Transaction Analysis of Interactions at the Reference Desk of a Small Academic Library

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Abstract

As discussions continue about the changing nature of reference service in academic libraries, the Geoffrey R. Weller Library determined that more detailed information on what was happening at the Reference Desk was needed. During the 2006/07 academic year, transactions at the Reference Desk were analyzed to determine when they occurred (both during the week and during the academic year), the length of time the transactions took, the categories of the transactions, what sources were used and whether or not instruction was provided as part of the transaction. Another round of data was gathered in September 2009 to determine if use patterns had changed. Transactions at the Reference Desk were generally conducted in person, took either <1 min. or between 1-5 min. to answer, and occurred most often on Mon-Thurs between 11am and 5pm. Between September 2006 and September 2009, specific title and research categories of questions decreased by 6% and directional and technical help categories of questions increased by 9%. There was also a decrease in the level of instruction being given. As a result of this research, service hours have been reduced and the ongoing data collection at the Reference Desk has become more detailed to allow for ongoing analysis.

Introduction

The University of Northern British Columbia is a small university (approximately 3500 FTE) located in northern British Columbia, Canada. The university was founded in 1990 as "a university in the north, for the north" (UNBC History, 1987-1994). Since then, UNBC has been recognized as one of BC's research-intensive universities, and is consistently ranked the best small university in Western Canada in the Maclean's magazine rankings of Canadian universities (UNBC Best in the West for Fifth Straight Year).

There are many issues tied to the notion of academic reference service; staffing (professional, paraprofessional or a combination of both), what type of service (face to face, electronic synchronous or asynchronous), the demand on the Reference Service (when are patrons asking questions or needing assistance), what types of sources are used (print or electronic), and the amount of time spent in answering questions (Carlson 25-30, Ewing and Hauptman 3-6, Goetsch 15-16, Merkley 143-147, Ryan 389-399, Spencer and Dorsey 290-294). There is general agreement in the field that "technology has changed the nature of
reference desk inquiries significantly” (Henry and Neville 364). Given these concerns about changing reference transactions combined with a concern about staffing the Reference Desk efficiently and an increasing desire to use evidence-based decision-making, it was necessary to determine if there were any patterns in the transactions occurring at our own Reference Desk.

At the Geoffrey R. Weller Library, we use a traditional reference service model where "direct librarian-user interaction takes place in some physical service points, typically the reference desk.” (Rieh 179). For the purpose of this survey, a reference transaction was defined as any interaction between a library patron and a reference staff member. The interaction could vary from a very simple directional question (i.e. "Where is the stapler?") to very complex, extended reference questions involving multiple sources. Anecdotal evidence suggested that the nature of the transactions at the Reference Desk was changing, but we did not have any concrete evidence about the changes in these transactions. Statistics about transactions at the Reference Desk have always been gathered using a modified Katz model (Katz 16) with categories of Directional, Basic or Complex; however, these statistics were limited to tally marks indicating which category and at what time of day they occurred. In order to make informed decisions about potential changes to our current Reference Service model, we undertook an analysis of transactions occurring at the Reference Desk at different times throughout the 2006/07 academic year. This included determining what types of questions were asked; when the questions were asked (time of year, day of the week, and time of day); the types of sources that were used to answer questions; and if any instruction was given during the transactions. In September 2009, another round of data gathering was conducted to determine whether there had been any changes to the pattern of transactions.

