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Should Chat Reference be Staffed by Librarians? An Assessment of Chat Reference at an Academic Library Using LibStats

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Abstract

This study analyzes 1,557 chat reference questions received at Grand Valley State University

Libraries over four semesters to determine the quantity and nature of the questions. Results

indicated that use of chat reference was low and that less than a quarter of chat questions

required a librarian to answer. The cost of a librarian answering a chat question ranged from $37

to $439 per question. The findings suggest that assigning chat reference to trained reference

assistants will not affect patron service and that it is not cost effective to use reference librarians

to answer chat questions.

KEYWORDS   chat reference, reference costs, LibStats, reference assessment,

digital reference, virtual reference, online reference, academic libraries, transcript analysis,

reference services analysis

Should Chat Reference Be Staffed by Librarians?

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INTRODUCTION

Chat reference is "synchronous or real-time text-based messaging between computer users on the Internet. Chat reference is often referred to as 'live online reference,' 'virtual reference,' or 'digital reference' in articles and discussions." (Ronan & Turner, 2002, p. 9). Libraries first began offering chat reference at the turn of the 21st century and Grand Valley State University (GVSU) librarians jumped on the chat reference bandwagon in early 2004. Chat was first used exclusively at GVSU to communicate with distance learning students but by mid 2006 answering chat questions had become part of the reference responsibilities of all reference librarians. The ability to chat with a GVSU librarian was available to anyone, anywhere, regardless of whether they were affiliated with the University. Like many librarians at that time, GVSU librarians were concerned with staying relevant in the digital age and they were concerned with the decline in reference desk activity. At the same time the librarians were shifting their service model from primarily service point reference to outreach, including classroom teaching and workshops. Chat reference appeared to fit with this revised service model. In the face of the digital revolution, GVSU librarians were looking for better ways to reach their patrons.

Chat reference was initially offered only four hours per day and was staffed by two librarians. By the time of the current study GVSU Libraries were offering chat for 73 hours per week during fall and winter semesters and 49 hours per week during spring/summer semesters. During the fall 2008 and winter 2009 semesters, 48 of the 73 hours that chat was offered per week were staffed by 16 reference librarians: Monday through Friday from 10 a.m. to 7 p.m. and

Sunday from 1 p.m. until 5 p.m. These times were anecdotally believed to have the highest chat

use. During time periods of perceived lower use (Monday through Friday from 8 a.m. to 10 a.m.

and from 7 p.m. to 9 p.m. and on Sundays from 5 p.m. until 9 p.m) trained reference assistants[1]

responded to chat questions. Chat reference was not offered on Saturdays. During the last

semester of the study, fall 2009, chat was answered by reference assistants only for the entire 73

hours per week. Spring/summer 2009 chat was offered for 49 hours per week Monday through

Friday from 8 p.m. to 5 p.m. and Sunday from 3 p.m. to 7 p.m. Chat reference was initially

staffed by librarians until it was transferred to reference assistants mid-semester.

From chat's initiation in 2004 until 2008 quantitative chat reference statistics were kept

in a variety of ways, from simple hatch marks on clip boards to more refined online spreadsheets

on the internal library wiki. These statistics reflected only the date and hour of chat questions

and contained no qualitative information. In August, 2008, GVSU Libraries began using

LibStats, an online tool that allowed for collection of both quantitative and qualitative reference

statistics. LibStats provided a way to evaluate and assess both the number and nature of all

types of reference questions received by GVSU Libraries, including chat.

LibStats Process

LibStats is a free, open-source online tool developed in 2006 by the University of

Queensland Library in St. Lucia, Australia (Jordan, 2008). LibStats was developed to enable

libraries to collect and report on quantitative and qualitative data collected by librarians and staff

members and is fully customizable for the needs of individual libraries. Reports are generated

directly from the LibStats interface and recorded data can be imported into Microsoft® Access®

or Excel® for further organizing and analysis.

