

Local Users, Consortial Providers: Seeking Points of Dissatisfaction with a Collaborative Virtual Reference Service

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Résumé de l'article

Objective – Researchers at an academic library consortium examined whether the service model, staffing choices, and policies of its chat reference service were associated with user dissatisfaction, aiming to identify areas where the collaboration is successful and areas which could be improved.

Methods – The researchers examined transcripts, metadata, and survey results from 473 chat interactions originating from 13 universities between June and December 2016. Transcripts were coded for user, operator, and question type; mismatches between the chat operator and user's institutions, and reveals of such a mismatch; how busy the shift was; proximity to the end of a shift or service closure; and reveals of such aspects of scheduling. Chi-square tests and a binary logistic regression were performed to compare variables to user dissatisfaction.

Results – There were no significant relationships between user dissatisfaction and user type, question type, institutional mismatch, busy shifts, chats initiated near the end of a shift or service closure time, or reveals about aspects of scheduling. However, revealing an institutional mismatch was correlated with user dissatisfaction. Operator type was also a significant variable; users expressed less dissatisfaction with graduate student staff hired by the consortium.

Conclusions – The study largely reaffirmed the consortium's service model, staffing practices, and policies. Users are not dissatisfied with the service received from chat operators at partner institutions, or by service provided by non-librarians. Current policies for scheduling, handling shift changes, and service closure are appropriate, but best practices related to disclosing institutional mismatches may need to be changed. This exercise demonstrates that institutions can trust the consortium with their local users' needs, and underscores the need for periodic service review.

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Research Article

Local Users, Consortial Providers: Seeking Points of Dissatisfaction with a Collaborative Virtual Reference Service

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Abstract

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Methods – The researchers examined transcripts, metadata, and survey results from 473 chat interactions originating from 13 universities between June and December 2016. Transcripts were coded for user, operator, and question type; mismatches between the chat operator and user's institutions, and reveals of such a mismatch; how busy the shift was; proximity to the end of a shift or service closure; and reveals of such aspects of scheduling. Chi-square tests and a binary

logistic regression were performed to compare variables to user dissatisfaction.

Results – There were no significant relationships between user dissatisfaction and user type, question type, institutional mismatch, busy shifts, chats initiated near the end of a shift or service closure time, or reveals about aspects of scheduling. However, revealing an institutional mismatch was correlated with user dissatisfaction. Operator type was also a significant variable; users expressed less dissatisfaction with graduate student staff hired by the consortium.

Conclusions – The study largely reaffirmed the consortium’s service model, staffing practices, and policies. Users are not dissatisfied with the service received from chat operators at partner institutions, or by service provided by non-librarians. Current policies for scheduling, handling shift changes, and service closure are appropriate, but best practices related to disclosing institutional mismatches may need to be changed. This exercise demonstrates that institutions can trust the consortium with their local users’ needs, and underscores the need for periodic service review.

Introduction

Chat reference has become increasingly common since its inception in the mid-1990s, and is now an integral part of library reference services (Radford & Kern, 2006). A study by Yang and Dalal (2015) found that 48% of college and university libraries in North America offer a chat service. Almost a quarter of these libraries provide chat service through a consortium, and the trend toward collaboration is increasing (Pomerantz, 2006; Yang & Dalal, 2015).

Chat reference is more resource-intensive than traditional in-person service due to labor and software costs (Weak & Luo, 2014). Many institutions find it difficult to launch or maintain a local chat service for budgetary or staffing reasons, especially if usage is low (Eakin & Pomerantz, 2009; Helfer, 2003; Radford & Kern, 2006). In an effort to make chat reference more cost-efficient and sustainable, many libraries have joined consortial arrangements (Coffman & Arret, 2004b; Peters, 2002; Powers, Nolen, Zhang, Xu, & Peyton, 2010). By coming together, libraries can mitigate the risks of launching a new service, build a centralized infrastructure, share costs and staffing demands, extend service hours, and tap into a larger target audience to

increase service usage (Bailey-Hainer, 2005; Breeding, 2001; Coffman & Arret, 2004a).

