

Beyond the Library: The Role of Academic Libraries' Chat Reference in Answering Campus Questions

Erin Owens (*corresponding author*)

Professor, Access Services Coordinator & Scholarly Communications Librarian

Sam Houston State University

Huntsville, TX, USA

SHSU Box 2179, Huntsville TX 77340

936-294-4567

ewens@shsu.edu

ORCID: [0000-0001-9520-9314](https://orcid.org/0000-0001-9520-9314)

Vanessa Arce

Assistant Professor, Head of Reference

Lehman College CUNY

Bronx, NY, USA

Vanessa.Arcesenati@lehman.cuny.edu

ORCID: 0000-0002-6100-9039

Darcy Del Bosque

Head, Research, Innovation, and Creation

University of Nevada Las Vegas

Las Vegas, NV, USA

Darcy.delbosque@unlv.edu

ORCID: 0000-0002-2716-8984

Robin Fowler

Public Services Coordinator

George A. Smathers Libraries, University of Florida

Gainesville, FL, USA

Rfowler73@ufl.edu

ORCID: [0009-0001-2042-0577](https://orcid.org/0009-0001-2042-0577)

Silvia Sheffield

Collections & Research Librarian for Engineering

North Carolina State University

Raleigh, NC, USA

slsheffi@ncsu.edu

ORCID: [0000-0003-4342-6450](https://orcid.org/0000-0003-4342-6450)

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Beyond the Library: The Role of Academic Libraries' Chat Reference in Answering Campus Questions

Even before the COVID-19 pandemic drove most users online, chat was establishing itself as a core service for asking library-related questions of many types, from basic directional and reference to research queries of a more sophisticated nature. This investigation seeks to provide insight into how academic libraries are seen not only as a source of library assistance, but also as a means of filling an information gap on a wider subject: the university campus at large. The study's methods involved analyzing chat transcripts from five large four-year public universities during a two-year period (2019-2021), noting the frequency of campus-related chat questions and coding the specific topics of those inquiries. The findings show that library reference services, particularly live virtual chat, are consistently valuable to the campus community and may be especially important to supporting less privileged student populations.

Keywords: academic libraries; library reference services; electronic reference services; online chat

Introduction

Live chat is not a new mode of reference service delivery in academic libraries, but in recent years it has grown into a core service in many academic libraries (for example, see data in Catalano et al., 2018, and Radford et al., 2022). The COVID-19 pandemic only further solidified the role of virtual reference, pushing it to the forefront as a critical tool to maintain services. Several studies have documented the explosive increase in question volume, analyzed the changing nature of reference questions through the pandemic, and detailed the launch of new virtual reference amidst pandemic closures (Decker & Chapman, 2022; Garvey, 2021; Hervieux,

2021; Radford et al., 2020; Radford et al., 2021; Radford et al., 2022). When COVID-19 lockdowns began, live chat was one of the central ways patrons could continue to use the library and, furthermore, a place they could go for information about the wider university's ever-changing pandemic-related policies. This raised a question for the researchers: how often do patrons seek answers from academic libraries to questions that extend beyond the walls of campus libraries, and what are they asking us?

Meanwhile, for the past decade, librarians have increasingly faced demands to "document and articulate the value of academic and research libraries and their contribution to institutional mission and goals" (Oakleaf, 2010, p. 6). Studies have addressed the possibility of communicating this value by diverse means such as student data and learning analytics, research consultations data, economic data, use of electronic resources, and more (see, for example, Cox et al., 2019; Davidson et al., 2013; Lamont, 2015; Oakleaf, 2018).

The present study, situated at the crossroads of growth in chat reference services and the urgent pressure for libraries to justify their value to their institutions, captures data about patrons' use of academic libraries' live chat systems to seek answers regarding other university services and offices. When we better understand how library reference services are supporting many university functions, we will be able to develop new means of articulating that support to administrators as part of the library's contribution to the institutional mission.

This cross-institutional study both aggregates and compares live chat data from five large, four-year public universities in the United States, as detailed in Table 1. Basic classification, size, and setting are noted according to the 2021 Carnegie Classification of Institutions of Higher Education data (Indiana University Center for Postsecondary Research); fall 2021 headcounts were obtained from the factbook on each institution's website.

Table 1. Institutional context

Institution & Location	Enrollment Headcount (Fall 2021)	Carnegie Basic Classification	Campus Size: Setting & Minority Pop.	Library Chat Service Overview
Lehman College, CUNY <i>Bronx, NY</i>	14,392	Master's Colleges & Universities: Larger Programs (M1)	Large: Primarily Nonresidential Underrepresented minorities: 88.50%	<ul style="list-style-type: none"> • Live chat began: 2011 • Current platform: LibChat • Chat co-op participant; chat available 24/7
North Carolina State University (NCSU) <i>Raleigh, NC</i>	37,556	Doctoral University: Very High Research Activity (R1)	Large: Primarily Residential Underrepresented minorities: 12.00%	<ul style="list-style-type: none"> • Live chat began: 2001 • Current platform: LibraryH3lp • No chat co-op; chat available during building hours
Sam Houston State University (SHSU) <i>Huntsville, TX</i>	21,612	Doctoral University: High Research Activity (R2)	Large: Primarily Nonresidential Underrepresented minorities: 43.00%	<ul style="list-style-type: none"> • Live chat began: 2004 • Current platform: LibChat • No chat co-op; chat available during building hours
University of Florida (UF) <i>Gainesville, FL</i>	55,781	Doctoral University: Very High Research Activity (R1)	Large: Primarily Residential Underrepresented minorities: 26.70%	<ul style="list-style-type: none"> • Live chat began: 2000 • Current platform: LibChat • Chat co-op participant; chat available M-F during daytime business hours
University of Nevada-Las Vegas (UNLV) <i>Las Vegas, NV</i>	30,679	Doctoral University: Very High Research Activity (R1)	Large: Primarily Nonresidential Underrepresented minorities: 66.90%	<ul style="list-style-type: none"> • Live chat began: 2004 • Current platform: LibChat • No chat co-op; chat available

				during reference desk hours
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Aims

This study was guided by the following research questions:

1. What proportion of library chats involve patrons seeking non-library campus information?
2. Are there patterns in this use of chat across the semester?
3. Did this use of chat change after the beginning of the COVID-19 pandemic?
4. What types/topics of non-library campus information do patrons seek via library chat?
5. How does this use of chat differ, if at all, between institutions according to Carnegie classification, commuter/residency campus types, and underrepresented minority students?

Literature Review

Numerous studies have evaluated live chat services in academic libraries from different angles, though none have yet sought to focus specifically on campus-related questions of a non-library nature. The most common approach has been to classify the type and/or complexity of questions according to broad categories, but without any distinction between library versus non-library subject matter. Our own observation in this regard is validated by Matteson et al. (2011), whose systematic review of empirical research on library chat services observed that most studies of chat questions categorized them into four basic question types—reference, specific search/known item, policy/procedure, and information/directional (p. 179)—and these did not distinguish between library and non-library questions.

For example, Marsteller and Mizzy (2003) employed a schema “designed to allow for categorization into one of four levels of complexity for the Type of Patron Query. The four

levels were (1) Directional/Policy/Procedure, (2) Known Item, (3) Facts/Ready Reference, and (4) Reference” (p. 154). Wan et al. (2009) first categorized all questions as reference and non-reference; the non-reference questions were then sub-categorized into directional, technical, hours-related, and general inquiries. Their analysis found that 84% of their virtual reference questions qualified as reference, meaning that all other inquiries, including hours and directions, comprised 16% of interactions (p.78).

