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In this research, surveys and interviews were conducted at New England Liberal Arts College Libraries to understand the changes and challenges faced by library reference services. Despite the significant impact, library reference services are reconnecting with students through various outlets and strategically embracing AI technology to better support teaching and learning in the post-COVID era.

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Changes and the Challenges of Library Reference Services After the Covid-19 Pandemic: Findings From a Survey Study in New England Liberal Arts Colleges

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ABSTRACT

During the COVID-19 pandemic, colleges and universities implemented numerous changes and launched new measures to resume teaching and learning activities, which significantly challenged library reference services. Although institutions are gradually recovering from the disruptions caused by the pandemic, students' learning behaviors have changed considerably. Reference service departments in academic libraries have undergone transformations and are actively seeking new solutions to revive or evolve services to help students who were deeply affected by the lockdown and the new norms that followed.

In this research, surveys and interviews were conducted at New England Liberal Arts College Libraries to understand the changes and challenges faced by library reference services. Despite the significant impact, library reference services are reconnecting with students through various outlets and strategically embracing AI technology to better support teaching and learning in the post-COVID era.

Keywords: COVID-19, Pandemic, Reference Service, Research Consultation, Artificial Intelligence (AI), Outreach

INTRODUCTION

From campus lockdowns to reopening, colleges and universities have faced numerous challenges over the past few years. Academic libraries, without exception, have worked diligently to ensure that regular services remain available at all times.

As a crucial service department in academic libraries, reference services have undergone numerous changes to accommodate new teaching and learning models. However, many uncertainties and questions remain.

Given that the pandemic crisis impacted library services from Spring 2020 to Summer 2021, will it continue to affect students' learning behaviors, particularly in information seeking and library use, in the long term? What new programs can library reference services implement to make their services more valuable and resources more accessible to the new generation of students?

To address these questions, it is essential to understand the broader landscape of academic library reference services. This research gathered statistical data on reference services from 21 liberal arts college libraries located in the New England area. The data spans the period from FY (Fiscal Year) 2020 to FY2023. In addition to the data, interviews were conducted with 12 librarians who had participated in the survey. The purpose of the study was to examine the changes and challenges affecting library reference services during this time.

LITERATURE REVIEW

Academic libraries are integral to the core mission of colleges and universities across the nation (Soria et al., 2013), and serve as the physical manifestation of the core values and activities of academic life (Kuh & Gonyea, 2003). The COVID-19 pandemic disrupted higher education in unprecedented ways, yet academic libraries were well-positioned to facilitate the digital shift when the crisis struck (Cox, 2023). Their long-standing investment in digital infrastructure allowed for business continuity, which was highly valued by campus communities and institutional leadership (Cox, 2023).

I. The Impact of COVID-19 on Reference Services

The pandemic led to a notable transformation in academic library reference services. As Flierl (2019) notes, one of the most glaring changes from March 2020 onward is the increased use of extant and new technologies to serve users. Reference services quickly adapted by introducing measures to accommodate online teaching and learning. These included streaming video collections, online research help services, and virtual synchronous and asynchronous library instruction (Koos et al., 2021).

The expansion of virtual reference services also brought both challenges and opportunities. Challenges included confusion among users about where to seek help and an increased workload for librarians. On the other hand, there were opportunities to explore how virtual technologies could continue to make reference services accessible, even after physical spaces reopened (Bussell, 2022).

II. Post-Pandemic Challenges

As academic libraries emerge from the immediate crisis, they face new challenges. These include budget reductions, rising costs of electronic resources, and ensuring equitable implementation of hybrid working models (Cox, 2023). The experience of the COVID-19 pandemic has catalyzed significant changes, but it has also provided libraries with the opportunity to reposition themselves and highlight their value to stakeholders. Seizing this moment of opportunity will be essential for libraries to continue to thrive in the post-pandemic era (Cox, 2023).

III. The Threat of Irrelevance and Artificial Intelligence

Despite the opportunities presented by the pandemic, the role of academic libraries on college campuses has shifted in recent years. Libraries have lost much of the centrality they once had, particularly as they no longer control access to information in the same way they did during the

print-only era. Fears of irrelevance have been exacerbated by the growth of an industry focused on assessing library value through metrics and other quantifiable data (Terrile, 2024).

Changes in higher education have put pressure on academic libraries to innovate in order to maintain support from administrators and strengthen their position on campus in an increasingly competitive climate (Terrile, 2024). Most commonly, academic librarians are asked to leverage the resources and services they have to meet students where they are and adapt existing spaces to be more inclusive and welcoming (Terrile, 2024).