Service quality is often a point of concern with consortial chat reference services (Meert & Given, 2009). Many libraries express doubt that staff from outside their institution can respond to their users’ questions effectively, especially queries that are local in nature (Berry, Casado, & Dixon, 2003; Bishop, 2011). The appropriate staffing for collaborative chat services is also a matter of debate. Approximately 39% of academic libraries rely on paraprofessional staff or library school students to staff a consortial chat reference service (Devine, Bounds-Paladino, & Davis, 2011). While expanding the operator pool beyond librarians is a cost-effective way to make up staffing deficits and extend service hours into the evenings and weekends (Blonde, 2006), there is some resistance to the practice, as librarians are considered the appropriate staffing level for answering research and reference questions (Weak & Luo, 2014).

Most of the literature about consortial chat services concerning service quality focuses on the completeness and correctness of librarians’ responses and staff members’ adherence to

behavioral guidelines. Although some studies have reported on user satisfaction, no studies have investigated factors affecting user dissatisfaction in the consortial context. This paper attempts to fill the gap by reporting on an evaluation of an academic library consortium's chat reference service. Using transcript analysis and exit survey responses, the researchers examined whether the consortium's collaborative service model, staffing choices, and policies contributed to user dissatisfaction.

Literature Review

Effectiveness of the Consortial Model

Location-Based Questions

Collaborative chat reference requires participants to respond to questions concerning unfamiliar libraries or locations. This adds a layer of complexity to the reference transaction, as answering questions from across the consortium may require local knowledge, the practical, collective knowledge that is rooted in a particular place and based on the immediacy of experience (Geertz, 1983, p. 75). Researchers have tried to estimate the proportion of chat questions that require local knowledge. Bishop (2011) refers to these queries as location-based questions, and defines them as questions that concern the geography of a library location or its attributes, such as its policies, services, or collections (Bishop, 2012, 2013). Eight studies have reported the quantity of location-based questions; they accounted for an average of 35% of total chat volume (Berry et al., 2003; Bishop, 2011, 2012; Bishop & Torrence, 2008; Coté, Kochkina, & Mawhinney, 2016; Hyde & Tucker-Raymond, 2006; Kwon, 2007; Sears, 2001).

Evidence regarding consortial partners' ability to answer location-based questions is mixed. Kwon (2007) found that local-specific questions are answered less completely than non-local queries and noted lower user satisfaction among patrons with local-specific questions. Bishop (2011) recorded a 45% referral rate for location-

based questions, with non-local librarians referring significantly more than local librarians. However, the correctness of responses to location-based questions does not differ greatly between local and non-local librarians (Bishop, 2012).

Consortial Service Quality

Researchers have also examined the quality of service provided by consortial chat services. Meert and Given (2009) assessed the chat service of an academic library participating in a 24/7 consortium, comparing local and consortial staff's adherence to the library's in-house reference quality standards. Adherence was high overall, with local staff meeting standards more often than non-local staff (94% vs. 82%, respectively). Consortial staff were less likely to answer questions in real time and made referrals at a higher rate than local staff. Similarly, an evaluation of Oregon's statewide chat consortium uncovered that guidelines were met in 62% of interactions, but staff had difficulties working with non-local users, including making referrals (Hyde & Tucker-Raymond, 2006). While consortial operators often rely on referrals as a strategy to handle non-local users' queries (Bishop, Sachs-Silveira, & Avet, 2011), user satisfaction with referrals is significantly lower than for completed chats. Referred users experienced the same degree of satisfaction as patrons who received a partial answer or no answer at all (Kwon, 2006).

Despite these weaknesses, consortial staff are capable of answering users' questions accurately, although they may take a different approach than local chat operators. Brown (2017) examined transcripts at a community college participating in QuestionPoint's 24/7 Reference. He found that answers from consortial back-up staff were largely correct, but they often provided more information rather than taking on an instructional role. Peer-review of transcripts from the statewide NCKnows chat consortium found that external staff from the 24/7 Reference company received similar scores

for skill in research and information use to local librarians, but were rated lower on engagement with the user (Pomerantz, Luo, & McClure, 2006).