Radford and Connaway (2013) analyzed question types as well as the accuracy of library responses. Categories of questions included *directional, ready reference, subject search, research, policy and procedural, holdings, reader's advisory, no question, and inappropriate* (p. 4). Luo (2017) similarly used categories such as *Technology, Supplies, Research, and Policy*, but did not distinguish non-library information. Maloney and Kemp (2015) categorized questions according to “the level of staff required to appropriately respond”—namely, Non-Professional, Generalist, and Librarian—and also employed the READ scale to indicate question complexity (p. 964). Mavodza (2019) likewise used the READ Scale, in addition to assigning questions to the broad categories *General, Technical, Known-Item Lookup, and Reference*. Meert-Williston and Sandieson (2019) developed a coding tool “to ascertain the type and complexity or depth of the question”; the tool differentiated first between *Reference* and *Service* questions, and then *Reference* was sub-divided into *Ready reference* and *In-depth reference*, while *Service* was sub-divided into *Directional* and *Informational* (pp. 56, 61). Even Youngbar (2012), who is considered to have done some of the most thorough sub-categorization of chat questions, references extra-library questions in only one category: *Directional -> Miscellaneous*, “Users asking for directions to specific rooms within the library, other offices on campus, or anywhere else” (Youngbar, 2012, Figure 1).

A study by Grallo et al. (2012) focused on non-library questions, but only in face-to-face reference. That study found a large proportion of these questions (47%) and classified them into two broad categories: technology and bureaucracy. Additionally, an analysis of queries received in an online Library FAQ page also noted the presence of campus-related questions (Arce & Ehrenpreis, 2023). Two studies were found that minimally identified non-library questions in chat reference. Houlson et al. (2006) started by assigning questions to broad categories such as *Circulation, Do You Own, How to Find, How to Use, Library Information, Remote Access/Privileges*, and more, which were then broken into a second tier of more specific categories. Some of these, such as *Library Information: Campus Phone* and *Library Information: Unaffiliated Services*, were capturing non-library campus questions, but that study's analysis focused only on library-related questions. Similarly, Fennewald (2006) included a category for non-library questions, but the number of queries in this category was relatively small (just 13 chat questions or 4% of the dataset), and no detailed analysis was done on them. However, Fennewald observed that these questions indicate the library's value as a campus information center, and it is exactly this value which the present study seeks to explore in more detail to fill this gap in the literature.

Methodology

Prior to beginning the study, each researcher was required to obtain a formal letter of permission from their library to download and use chat transcripts for research purposes. Additionally, all researchers were required to complete and submit certification of research ethics training as required by the principal investigator's institution, SHSU. Then the project's purpose, research questions, and methods were submitted to and approved by the Institutional Review Board (IRB) at SHSU, as well as the NCSU IRB according to their internal requirements.

Due to the sheer quantity of chat transcripts available in the selected timeframe, the researchers chose to prioritize efficiency over absolutely comprehensive data capture. Reading every record manually to hand-select relevant questions would have resulted in the most comprehensive dataset but would have been intensely time-consuming. Constructing a list of likely keywords based on common topics and programmatically searching the transcripts for those terms was decided to be the more consistent and efficient approach, even though relevant data pertaining to unanticipated topics might be omitted.

First the researchers compiled a list of keywords pertaining to common campus topics, based on their own library experience; Wilkinson et al. (2021, p. 197-198) used a similar keyword method, though this study's approach was not based on that publication. A master list contained keywords that would be common across campuses—for example, *admissions* and *advising*—while separate lists were also composed for keywords unique to each campus, including branded names for campus systems and the names of campus buildings. These keywords were reviewed and revised several times for thoroughness, and terms were entered strategically to catch as many variations as possible—for example, plural suffixes were avoided, and some stemming was included, such as the keyword *public librar* to catch *library*, *libraries*, and *librarian*. The final list of keywords used for each institution is documented in Appendix A.

Next, each researcher downloaded transcript data from their live chat platform—all participating libraries used either Springshare's LibChat or LibraryH3lp (see Table 1). The data collection period was defined as 2019-06-01 through 2021-05-31 for two full years of data; however, the Lehman campus had recently migrated chat platforms and could not access pre-migration transcripts, so their collected data began on 2020-06-08, about one year after the other participating institutions.

Each researcher began with a blank, macro-enabled workbook in Microsoft Excel. Chat transcript data exported from the chat platform was pasted into the first worksheet, and in the second sheet they pasted into a single column their selected keywords, both cross-institutional and campus-specific (see Appendix A for keyword lists). A custom macro written in Excel VBA compared the keyword list to the transcript metadata and created a Conditional Formatting rule in the spreadsheet to highlight in red any cell that contained one or more listed keywords (see [Supplementary Appendix 1](#) for VBA macro).

Records lacking highlighted fields (that is, not containing any listed keyword) were removed from the dataset. Each researcher then reviewed their remaining records to verify relevance and removed additional records that were deemed *false positives*—incidentally containing a keyword but not truly pertinent to the study—according to criteria established by the team and applied knowledge of the local campus context. At the same time, all personally identifying information—including patron names, identification numbers, email addresses, and phone numbers—was redacted from the records. Finally, de-identified records from all individual researchers were shared with the principal investigator and merged into a single dataset. The fields maintained in the dataset, and how they were aligned between LibChat and LibraryH3lp systems, are detailed in the data dictionary in Appendix B.

An initial list of codes was created by thematically sorting and grouping all of the keywords used in the programmatic filtering. As the groups developed, broad category names and more specific topics were defined, and some inclusion and exclusion notes were documented.

Two rounds of interrater reliability testing were done to ensure coding consistency. All datasets were given a random number (using the *RAND()* function in Excel) and sorted by that value to obtain a random sample of six chat records. All five researchers independently selected

a single code for those six records, and then the codes were compared by calculating the interclass correlation coefficient (ICC) as described by McGraw and Wong (1996). ICC estimates and their 95% confident intervals were calculated using SPSS statistical package version 27 (SPSS Inc, Chicago, IL) based on a mean-rating ($k = 5$), consistency, two-way mixed-effects model. In round one of testing, the ICC value's 95% confidence interval ranged between 0.748 and 0.988, representing good reliability according to Koo and Li (2016). Some clarifications were made to the coding categories following round one of reliability testing and then a second round was undertaken. In round two, the ICC value's 95% confidence interval ranged between 0.998 and 1, representing excellent reliability (Koo & Li, 2016). However, the researchers do acknowledge that the six-record sample, used for time and convenience reasons, was smaller than the 30 records recommended by Koo and Li.

Following the conclusion of reliability testing, the complete multi-institutional dataset was divided into five roughly equal groups, and coding was completed by the five researchers (one coder per record). A total of 25 possible codes were available, including one code which indicated simply that more information or local expertise was required for proper coding. Each transcript received a minimum of one code, but a maximum of two codes was permissible when necessitated by, for example, complex multi-part questions. During this first pass, coders also made notes regarding questions, transcripts which they found difficult to code, and new codes they recommended adding. Questions were resolved via group discussion (including those transcripts which required local knowledge), several new codes were added, and several codes were modified or clarified. All researchers then made a second pass through their transcripts to correct coding as needed based on modifications. The final codebook is available in Appendix C.

