Title: Developing and Assessing a Graduate Student Reference Service

Authors: Robin Canuel, Sandy Hervieux, Veronica Bergsten, Amélie Brault, Rachelle Burke

Introduction

Integrating graduate student reference assistants into reference service teams in academic libraries is a long-established practice. However, there are few studies that focus on the assessment of the reference practices of graduate students. Given that one goal of academic librarians is to help create independent lifelong learners, it is important that library interactions incorporate instruction at every opportunity. Previous research by Desai and Graves (2008), and later by Hervieux and Tummon (2018), identified the teaching practices of librarians during reference interactions; however, they did not address the implications for students providing reference services. This paper describes the development and formal assessment of a training program attended by graduate student reference assistants, and the reference services they subsequently provided at McGill University. To guide and inform the assessment of the training program, and the reference service provided, the authors conceived the following four research questions: Are graduate student using the reference interview?; To what extent are they using the reference interview?; Is instruction happening in graduate student reference assistant interactions?; and Which types of instructional methods are used? The authors aimed to answer these questions through a qualitative content analysis of virtual reference transcripts, and an evaluation of in-person reference interactions at a library service desk.

Institutional Context and Training Program

The Humanities and Social Sciences Library at McGill University provides reference services to the university and local community. Although the library's collection focuses on subjects in the humanities and social sciences, students from all disciplines use its reference

services. During the Fall and Winter semesters, in-person reference at a service desk is available 52 hours per week, including one weekend day. Virtual reference is also offered 35 hours per week, every weekday. The Question Point platform from OCLC is used to provide the virtual reference service.

A previous graduate student-staffed reference program involved information studies students who provided virtual reference services for 20 hours per week. In order to offer students a more fulsome experience, it was decided that the program should also include reference duties at a service desk. To facilitate funding for this pilot project, a partnership was established with the Post-Graduate Students' Society to financially support the creation of graduate student reference assistant positions. The first cohort of three students was hired in September 2018. They were responsible for providing in-person and virtual reference services for a total of 30 hours per week.

Although the graduate students were pursuing an information science degree, and should have been familiar with certain aspects of providing reference services, it was decided that a robust training program should be established to prepare them. Using the "Guidelines for Behavioral Performance of Reference and Information Service Providers" established by the Reference and User Services Association, the librarian supervising the graduate students created a training plan that focused on the reference interview and on providing instruction (Reference and User Services Association, 2008a). The graduate student reference assistants completed seven hours of training that focused on the reference interview, orienting them to the library, and making sure they were aware of the different catalogues, databases and library resources available to them. The formal reference training also included extensive instruction on the chat platform Question Point. Since teaching is an important part of providing reference services, the

supervising librarian consulted a previous study conducted by Desai and Graves (2008) to inform the training and promote an awareness of the different approaches available to the students when teaching during a reference interaction. In addition to this reference training, the graduate reference assistants were encouraged to attend a citation management software workshop, and were offered fire and safety instruction. In addition to the formal training, the graduate students also completed 30 hours shadowing experienced librarians as they provided reference services. The shadowing included hours at the reference desk and on virtual reference. During these shadowing sessions, librarians were encouraged to share their searching and subject expertise with the students, as well as the most commonly received reference questions. Although not part of the official training program, the supervising librarian and their colleagues were always available to answer the students' questions and assist them during their shifts. The supervising librarian also reviewed their virtual reference interactions for quality control and to inform continuous training and improvement.

Literature Review

Reference services are a core component of librarianship, encompassing all of the services librarians offer, whether in-person or virtually, to meet the information needs of their various patrons. It has become common practice in academic libraries to hire students to work alongside librarians in providing reference services. Some libraries choose to hire students from a variety of disciplines, studying at either the undergraduate or graduate level, while others hire exclusively students in the Library and Information Studies (LIS) field. These opportunities for students, regardless of their academic background, can provide them with great work experience to help advance their future library careers, in a nurturing environment where they have an opportunity to develop their professional reference skills (Duffus, 2017).