Users are largely satisfied with the service provided by consortial or collaborative chat reference services. For example, the University of Maryland University College's chat service, which partially outsources staffing to provide 24/7 service, has a 90% approval rating (Rawson, Davis, Harding, & Miller, 2012). Kwon (2007) examined exit survey responses for a large public library system's chat reference service and found that the results were positive: 65% of users were satisfied with the answer provided, 68% stated that the librarian's handling of the question was excellent, and 77% of patrons would use the service again. Satisfaction did not differ significantly based on the user's question type.

In addition to overall satisfaction, one study compared satisfaction with different types of staff members within a collaboration. Hill, Madarash-Hill, and Allred (2007) compared user satisfaction with local librarians, librarians from partner libraries in the local area, and staff from Tutor.com's Librarians by Request on Southeastern Louisiana University's chat service. Local librarians received higher satisfaction scores than external librarians overall, but the partner librarians did receive higher satisfaction scores than local librarians in some categories. Notably, satisfaction scores for external librarians concerning the quality of answers, friendliness, overall service, and willingness to return rose over time, indicating that non-local librarians' performance improves as familiarity with non-local libraries and campuses grows.

Appropriateness and Effectiveness of Student Staffing

There has been significant debate about the appropriateness of using student employees to staff in-person and online reference services.

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; Bravender, Lyon, & Molaro, 2011; Ryan, 2008). Case studies have also reported a high proportion of simple directional or technology questions at the reference desk, suggesting that many transactions do not require the skills of a librarian (Bishop & Bartlett, 2013; Ryan, 2008; Stevens, 2013). However, there are conflicting findings about the most common question types on chat. Bravender et al. (2011) and Cabaniss (2015) reported that reference questions accounted for 17.7% and 23.3% of chats on their respective services, leading them to recommend staffing models in which graduate students or reference assistants handle the majority of chats. However, other researchers have reported that complex research or reference questions occur in 40%–66% of chats, supporting staffing by professional librarians (Coté et al., 2016; Fuller & Dryden, 2015; Morais & Sampson, 2010).

Studies assessing the quality of service provided by student workers have largely been positive. At the reference desk, case studies have shown that student employees receive comparable satisfaction ratings to librarians and score well on measures of approachability and helpfulness (Faix, 2014; Stevens, 2013). On chat reference, transcript analysis by Lux and Rich (2016) found that student employees offered quality assistance in 88% of transactions. While the reference librarians outperformed the student workers in most measures of comparison, the margin between them was not large. Keyes and Dworak (2017) also found that librarians outperformed students in their transcript analysis study. However, there was no significant association between staffing type and patron ratings. Both research teams argued that student workers are capable of providing chat reference services and can improve on their weaknesses through training. In particular, many student workers deviate from the Reference and User Services Association's (RUSA) best practices; they often fail to conduct

a thorough reference interview and communicate in an overly informal style (Barrett & Greenberg, 2018; Langan, 2012). Guiding students through the reference interview to provide appropriate behavioral benchmarks and reviewing transcripts can increase an awareness of reference standards among student workers (Langan, 2012; Ward, 2003).

Aims

The Consortial Context

The Ontario Council of University Libraries (OCUL) is a consortium representing the libraries of all 21 universities in the province of Ontario, Canada. Collectively, these universities have a student population of over 480,000, representing approximately one third of the university population of Canada.

OCUL leverages collective resources to purchase, manage, and preserve electronic collections, and provides access to them through a digital infrastructure offered by Scholars Portal (SP), the consortium's service arm. OCUL's largest member, the University of Toronto Libraries (UTL), acts as the service provider. SP supports a wide range of content repositories, member services, and technical services in the areas of collections, resource sharing, research services, and digital preservation.

Ask a Librarian is a virtual reference service managed by SP that connects students, faculty members, and researchers from participating university libraries across Ontario with real-time library and research assistance through chat. The service launched in 2011 as a partnership among seven OCUL libraries and has since expanded to 15 of the 21 OCUL members. The service reaches approximately 400,000 full-time equivalent students and handles roughly 25,000 chats per year. Since 2014, the service has also been offered in French under the name *Clavardez*

avec nos bibliothécaires ("Chat with our Librarians") at five libraries.