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[1] Reference assistants were either full-time library employees or part-time student workers who were trained to respond to questions received at the reference desk and via chat reference. The number varied over the study period.

GVSU modified its LibStats interface to allow for the collection of the following

statistical data regarding every reference transaction in its libraries as shown in Figure 1.

Figure 1 Example of LibStats Interface

Library Stats : Add Question		Quick Search:		

Location		Patron Type		Question Type		Time Spent		Question Format		Initials	Backdate
Steel-REFDESK	⬛	Student	⬛	Directional	⬛	0-5 minutes	⬛	Chat/IM	⬛		
Steel - REFOnCall		Faculty		Reference		5-15 minutes		Consultation			
Zumberge-REF		Community		Technical		15+ minutes		Email			
Zumberge-CIRC	⬛	GRBA	⬛	Courtesy	⬛	30+ minutes	⬛	Walk-Up	⬛		

Question

Answer

Save Question/Answer	Last question added from this computer at 8/18 10:39 AM

Edit	Patron Type	Question Type	Question Format	Location	Question/Answer	Date
2438	Student	Reference 15+ min	Walk-UP	Steel-REF	Q: **Formatting URLs for APA reference list** A: Can break the URL at a slash.	12/13/2010 3:10 PM
2437	Student	Reference 15+ min	Walk-UP	Steel-REF	Q: **Books on hereditary blood diseases** A: Found several but were at Frey. Student wanted to browse them, so I gave him directions on getting there. Also showed him how to get books out of the ARS.	12/13/2010 2:09 PM
2436	Student	Directional 0-5 min	Walk-UP	Steel-CIRC	Q: **printer at STL** A:	12/12/2010 1:33 PM
2435	Student	Reference 0-5 min	Walk-UP	Steel-REF	Q: **Student wanted Freakonomics which was checked out.** A: She belongs to KDL and her branch has one available on the shelf	12/12/2010 1:07 PM
2434	Student	Reference 15+ min	Walk-UP	Steel-REF	Q: **student needed to understand the differences between thesis and project** A: retrieved thesis and project on topic from ARS, talked about the differences	12/12/2010 12:53 PM

From a drop down menu, one can select:

1. Location of the librarian or reference assistant responding to the question

2. Patron type (if determinable)

3. Type of question

4. Amount of time spent answering reference question

5. Question format

There is a text entry box for entering the initials of the person responding to the chat question and two open text entry boxes, one for recording the question and one for recording the answer. In a typical in-person transaction, a librarian or assistant would record the transaction by paraphrasing both the reference question and the answer given. For many of the chat reference transactions, however, the entire transcript (question and answer) was simply copied verbatim from the chat software and then pasted directly into one or both of the text entry boxes in LibStats. These text boxes can contain up to 8,000 characters which is especially useful for entering entire chat transactions such as the one shown in the following example:

Q: (2:30:29 PM) gvsulibraries entered the room. (2:30:29 PM) Guest_5FE50A35 entered the room. (2:30:45 PM) gvsulibraries: How can we help you? (2:30:55 PM) Guest_5FE50A35: Hi I found a book that MSU libraries have and I was wondering how I go about requesting it to be delivered here
A: (2:32:37 PM) gvsulibraries: You can either request ... (2:33:19 PM) gvsulibraries: via MeL or Document Delivery. (2:33:34 PM) Guest_5FE50A35: And I can just do that online, right? (2:36:42 PM) gvsulibraries: You can do a search in our catalog and if we do not own this title just click on the MeL icon and log-in using your GVSU Username and Password and follow the steps. (2:38:51 PM) Guest_5FE50A35: Thank you so much for your help! (2:39:54 PM) gvsulibraries: You are Welcome!

Occasionally, instead of copying the entire transaction into LibStats, the question and answer were both summarized after the chat transaction was concluded. For example:

Q: Can you help me find a Supreme Court Case?
A: Described how to search for a case in Westlaw Campus.

The LibStats program automatically dates and timestamps each entry. Ideally, information about a reference session is entered at the close of the session. Occasionally it is entered later and LibStats allows for post-dating of entries to account for this.