Not all reference questions require the expertise of librarians. At Bowling Green State University, library statistics for 2014 revealed that 91% of their chat questions could be considered reference, and decreasing to 50% for questions received in person (Lux and Rich, 2016). Studies have found that, at the desk, lower-level questions are by far the most frequent (Faix, 2014), and no more than 3% of them require 10 minutes or more to answer (Stevens, 2013). Still, a recent study by Keyes and Dworak (2017) revealed that 89% of all chat questions rate 3 or lower on the Reference Effort Assessment Data (READ) scale, which is a six-point assessment tool used to rank reference question difficulty. Comparable findings at Grand Valley State University led Bravender, Lyon and Molaro (2011) to conclude that most chat inquiries could be answered by properly trained students, even if elaborate research questions require the expertise of a librarian.

Overall, academic libraries benefit greatly from student contributions to reference services. According to a survey conducted by Stanfield and Palmer (2010), academic library staff believe that well-trained students can proficiently answer basic questions. Additionally, library users surveyed locally about the service they received from student assistants reported overall satisfaction (Barrett and Greenberg, 2018; Faix, 2014; Keyes and Dworak, 2017; Stevens, 2013), while an examination of closing comments from patrons in chat transcripts lead Lux and Rich (2016) to similar conclusions. Despite these results, some librarians fear losing control over reference services with the establishment of student assistant programs (Stanfield and Palmer, 2010). Stanfield and Palmer (2010) point out that training and supervision of students is a significant investment in terms of budget and time, and that there are several challenges associated with staffing reference desks with students. As a matter of fact, libraries are evolving constantly, making training programs never-ending works-in-progress (Connell and Mileham,

2006). When coupled with the high turnover of student staff, this can pose a challenge with regard to knowledge retention and transfer (Mitchell and Soini, 2014; Stanfield and Palmer, 2010). Nonetheless, the work performed by students must be regularly and consistently evaluated in order for academic libraries, and their patrons, to fully benefit from their reference assistant programs. Evaluating the quality of student reference work is usually done through a combination of methods ranging from informal observation, quizzes, and monitoring answers (Barrett and Greenberg, 2018; Connell and Mileham, 2006; Jones et al., 2004; Mitchell and Soini, 2014; Thomsett-Scott, 2012; Womack and Rupp-Serrano, 2000). When compared to librarians, students slightly underperformed, suggesting that student work, while valuable, may not necessarily provide service at the same level as a trained professional (Keyes and Dworak, 2017; Lux and Rich, 2016).

A few case studies use reference transaction transcript analysis to examine the effectiveness and quality of undergraduate student reference assistants' practices (Keyes and Dworak, 2017; Langan, 2012; Lux and Rich, 2016; Ward, 2003). While generally praising students' work, the literature indicates that there is room for improvement in areas like adherence to reference interview techniques, RUSA guidelines, and communication skills. Students' recurring weaknesses include not recognizing situations when a referral would be necessary (Keyes and Dworak, 2017; Lux and Rich, 2016), failing to conduct thorough reference interviews (Langan, 2012; Lux and Rich, 2016; Ward, 2003), not providing instructions often enough to patrons (Keyes and Dworak, 2017), or keeping patrons fully updated on search progress (Ward, 2003). While some researchers have noted that formal communication skills are at times lagging in students (Langan, 2012; Lux and Rich, 2016), Keyes and Dworak found that students outperform librarians in things like greetings and tone (2017). Reviewing the work done

by LIS students at the Ontario Consortium of University Libraries' chat services, Barrett and Greenberg (2018) observed a similar lack of adherence to RUSA guidelines and a more informal tone in communication style than trained librarians. However, students were praised for the quality of the instructions they provided (Barrett and Greenberg, 2018; Keyes and Dworak, 2017). Generally, the literature suggests that properly trained students can adequately engage in reference services and make important contributions to academic library services.