Ask a Librarian is open 67 hours per week during the academic year. Staffing is managed through a collaborative model in which libraries provide staffing hours relative to their student populations and service usage patterns. During evenings and weekends, staffing is supplemented by part-time virtual reference operators (VROs), generally second-year LIS students or recent graduates, hired by OCUL directly.

Consortial Analysis

In 2012, one year after the initial implementation of Ask a Librarian, SP staff conducted a research project investigating the types of questions asked on the service, the academic status and location of users, and overall user satisfaction. In 2017, after an influx of new partners, the introduction of bilingual service, and changes in chat software, a joint research team at SP and UTL began another research project, building upon the previous work. This major transcript analysis sought to investigate a wide range of questions about virtual reference.

As one segment of the broader analysis, this paper focuses on the service model, policies, and practices of Ask a Librarian as a consortial virtual reference service. The aim was to determine whether the current collaborative model is providing appropriate and satisfactory service to local users. Since user feedback tends to be very positive overall, the researchers intentionally sought out points of dissatisfaction in order to highlight any weaknesses in the service. To that end, the research questions were:

R1: Are dissatisfaction levels higher for some types of users or some categories of questions?

R2: Do users experience increased levels of dissatisfaction when served by an operator from another institution? Do levels of dissatisfaction increase if the user is made aware that the operator is from another institution?

R3: Do users experience increased levels of dissatisfaction when served by student staff?

R4: Do busy shifts have an effect on user dissatisfaction?

R5: Do questions submitted around shift change times or the service's closure have higher rates of user dissatisfaction? Do levels of dissatisfaction increase if the user is told that a shift change or service closure is approaching?

The answers to these questions will help determine if the current collaborative model, as well as our policies and procedures around issues such as staffing levels and instructions to operators for handling events like shift changes, are appropriate and successful.

Methods

The researchers received approval for this study from the University of Toronto's Research Ethics Board and OCUL's Ask a Librarian Data Working Group.

Data Collection and Sampling

The researchers reviewed chats that took place between June 1 and December 1, 2016. During this period, 9,424 chats were submitted to the service. Complete chat transcripts, responses to the question initiation form, and chat metadata were available for each interaction through the chat software. Of the 9,424 chats that took place during this period, 1,395 interactions (14.8%) had a corresponding completed exit survey.

Only chats with completed exit surveys were eligible for sampling. Four of the eight exit

survey questions assess the user's satisfaction with the interaction; only responses to these questions were examined in this study. The researchers used an Excel spreadsheet to identify chat interactions that had corresponding exit surveys with only satisfied responses, and interactions that had exit surveys with either neutral or dissatisfied responses. The exit survey questions and examples of satisfied, neutral, and dissatisfied responses are listed in the Appendix.

A total of 473 chats were sampled according to the following procedures:

- A sample of 256 chat interactions with satisfied exit survey responses was randomly selected using Excel, representing 18% of all chat interactions with completed exit surveys ($n = 1,395$). This sample size was chosen because it provides a confidence level of 95%.
- All 217 chat interactions with corresponding exit surveys reporting anything less than satisfaction were included in the sample. This included any chats with at least one exit survey response that was neutral or dissatisfied. This sampling method was chosen because only 16% of eligible interactions met this criterion. Homogenous purposive sampling allowed us to draw on as much data as possible to investigate the experiences of dissatisfied users.

Data Preparation

The researchers compiled the chat session metadata, responses to the question initiation form, and exit survey responses pulled from the chat software into an Excel spreadsheet. Chat session metadata included operator type, whether the user and operator were from the same institution, the time the chat was initiated, and whether the shift was busy. The question initiation form included user type and question

type. The exit survey responses related to user dissatisfaction.

The researchers anonymized the spreadsheet data according to standards set by the consortium's Data Working Group. Any identifying information, such as the identity of the chat operator, the user, or the institutional affiliation of either individual, was removed. The same process was used to anonymize the corresponding chat transcripts.

Study Variables

The researchers recorded information related to the study variables in the same spreadsheet containing the data extracted from the software.