All coded transcript data was loaded into a Microsoft Access database, where a series of SQL queries were then written and run to gather descriptive statistics, both for the complete

dataset and by institution. These queries documented our analysis steps and allowed any given statistic to be quickly and easily acquired again by the same means, ensuring consistency in results. Although the researchers de-identified the transcripts to the extent possible, the transcript data itself has not been shared due to the severity of patron privacy concerns if any identifying information were overlooked.

Results

An initial set of 1333 records were evaluated after macro-based filtering and manual cleaning (see Table 2). Additional records deemed by the researchers to be out of scope were omitted during coding, and a total of 1172 records were fully coded and included in analysis. NCSU provided the largest proportion of the coded transcripts (56.57%). Figure 1 illustrates each institution's contribution to the dataset for analysis.

Table 2. Progressive filtering of transcripts for analysis

Institution	2019-06-01 to 2021-05-31	Flagged by Macro		After Cleaning		After Coding	
	Total Transcripts	N	%	N	%	N	%
Lehman	1767	174	9.85%	111	6.28%	100	5.66%
NCSU	20123	4601	22.86%	707	3.51%	663	3.29%
SHSU	3530	130	3.68%	126	3.57%	124	3.51%
UF	20558	249	1.21%	280	1.36%	198	0.96%
UNLV	2042	688	33.69%	109	5.34%	87	4.26%
TOTALS	48020	5842	12.17%	1333	2.78%	1172	2.44%

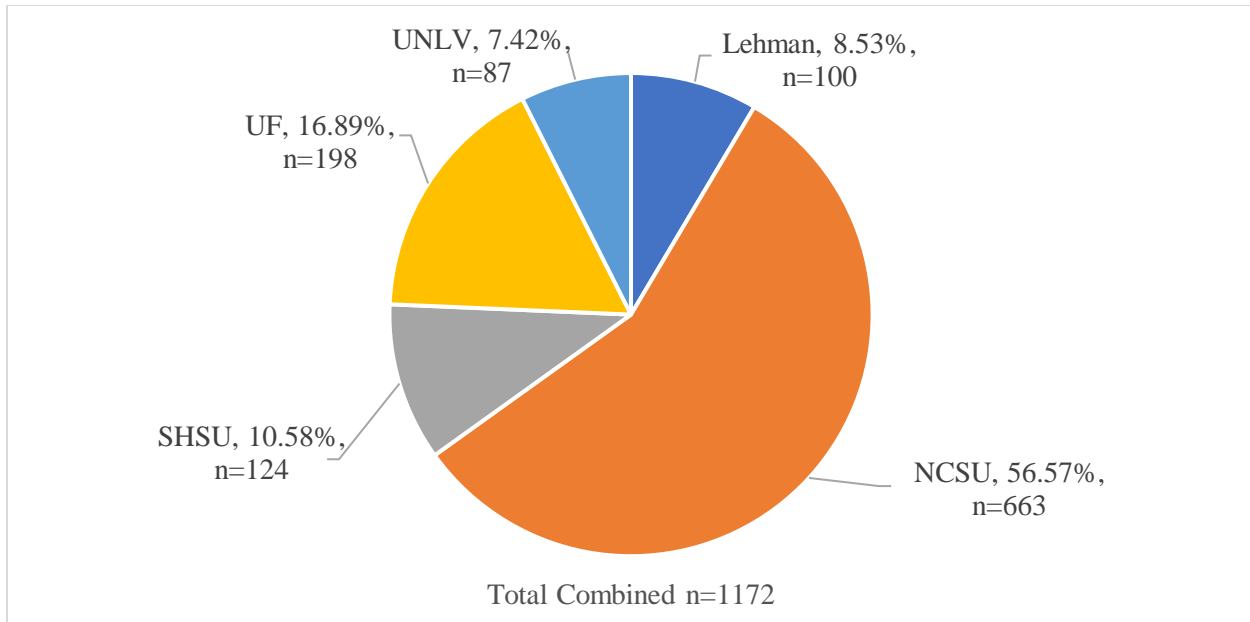


Figure 1. Percentage of coded transcripts contributed by each institution

The frequency of campus-related chats overall was found to be 2.44%, but this varied among institutions: 0.96% at UF, 3.29% at NCSU, 3.51% at SHSU, 4.26% at UNLV, and 5.66% at Lehman. The average frequency of these chats among non-residential institutions—Lehman, SHSU, and UNLV—was higher than at residential institutions: 4.48% on average versus 2.13%. Institutions which are not Carnegie classified as R1 research institutions—Lehman and SHSU—experienced more of these chats than the R1 schools: 4.59% versus 2.84%. Finally, chats were also more frequent on campuses where underrepresented minorities make up more than half the student population—Lehman and UNLV—at 4.96% on average versus 2.59%. Welch’s test (also known as unequal variances t-test) suggests that all these differences are statistically significant, though it is difficult to determine the validity with only five data points to compare.

About two-thirds of the transcripts (65.44%) originated during the COVID-19 pandemic; the other one-third originated before the pandemic. Figure 2 shows what proportion of each

institution’s analyzed transcripts came before or during COVID; each institution’s COVID closure date, ranging from March 11 to March 18, was used for calculations.

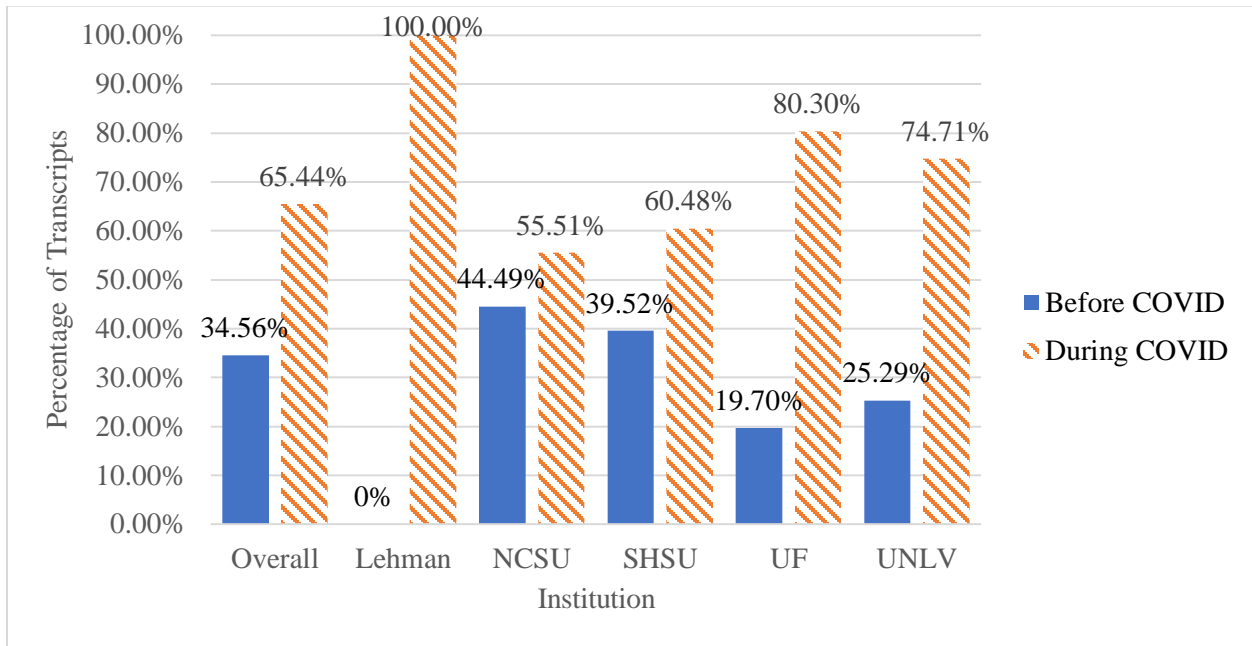


Figure 2. Coded transcripts before and after each institution’s COVID shutdown

Only in August 2020, as students were returning or preparing to return to classes while campus closures continued, did the dataset demonstrate a significant increase in the number of non-library chat questions, compared to August 2019 (88 chats vs 30); June 2020 showed a more modest increase compared to June 2019 (from 23 to 40 chats), but most other months saw a relatively stable number of non-library questions before and during the pandemic or even a decrease. See Figure 3 for details; Lehman’s data is excluded from this figure, since it lacks pre-COVID dates, to avoid skewing.