Thorough training is necessary for providing quality reference services. According to Stanfield and Palmer (2010), as well as Mitchell and Soini (2014), librarians expect their student reference assistants to have several competencies, including communication and customer service skills, reference interview skills, research skills and knowledge of library collections, IT skills, and knowledge of library and campus policies and services. In addition to this set of skills, many authors single out appropriate referral to librarians by students as an essential prerequisite for maintaining excellent reference services (Barrett and Greenberg, 2018, p. 211; Barsky, et al., 2010; Keyes and Dworak, 2017, p. 472; Stevens, 2013, p. 209). It is important to impart these competencies through training to LIS student assistants, as well as other graduate students, so that they can deliver quality services. According to Thomsett-Scott (2012), best practices for training student reference assistants combine the development of a formal instruction program that has explicitly stated goals and an evaluation process, adheres to RUSA guidelines, and includes a continuing on-the-job dimension.

For LIS student library assistants in particular, researchers recommend approaching training and evaluation as part of an overarching mentorship system (Duffus, 2017; Forys, 2004; Lewey and Moody-Goo, 2018; Thomsett-Scott, 2012; Wu, 2003). While students in LIS gain valuable knowledge in the classroom, there are aspects of the profession they may not be

exposed to through coursework alone (Ball, 2008; Barsky, et al., 2010; Meyer and Torreano, 2017). LIS students working as reference assistants experience the day-to-day realities of their chosen profession and gain valuable insight through practical experience. Students in these positions can put the skills learned in the classroom to practical use, and can receive feedback in a structured and supportive environment (Ball, 2008; Barsky, et al., 2010; Neal et al., 2010). With mentorship from expert librarians, students can absorb knowledge, observe skilled professionals, and study their reference interactions models (Barsky, et al., 2010). This type of opportunity can also improve students' research skills and ultimately build their confidence and competency in providing quality reference service (Barsky, et al., 2010; Brenza, et al., 2015; Faix, 2014; Meyer and Torreano, 2017). Furthermore, LIS students can develop professional networks, gain valuable work experience, build and diversify their résumé, as well as prepare for the roles and responsibilities of their future careers (Ball, 2008; Barsky, et al., 2010; Brenza et al., 2015; Meyer and Torreano, 2017).

While there are many benefits for students employed by the university library, there are also numerous advantages for their professional librarian colleagues. Student workers can free librarians from frequent directional, technical, citation, and ready-reference questions (Bodemer, 2016; Bravender et al., 2011; Brenza et al., 2015; Faix, 2014; Meyer and Torreano, 2017; Neal et al., 2010). This freed-up time allows librarians to focus on various other commitments and higher-level tasks of their profession such as collection development, teaching, outreach, committees, research projects, liaison activities and helping patrons who have been referred when more specialized or in-depth assistance is needed (Barsky, et al., 2010; Brenza et al., 2015; Faix, 2014; Meyer and Torreano, 2017; Neal et al., 2010). The mentorship aspect of the librarian-student assistant relationship also contributes to fulfilling academic librarians' teaching

commitments (Forys, 2004). Conversely, Bodemer (2016) argues that student workers help librarians by enabling them to remain in step with the ever-changing student body, updating services, outreach, and instruction in ways that foster ongoing professional learning.

While student assistants provide essential library services, Brenza, Kowalsky, and Brush (2015) note that the value of student workers extends beyond their assigned tasks. Student assistants can bring "peer-value" to the reference services offered by the university library (Neal et al., 2010). There is an inherent authority imbalance between the student community and librarians and thus "peer consultants exist in a space that faculty cannot" (Meyer and Torreano, 2017, p. 42). Bodemer (2014) suggests that student-learning can benefit from the informality of peer-to-peer interactions, as peers can communicate with and understand the information needs of their community in a friendlier, more relaxed, non-authoritarian fashion (Bodemer, 2016; Brenza et al., 2015; Neal et al., 2010). Student assistants represent a less intimidating figure in the academic library and contribute to the approachability of the library space to the student body (Bodemer, 2016; Brenza et al., 2015; Faix, 2014; Meyer and Torreano, 2017; Neal et al., 2010). Brenza, Kowalsky, and Brush, (2015) argue that "if student users are more willing to approach student workers, then the employment of student reference assistants is a key factor to ensuring that the library is properly serving its user community" (p. 726). Student workers can affect users' experience of the library by helping form positive first impressions and contribute to the library's approachability (Bodemer, 2016; Brenza et al., 2015; Faix, 2014; Meyer and Torreano, 2017; Neal et al., 2010). Student assistants can help reduce student anxiety and act as the library's potential ambassadors to an occasionally apprehensive student community.