User Type

Users identified their status with the university through a mandatory question initiation form. The options were: undergraduate student, graduate student, faculty, alumni, or other.

Operator Type

The operator(s) who participated in the chat interaction were listed in the chat metadata. The researchers recorded whether they were librarians, paraprofessionals, part-time virtual reference operators employed by the consortium, students (graduate student workers employed directly by participating libraries), or of different types.

Question Type

Users were asked to provide a detailed description of their question in a mandatory question initiation form. The researchers coded their responses by question type according to a schema that was previously developed by local researchers (Maidenberg, Greenberg, Whyte Appleby, Logan, & Spence, 2012). The question type categories are: accounts, citation, e-resources, facilities, computing, miscellaneous, non-library, policies, research, and writing.

Institutional Mismatch and Institutional Mismatch Reveal

The institutional affiliation of the operator and user were listed in the software's chat metadata. The researchers recorded whether the participants in the chat were associated with the same institution or whether there was a mismatch. Through transcript analysis, the researchers recorded chats in which the operator disclosed that they did not have the same institutional affiliation or home campus as the user.

Busy Shift

The chat session metadata listed the time at which the chat was initiated. From this information, the researchers determined the shift during which the chat took place. Shifts are an hour in length. The researchers consulted SP's chat volume statistics to determine how many chats were submitted during that same shift. Busyness was determined based on the number of chats submitted during the shift, compared to the number of operators scheduled to be online during the shift. A shift was considered busy if more than three chats were submitted for every available operator.

Aspects of Scheduling

The chat session metadata recorded the time at which the chat was initiated. The researchers recorded whether the chat began during the last 10 minutes of the shift or within 10 minutes of the time the service was scheduled to close. Through transcript analysis, the researchers also noted whether the operator disclosed any information about their shift schedule or about the service's hours (i.e., whether they were about to go off shift or the service was closing soon).

Dissatisfaction

Based on the exit survey responses associated with the chat interaction, the researchers

recorded whether the user was dissatisfied or not dissatisfied. Users were considered dissatisfied if they answered at least one of the four exit survey questions related to satisfaction (Appendix) with a neutral or dissatisfied response.

Coding

Question Type

Question type was coded by two members of the research team. The researchers coded an initial test set of 42 transcripts and achieved substantial intercoder agreement, as measured by Cohen's Kappa, $K = 0.794$. After discussing discrepancies, the researchers coded a second test set of 44 transcripts. They achieved near perfect agreement, as measured by Cohen's Kappa, $K = 0.876$.

Transcripts

As part of a larger service evaluation project, transcripts were coded for 30 variables hypothesized to effect user dissatisfaction, including two variables in the present study: institution mismatch reveal and schedule reveal. The four-member research team coded a test set of 15 transcripts using a draft codebook and coding form to establish intercoder reliability. The team met to discuss discrepancies, refined the definitions and examples in the codebook, and then coded a second test set of 10 transcripts. The researchers assessed intercoder reliability using average pairwise percent agreement, which was set at a threshold of 80%. For the second test set, average pairwise percent agreement was 93.3% for institution mismatch reveal and 95% for schedule reveal.

Data Compilation and Analysis

Once transcript coding was completed, the data from the coding form was merged with the spreadsheet containing the chat metadata, survey responses, and information for the other study variables. Pearson chi-square tests of

independence were conducted in SPSS to determine if there were significant relationships between variables, with a significance level of $p < 0.05$ set a priori. The researchers then entered the variables into a binary logistic regression model to determine the strength and directionality of the variables' effects.

Results

The researchers ran eight Pearson chi-square tests of independence to determine if there was a significant relationship between user dissatisfaction and aspects of Ask a Librarian's service model and staffing and scheduling practices. Two variables had a significant relationship with user dissatisfaction at an alpha level of 0.05: operator type, $\chi^2 (4, N = 473) = 25.513, p < 0.001$, and institution mismatch reveal, $\chi^2 (1, N = 473) = 4.323, p = 0.038$. The remaining variables were not significantly related to dissatisfaction. The results of each chi-square test of independence are available in Table 1.