GVSU librarians and reference assistants were trained to use the simple LibStats interface which replaced paper and other online reference logs. Starting in fall semester 2008, LibStats became the primary source of reference transaction data collection at GVSU.

GVSU librarians adopted the use of LibStats for two principal reasons. Since the content of the questions and answers is fully searchable, the first was to build a knowledge base of all reference questions and answers to enable librarians across the campuses to share information and better serve patrons. The second purpose was to use the statistical features to more efficiently analyze reference activity in all forms at the GVSU libraries and to use that information to determine staffing.

LITERATURE REVIEW

Chat reference is a relatively new reference service and it is only in the last ten years that evaluative studies have begun to appear in the literature. Much of the literature describes or evaluates chat reference services in academic libraries or library consortiums. Some of the literature consists of case studies of chat reference services at individual institutions (e.g., Sears, 2001; Kibbee, Ward, & Ma, 2002; Bobal, Schmidt, & Cox, 2005; Naylor, Stoffel, & Van Der Laan, 2008) and articles on how to provide effective chat reference interviews (Ronan, 2003).

Houlson, McCready, and Pfahl (2006) analyzed chat reference transcripts received at their university library. They categorized the types of chat questions using a two-tiered classification system. Their data showed that only 17% of the chat questions they received from undergraduates were seeking in-depth reference assistance. Chat was staffed by a team of reference specialists from within their library system and they did not specify whether or not librarians staffed reference for any or all or part of the time it was offered.

One area of concern in the literature is whether chat reference should even be offered as a standard reference service. This question has generated heated discussion. Lauer and McKinzie (2002/2003) express some strong opinions about the value of digital reference generally and about chat reference in particular. They argue that librarians often overvalue technology and that "[t]he library world has been far too gullible, far too willing to regard any technical advance as a service advance..." (p. 46). They also argue that digital reference is not cost effective (p. 47). Lauer and McKinzie suggest that digital reference transactions take much longer than face to face or phone reference transactions, librarians are burdened with mastering the software used, and there are always additional administrative costs (p. 49).

Coffman and Arret (2004a & 2004b) examined the development of chat reference from its use by just a few libraries in the early 2000s to its widespread use in 2004. They noted that what initially was thought to be the answer to the drop-in visits to library reference desks has not turned out to be "the panacea many of us hoped for" (2004b, p. 49) and that "[m]uch of the profession seem to have been gripped by a sort of 'irrational exuberance'...about the prospects of virtual reference" (2004b, p. 56). Coffman and Arret (2004b) suggest that, based on the cost of implementing and maintaining a chat program and the continued low numbers of chat reference questions, that librarians approach the whole issue of virtual reference with more careful and deliberate consideration.

A second area of concern is that studies have found that chat use in academic libraries is low. Horowitz, Flanagan, and Helman (2005) found that the use of their chat reference service was small compared to other reference services and that "the resources required for training and management...were disproportionately high for the rate of use of the service" (p. 255). Naylor et. al. (2008) used student focus groups in an attempt to discover why chat reference at their

university library was not being used. Radford and Kern (2006) examined nine chat reference services that were discontinued and reported that "low volume was the most frequently cited reason for service discontinuation" (p. 527).

Even though there is evidence in the literature that chat numbers in academic libraries are low and remain low, some librarians (e.g., Thomas, 2005; Tenopir, 2004; Bailey-Hainer, 2005) contend that chat reference should be offered regardless of low use. Thomas (2005) argues that librarians need to be where the users are at their time of need. Tenopir (2004) believes that students may be intimidated by the reference desk and would welcome the opportunity to ask anonymous questions. Bailey-Hainer (2005) who is affiliated with a statewide virtual reference consortium, proposes that chat reference could be used as a recruiting tool for young people by showing them the exciting services they could be a part of should they enter the library profession.