Establishing student reference assistant programs also has an impact on libraries at a more institutional level. Student workers augment the libraries' ability to serve more users at a

lower cost (Barrett and Greenberg, 2018; Bravender et al., 2011; Logan, 2012); questions can be triaged to meet appropriate users' needs (Barsky, et al., 2010; Brenza et al., 2015; Faix, 2014; Meyer and Torreano, 2017; Neal et al., 2010); and service hours can be extended (Aho et al., 2011; Lux and Rich, 2016; Wu, 2003). However, behind these easily quantifiable effects lie a wealth of additional benefits. If they go on to become professors themselves, former student library assistants may prove to be valuable allies to the library and librarians (Jones et al., 2004). Some authors also argue that when training LIS students, in particular, organizations engage in the ongoing improvement and sustainability of academic librarianship itself (Duffus, 2017; Lewey and Moody-Goo, 2018). Hiring LIS students as graduate reference assistants can build fruitful relationships with library schools (Forys, 2004) and is a way to attract talented future colleagues (Barsky, et al., 2010; Jones et al., 2004), and also gain recognition from other academic libraries (Thomsett-Scott, 2012).

Methodology

The authors evaluated 574 chat transcripts and 620 desk interactions from the Fall and Winter semesters of the 2018-19 academic year. The three graduate student reference assistants were invited to co-author this publication, consequently, the two librarians decided not to involve them in the coding process, to avoid bias. The students were identified as "Student 1", "Student 2", and "Student 3". The complete chat transcripts were exported from the Question Point platform while the desk interactions were self-recorded by the students using a Google Form. The distribution of chat transcripts and desk interactions per student are outlined in Table 1. The differences in the distribution of interactions is due to the number of hours per week that each student worked. For one semester, they may have had more chat shifts than desk shifts and vice versa. The quantity of questions received during peak times may also have contributed to this

disparity. The greater number of interactions for the Winter semester is primarily the result of the additional weeks the students worked during this period. They worked 11 weeks in the Fall semester and 15 weeks in the Winter semester.

[INSERT TABLE 1]

Given the number of transcripts, the authors chose to do manual coding instead of using a software such as SPSS or NVivo. The transcripts were coded by both librarians not only to ensure intercoder reliability, but also to ensure that they knew the types of questions being asked to inform further training. Practice chats that occurred during training, duplicated questions that were asked by the same patron during one chat shift, and early patron disconnections during transactions were excluded from the sample since they did not contain enough information to contribute to the findings. A total of 28 interactions were excluded from the sample. The authors used qualitative coding based on the research questions of interest to them. Some of the coding schemes were adapted from previous studies that looked at similar aspects of virtual reference interactions. Since the desk interactions were self-reported, and did not include full transcriptions, the librarians evaluated them in order to determine the percentage of reference questions received at the desk, and their level of difficulty. The same coding scheme used for the chat interactions was also used to determine the complexity of the questions received at the desk. Although full transcripts were not available for these interactions, monitoring the types and levels of interactions is important for training purposes and the improvement of services. The results were compiled and tabulated in an Excel spreadsheet.

The chat interactions were coded first as either reference or transactional interactions. To determine what counted as a reference interaction, the authors used the definition outlined by the Reference and User Services Association which states that reference interactions are

"information consultations in which library staff recommend, interpret, evaluate, and/or use information resources to help others to meet particular information needs." (Reference & User Services Association, 2008a). Interactions that centered on "assistance with locations, schedules, equipment, supplies, or policy" (Reference & User Services Association, 2008a) were coded as transactional. If the interaction was coded as "reference", it was then assessed for the level of question asked by the user. For this, the authors relied on a previous study that outlines three levels of question: basic, intermediate and advanced (Côté et al., 2016). The definitions of each category of question can be seen below. The transactional interactions were not described beyond the first level of coding.

Basic reference questions: Simple interactions that require minimal searching on the part of the reference assistant. For example, a known-item search.