Next, we entered the variables into a binary logistic regression, in order to determine how well the variables, taken together, can explain or predict dissatisfaction, as well as to understand the significance, strength, and directionality of the individual variables' effects. The overall model was statistically significant, $\chi^2 (22, N = 473) = 63.087, p < 0.001$, meaning that it was statistically reliable in distinguishing between satisfied and dissatisfied patrons. The model did not have strong predictive power, represented by a Nagelkerke R^2 of 0.167. Nagelkerke's R^2 is a measure relating to the goodness of fit of the model, and can range from 0 to 1. The model was correct in predicting the outcome (i.e., whether the user was dissatisfied) in 64.9% of cases.

In the regression model, there were two significant explanatory variables at the 0.05 alpha level: operator type and institutional mismatch reveal. Within the operator type category, the part-time virtual reference

Table 1
Summary of One-Tailed Chi-Square Tests of Independence by Variable

Variable	Dissatisfied		Not Dissatisfied		Pearson χ^2	df.	Sig.
	Observed	Expected	Observed	Expected			
User type					8.010	4	.091
Undergraduate student	129	120.7	134	142.3			
Graduate student	56	55.5	65	65.5			
Faculty	13	11.9	13	14.1			
Alumni	7	8.7	12	10.3			
Other	12	20.2	32	23.8			
Operator type					25.513	4	.000*
Librarian	80	78.5	91	92.5			
Paraprofessional	74	60.6	58	71.4			
Part-time virtual reference operator	25	44	71	52			
Student	24	24.8	30	29.2			
Mixed	14	9.2	6	10.8			
Question type					14.714	9	.099
Accounts	14	18.8	27	22.2			
Citation	28	20.6	17	24.4			
E-resources	12	16.5	24	19.5			
Facilities	6	5.5	6	6.5			
Computing	5	6	8	7			
Miscellaneous	8	9.6	11.4	5			
Non-library	2	3.2	5	3.8			
Policies	16	18.4	24	21.6			
Research	124	117.4	132	138.6			

Writing	2	9	0	1.1			
Institutional mismatch	Observed	Expected	Observed	Expected	0.073	1	.787
Match	84	82.6	96	97.4			
Mismatch	133	134.4	160	158.6			
Institutional mismatch reveal	Observed	Expected	Observed	Expected	4.323	1	.038*
Revealed	34	26.6	24	31.4			
Did not reveal	183	190.4	232	224			
Busy shift	Observed	Expected	Observed	Expected	.745	1	.388
Busy	34	30.7	33	36.3			
Not busy	183	186.3	223	219.7			
Chat initiated within 10 minutes of end of shift / service closure	Observed	Expected	Observed	Expected	2.773	1	.096
Initiated within 10 minutes	41	34.4	34	40.6			
Not initiated within 10 minutes	176	182.6	222	215.4			
Reveal of aspects of scheduling	Observed	Expected	Observed	Expected	3.202	1	.074
Revealed	39	32.1	31	37.9			
Did not reveal	178	184.9	225	218.1			

Note. df. = degrees of freedom; Sig. = significance.

*Denotes that relationship is significant at an alpha level of 0.05.

Table 2
Summary of Binary Logistic Regression

Variable	Category	β	S.E.	Wald	df.	Sig.	Exp(β)
User type				6.993	4	.136	
	Undergraduate student	.558	.579	.930	1	.335	1.747
	Graduate student	.331	.588	.317	1	.573	1.393
	Faculty	.840	.696	1.455	1	.228	2.316
	Other	-.368	.648	.322	1	.570	.692
Operator type				26.860	4	.000*	
	Librarian	.125	.339	.135	1	.713	1.133
	Paraprofessional	.548	.349	2.459	1	.117	1.730
	Part-time virtual reference operator	-1.065	.400	7.099	1	.008*	.345
	Mixed	.777	.595	1.703	1	.192	2.175
Question type				12.147	9	.205	
	Accounts	-21.661	.000	28257.649	1	.999	.000
	Citation	-20.417	.000	28257.649	1	.999	.000
	E-resources	-21.657	.000	28257.649	1	.999	.000
	Facilities	-21.012	.000	28257.649	1	.999	.000
	Computing	-21.812	.000	28257.649	1	.999	.000
	Miscellaneous	-21.354	.000	28257.649	1	.999	.000
	Non-library	-22.236	.000	28257.649	1	.999	.000
	Policies	-21.355	.000	28257.649	1	.999	.000
	Research	-21.000	.000	28257.649	1	.999	.000
Institutional mismatch		-.299	.225	1.757	1	.185	.742
Institutional mismatch reveal		.875	.337	6.750	1	.009*	2.399