A third area of concern is cost effectiveness. Coffman and Arret (2004a) suggest that libraries have "bought millions of dollars of software, shelled out thousands more on re-vamping Web-sites and adding authentication software..." (p. 42). Costs also include "the training and salary costs of the thousands of librarians who have staffed these systems" (p. 43). Researchers who have studied the question of cost usually only consider those associated with purchasing or leasing chat software (e.g., Bailey-Hainer, 2005). According to Luo (2007), there is a lack of empirical studies that measure the cost-effectiveness of chat reference. There is nothing in the literature that addresses the cost of professional staff time required to offer chat reference as a service in academic libraries. This study will fill a gap in the literature by evaluating both the quantity and nature of chat questions at an academic library to determine whether the chat

reference questions asked required the skills of a librarian to answer. It will also evaluate the costs associated with staffing chat reference with librarians.

BACKGROUND

Grand Valley State University is a public liberal arts university with its main campus in Allendale, Michigan, additional campuses in Grand Rapids and Holland, and regional centers in Muskegon and Traverse City. This study covers a period of four academic semesters, from August 2008 to December 2009 during which time all reference questions were recorded in the LibStats database, including reference questions asked at GVSU's reference desks, chat reference, email and consultation reference questions asked of individual reference librarians. For purposes of this study, only chat reference questions were examined. The answers to these questions were not part of this study and were not evaluated.

This study came about as the result of ongoing discussions among GVSU reference librarians regarding the nature and number of chat questions that they were receiving during their scheduled chat reference sessions and a 2009 summer semester reference schedule that, for the first time, scheduled librarians for chat reference beginning at 8 a.m. Prior to this time reference assistants were assigned chat from 8 a.m. until 10 a.m. In the summer of 2009 when questions regarding the necessity of staffing early morning chat reference with librarians arose, the data necessary to evaluate and analyze chat reference at GVSU was already in LibStats.

METHODOLOGY

The purpose of this research was to answer the following questions:

1. How many chat questions are actually received at GVSU and is there a predictable pattern of use?

2. Is the expertise of a reference librarian necessary to answer chat reference

questions?

3. How much does it cost to staff reference chat with librarians?

The sample of chat reference questions for this study was the entire population of chat

reference questions recorded in LibStats for the study period (n = 1,557). All chat questions

recorded during the study period[2] were imported into an Excel® spreadsheet from the LibStats

database. These chat questions were counted and rated according to the system described below.

The researchers determined that the most effective way to rate the transcripts was to use

content analysis which is a systematic and objective analysis of a message's characteristics

(Wildemuth, 2009). Content analysis most effectively reveals the themes from the transcript

data (Leedy & Ormrod, 2009) . The researchers first looked at existing reference classification

systems such as the Warner Scale and the READ Scale. Warner (2001) created a system for

classifying reference queries in four levels; non resource based, skill-based, strategy-based and

consultation. (p.53). The READ scale "is a six-point scale tool for recording vital supplemental

qualitative statistics gathered when reference librarians assist users with their inquiries or

research-related activities by placing an emphasis on recording the skills, knowledge, techniques

and tools utilized by the librarian during a reference transaction" (Gerlich & Berard, 2007, p. 7).

For the current study, the researchers were interested not only in determining the nature

of the questions that were being asked during chat reference at GVSU but also in understanding

who, in terms of reference training or ability, would be able to adequately and correctly answer

the questions. Neither the READ nor Warner Scales provided a method for assessing who was

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[2] It is assumed that some chat reference transactions were not recorded, so this number represents the
minimum number that occurred during the study period. Four recorded chats were thrown out of the
sample. Two were spam and two were incomplete questions with no answers where no analysis was
possible.

best suited to answer a particular reference question. So with reference to these scales, the researchers created a four-level classification scale to rate the GVSU chat reference questions. Chat questions that could be answered without reference to library resources, including those that were computer skill based, were categorized as directional, technical or policy questions. These types of questions could be answered by a student library assistant or referred to the appropriate university department such as the Information Technology Department. Questions that could be answered with one or two facts or with other brief information, usually with reference to library resources, were classified in category 2. These types of questions were considered to be ready reference and could be answered by reference assistants. Questions that were strategy based were classified in category 3. The researchers determined that category 3 questions required the knowledge or expertise of a librarian to be adequately answered.

