reference services through chat.

22. Virtual reference can never equal the potency and effectiveness of on-site, in-house, in-place, and wholly interactive traditional reference practice.

23. Traditional reference – face-to-face interaction and over-the-phone discussion – still provides the best all around service to our patrons?

24. Why do we wish to penalize those who have adapted to the online world and its technologies by lamenting the fact that they don't use the old technologies?

25. I'm glad to have the opportunity to assist our students in whatever manner they choose to contact us. I'm here to provide reference – and reference is reference – regardless of format.

26. One of the problems with trying to conduct a good reference interview in a chat session is that the patron is often in a great hurry.

27. A basic knowledge of how to instant message or chat is an essential skill held by and needed in our librarians.

28. The institution should offer the gamut of reference service/contact – I'm not sure that means every staff member has to be able to do it all.

Appendix 2 – Sorting Instructions

The objective here is to sort the statements along the continuum from the ones that you most disagree with to the ones that you most agree with.

1. Look at all the opinion statements to familiarize yourself with the range of issues.
2. Sort the issues into 2 piles. One should contain the statements that you *agree* with -- for any reason. The other pile contains those statements that you do *not agree* with -- for any reason. The piles do not have to contain equal number of statements.
3. From the pile of statements you agree with, select the three items (only three) that you *Most Agree* with. Place them in a three-item column at the extreme right of your workspace.
4. From the remaining *Agree* pile, select four more issues that are now more agreeable to you than the others in the pile. Place these four statements in another column just to the left of the three already selected in Step 3 above.
5. Next, select from the remaining *Agree* pile the four statements that you now *Agree* with the most. Place these four statements in another column just to the left of the four already selected in step 4 above.
6. Next, select from the remainder of the *Agree* pile the six statements that you *Agree* with the most. Place these six statements in another column just to the left of the four already selected in step 5 above. If you have run out of statements in the *Agree* pile and cannot finish step 6, proceed immediately to the next step. If you have extra unsorted statements at the end of this step, combine the extras with the *Not Agree* pile and go on to the next step.
7. Now, work with the pile of statements you feel you do *Not Agree* with. Begin by selecting the three statements you find *Most Disagreeable*. Place them in a three-item column on the far-left side of your work area.
8. From the remaining Most Disagree pile, select four more statements that are now *more disagreeable* to you than the others in the file. Place these four statements in another column just to the right of the three already selected in Step 7 above.
9. Next, select from the remaining Disagree pile the four statements that you *Disagree* with the most. Place these four statements in another column just to the right of the four already selected in Step 8 above.
10. Place any remaining statements in the middle of your grid.
11. Now, look at your arrangement. Feel free to move issues around to make sure that you opinion is reflected correctly.
12. When everything is sorted as you want it to be, write the statement numbers in the blank boxes in the grid on your answer sheet and answer the remaining questions of the form.

Appendix 3 – Q-sort Grid

Most Disagree   Most Agree

-3	-2	-1	0	+1	+2	+3