Using Transaction Logs to Study the Effectiveness of Librarian Behaviors on User Satisfaction in a Virtual Setting: A Mixed-Method Approach

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Abstract: Chat reference is becoming more common, so it is important to be able to effectively judge user satisfaction with the results that they receive and secondly what behaviors the reference librarian should use to help ensure that users are satisfied with chat reference sessions. Our research indicated that many of these behaviors could be mapped to the virtual environment with great success. The purpose of this paper will be to describe and explain the methodology, which is a mixture of qualitative and quantitative methods, so that others can adapt what we did to their own situations.

Keywords: Chat, Librarian Behaviors, Translation Logs, User Satisfaction

Introduction

Chat reference is becoming more common, so it is important to be able to effectively judge user satisfaction with the results that they receive and secondly what behaviors the reference librarian should use to help ensure that users are satisfied with chat reference sessions. In this research project, online transaction logs were obtained from the Southeastern Florida Library Information Network. At the time of the reference interview neither the librarians nor the users knew that these transactions logs would be used in a research project, so all the data gathered was in an unobtrusive manner. In an article in Reference and User Studies Quarterly (Winter 2008), the Reference and User Services Association (RUSA) Guidelines for Behavioral Performance of Reference and Information Service Providers (2004) were tested against the transcripts to see if the behaviors for face-to-face reference could be used in a virtual environment. Our research indicated that many of these behaviors could be mapped to the virtual environment with great success. This paper describes and explains the methodology’s mixture of qualitative and quantitative methods.

Literature Review

Successful reference interview between patrons and reference staff has been emphasized consistently in previous literature as an important factor of reference success. Gers & Seward (1985) demonstrated that reference librarians’ verbal
and nonverbal communication skills are very important in delivering effective reference services. This has brought a great attention on reference interview and staff training to teach effective verbal and nonverbal communication skills.

From this research and background, the Reference and User Studies Association (RUSA) of the American Library Association has developed the behavioral Guidelines, known as the Guidelines for Behavioral Performance of Reference and Information Service Providers. It delineated behaviors that can lead to an effective reference interview. A handful of research studies consistently showed that the use of the behaviors in the Guidelines is positively associated with reference success (Gatten & Radcliff, 2001; Saxton, 2002). Thus, the Guideline has been recognized as a useful staff training and performance evaluation tool. In June 2004, RUSA revised the original 1996 Guidelines to help librarians who provide virtual reference interviews.

To date not a lot is known about the nature of virtual reference interview. For example,

- How do reference librarians interact with their patron in virtual reference settings?
- Are they similar to traditional reference services or different?
- Are the verbal and nonverbal cues in virtual references similar to physical interactions?
- What are the model behaviors that could lead the virtual reference service more successful?

Among studies that looked into the Guidelines, Gatten & Radcliff (2001) evaluated the effectiveness of the staff training of the 1996 RUSA Guideline in physical reference service settings. Their study was conducted using an unobtrusive observational method where proxies approached the librarians and recorded the occurrence of the behavior and rated their satisfaction with the answers. This type of research can be much easily done in virtual reference setting. Librarians can easily access the interview transaction transcripts that recorded reference interview word by word along with co-browsing process. So far, to our knowledge, there has been little research that assessed the virtual reference interview using this easily available observational data.

The RUSA Behavioral Guidelines are basically an extended version of the 1996 edition. Recognizing the increasing need for a guideline that help the staff who provide digital reference, RUSA revised the guideline. Maintaining the original five-component structure, the revised Guidelines categorized each of the five areas into three aspects: general setting, physical setting, in remote access settings. The important behaviors are classed in 5 categories:
Approachability includes behaviors that ensure easy access to the reference staff by removing/lowering the barrier to personal assistance. (Examples: Making signs visible, making the presence of virtual reference visible, making the eye-contact or word contact with the patrons)

Interest includes behaviors that show librarians’ interest to the patron’s reference questions so that patrons could state their questions without hesitance. (Examples: Focus attention to the patron, maintaining and re-establishing “word” contact, making question scope visible and clear)

Listening / Inquiring includes behaviors that ensure good listening and questioning skills so that librarians can find out patrons’ real information needs, which sometimes are buried or unclear. (Examples: communicating receptive cordial ways, use proper written language, using adequate probing, rephrasing questions for adequate understanding of the questions)

Searching includes effective search skills and related behaviors during information searches to maximize searching effectiveness and accurate answer (Examples: explaining search strategies, escorting patrons in the search process, provide pointers and information sources)

Follow-up includes behaviors that ensures proper ending of the reference transactions, ensuring patron satisfaction with the answers, and referring to the alternative (Examples: “Asking if their questions have been completely answered, if they need additional information, refers to alternative sources if not answered, ask to come back if they need further assistance)

Research Methodology

This study examined chat reference services delivered through the Broward County public library system in Florida, the State’s largest library system, with 33 regional and branch libraries. Since August 2002, the system has used the 24/7 Reference chat reference service delivered by the Metropolitan Cooperative Library System (MCLS), an association of libraries located in the Los Angeles area, funded by a Federal Library Services and Technology Act (LSTA) grant. The data analyzed for the present study were on-line chat reference transactions initiated by the patrons of the Broward County library system, along with online survey questionnaires, which the service users completed voluntarily.