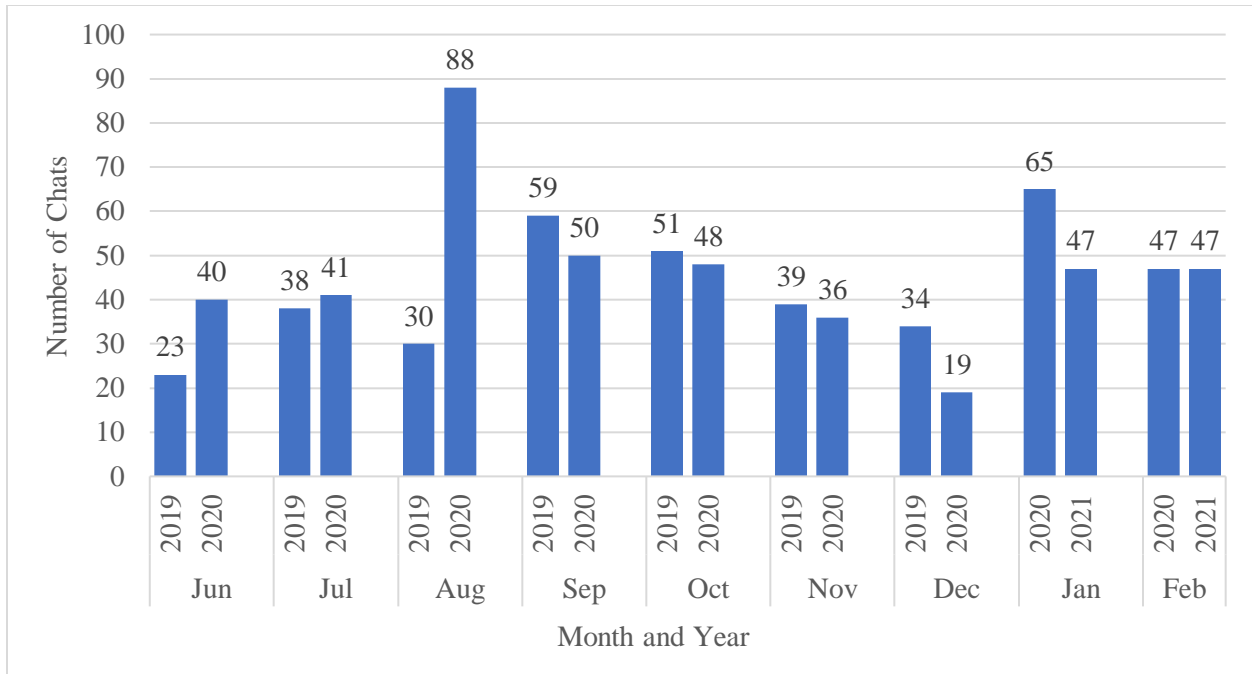


Figure 3. Number of chats by month before and during COVID-19 pandemic (excludes Lehman)

Researchers coded chats into a potential of thirty-three topics, one of which (25) was a prompt that more information was needed before a transcript could be coded. Therefore, there are no references to code 25 in the results. Appendix C provides the codebook in full. Codes 26-33 were added after the initial round of coding uncovered some gaps in categories. Figure 4 shows the frequency with which each code was assigned to chat transcripts overall; note that each transcript could be assigned to up to two codes, so percentages may total more than 100%.

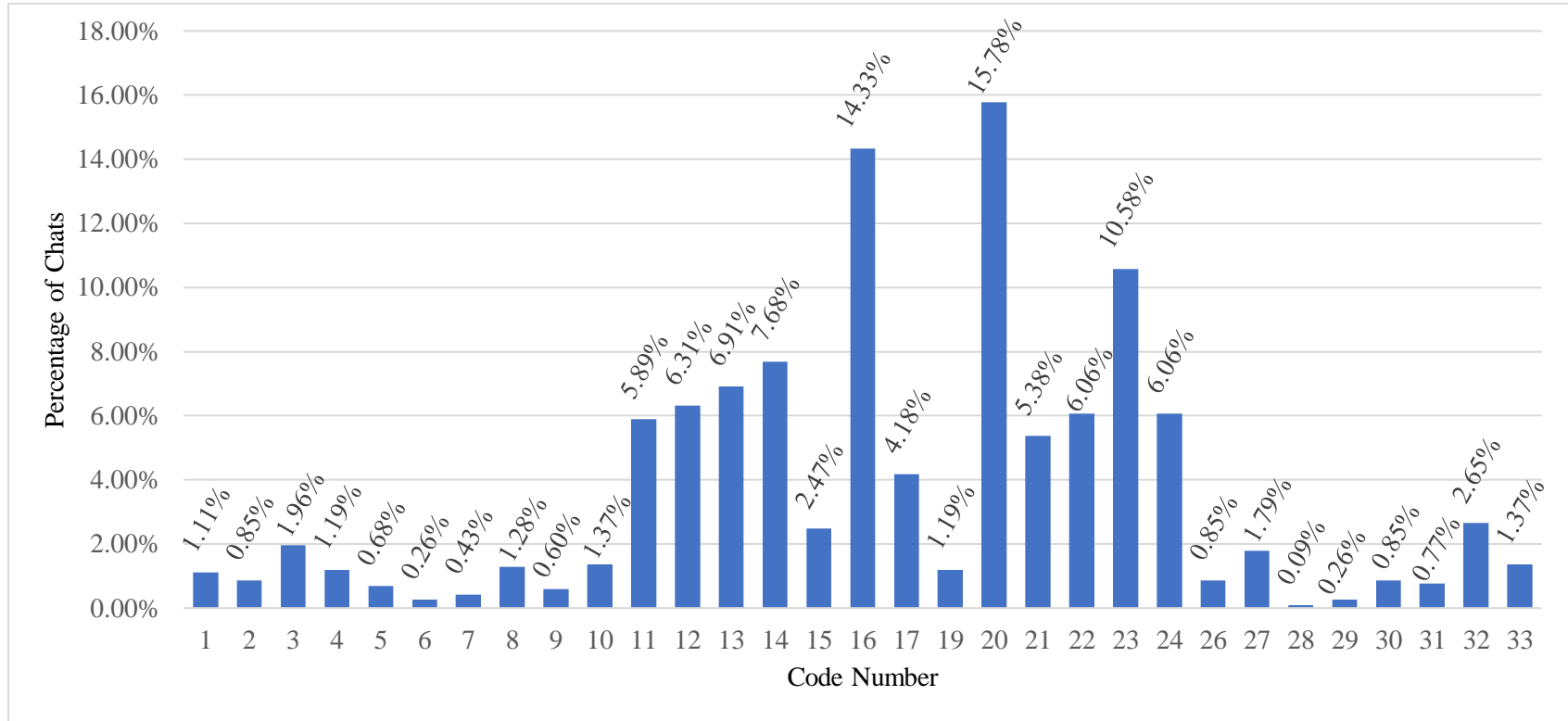


Figure 4. Frequency of codes in chats across all institutions

When comparing the top codes at each individual library to the top codes overall, there was very little consistency. The most frequently occurring code overall, Software-General (Code 20), showed up in the top five codes of four institutions, only being excluded from the top five at Lehman College. Code 14, User Account/Password, showed up in the top five at three institutions: Lehman, UNLV, and UF. Across the five campuses, the topics coded most often in the transcripts were Software-General (Code 20), Printing/Scanning/Faxing (Code 16), Textbooks (Non-library) (Code 23), User Account/Password (Code 14), and Offices & Services (Code 13). The five topics least often coded in the transcripts were Payment (Code 9), Tuition & Fee Cost (Code 7), Graduation (Code 6), Academic Calendar (Code 29), and Grades (Code 28). [Supplementary Appendix 2](#) provides additional figures showing the frequency of codes at each institution.