**Gathering the Data**

Data was gathered four times during the 2006/07 academic year, for a period of two weeks each time. The data-gathering times were chosen to give an indication of a cross-section of reference service over the year, with one at the end of the Winter semester (March 13 -- 26, 2006), one during the Spring semester (May 29 -- June 12, 2006), one at the beginning of the Fall semester (Sept. 18 -- Oct. 1, 2006), and one in the middle of the Winter semester (Feb. 5 -- 18, 2007). The 2006/07 data collection served as a baseline for specific details of what was occurring at the Reference Desk. Due to a number of unrelated factors, no changes were made to the reference service model after this data was collected, but in 2009, questions surrounding the Reference model were raised again. As the majority of transactions from the previous round of data collection occurred during the Sept. 2006 period, another round of data collection was conducted during the 2009 fall semester (Sept. 21 -- Oct. 4, 2009) to determine whether the pattern of transactions had changed in the intervening years.
During both the 2006/07 and 2009 data-gathering periods, the Reference Desk was staffed for 60 hours a week (Monday -- Thursday from 9 am to 9 pm, Friday from 9 am to 5 pm and Sunday from 1 pm to 5 pm). Asynchronous electronic reference (email) was also available 24 hours a day. Nine people staffed the Reference Desk during the 2006/07 academic year and eleven people during the September 2009 collection period. The Reference Desk was staffed with both professional librarians and paraprofessionals during both data collection periods.

During the data collection periods, the staff members were asked to fill out a questionnaire for each transaction that occurred at the Reference Desk (Figure 1). The questionnaire was based on the questionnaire used by St. Clair and Aluri (St. Clair & Aluri 150), but was modified to suit the purposes of this study. Reference staff members were asked to record or paraphrase the question(s) asked at the reference desk, record the time that the question occurred, the sources used to answer it, whether any instruction was given and the length of time taken to answer the question. The questionnaire was available in either print or electronic form. The information in the submitted questionnaires was then transcribed into an Excel spreadsheet for classification and analysis.

![Reference Transaction Slip](image)

As two sections of the questionnaire (description of the question and sources used) were self-reported by the Reference staff, there could be a potential for misrepresentation in the data. As Wendy Baldwin states "a desire to look good could distort data either intentionally or unintentionally" (Baldwin 3). However, in
this situation, self-reported data was seen as the most effective way of gathering the data. In an attempt to mitigate any potential tendency towards distortion when completing the questionnaires, the Reference staff members were assured that their responses would be anonymous and were encouraged to be as objective and as specific as possible when filling out the questionnaires. It was explained that the data would be aggregated so that no individual questions or staff member would be identifiable. The data was aggregated by a single person to further reduce the impact of any potential distortion or misrepresentation (Baldwin 5). Reference staff members were also asked to fill out one questionnaire per question (i.e. if a single patron asked multiple questions, multiple questionnaires should be filled out).

**General Patterns from the Data**

**Timing of Transactions**

The types of transactions conducted at the Reference Desk were similar between the 2006/07 and 2009 data collection periods with 95% of questions being asked in person and the other 5% split between phone and email interactions.

The length of time taken to ask questions during the two data collection periods was also similar. As can be seen in Figure 2 below, the majority of questions asked took between 1-5 min. to answer during both time periods. During 2009, there is evidence of an increase in the questions that take between 1-5 min. to answer with a corresponding decrease in the number of questions that take between 6-15 min. and over 16 min. to answer. The percentage of questions that take less than 1 min. to answer stayed relatively stable.

![Figure 2 -- Length of Time of Transactions](image)
In both data collection periods (2006/07 and 2009), the time of day when transactions occurred had a general bell curve with the number of questions rising slowly from 9am, peaking around 2-3 pm and then dropping off dramatically after 6 pm.

As seen in Figure 3, the beginning of the week (Monday to Wednesday) had slightly more questions than Thursday; Friday and Sunday had the lowest demand. This can be partially explained by the Reference Desk hours as the Reference Desk closed at 5pm on Friday and was only open between 1-4pm on Sunday. However, even taking this into account, the demand for Reference service on Friday and Sunday was quite low.