Intermediate reference questions: These questions would require the use of multiple information sources and would include user instruction on how to use these tools. For example, finding government documents.

Advanced reference questions: These interactions would normally fall under the purview of subject specialists and would require the use of multiple advanced sources. For example, a systematic review search.

Once the reference interactions were coded for their levels of difficulty, the authors wanted to analyze how the graduate students responded to the queries, and if they used elements from their training. The first step was to see if the students engaged in a reference interview. The

authors developed the following coding scheme to detect the absence of a reference interview, or if a partial or complete one was employed by the student.

R1: No reference interview: No follow-up questions were used.

R2: Partial reference interview: 1 or 2 open-ended questions were used to clarify the question.

R3: Complete reference interview: More than 2 questions were asked, reference questions coupled with clarifying questions and paraphrasing to establish the research need.

To determine which level of the reference interview was used by the students, the authors measured the number of times that they used follow-up questions. The graduate students had previously been exposed to those questions during their reference training.

Finally, the reference transactions were analyzed to identify any instruction that took place within the interactions. The coding scheme used to identify instructional methods was based on the coding established by Desai and Graves in 2008. As opposed to the previously described codes, which were unique, more than one instructional code could be used to describe an interaction. If no instruction took place in the interaction, the code T0 was used with no possibility of adding a second instruction code.

T0: No instruction took place within the chat interaction.

T1: Modelling – The reference assistant gives the user the steps to finding the information that they are looking for. For example: “go to the library catalogue, enter your keywords in the search box and click search”.

T2: Resource Suggestion and Explanation – The reference assistant suggests a resource or service and tells the user how to use it. Referrals to specific subject librarians were included in this category.

T3: Terms Suggestion – This method centers on providing assistance in the creation of a search strategy by suggesting keywords, subject headings, Boolean operators, or limits.

T4: Leading – This approach is similar to modelling. The reference assistant gives the user the steps to finding the information that they are looking for and checks back with the user to see if they understand the steps and are following them.

T5: Lessons – The reference assistant shares their knowledge and provides instruction on library and research concepts such as the meaning of peer-review or open access.

Research Limitations

The research limitations of this study include the subjective nature of qualitative coding. The authors attempted to mitigate this by both coding all transcripts in order to ensure inter-coder reliability. Given that previous studies have used a similar method of coding, the authors felt confident in using this approach (Desai and Graves, 2008; Hervieux and Tummon, 2018).

The fact that the desk questions were self-reported means that they can be seen as less reliable than the chat transcripts. Only part of the coding was used to describe these interactions, and it focused on aspects that were not indicative of performance (for example the nature and level of the questions) which makes it less likely that the students artificially improved their results when reporting them. Although these questions were less reliable and more difficult to

evaluate, they were included in this study because they provide valuable insight into the types of questions that occur at the reference desk.

The students were aware of this study during some of the hours that they were at the reference desk, which could potentially lead to bias. The authors purposefully excluded them from the analysis of the results to avoid a positive bias in their favour. It is possible that the students' performance improved because they knew that their interactions would be evaluated; however, they were only made aware of the study during the Winter semester. Given the fact that their supervising librarian was already performing quality control on their transcripts and that there was no significant improvement in the data, the authors believe that the students' awareness to the research had a minimal impact on the results.

Findings

Types of Interactions

The qualitative analysis of chat transcripts revealed that, on average, 49% of interactions handled by the reference assistants during the 2018-2019 academic year involved reference questions. The remaining 51% of interactions focused on transactional questions that did not require the use of the reference interview. In the Fall semester, the authors coded 119 of 248 interactions as including a reference question, while 129 patron questions were classified as being transactional in nature. The Winter semester exhibits a similar pattern with 163 reference interactions and 163 transactional questions for a total of 326 chats. These findings are in keeping with a previous study conducted by Hervieux and Tummon, who established that 50% of all chat interactions involved reference questions and opportunities for instruction (2018).