However, when individual codes were collapsed into their broader categories, the five libraries shared more in common. The thirty-two coding topics were grouped into eight broad categories: Apply, Enroll & Attend, Pay, Campus Life, Technology, Study & Learning, Faculty & Research Services, and About the Institution. Overall, the most frequent two categories of campus questions were Technology and Study & Learning. Lehman, SHSU, and UF followed this trend, with those being their top two categories (although not always in the same order), while both UNLV and NCSU had the top two categories of Campus Life and Technology. Figure 5 displays the percentage of transcripts that were assigned a coding category, overall and by institution; [Supplementary Appendix 2](#) also includes supplementary figures showing the frequency of coding categories for each institution individually.

The Apply category ranked consistently as the least common one, overall and for all five institutions. While the five least chosen categories differed by institution, each of those

categories accounted for less than 10.00% of the results. For individual libraries, the top two categories comprised the bulk of the assigned codes. The category with the most transcripts assigned accounted for between 44.97% (Technology, UF) and 67.11% (Technology, NCSU) of the total, while the second highest category had between 21.84% (Campus Life, UNLV) and 35.00% (Technology, Lehman). The third most popular categories dropped substantially, coming in between 12.00% (Enroll & Attend, Lehman) and 19.19% (Campus Life, UF).

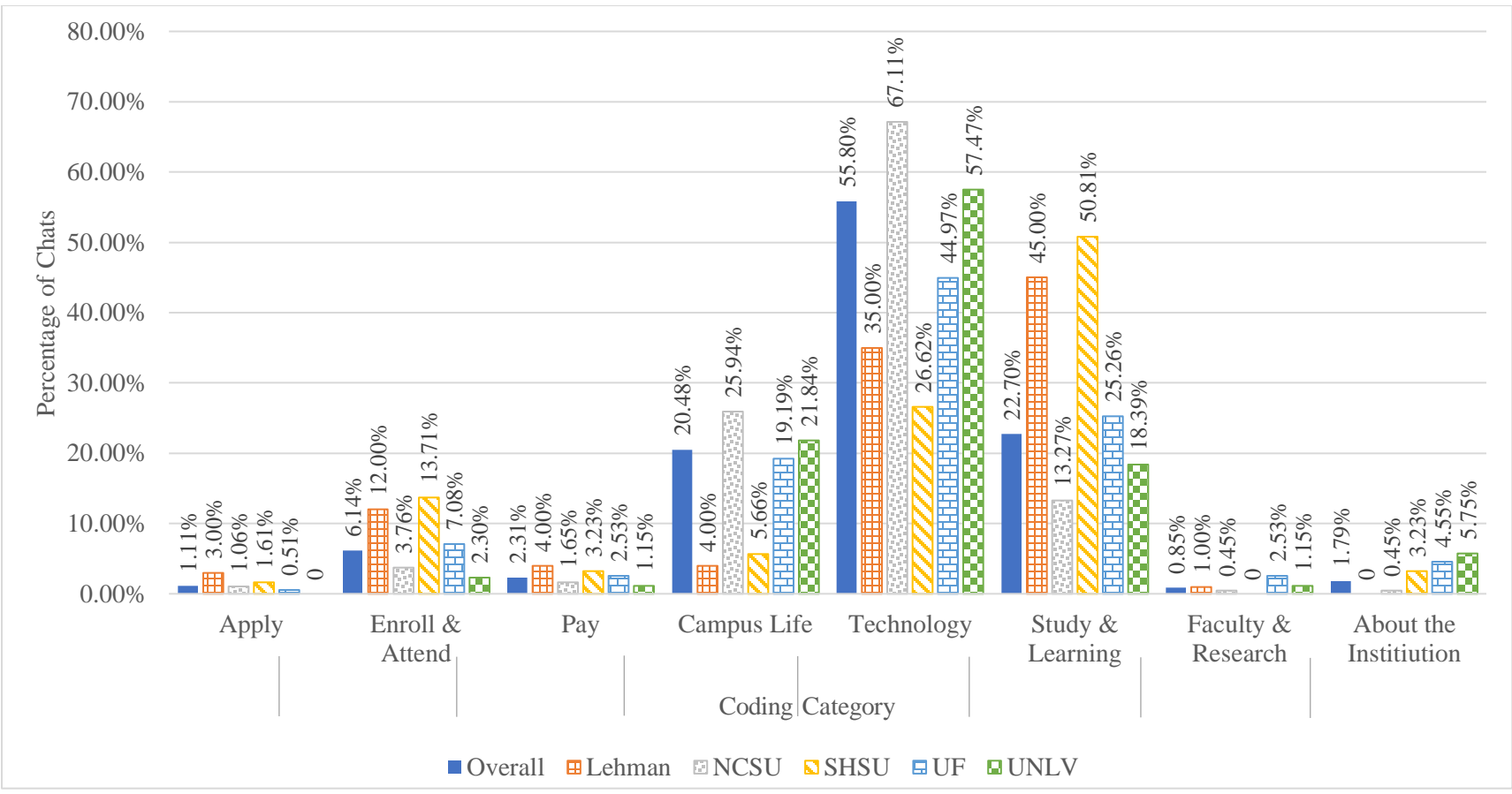


Figure 5. Frequency of coding categories in chats by institution and overall

Researchers could assign more than one code to a transcript, but this was not done often, with only 11.18% (n=131) of overall transcripts being assigned to more than one code. This was an area that seemed to vary more widely by institution: NCSU (14.18%), UNLV (9.20%), Lehman (8.00%), UF (7.07%), SHSU (5.65%). Figure 6 shows the percentage of transcripts with two codes.