The majority of transactions took place in September as can be seen in Figure 4 below. September 2009 showed a very similar pattern to the September 2006 period, with a very slight increase in the percent of 1-5 min. transactions. Even the number of transactions was very similar between these two data collection periods as there is only a difference of 34 transactions between September 2006 and September 2009.
In 2006/07, transactions taking <1 min. and 1-5 min. were more common and occurred mostly between 12-3pm. Transactions taking 6-15 min. and 16+ min. occurred less often, and had their peaks later in the day (between 2-5pm). In 2009, transaction taking <1 min. and 1-5 min. were also more common and peaked between 11-1pm and 2-3pm respectively. In 2009, transactions taking 6-15 min. and 16+ min. had a peak between 11-12pm as well as between 2-5pm.

The complexity of questions is of interest when doing an analysis of transactions at the Reference Desk. If you assume that more complex questions take longer to answer, then the length of time taken to answer a question can be a good gauge of levels of complexity. Anecdotal reports from this survey indicated that at least one of the transactions took up to 30 min. Further investigation of the link between complexity of questions and length of time taken to answer should be investigated to reveal if this is the case.

Types of Questions

In order to aggregate the types of questions, a categorization scheme was developed that classified the questions into 15 categories. Table 1 below gives the categories and a general indication of the type of question in each category. A single person created and was responsible for classifying all of the transactions in order to ensure that there was a consistent application of the scheme across all responses and that each transaction was assigned to a single category.
During both the 2006/07 and 2009 data collection periods, the common types of questions were directional, printing, research, specific title, and tech questions. In 2006/07, traditional types of reference questions (specific title and research) made up 44% of questions asked at the Reference Desk. Directional and technical help type questions made up 33%, with the remaining 26% of questions distributed over assistance with various services or formats offered by the library (Figure 5). Looking at the details of September 2006 (Figure 6), traditional types of reference questions (specific title and research) made up 44% of questions asked at the Reference Desk. Directional and technical help type questions

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<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD-Rom computers</td>
<td>How to access or use the products on the CD-Rom computers.</td>
</tr>
<tr>
<td>Circ.</td>
<td>Storage and processing requests, picking up and signing out items</td>
</tr>
<tr>
<td>Data</td>
<td>Questions dealing with statistical products (Cansim, StatsCan products, etc.)</td>
</tr>
<tr>
<td>Directional</td>
<td>Location of offices, stationary supplies, areas of library, etc.</td>
</tr>
<tr>
<td>ILL</td>
<td>Questions dealing primarily with Interlibrary Loans (picking up, placing, etc.)</td>
</tr>
<tr>
<td>Maps</td>
<td>Questions dealing with maps and locating or interpreting them.</td>
</tr>
<tr>
<td>Microfiche/film</td>
<td>How to access or use items of microfiche or microfilm</td>
</tr>
<tr>
<td>Misc.</td>
<td>Questions that did not fit in any other category (tours, filling out forms, etc.)</td>
</tr>
<tr>
<td>Photocopiers</td>
<td>Troubleshooting or how to use photocopiers</td>
</tr>
<tr>
<td>Printing</td>
<td>Troubleshooting or how to print documents</td>
</tr>
<tr>
<td>Remote Access</td>
<td>How to access library resources from off campus</td>
</tr>
<tr>
<td>Research</td>
<td>Questions dealing with research on various topics</td>
</tr>
<tr>
<td>Specific Title</td>
<td>Questions dealing with specific titles, either books or journals</td>
</tr>
<tr>
<td>Style Guides</td>
<td>How to find or interpret style guides</td>
</tr>
<tr>
<td>Tech.</td>
<td>Troubleshooting technological problems (USB keys, Word docs, networks, etc.)</td>
</tr>
</tbody>
</table>
made up 36%, with the remaining 23% of questions distributed over assistance with various services or formats offered by the library.