A fourth category was created for chat questions that were related to citation formatting or bibliographic software. In 2006 GVSU libraries had begun subscribing to RefWorks®, an online bibliographic management program. Since making RefWorks® available to students and faculty GVSU librarians had received reference questions (both in person and online) regarding its use. GVSU librarians also received reference questions regarding proper citation formatting. Based on the classification criteria, most citation questions fell into the first two classification categories, technical or ready reference. The role of librarians in assisting students with proper citation formatting was a topic of debate at GVSU so the researchers were interested in determining the nature and number of citation related questions that were being asked via chat. These types of questions were analyzed separately.

Table 1 GVSU Chat Classification Scale

Rank	Type
	Examples
1	**Directional, Technical, Policy (could be answered by a student library assistant)**
	• How do I access course reserves?
	• The printer is out of paper.
	• Where is the bathroom?
2	**Ready Reference (could be answered by a trained reference assistant)**
	• I need the nursing journals from 1989 and 2008.
	• Where is Michigan Compiled Laws Annotated?
3	**Reference (should be answered by a librarian)**
	• What are the environmental concerns with electroplating?
	• I am searching for my topic and I am not sure what to choose under the subject resources. I am searching International Health Care.
4	**Citation**
	• I'm having trouble importing a citation into RefWorks®.
	• How do I cite government data in APA?

Referring to this classification scale, each of two researchers independently rated every

chat question that was recorded during the study period. An interrater reliability analysis using

the Kappa statistic was performed to determine consistency among these two raters. Differences

in classification were resolved by a third, independent rater who served as a tie-breaker. Code-

checking provides credibility to the analysis of the transcripts and the overall data analysis of this

research project (Babbie, 2007).

FINDINGS

This study analyzed a total of 1,557 chat reference questions (N = 1,557) asked at GVSU

over four academic semesters. The total number of recorded chat questions for the fall 2008,

winter 2009 and fall 2009 semesters was 1,476 (n = 1,476). The 81 (n = 81) chat questions

received in spring/summer semester 2009 were also evaluated and will be discussed separately.

The interrater reliability was found to be Kappa = 0.86. According to Landis and Koch (1977)

this is almost perfect agreement (p. 165).

Numbers of Chat Questions

During the fall/winter/fall semesters of the study period GVSU chat reference averaged

one chat question per every 48 students. The use of chat by students in the spring/summer

semester contrasted sharply to fall and winter use. Not only are the chat use numbers very low

compared to the other semesters, but even taking into account the lower student population, the

ratio of chat to student, one chat per every 132 students, is much lower than the average one chat

for every 48 students during the fall and winter semesters. The average number of chats received

per week was only 6.2 (Table 9) as compared to 30.8 (Table 8) during the fall/winter/fall

semesters.

Table 2 Fall/Winter/Fall Chat Numbers

	Chat Questions	Student Population	Ratio of Chats:Students
Fall '08	597	23,892 students	1:40
Winter '09	460	22,767 students	1:49
Fall '09	419	24,408 students	1:58
Total	1,476	71,067 students	1:48

Table 3 Spring/Summer Chat Numbers

	Chat Questions	Student Population	Ratio of Chats:Students
1st Six Weeks	43	9,432 students	1:219
2nd Six Weeks	38	6,855 students	1:180
Sp/Sum combined	81	10,699 students	1:132

Patterns of Use of Chat Questions

During the fall/winter/fall semesters, chat use was highest between 2:00 p.m. to 4:00 p.m. with 25.3% (373) of questions occurring during those hours. The data showed that 8:00 a.m. to 10:00 a.m. was a very low use time for chat reference with only 6.7% (99) of questions being received during that 2 hour time frame. During the spring/summer term, the period between 1 p.m. to 3 p.m. experienced the most chat activity. Only 11 of 81 of the chat questions were asked between 8 a.m. and 10 a.m. and of these 81 only one was determined to be a true reference question. This was an important finding because the impetus for this study was the question of quantity and nature of chats during this time frame.