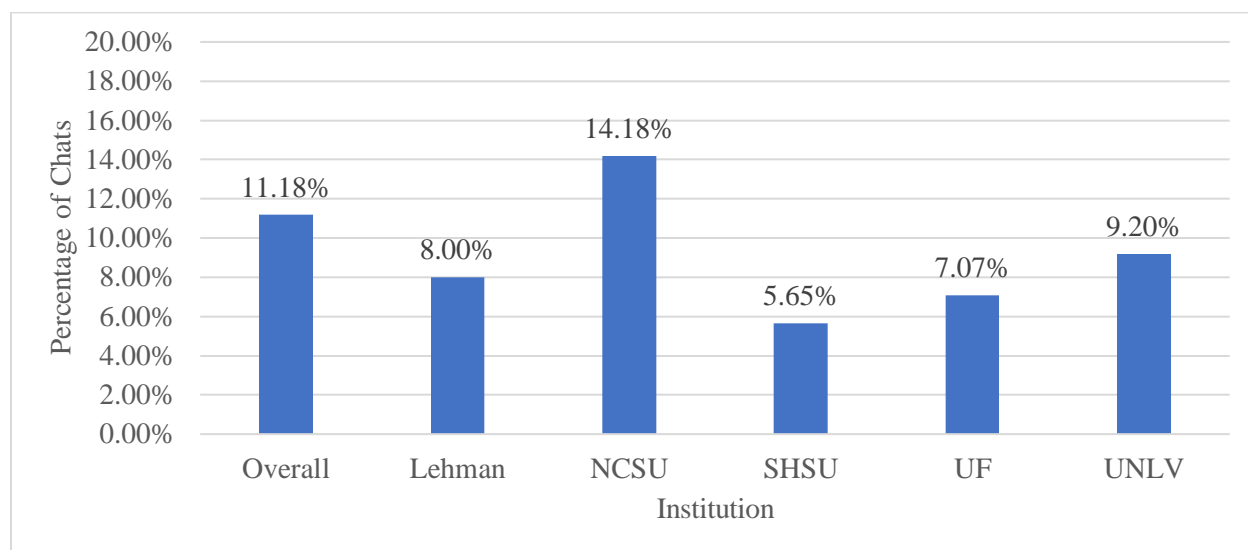


Figure 6. Percentage of transcripts with two codes by institution

Most code pairs were unique, with only four code pairs occurring in more than 3% of the two-code transcripts. The most common co-occurring codes were Remote Access to Computing (Code 17) and Software-general (Code 20), which accounted for 19.85% of pairs. Among the most prevalent four code pairs, the latter was the only set where both codes fell into the same category—Technology. The other three top code pairs were:

- 8.40% Offices and Services (Code 13/Campus Life) and Printing, Scanning, Faxing (Code 16/Technology)
- 3.05% Offices and Services (Code 13/Campus Life) and Hardware/Equipment/Devices (Code 21/Technology)

- 3.05% Learning Management Systems (Code 15 / Technology) and Textbooks (Non-Library) (Code 23/Study & Learning)

The only two categories that did not show up in code pairs at all were Faculty & Research and About the Institution. Codes in two-code transcripts were most likely to fall into the Technology category; out of a total of 262 codes (2 each in the 131 two-code transcripts), the category Technology appeared in 58.02% (n=152). Figure 7 illustrates this and the proportions of the other coding categories.

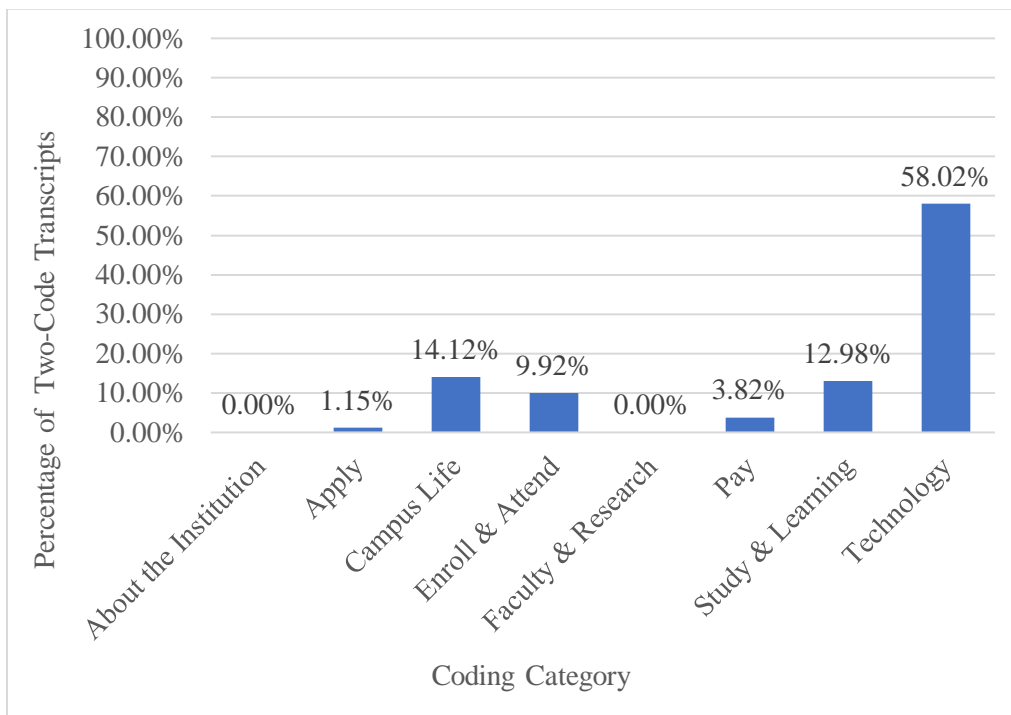


Figure 7. Frequency of coding categories in two-code transcripts

Discussion

This study found that non-library campus questions, on average, accounted for 2.44% of library chat questions, a relatively small proportion of all library chats. This aligns reasonably with Fennewald's finding of 4% in 2006, which suggests that academic libraries have been filling this information gap on campuses consistently over many years. Assisting with non-library campus

needs is, perhaps unsurprisingly, not a primary function of library chat, but is consistently present. The frequency of these chats varied widely between institutions (ranging from 0.96% to 5.66%), indicating that different populations of students may have different information needs in this area. Different student bodies may also have different perceptions of the approachability of library chat services or may make different determinations regarding when the library is an appropriate resource to contact.

Comparisons of chat frequency according to Carnegie classification, residential status, and underrepresented minority student populations, taken together, suggest that this kind of library support may be a more significant resource for less privileged student populations. Although additional comparisons were sought based on first-generation student populations and student household median incomes, these metrics were readily available for only a few of the participating institutions. Future studies might investigate further and determine whether the apparent trend in benefit to the less privileged continues to play out.

Although certain broad categories appeared quite frequently across institutions—for example, Technology appeared in the top two codes for all five institutions—each school also showed unique priorities in their chat topics. For example, although two non-residential campuses saw a significant number of chats regarding non-library textbook acquisition (Lehman, 30.00%, and SHSU, 38.71%), this topic represented very few chats at the third non-residential campus (UNLV, 1.15%). These variations in priorities further reinforce the impression that not all student populations will turn to the campus library with the same kind of needs. Examining the priorities among the local campus population can identify which campus services and resources library personnel should be most informed about. Applying to the university was a very uncommon topic, suggesting that the library may not readily suggest itself as a point of contact to students who are not yet part of the campus community—or else that universities are

very skilled at directing prospective students to application and enrollment information, while perhaps not guiding them so successfully once they are part of the campus community.

Looking at top codes and top coding categories, Technology was clearly a significant source of questions across campuses. It was also a large component of code co-occurrences, indicating that, when students ask questions on multiple topics, they are often multiple questions about technology. Without further research, it is unclear precisely why so many of these technology-related questions were directed towards the library. Do students simply encounter issues with campus technologies, such as Wi-Fi, computers, user accounts, and so forth, while in the process of using that technology for library research, thus causing them to turn to the library first for support? Students might simply lack knowledge of how to contact their campus Information Technology (I.T.) department with these questions, or their I.T. department may have insufficient hours of staffing. Additionally, or alternatively, their I.T. department may only offer contact methods such as online ticket submission, which is asynchronous and can have slower response times, or telephone calls—these at least are synchronous and immediate, but, as Daniel Long noted in his 2018 dissertation on generational differences in text messaging habits, “the younger the group, the more likely they are to text rather than call” (p. 110).