![Types of Questions - 06/07](image1)

*Figure 5 -- Types of Questions 2006/07*

![Types of Questions - Sept 06](image2)

*Figure 6 -- Types of Questions Sept 2006*

In September 2009, the distribution of questions was slightly different. In September 2009, traditional types of reference questions (specific title and research) only made up 38% of all transactions, (a drop of 6% from September 2006) and directional and technical help types of questions made up 45% (an increase of 9% from September 2006). Questions pertaining to library services and help with different formats made up 18% of the questions in 2009 (a drop of 5% from September 2006). (Figure 7)
Sources Used during Reference Transactions

The sources used to answer questions at the Reference Desk were also analyzed. The data taken from the questionnaires regarding sources used was aggregated into 12 categories modified from Bradford, Costello and Lenholt's categories of sources (265). Table 2 below gives the categories used and a general indication of the type of source in each category. The category of librarian's knowledge was quite multifaceted. The knowledge that a librarian or paraprofessional has, such as: their experience and understanding of library policy, their knowledge of local technology and software applications, including troubleshooting and instructing students in their use, as well as specific subject expertise is a very valuable resource and should be considered (Henry and Neville 372).
Table 2 -- Source Categories Scheme

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalogue</td>
<td>Library’s online catalogue</td>
</tr>
<tr>
<td>Data</td>
<td>Statistical products (Cansim, StatsCan products, etc.)</td>
</tr>
<tr>
<td>Indexes</td>
<td>Index or database subscribed to by the library</td>
</tr>
<tr>
<td>Librarian’s knowledge</td>
<td>Use of librarian’s experience and knowledge (local knowledge, troubleshooting experience, subject expertise, etc.)</td>
</tr>
<tr>
<td>ILL</td>
<td>Interlibrary Loans web pages or referral to ILL staff</td>
</tr>
<tr>
<td>Google Scholar</td>
<td>Use of Google Scholar</td>
</tr>
<tr>
<td>Microfiche/film</td>
<td>Microfiche or microfilm resources</td>
</tr>
<tr>
<td>Library web pages</td>
<td>Webpage authored by the Library</td>
</tr>
<tr>
<td>Other library catalogues</td>
<td>Other library’s catalogues</td>
</tr>
<tr>
<td>Ref. collection</td>
<td>Source from the library’s print Reference collection</td>
</tr>
<tr>
<td>UNBC web pages</td>
<td>Webpage authored by the university</td>
</tr>
<tr>
<td>WWW</td>
<td>Webpage freely available on the WWW</td>
</tr>
</tbody>
</table>

As seen in Figures 8 and 9 below, ~25% of questions were answered without using any sources in both the 2006/07 and 2009 data collection periods. It is likely that these are correlated with directional, printing or technology types of questions, but more analysis would be needed to confirm this. In both data collection periods, the common types of sources used to answer questions were the catalogue, the indexes or the librarian's knowledge. There was a slight decrease in the percentage of questions answered using the catalogue as a source in 2009, and a slight increase in questions answered using ILL as a source, but otherwise these two figures were very similar.
Instruction during Reference Transactions

Instruction is often a component of a reference transaction. Four types of instruction were identified: 1) instruction in the use of the catalogue; 2) instruction in the use of the indexes; 3) instruction or recommendations about search strategies that the patron may use; and 4) instruction about how to read call numbers. (Note: Each transaction may have included more than one type of instruction.)

In 2006/07, 51% of questions did not involve any instruction. Looking at the details of September 2006, this figure jumped to 57%. In September 2009, that percentage had increased to 60% (Figure 10). This may be caused by the increase in the number of directional and technical help type questions occurring at the Reference Desk, but more research would be needed to confirm this.
About half of the reference transactions included some type of instruction. The majority of instruction involved demonstrations of how to use the catalogue, followed by about an equal number where instruction was given in the use of indexes or search strategies. The majority of instruction took either between 1--5 minutes or 6-15 minutes, and most of the transactions that took over 6 minutes involved instruction. Instruction generally occurred throughout the day starting at about 10 am and tapering off at about 5 pm with the peak seeming to occur between 2-3 pm (except for instruction in search strategies which peaked between 4-5 pm).