Table 4 Chat by Hour

Fall '08 Semester		Winter '09 Semester		Summer '09 Semester		Fall '09 Semester		TOTAL CHATS
	Total Chats		Total Chats		Total Chats		Total Chats	
8-9 am	16	8-9 am	9	8-9 am	4	8-9 am	7	36
9-10 am	27	9-10 am	21	9-10 am	7	9-10 am	19	74
10-11 am	55	10-11 am	32	10-11 am	10	10-11 am	26	123
11-12 am	57	11-12 am	66	11-12 am	12	11-12 am	30	165
12-1 pm	56	12-1 pm	42	12-1 pm	6	12-1 pm	36	140
1-2 pm	73	1-2 pm	36	1-2 pm	12	1-2 pm	49	170
2-3 pm	58	2-3 pm	75	2-3 pm	12	2-3 pm	50	195
3-4 pm	87	3-4 pm	43	3-4 pm	10	3-4 pm	60	200
4-5 pm	51	4-5 pm	43	4-5 pm	6	4-5 pm	35	135
5-6 pm	53	5-6 pm	23	5-6 pm	2	5-6 pm	31	109
6-7 pm	15	6-7 pm	22	6-7 pm	0	6-7 pm	28	65
7-8 pm	24	7-8 pm	26	7-8 pm	0	7-8 pm	24	74
8-9 pm	25	8-9 pm	22	8-9 pm	0	8-9 pm	24	71
								0
Total	597	Total	460	Total	81	Total	419	1557

During the fall and winter semesters chat reference was spread rather evenly throughout the first four days of the week with slight peaks on Monday and Wednesday. These peaks correspond to observed patterns of face-to-face reference and library space use at GVSU

Libraries. During these semesters Sunday chat use was slightly higher than Friday even though it was only offered for only four hours that day.

Student population at GVSU during spring/summer semesters is much lower than during fall and winter semesters. Spring/summer semester consists of two 6-week sessions and one 12-week session (a combined 13 weeks including exam times) and the student population varies over the semester. During the study period there were 9,432 students enrolled in class for the first 6-week session of spring/summer 2009 and 6,855 students in the second 6-week session. The total number of individual students taking classes during the combined spring/summer sessions was 10,699. The numbers of chat reference questions recorded during that period are shown in Table 5.

Chat use during the spring/summer semester also appears to be evenly spread during the week, including Friday. There was only one recorded chat question on Sunday during the entire semester.

Table 5 Chat by Day of the Week

	Mon	**Tues**	**Weds**	**Thurs**	**Fri**	**Sun**	**Total**
Fall '08	147	112	121	95	62	60	597
Win '09	128	82	114	71	27	38	460
Fall '09	74	83	89	81	46	46	419
Total	349	277	324	247	135	144	1476
Sp/Sum '09	19	17	14	17	13	1	81
Grand Total	368	294	338	264	148	145	1557

Nature of Chat Questions

Based on the classification scale developed by the researchers, the researchers determined that of the 1,476 chat reference questions recorded over the fall/winter/fall semesters, 495 questions (33.5%) were directional, technical or policy, 524 questions (35.5%) were ready

reference, 344 (23.3%) were reference, and 113 (7.7%) related to citation formatting or the use

of RefWorks®.

Table 6 Chat Types Fall/Winter/Fall and Spring/Summer

Chat Type	Fall/Winter/Fall	Percentage of Chats	Spring/Summer	Percentage of Chats
Directional/Technical/Policy	495	33.5%	31	38.3%
Ready Reference	524	35.5%	29	35.8%
Reference	344	23.3%	15	18.5%
Citation	113	7.7%	6	7.4%
Total Chats	1476		81	

The 81 spring/summer chat reference questions were analyzed separately because the

researchers wanted to know if the nature of chat questions asked during this semester was

different than during the fall and winter semesters.   Graduate student numbers remain stable

during this semester, but there are two-thirds fewer undergraduate students on campus at this

time. Despite a much lower student population generally and an increase in the proportion of

graduate to undergraduate students, the percentages of the types of chat questions asked during

the summer were very similar to those asked during fall and winter semesters.