Do libraries receive these questions simply because they are “the” campus provider of live chat? At many of the five institutions participating in this study, other campus offices had either no chat or only an artificial intelligence chatbot, so this may have been a factor. Other administrative units at Lehman did launch live chat features within their bots in 2020, and many non-library questions still came through library chat; a thorough comparison of hours and quality of staffing would likely be needed to understand why these questions continue to gravitate towards the library. Likewise, the UNLV Office of Information Technology provided access to live chat with a bot, but technology was still one of the most frequent categories among non-

library questions. Conducting similar library chat analysis specifically on campuses where campus I.T. also offers live chat might yield interesting findings; qualitative interviews with students about their motives for choosing a chat tool might as well.

In general, campus-related chats tended to be higher in the first month of a semester and decline month by month over the course of the semester. This same general trend appeared when comparing all semesters (fall, spring, summer), fall semesters only, spring semesters only, and “long” (fall and spring) semesters only. However, t-tests of means showed no statistically significant difference between pairings of the first, second, and third months of semesters. When evaluating the potential impact of COVID, August 2020 did show a spike compared to August 2019; many students were either starting their first semester of college or else returning to courses for the first time after COVID-19 lockdowns. Since COVID-19 conditions were constantly changing and related campus policies would be new for most students, the researchers found it unsurprising that students reached out more during these early days of the semester to seek help with accessing campuswide resources and services. However, beyond this one spike, the pandemic did not seem to impact the use of library chat for seeking campus answers. The need for these types of answers seemed to remain consistent from semester to semester.

The significant difference in the number of transcripts flagged at each institution, which may relate to the quantity or diversity of anticipated keywords, illustrates a challenge to conducting this kind of analysis. Library personnel may be unable to predict all campus-related topics of interest or all the variations in language that may appear when these topics are discussed in chat. This suggests that libraries interested in observing these types of requests may be better served by conducting more frequent manual reviews of smaller batches of transcripts rather than conducting large-scale automated categorization. Adding one or more categories to a reference statistics tracking form is another option that would allow libraries to better track and

report their effort in providing campus answers beyond the library. Even adding just one flag to a transcript, as illustrated in Figure 8, readily identifies relevant chats for further coding or analysis.

The image shows a digital form for tracking reference statistics. At the top right, there is a 'READ scale *(Required)' with buttons for 1, 2, 3, 4, 5, and 6, along with a 'reset' button and an information icon. Below this are four vertical panels: 'Time Spent', 'Format', 'Referrals to (if applies)', and 'Unique Attributes (if applies)'. The 'Unique Attributes' panel has a yellow highlight on the text 'Campus/Non-NGL Resources'.

Figure 8. Reference statistics tracking form with a flag to indicate “non-library” inquiries

Limitations and Further Research

First and foremost, the institutions represented in this data were selected based on only the affiliations of the collaborating co-authors and do not necessarily reflect a representative sample. Additionally, the keyword-matching approach used to programmatically filter transcripts was not as effective as desired; however, it erred on the side of including too much, rather than excluding too much. As a result, while the remaining filtering process remained laborious for the researchers, we feel the approach did not appreciably threaten the inclusion of relevant data on the selected topics.

This filtering method was also limited to the topics initially listed by the researchers, so additional unexpected relevant topics may have been excluded. The findings should be read as a useful representative sampling of topics but not necessarily a comprehensive cataloging, therefore representing only the minimum estimate of library contribution in this area rather than a maximum.

Due to time and convenience, a sample of only six records was used for inter-rater reliability, which is significantly less than the 30 records recommended by Koo and Li (2016). The authors acknowledge that additional inter-rater reliability testing would have increased confidence in the data. Having multiple raters review each record would also have increased confidence, though this did not feel feasible given the large amount of data.

Further research building on this study could examine the prevalence of campus-related questions at physical service points in the library and compare this to chat. Since the participating institutions in the present study were all public, further studies could repeat the transcript analysis with private institutions and compare results. Analysis of the answers given to campus-related questions—for both accuracy and fulfillment of the Reference User Services Association (RUSA) Guidelines for Behavioral Performance of Reference and Information Service Providers—could also yield deeper insight into libraries' performance in this valuable area of contribution to their campuses. Finally, interviews could be conducted with student users of library chat to explore their motivations for directing campus-related questions through the library.

Conclusions

Library reference services via live chat are used for campus-related questions beyond the library, not at a high frequency but consistently, across multiple large universities.- This is not a new phenomenon and has remained relatively steady both before and after the COVID-19 pandemic. Academic libraries are seen not only as useful for their internal resources, but also as a means of connecting with information about the campus at large.

Topics of campus-related chats vary among institutions, and, at least within this study's sample, higher frequency of these chats was seen at schools which are primarily non-residential, not Carnegie classified as R1 institutions, and serving student populations which consist of more

than 50% underrepresented minorities. It is not surprising that questions asked would be reflective of the campuses where they are being asked. Nor is it surprising that the library is a valued source of information for students and fills a gap for those who might be unfamiliar with the complex layers of campus life.

Campuses are frequently asking for libraries to prove their value to the organization in quantitative ways. While there are many approaches to this that libraries can take, this study reveals an additional way to provide data on the valuable role the library fills by reviewing the types and frequency of campus-related chat questions. Davidson (2013) states how important it is, “to think about the value of the library, and demonstrate to ourselves, the deans, and our stakeholders the impact we have on the students and their success” (p.75). At the same time, it is important to consider privacy and methodology in regard to data collection (Cox, 2019). Use of chat data, when stripped of identifying information, can help with both of these aims and demonstrates to administration the important role played by libraries to connect students to needed resources within the campus. This study did not explore specific messaging that could be crafted to send to campus administration, but it does pave the way for future research aimed at leveraging chat data to construct a narrative about the value of the library on campus.

While it is hard to create a direct connection between answered campus chat questions and student success, these transcripts provide a unique opportunity to identify areas where students are in need of additional information and support. The data can help identify offices and services on campus with which library chat operators should be most familiar and prepared to address in chat inquiries. This not only creates opportunities for collaboration but also underscores the importance of maintaining open lines of communication across campus.

Chat has been a valuable tool for libraries offering a convenient and efficient way for the campus community to access library services and support. This research has shown that it also

provides an accessible and immediate channel for students and faculty to seek assistance for all things campus related. It also points to chat transcripts as a rich and valuable resource for libraries to explore in connecting their value with campus strategic goals.

Author Contributions According to CRediT Taxonomy

Erin Owens: Conceptualization, Project Administration, Data Curation, Investigation, Methodology, Formal Analysis, Visualization, Writing—Original draft, Writing—Review and editing; **Vanessa Arce:** Data Curation, Investigation, Methodology, Formal Analysis, Writing—Original draft, Writing—Review and editing; **Darcy Del Bosque:** Data Curation, Investigation, Methodology, Writing—Original draft, Writing—Review and editing; **Robin Fowler:** Data Curation, Investigation, Methodology, Writing—Original draft, Writing—Review and editing; **Silvia Sheffield:** Data Curation, Investigation, Methodology, Writing—Original draft, Writing—Review and editing.

Disclosure Statement

The authors report there are no competing interests to declare.