The desk interactions showed a significantly different pattern. Reference questions only totalled 21.9% of all interactions at the desk, while the majority of inquiries centered on

transactional questions such as circulation and policy. These findings match the statement made by Faix (2014) that questions of a lower-level of difficulty are more frequent at the desk. The distribution of the reference and transactional questions received at the desk and on chat is represented in figure 1.

[INSERT FIGURE 1]

Levels of Questions

The coding of the questions showed an interesting pattern for both the Fall and Winter semesters. During both periods, the reference assistants received a significantly higher number of basic questions on chat compared to intermediate or advanced questions. The same pattern can also be seen in the desk interactions that they took part in.

For the Fall semester, 92 basic, 23 intermediate and 4 advanced questions were received on chat. The desk interactions show a higher proportion of basic questions with 44 interactions being classified with this designation. Intermediate and advanced questions at the desk only totalled 5 and 1 interactions respectively.

The Winter semester is also representative of this pattern, with a higher percentage of basic questions received on chat and at the desk. The librarians coded 140 chat interactions involving basic questions while 18 were judged to be intermediate and only 5 were designated as advanced. The questions received at the desk show a similar pattern, with 76 basic questions, 9 intermediate ones, and only 1 advanced inquiry. The complete distribution of levels of questions can be seen in Figure 2 for the Fall semester and in Figure 3 for the Winter semester.

[INSERT FIGURE 2]

[INSERT FIGURE 3]

Reference Interview

Only the chat transcripts were coded for the presence and depth of the reference interview. Overall, very few partial or complete reference interviews took place in the 2018-19 academic year. Most interactions resulted in no reference interview. For the Fall semester, 77.3% of interactions did not result in a reference interview. Only 19.3% of chats included a partial reference interview and 3.4% involved a complete reference interview. The Winter semester shows a similar pattern with an absence of reference interview in 77.3% of interactions, a partial reference interview in 21.5% of instances, and a complete reference interview in only 1.2% of chat interactions. It is interesting to note that this pattern mirrors the results the authors uncovered for the levels of questions.

[INSERT FIGURE 4]

[INSERT FIGURE 5]

Instruction

Overall, instruction occurred in 65.5% of all chat interactions and *resource suggestion and explanation* and *modelling* were the methods of instruction most frequently used. For the Fall semester, instruction occurred in 64.7% of chat interactions. *Resource suggestion and explanation*, and *modelling* were the methods preferred by the reference assistants with a presence in 57 and 34 of all 119 reference interactions respectively. *Terms suggestion*, *leading*, and *lessons* were the methods least-used to offer instruction in chat interactions. The authors coded *terms suggestion* in 8 interactions while *leading* and *lessons* each occurred in 2 instances.

In the Winter term, instruction in chat interactions increased slightly to 66.3%. The librarians coded 163 reference interactions and established that *resource suggestion and explanation* occurred in 90 interactions and *modelling* in 41 chat discussions, which follows the pattern established in the Fall semester. *Terms suggestion*, *leading*, and *lessons* were once again

the least used methods of instruction; however, their presence increased slightly with instances in 12, 6 and 9 interactions respectively. These findings are in keeping with the results uncovered by Hervieux and Tummon (2018) which evaluated the preferred methods of instruction of librarians.

Although it was impossible to code the desk interactions for instruction, given the lack of transcripts, the librarians noticed that the reference assistants referred 56 patrons to subject specialists and librarians, which constitutes both "*resources suggestion*" and "*modeling*". It can therefore be inferred that instruction also took place at the reference desk. However, an observational study would need to take place to identify its prevalence and the preferred methods of teaching.

Discussion

The librarians designed this research project to only analyze reference questions that can be perceived as higher-level interactions. However, approximately 50% of all chat questions answered were transactional in nature. The authors did not perform in-depth analysis of those interactions but noticed that reference interviews and instruction did occur in those instances. Technical expertise and transactional interactions are also very important to library users, and were part of the training program. Although the authors feel the graduate students provided a high level of service in these areas as well, these aspects of the service were not the focus of this study. More research needs to be conducted to evaluate the transactional questions in order to fully understand their implications for graduate student training.