Based on the analysis criteria, the researchers determined that of the total 1,557 chat

questions received during the study period less than one-quarter (23.1%) of the chat questions

received required the knowledge or expertise of a librarian to answer adequately. Of all chat

reference questions, 76.9% could be answered by trained reference assistants, including 7.6%

that were related to citation formatting.

Table 7 Total Combined Chat Types

Chat Type	Total Study Period	Percent of Chats
Directional/Technical/Policy	526	33.8%
Ready Reference	553	35.5%
Reference	359	23.1%
Citation	119	7.6%
Total Chats	1557	

Citation Formatting Questions

Citation questions that were received in person at the reference desks were usually considered to be ready reference. Patrons requesting citation formatting information were directed to style manuals or to the GVSU Writing Center. Due to the fact that there were a significant number of chat questions regarding citation formatting and the use of RefWorks,® these questions were separately categorized. The researchers were interested in determining the nature and number of citation related questions that were being asked via chat. Over the course of the four semesters studied, 119 chat questions related to citation style, formatting and RefWorks.® Of these, 86 (72%) were questions about citation formatting. GVSU librarians provide guides and links to citation and style manuals and patrons making online queries were referred to these for help. The remaining 33 (28%) chats in this category were about RefWorks®, and most of these were technical in nature, e.g., patrons were having problems accessing it from their home computers or they needed information on how to import citations into RefWorks® from particular databases.

Cost of Chat Questions

GVSU Libraries implemented chat reference without fully considering or evaluating the long-term or hidden costs involved. For example, for the 2009 academic year, the salary cost to

staff chat with a librarian during fall and winter semester at an average salary of $56,693[3] ($27/hr.) for 30 weeks at 48 hours per week equaled $38,880. During the 2009 spring/summer semester for 13 weeks at 49 hours per week the cost was $17,199. Total salary costs for librarian staffing of chat for the 2009 academic year were $56,079, just slightly less than the average salary of one librarian at that time. The librarian's primary assignment during assigned chat time was to be available to answer chat questions and GVSU Libraries committed to have a librarian available for this task. Whether the librarian was fully engaged in chat for the entire session or responded to no chats at all, the salary cost to the library was the same.

Although the cost of obtaining and running special programs to perform chat are not part of this study, they represent additional costs. So is the labor of library technical support staff who set up the programs, trained users, and were available for troubleshooting when problems occurred. There were other hidden costs, particularly the costs involved in spending time to find substitutes for scheduled chat sessions. The chat reference schedule was made at the beginning of each semester, before meetings, liaison teaching requests, and other demands on librarians' time were scheduled. Librarians were required to find substitutes for chat sessions with which they had conflicts and this was usually done by emailing all reference librarians. Reading and responding to these frequent requests and marking changes in the online chat schedule and personal calendars became time consuming and interfered with other work required of librarians.

Hidden costs aside, based strictly on librarian labor, the cost of the chats answered by a GVSU librarian in the fall and winter semesters of the study period based on the average salary of $56,693 ranged from $37 to $100 per chat. The average cost of a chat answered by a librarian during these semesters was $49.

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[3] Average salary of GVSU librarians who answered chat questions in 2008 and 2009.