Research Question 1: To what extent is each RUSA behavior observed in virtual reference interviews?
Research Question 2: Do RUSA behaviors make virtual reference successful?
Research Question 3: How good are the Guidelines as a virtual reference service assessment tool?

Content Analysis and Survey. To aid in answering these questions, a survey was devised and supplied by 24/7 Reference and popped up upon completion of
each transaction. While the patrons were mostly the users of the library system, the reference staff who provided the service were from forty-nine library systems across the United States participating in the MCLS 24/7 Reference program.

During the six-month research period between January and June 2004, a total of 1,667 transactions took place and 1,387 were analyzable as being either completed or transferred transactions. In order to analyze the influence of referrals on user satisfaction, all 420 transactions that had a corresponding questionnaire that chat service users had submitted immediately after their session to report their satisfaction with the service were chosen. This amounted to 30.1% of the total analyzable transactions.

By having a chat reference session transcript with a matching user satisfaction survey questionnaire, the researcher was able to examine what question was asked in a reference session, whether the question was answered completely or referred, and to what extent the patron was satisfied with the answer or referrals she or he received.

The Independent variable of the study is Librarian Behaviors. Librarian Behaviors were measured in terms of the behaviors prescribed in the RUSA Guidelines. The behaviors were observed from reference session transcripts. The transcripts recorded all verbal interactions between reference librarians and patrons, including URLs from co-browsing activities where librarians guide users to see what the librarians show. The Dependent Variable in this study is User satisfaction. It was measured using patrons’ answer to a short pop-up survey that was submitted immediately after each reference transaction.

Initially, the behaviors in the transcripts were coded for all 49 items in the Guidelines by assigning “1” for the appearance of the behavior and “0” for the absence of such behavior, but many of these behaviors were not observable in a virtual references interview. In the end 9 behaviors were selected upon which to focus. Basically, we coded only those RUSA behaviors that can be readily observable. For example, we can code a behavior such as “Maintains or re-establishes “word contact” with the patron”. However, behaviors like “Focuses attention on the patrons” are not easily observable in text-transcript. So, we took a more conservative approach by including only apparent behaviors for the content analysis. Those behaviors include:

- **Area 1 (8 items):** General concept of “welcoming” was opted (e.g.: Hi, this is reference librarian); Excluded: most of items were not coded because they are applicable to pre-reference interview stage (1.8), or to in-person situation. Items most for pre-interview stage.
Area 2 (8 items): Only two were applicable (2.2 & 2.6). Excluded: Physical (2.1, 2.3-2.5), out of scope (2.7 -email); 2.8 pre-transaction info).

Area 3 (10 items): Receptive communication (3.1 & 3.2); probing by rephrasing, clarifying, asking questions (3.5-3.8). Excluded: not easily observable (3.3, 3.4, 3.9); overlap (3.9).

Area 4 (11 items): Many items are overlapped and thus one behavior could be coded across multiple behaviors. Thus, we decided to code Searching with two aspects: “Searching for or with patrons” which include 4 items (4.3, 4.6, 4.11) and “Providing information sources” which combine 3 items (4.5, 4.9, and 4.11). Excluded: falling in a better category (reference interview (4.1, 4.2-verifying words), follow-up (4.7)), cognitive process rather than explicit behavior (4.2 in part).

Area 5 (10 items): Has three distinctive behaviors: (1) proper closing (asking if answered and needs more info-4.7, 4.1, and 5.9); (2) offer alternatives or refer (5.4-5.8, and 5.9remote); and 5.2 (comeback). Excluded: inapplicable(5.3)

Finally, one area from IFLA: “Use the client's name” (from 2.4 Guidelines for Chat Sessions: IFLA Digital Reference Guidelines) to “Area 1” approachability.

Inter-coder reliability. RUSA behaviors were coded by two independent coders for intercoder reliability in order to ensure the consistency. The tests show the level of agreement between two independent coders.

As the first step for this purpose, the primary researcher coded the entire 422 transactions. Then, the second coder, a reference librarian who received training for coding the RUSA behaviors, coded every fifth transaction (n = 84). This sample for intercoder reliability comprises 20 % of the total transactions, which is the recommended percentage for social science research.10 Finally, the percentage agreement between the two coders was calculated for each behavior, which informs the level of agreement between two coders.11 The agreements were Welcoming (91.7%), Use of patrons' name (96.4%), Interest (78.5%), Listening (85.6%), Inquiring (78.6%), Searching with or for patrons (76.2 %), Offering pointers and information sources (78.6 %), Asking if answered completely (91.7 %), Offering referrals (85.0 %), and Asking to come back for further assistance (90.5 %). All these intercoder percentage agreements were either above or close to the generally acceptable threshold value of 80%.