The most striking finding of this study is that students did not perform reference interviews in most interactions even though the training program focused on this component. This could be partially due to the level of questions asked. Most chat interactions involved basic

levels of questions, and although the questions themselves were not coded, the authors noticed that most basic-level questions were known item searches. It is possible that the graduate students felt that there was no need for a reference interview in those instances. Another explanation could be that it is more difficult to perform a reference interview in a virtual environment than in-person (Reference and User Services Association, 2008b). It is also interesting to note that even if few reference interviews occurred, instances of instruction were high, particularly with regards to known item searches. The librarians also found that fewer reference questions were being asked at the physical service desk. This fact has important implications for the training of future cohorts of graduate student reference assistants. For example, more time could be spent on teaching them best practices for virtual reference interviews. The librarians are interested in further investigating the differences between the virtual occurrence of reference interviews and those at the reference desk, as well as the development and applications of reference standards for those different services (Schwartz and Trott, 2014).

The graduate student reference assistants performed very well in the area of instruction. "*Resources suggestion and explanation*" and "*modelling*" were the preferred methods of instruction used and were often used in tandem. Hervieux and Tummon (2018) found similar findings with regards to librarians in their study on instructional methods used in chat. The librarians did not set out to evaluate the accuracy and completeness of the service provided by the students, but they were generally impressed with the caliber of their work, and how they applied the teaching strategies that were covered in the training program.

It would be interesting to compare the performance of the graduate students with full-time librarians. The authors chose to avoid such a comparison due to the vast differences in

context. The graduate student reference assistants were hired solely to provide reference services and did not have to juggle multiple demands and tasks as librarians often do. It would also be unfair to compare students who are in the process of learning with trained professionals with years of experience.

Conclusion

This study evaluated the reference services provided by graduate student reference assistants, and the development and impact of the training program designed for them. The main findings highlight the low frequency of reference interviews in chat interactions while also showing that instructional methods are frequently used by graduate student reference assistants. Although there was no comparison made between the performance of graduate students and librarians, the overall findings of this study also have important implications for the training and on-boarding of new librarians. Furthermore, it is clear that more importance needs to be placed on the reference interview, and additional time needs to be spent on reference interview training, particularly for chat interactions. Given the overarching goal of contributing to the development of independent lifelong learners, ensuring that users receive instruction on how to complete research tasks on their own at every opportunity is paramount. Future directions for research include the observation and evaluation of reference interactions at the desk, and comparing these interactions to online ones. Analyzing transactional interactions, evaluating patron satisfaction with the services provided, as well as analyzing referrals to librarians, are also other potential areas of research to contribute to the improvement of reference services provided by graduate students. A deeper understanding of the impact of the training could be gained by collecting the reflections and impressions of students when they provide reference services throughout the year. Continually improving training programs and evaluating the work done by reference

assistants is a worthwhile endeavor. These improvements not only contribute to the provision of excellent service, but also provide a deeper understanding of both users and how graduate student colleagues are supporting them.

Appendix A

Reference Desk Form

Please fill out this form with information about your reference interactions that you had on the desk. No reference interaction is too small or too big. Had someone ask where the bathroom was? Fill out the form. Had someone ask you about the relevance of climate change during medieval times? Fill out the form!

* Required

1. **Your Name** *

2. **Date of the Interaction** *

   Example: December 15, 2012

3. **Length of Time of the Interaction** *
   Mark only one oval.

   - ◯ 5 Minutes or Less
   - ◯ 10 mintes
   - ◯ 15 minutes
   - ◯ 20 minutes
   - ◯ 25 minutes
   - ◯ 30 minutes or longer

4. **Nature of Question** *
   Mark only one oval.

   - ◯ Directional (bathrooms, room locations, building location, etc.)
   - ◯ Question about accessing resources
   - ◯ Reference
   - ◯ Circulation
   - ◯ Other: _____

5. **Steps you took to answer your question. Please feel free to include the question, and the necessary steps you took when answering the question.** *

6. **Did you make a referral?** *
Mark only one oval.

- ◯ Yes
- ◯ No

7. **If you referred, did you refer the person to:**
Mark only one oval.

- ◯ A service
- ◯ A librarian

8. **Any additional comments (not mandatory).**

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