![Figure 10 -- Types of Instruction](image)

**Secondary Observations**

**Research and Specific Title Questions**

There was an interesting correlation between research and specific title questions and the sources used. Research questions were usually answered using the catalogue, the indexes and librarian's knowledge (Figure 11). Specific title questions were usually answered using the catalogue, but sometimes with librarian's knowledge or the indexes (Figure 12). Questions in the research and specific title categories were more likely to involve instruction. Instruction for research questions was pretty evenly split between instruction in how to use the catalogue, how to use the indexes and recommendations about search strategies. Instruction with questions looking for a specific title mostly focused on how to use the catalogue.
Impact on Existing Service

This study of reference transactions has now given the Geoffrey R. Weller Library a baseline of data about specific details of transactions occurring at the Reference Desk, as well as a glimpse of potential long-term patterns. As a result of this research, service hours have been reduced to allow staff time to be more specifically targeted at the peak reference hours of 11-6. The reference desk is currently still being staffed on Sundays but this is being monitored more closely and maybe reassessed in the future.
The ongoing data collection at the Reference Desk has become more detailed, which will allow us to continue to make informed decisions surrounding reference service, without engaging in an intensive data-gathering project. An online questionnaire with three categories is now used to track reference transactions. The three categories of transactions are facilitative (directional or geographical), technology (anything that plugs in) and research (everything else) (McCabe and Fuchs). Drop-down menus allow probing questions to gather further information about each transaction depending on the category of each transaction. For example, if reference staff indicated that they answered a facilitative question, more details are requested about the type of facilitative question (was it related to ILL, Circ, adding money to print cards, etc.) If reference staff indicated that they answered a technology question, more details are requested regarding the type of technology or assistance (accessing student drives, email, printers, etc.). Reference questions (everything excluding facilitative or technology related) are further categorized based on the length of time taken to answer them (1-5 min., 6-15 min., 16+ min.). This detailed data about transactions at the Reference Desk will allow for ongoing analysis and will allow us to continue to make evidence-based decisions regarding Reference service.

Finally, a Roving Reference research project using iPads will be implemented in September 2010. In light of the evidence that the number of reference transactions has been decreasing, two librarians at UNBC hypothesized that one of the reasons for this decrease may be due to the form of reference service that we were providing, whereby patrons must physically come to the reference desk to seek assistance. As a "stationary librarian cannot reach a stationary patron" (MacDonald and McCabe, 1), the Roving Reference project will seek answers to the question of why reference questions have been decreasing. The Roving Reference project will be implemented by five librarians with iPads who will move throughout the library seeking patrons who may be in need of assistance. The librarians can also be contacted through a chat widget and can offer to come to the patron’s location. This service will be offered from Monday to Wednesday from 1-4 pm to target the times when the majority of questions occur.

Conclusion

By comparing the two data collection periods (March 2006-February 2007 and September 2009), there are generalities that can be made about transactions at the Reference Desk. Transactions at the Reference Desk are generally in person, take either <1 min. or between 1-5 min. to answer, and occur between Mon-Thurs between 11-5.

It is clear that the nature of the transactions at the Geoffrey R. Weller Library Reference Desk is changing. Between September 2006 and September 2009, traditional types of reference questions (specific title and research) decreased by 6% and directional and technical help types of questions increased by 9%.
There was also a decrease in instruction, which is likely related to the increase in technical help questions. Questions involving instruction usually took either 1-5 or 6-15 min. and most often occurred between 12-5 pm. If instruction was given, it was usually about how to use the catalogue or how to use indexes and formulate a search strategy. Instruction was strongly correlated with research or specific title types of questions.

The baseline data from 2006/07, combined with the data gathered in September 2009, have shown us that transactions at the Reference Desk are changing, specifically in terms of the types of questions being asked. It is recommended that more research be done to determine if this type of pattern is consistent with similar academic institutions and if so, what factors may be contributing to this change. The research shown here would provide a valuable template for other institutions to follow when gathering data about their reference services. This information would be vital in allowing institutions to make evidence-based decisions regarding staffing models, identify possible training needs and respond to future trends in reference service.
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