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Appendix A**Search Macro Keywords**

This table lists both institution-specific keywords and the shared keywords that were used for all institutions. The authors drafted the institution-specific keywords mainly by identifying any local terms related to these categories:

Learning Management System

Student and employee web portal(s)

Plagiarism detection software

Remote proctoring software

Student ID card

Local public library/ies

Bookstore name(s), campus or local independent

Course pack service(s)

Campus IT name, if locally branded

Online ed/distance learning office, if locally branded

Campus safety/police, if locally termed or branded

Specific building names (maybe including gym, student center, health center, dining halls, etc.) - wherever you might direct patrons

Campus events/catering unit

Shared keywords (80)	Lehman only (11)	NCSU only (27)	SHSU only (33)	UF only (16)	UNLV only (27)
admission	Apex	Carmichael	AB1	Academic technology	Center for Social Justices
advisement	Carman	allcampus	AB4	Alachua County Library	Charging Station
advising	Concert Hall	Centennial	ABI	Baby Gator	Cottage Grove
advisor	Davis	Chapel Hill	ABIV	Gator Dining	dining commons
blackboard	Gallery	Dan Allen	Bearkat OneCard	Gator1	Faculty Center
book store	Gillet	DELTA	CJ Center	GatorOne	FAST Center
bookstore	High School of American Studies	Duke	CJC	Newell Hall	Free Lot
bursar	Lehman 360	Durham	CMIT	one.UF	GPSA
bus	Lehman Connect	mediasite	Estill	Public Library	Grad Commons
campus rec	Old Gym	my pack	Evans	Reitz Union	Greenspun
campus safety	NYPL	Mypack	Evans Complex	Student Government	Intersection
canvas		NC Central	Gaertner	Target copy	Jean Nidetch Care Center
career center		NCCU	General's Market	The Hub	Marjorie Barrick Museum of Art
cashier		OIT	HKC	UF help desk	MyUNLV
child care		one card	IT@Sam	UFIT	Office of Online Education
childcare		Onecard	LEMIT	UPD	OIT
club		panopto	LSC		RAVE
coliseum		portal	MySam		Rebel Copy and Send
course pack		Raleigh	observatory		RebelCard
coursepack		Rave	Old Main Market		RebelMail

day care		Talley	PAC		Reprographics
daycare		UNC	Paw Print		RTC Transit Center
department		VCL	raven		Stan Fulton Building
dining		Virtual Computing Lab	Sam South		Summer Term
disability		Wake	SamWeb		TAM Alumni Center
dorm		Witherspoon	SHB		Thomas & Mack
enroll		wolf	SHC		WebCampus
fax			SHCC		
fedex			SHSU Online		
financial aid			SHSUOnline		
flier			Smith Hutson		
flyer			South Paw		
fraternity			UPD		
graduation					
gym					
health center					
help desk					
hotel					
lactation					
large format					
math lab					
moodle					
organization					
pantry					
park					
payment					
plagiarism					

police					
poster					
preschool					
proctor					
prospective					
public librar					
public safety					
reading center					
reading lab					
rec center					
rec sport					
registrar					
registration					
rental					
res life					
residence hall					
residence life					
respondus					
scholarship					
sorority					
stadium					
student health					
student life					
student org					
student service					
transcript					
tuition					
turnitin					
tutor					
UPS					

withdraw					
writing center					
writing lab					

Appendix B**Data Dictionary**

Note: Chat system fields which are not listed here were deleted following the data download.

Field Name in LibChat	Field Name in LibraryH3lp	Field Name in Project Database <i>(tblAllOriginalTranscripts)</i>	Description
Referrer	Referrer	fldReferrer	URL of the web page from which a chat began
Widget	Queue	fldWidget	Identifies a specific chat contact point as defined in the chat system setup
Timestamp	Started	fldTimestamp	Date and time that chat began; formatted as <i>m/d/yyyy hh:mm</i>
Wait Time	Wait	fldWaitTime	Length of time patron waited for first library response; formatted as <i>hh:mm:ss</i>
Duration	Duration	fldDuration	Length of time from chat answered until chat answered; formatted as <i>hh:mm:ss</i>
Initial Question	<i>n/a</i>	fldInitialQuestion	Initial question entered by patron before initiating a chat (if applicable)
Transcript	Text	fldCompleteTranscript	Complete text of the chat
<i>n/a</i>	<i>n/a</i>	fldIdentifier	Unique value per record; structured as first 3-4 letters of the institution name, in capital letters, followed by consecutive numbers starting at 001; e.g., INS001
<i>n/a</i>	<i>n/a</i>	fldAssignedCode1	First thematic code assigned by researchers (<i>required</i>)
<i>n/a</i>	<i>n/a</i>	fldAssignedCode2	Second thematic code assigned by researchers (<i>optional</i>)

Appendix C**Codebook**

Note: Topical codes are grouped in logical Categories. Final codes are non-sequential due to codes being eliminated and added during iterative coding.

Code	Category	Topic	Examples of Included Content	Notes
1	Apply	Applying	admissions, prospective students, application deadlines, etc.	
2	Enroll & Attend	Enrolling	(as a student in the university)	
3		Registering	registration (for classes), registrar, withdrawing, etc.	
4		Advising		
5		Transcripts		
6		Graduation		
28		Grades		
29		Academic Calendar		
30		Course Info	Course catalog, course schedules, syllabi, course modality, etc.	
7	Pay	Tuition & Fee Cost		
8		Financial Aid	scholarships, loans, etc.	
9		Payment	cashier, bursar, deadlines, etc.	
10	Campus Life	Extracurricular	student organizations, clubs, Greek life, fraternities, sororities, posting flyers, campus events, residence life, etc.	
11		Transportation & Directions	parking, buses, shuttles, etc.	
12		Facilities	health center, rec center, student recreation, rec sport, gym, residence hall, dorm, coliseum, stadium, hotel, lactation, rental, post office, etc.	<i>Some overlap with Services, distinguished by context</i>

13		Offices and Services	daycare, childcare, preschool, student health, food pantry, disability, dining, career center, student ID card, police, public/campus safety, catering, mailing, shipping, bookstore (specifically non-textbook related), Title IX office, etc.	<i>Some overlap with Facilities, distinguished by context</i>
14	Technology	User Account/Password		
15		Learning Management Systems		
16		Printing, Scanning, Faxing	also related services like binding	
17		Remote Access to Computing	Virtual Computing Lab, VPN, Remote Desktop, etc.	
19		Student/Employee Web Portal		
20		Software - General		
31		Software - Proctoring		
32		Software - Plagiarism Detection		
21		Hardware/ Equipment/ Devices	e.g., laptops, tablets, hotspots, desktops in computer labs, etc.	<i>Limited to hardware outside of library services; e.g., borrowing a laptop from the library circulation desk would be out of project scope</i>
33		Internet / Wi-fi		
22	Study & Learning	Learning Support Services	tutoring, writing/math/reading center or lab, plagiarism (teach/help, not software), proctoring (support, not software), etc.	
23		Textbooks (Non-Library)	also includes course packs	

24		Academic Departments & Colleges	locations, contact info, etc. for other service offices, faculty, etc.; also includes questions about theses and dissertations that are outside library scope (e.g., at Graduate School level)	
25	Need Local Knowledge	Consult with specific team member	choose this code when local knowledge or clarification may be needed from the team member from this institution	<i>These entries will be sorted and addressed after other coding, so this code will not remain in final data</i>
26	Faculty & Research Services	Faculty & Research Services	Office of Research, IRB, grants, research support services, etc.; can also include graduate student questions on these topics	
27	About the Institution	About the Institution	History, budget, statistics, branding, requests for promo photos, external relations, people seeking jobs at the institution	