Table 8 Fall/Winter/Fall Chat

	Total Chats FWF	No. of Weeks	Avg. No. Chats per Week	Total Hrs. Chat @ this time	Avg. No. Chats/Hr.	Avg. Cost per Chat[4]
8-9 pm	32	48	0.7	240	0.1	na
9-10 pm	67	48	1.4	240	0.3	na
10-11 am	113	48	2.4	240	0.5	$57
11-12 am	153	48	3.2	240	0.6	$42
12-1 pm	134	48	2.8	240	0.6	$48
1-2 pm	158	48	3.3	260	0.6	$44
2-3 pm	183	48	3.8	260	0.7	$38
3-4 pm	190	48	4	260	0.7	$37
4-5 pm	129	48	2.7	260	0.5	$54
5-6 pm	107	48	2.2	240	0.4	$61
6-7 pm	65	48	1.4	240	0.3	$100
7-8 pm	74	48	1.5	240	0.3	na
8-9 pm	71	48	1.5	240	0.3	na
Total	1476	48	30.8	3200	0.5	

In spring/summer 2009, the cost per chat ranged from $146 to $439. The average cost for the 81 chat questions answered by a librarian was $217. During this semester only 15 chat questions were classified as reference. If the purpose of staffing chat with librarians was to make sure that true reference questions were answered by a librarian, the cost of answering each true reference chat was $1,170 per chat.

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[4] Determined based on a librarian average salary of $56,693 or $27 per hour. Costs were not calculated during times when chat was staffed by non-librarians.

Table 9 Spring/Summer Chat

	Total Chats Sp/Su '09	No. of Weeks	Avg. No. Chats/Wk	Total Hrs. Chat @this time	Avg. No. Chats/Hr.	Avg. Cost per Chat
8-9 am	4	13	0.3	65	0.1	$439
9-10 am	7	13	0.5	65	0.1	$251
10-11 am	10	13	0.8	65	0.2	$176
11-12 am	12	13	0.9	65	0.2	$146
12-1 pm	6	13	0.5	65	0.1	$293
1-2 pm	12	13	0.9	65	0.2	$146
2-3 pm	12	13	0.9	65	0.2	$146
3-4 pm	10	13	0.8	65	0.2	$176
4-5 pm	8	13	0.6	65	0.1	$219
Total	81	13	6.2	650	0.1	$217

CONCLUSION

Based on the results of this study, the authors conclude that use of the chat reference service at GVSU during the study period was low, averaging only 30 questions per week during fall and winter semesters. During the entire spring/summer semester studied only 81 questions were asked, an average of 6 questions per week. Chat questions at GVSU, although low in number, were received steadily throughout the first four days of the week and fall off on Fridays. Chat questions pick up again on Sunday, possibly when students begin to work on assignments due in the week ahead.

Results indicated that three quarters of the chat questions recorded over the entire study period could be competently answered by either a library assistant or a student assistant. The average 7 questions per week (fall/winter/fall) and 1 question per week (spring/summer) that required the expertise of a librarian could be referred to on-call or subject specialist librarians with little impact on patron service.

The study also showed that that it is not cost effective to use reference librarians to answer chat questions at GVSU. The cost of staffing chat reference with a librarian in 2009 was

approximately $56,079. The price tag for each of the chats answered by a librarian ranged from $37 to $439.

Based on the initial results of this study, midway through the spring/summer 2009 semester, GVSU librarians were no longer assigned to chat reference. Instead a program was developed whereby chat was monitored by trained reference assistants who responded to ready reference and directional questions and referred reference questions to librarians.

FUTURE RESEARCH AND RECOMMENDATIONS

Librarians often undervalue their expertise and professional competence (Lauer & McKinzie, 2002/2003,) and this attitude carries over into an undervaluation of their time. GVSU Libraries' experience with chat reference is an example of this phenomenon. This study provides evidence, for the first time, of the professional labor cost of providing chat reference service to university library patrons. These findings, however, are for a medium size midwestern public university with a small graduate student presence. Further study is necessary to determine if these results are consistent throughout other university libraries.

The drop in chat as a ratio of chats per student was significant during the spring/summer semester studied at GVSU. Because chat data is only available for one spring/summer semester, further evaluation is necessary to determine whether these numbers are typical for this period at GVSU and whether these results are consistent with other university libraries who offer chat reference during spring/summer semesters.

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