Since the purpose of this paper is to explain and reflect on the methodology, the results of the study will be abbreviated. Anyone wishing to read the full article on the results of the study should consult: "The Effects of Librarians' Behavioral Performance on User Satisfaction in Chat Reference Services." Reference & User Services Quarterly 46, no.2 (December 2007), pages 33-44.
Data Analysis. In creating a composite variable, a series of computations was conducted because the three items in the survey questionnaire were measured either on a three-point or on a four-point ordinal scale (e.g., 'satisfied,' 'not sure,' and 'not satisfied' for the 'satisfaction with the answer' item). The three items were rescaled on the same five-point scale, and then summed as a single composite variable. This procedure of data management allowed the researcher to conduct the necessary inferential statistical tests.

Additional checking to minimize the arbitrariness in assigning numeric values to the verbal descriptors. That is, two alternative scales (i.e., four-point and six-point scales) were used in addition to the selected five-point scale by making slight variations in the value assignment. When the test results from a series of statistical analyses for Research Question 2 and Research Question 3 were compared for all three scales to examine the stability of the assigned values, the test results were identical across all three scales, indicating the value assignment on the five-point scale is stable and reliable. In order to determine the reliability and validity of the scores yielded by the composite variable, a reliability test and a factor analysis were conducted, respectively. For reliability: a Cronbach's alpha coefficient of .85 was obtained, indicating that the composite variable generated scores were reliable.

For validity: the factor analysis revealed that the three items were represented by one factor, with structure-pattern coefficients of .868, .916, and .876. This factor explained 78.64% of the total variance. This high validity score confirms that the composite variable is measuring a single construct, suggesting that the composite variable is a valid measure of user satisfaction.

How significant was the difference? To answer this question, t-test was used to compare user satisfaction between when the behavior was present and when the behavior was not present. Looking at the behavior of Patron name, as an example, among the transactions where reference librarians called patron’s name, their average user satisfaction was 13.29. Among the transactions where reference librarians didn’t call patron’s name, the average reference success was 12.45. The average reference success was 0.84 point higher when librarians called the patrons’ first name which was statistically significant. Across six out of the ten observed behavior, there was a statistically greater user satisfaction when librarians showed the behaviors than not. Independent samples t-test results showed that the use of RUSA behaviors resulted in higher user satisfaction in the seven behaviors marked at the significance level of $\alpha < .05$.

In other words, reference service tends to be more successful when librarians:
1) Used patron’s first name during the reference interview;
2) Communicated more receptively and listened more carefully;
3) Searched with or for the patrons;
4) Provided pointers;
5) Asked whether the question was completely answered; and
6) Asked to come back if patrons needed further assistance.

This finding confirms the earlier literature that showed the importance of the RUSA Guideline behaviors to successful reference interview transactions. Furthermore, this study showed that the RUSA behaviors are also crucial for user satisfaction in virtual reference setting.

To answer research question 3, another statistical test, called “Multivariable regression analysis.” Through this test, four behaviors were identified that allow us to predict virtual reference success. The strongest behavioral predictor was “asking whether their question was answered completely,” followed by “providing pointers,” “asking patrons to come back when they have further assistance,” “searching with/for patrons, and “receptive, cordial listening.

The strongest predictor was asking a very simple follow-up question: Did you find what you needed? Does this completely answer your question? Is there anything else I can help you with?

Implications and Conclusions

For the research community: An advantage of studying virtual reference is the availability of reference transaction scripts. It allows the researcher to observe reference interview unobtrusively in natural setting. Methodologically, this study demonstrated a relatively easy way to utilize available, unobtrusively collected real reference transactions in assessing reference service performances. Furthermore, using the accompanying pop-up user survey, we were able to determine the causal relationship between librarian behavior and immediate user satisfaction. This mixed method approach is very powerful yet easily applicable research method by both researchers and practitioners.

For the practitioner community: The finding could help reference staff training in practice. As the previous literature consistently demonstrated (Gers & Seward, 1985; Dewdney & Ross, 1998), this study also showed that the simple questions like, “Did it completely answer your question?” “Do you need anything else?” could enhance reference success significantly than any other efforts. This finding should be reassured in reference staff training to enhance the performance.

For RUSA: We believe the findings of this study are very encouraging for RUSA. This study was the first study that demonstrated the value of the Guideline by assessing its real items in 5 areas in virtual reference setting. The
findings demonstrated that the RUSA Guideline can continue to serve the reference community as a great training guideline. It needs some adjustment in order to be used as a direct assessment tool. Some items in the Guideline need further clarifications if it were to be used as a concrete evaluation tool without any modification (i.e., providing more examples, in approachability, interest, listening). Some items were not really observable as an explicit behavior and some items were mixed across different areas. Useful examples under each item would be very useful (what could be useful examples of “communicate in a receptive manner). Nonetheless, RUSA could further promote the Revised Guidelines for use as a training and assessment tool by offering effective behavioral standards of virtual reference interviews.

References