Busyness of the shift		-.007	.293	.001	1	.981	.993
Chat initiated within 10 minutes of end of shift / service closure		.284	.276	1.059	1	.304	1.328
Reveal of aspects of scheduling		.363	.297	1.494	1	.222	1.437

Note. β = coefficient, S.E. = standard error, Wald = Wald chi-square test (which tests the null hypothesis); df. = degrees of freedom; Sig. = significance; $\text{Exp}(\beta)$ = odds ratio.

*Denotes that relationship is significant at an alpha level of 0.05.

operator type was a significant, negative variable within the model ($\beta = -1.065$, $p = 0.008$). This means that dissatisfaction decreased if users were served by graduate student staff or recent graduates hired by the consortium. The other operator types did not significantly contribute to dissatisfaction. Institutional mismatch reveal was a positive variable in the model, indicating that users were more likely to be dissatisfied if the operator revealed they were not at the user's home institution ($\beta = 0.875$, $p = 0.009$).

Discussion

This analysis did not find a statistically significant relationship between dissatisfaction and user or question type (research question 1), indicating that Ask a Librarian provides a consistent level of service to all patrons and satisfactorily answers all types of library- and research-related questions. The results largely reaffirm the consortium's service model, staffing practices, and policies. Dissatisfaction levels did not show relationships with most of the factors examined, indicating that overall service is appropriate and satisfactory. In particular, busy shifts and chats initiated near shift change times or service closure (research questions 4 and 5) had no relationship with dissatisfaction, suggesting that Ask a Librarian's scheduling

practices and policies for handling shift changes are appropriate.

Consortial Service Quality and Institutional Mismatch

The analysis found no relationship between institution match and dissatisfaction, indicating that users can be served by operators across the consortium without compromising patron satisfaction. This fits into the literature that finds that users tend to be satisfied with consortial or collaborative chat reference (Kwon, 2007; Rawson et al., 2012).

The nature of OCUL as a purchasing, advocacy, and service-providing consortium means that there are deep levels of collaboration between institutions, which tend to have access to similar resources. This may make it easier for operators from one institution to successfully answer questions from another, consistent with the findings of Hill et al. (2007) that satisfaction scores for external librarians in collaborative chat improved as their familiarity with the user's library increased. Therefore, the finding that users are satisfied by service from operators at partner institutions is not necessarily generalizable to all consortia, and particularly large, multi-type consortia such as the one Bishop (2011, 2012) found inadequate for answering local questions.

The reveal of an institution mismatch was associated with user dissatisfaction. This is an area that has not been widely studied and the authors were unable to find other literature to help provide context, making this a fruitful area for potential future research. This finding especially requires further investigation to rule out confounding factors. Users may simply be more dissatisfied when they learn that they are not being served by their own local library, but the authors' current hypothesis is that operators are more likely to reveal that they are from another institution if they are unable to answer the user's question, or if the chat is otherwise going poorly. Pending more analysis, SP will consider changing Ask a Librarian policies to recommend against revealing an institution mismatch unless absolutely necessary.

Appropriate and Effective Student Staffing

The results show that users do not express dissatisfaction with the service of non-librarians, and in fact show a slight preference for graduate student staff hired by the consortium. This aligns with earlier literature indicating users find student staff to be approachable and helpful (Stevens, 2013) and that they provide high-quality assistance via chat, although not as high-quality as librarians (Keyes & Dworak, 2017; Lux & Rich, 2016). However, it is also important to note that the student staff of Ask a Librarian are all LIS graduate students who have taken at least one reference course. As such, they may perform more like librarians than undergraduate students and non-LIS graduate students staffing similar services (for example, in terms of following RUSA best practices). However, as noted above, this study did not examine response completeness or accuracy as other studies have done.

This finding reinforces Ask a Librarian's use of student staff to supplement evening and weekend shifts as an appropriate way to extend reference services beyond the normal working hours of reference librarians.

Limitations

Beyond the generalizability of specific findings, there are a few limitations to this study. In examining consortial service quality, the researchers did not identify whether the questions required local knowledge, as Bishop (2011, 2012) and other researchers have done. Satisfaction was reported by users in an exit survey, which was only presented when the operator ended the chat, or when the user clicked an "end chat" button; users who simply closed the window did not see it. Self-reported satisfaction scores are also not always reliable measures as they can introduce the user's bias, and user satisfaction is only one measure of an interaction's success. This study did not examine other quality metrics, such as response accuracy or completeness or adherence to behavioural standards like RUSA guidelines. Other factors, including those discussed in the Further Research section below, influence user satisfaction and therefore may complicate the relationships discussed here. The quantitative analysis for this study did not include any moderating variables that may partially explain relationships.

Further Research

The research team is already conducting further analysis on the same dataset, building on previous knowledge of what affects dissatisfaction in reference transactions. Articles on how operator behaviour and communication styles impact user dissatisfaction are already published (Logan & Barrett, 2019; Logan, Barrett, & Pagotto, 2019), and work has begun to study instruction and referrals in chat.

More in-depth research is needed to flesh out the nuances of the relationships uncovered in this paper. Qualitative research, in particular, could complement these findings by disentangling what leads users to give low scores on the exit survey.

Finally, while Ask a Librarian is a bilingual service, the number of French interactions was so small that it was not feasible to analyze any differences between English and French user satisfaction. This is an area the researchers hope to examine in more depth in the future.

Conclusions

As a collaborative chat service, Ask a Librarian was launched to leverage shared resources and provide cost-effective reference service to Ontario university libraries. Its service model and policies were developed based on standards and best practices informed by other virtual reference practitioners. Now that Ask a Librarian has grown into a mature service, a review is important to ensure that the model and policies are backed by evidence.

The study largely reaffirmed the consortium's service model, staffing practices, and policies. Users are not dissatisfied with the service received from chat operators at partner institutions or by service provided by non-librarians. Current policies for scheduling, service closure, and handling shift changes are appropriate. Best practices related to disclosing institutional mismatches may need to be changed, as these reveals were associated with higher levels of dissatisfaction. This is an area that merits further investigation.

No areas of weakness were uncovered, indicating that Ask a Librarian provides appropriate and satisfactory service to all different user types and for all different question types. Overall, this research demonstrates that institutions can trust the consortium with their local users' virtual reference needs.

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Appendix

Exit Survey Questions Assessing User Satisfaction

The following questions were included in the current study. Responses in bold were identified as dissatisfied, responses in italics were classified as neutral, and those with no text effects were considered satisfied.

1. The service provided by the librarian was
 - a. Excellent
 - b. Good
 - c. *Satisfactory*
 - d. **Poor**
 - e. **Very poor**

2. The library provided me with
 - a. Just the right amount of assistance
 - b. **Too little assistance**
 - c. *Too much assistance*

3. This chat service is
 - a. My preferred way of getting library help
 - b. A good way of getting library help
 - c. *A satisfactory way of getting library help*
 - d. **A poor way of getting library help**
 - e. **A last resort for getting library help**

4. Would you use this service again?
 - a. Yes
 - b. **No**

The following questions also appear on the exit survey, but were not included in this study.

1. Was this your first time using the service?
 - a. Yes
 - b. No

2. Where were you when you chatted with us today?
 - a. Off campus
 - b. On campus but not in the library
 - c. In the library

3. How did you find out about this service? (Users could select more than one response.)
 - a. Library website
 - b. Librarian
 - c. Library instruction session
 - d. Friend
 - e. Professor or TA
 - f. Promotional material (poster, flyer, etc.)

- g. Social media
 - h. Other (free text response)
4. Other feedback or suggestions (free text response)