Furthermore, academic libraries are facing new challenges with the rise of AI (Artificial Intelligence) in the so-called Fourth Industrial Revolution (Lund, 2021). In particular, GenAI (Generative Artificial Intelligence) offers enhanced discovery and retrieval capabilities, which are influencing the ways students access and utilize library resources (Meakin, 2024). Although GenAI can offer personalized assistants to help students conduct extensive research, its algorithms are based on the data on which they were trained. This can create “filter bubbles” that present only information that aligns with students’ existing views, potentially leading to intellectual isolation (Meakin, 2024). GenAI may also influence students’ critical thinking by providing ready-made solutions (Meakin, 2024). Therefore, information literacy, taught by librarians, remains essential for helping students think critically and evaluate sources generated by AI-supported searches (Meakin, 2024).

IV. Evolving Reference Service Models

The future of reference services has been an ongoing discussion in the library field, with some institutions transitioning to a “one main service desk” model a decade ago (Schulte, 2011). However, Schulte (2011) cautions that eliminating traditional reference desk services requires careful analysis, planning, and ongoing training for frontline staff. In response to the challenges posed by the pandemic, some libraries shifted to having student workers cover reference desks, while others extended their online service models. For instance, Texas A&M International University Library successfully transitioned to a student-staffed research desk during the pandemic. Meanwhile, the University of Colorado’s Anschutz Medical Campus Library decided to keep using the online platform that had been implemented for reference services during the pandemic (Wilairat et al., 2021). These examples highlight how some pandemic-driven changes may have lasting effects on how reference services are structured and delivered in the future.

Overall, the COVID-19 pandemic accelerated many changes in academic libraries, particularly in reference services. These transformations are likely to have long-term effects. However, there is no comprehensive research that addresses all these topics across different college libraries. This study aims to fill a gap in the existing literature by collecting data from liberal arts college libraries in the New England region.

METHODOLOGY

This study used an explanatory sequential mixed method. Quantitative data was collected via survey, and qualitative data was gathered through follow-up in-depth interviews. The population for the research consisted of academic libraries at liberal arts colleges in the New England area of the United States. The list of colleges was obtained from the Carnegie Classification of Institutions

of Higher Education (Appendix A). The Institutional Review Board determined that this research project is exempt from Informed Consent requirements according to 45 CFR 46.101(b).

The sample survey recruitment email is added as Appendix B. The survey link was first sent to key personnel in the reference units of the 100 libraries included in the research sample in November 2023 and resent in January 2024. A total of 21 responses were received by the end of January 2024.

The survey tool “Class Climate” was used to collect and store the survey data. The survey asked the library reference unit heads to provide the following yearly statistical data of reference services from 2019 to 2023:

- The number of reference librarians on duty.
- The total number of all types of questions received by reference services (including directional questions and all others).
- The total number of reference (research-related) questions received.
- The number of reference (research) questions received at the physical service desk.
- The number of reference (research) questions received via online form/email.
- The number of research consultations conducted.

The survey participants were also asked if they would be interested in participating in follow-up interviews. A total of 12 survey respondents agreed to participate in the interviews.

The interview consisted of 12 questions designed to interpret the changes in the statistical data and uncover the stories behind it. The length of the interviews ranged from around 25 to 40 minutes. Here is the list of interview questions that were asked of the participants.

1. Ice-breaking question: Can you briefly introduce your library reference service? (Staff, hours, etc.)
2. What was the reference service model before the pandemic lock down in 2020?
3. How did the reference service run during the pandemic time from 2020 to 2021?
4. Were there any changes on the reference service model from 2021 to 2022 when people slowly went back to campus?
5. What is the reference service model right now from 2022 since everything backs normal? What is the biggest change compared to the pre-pandemic time if there is any?
6. Does your reference unit have staffing problems or any personnel changes from 2020 to current? If yes, does it affect the reference service model?
7. In your observation, what are the main changes in terms of the traffic at the physical and virtual reference services before and after the pandemic?
8. How do you think the pandemic measurements will be having a long-term effect on the reference service?
9. What are the challenges and problems the reference service is facing now?
10. Has your library changed the chat service hours since the pandemic?

- a. Follow up questions: If yes, how do you staff the service? If not, will you consider it in the future?
- 11. Do you have any plan for remodeling the reference service in the new future?
 - a. Follow up questions: If yes, can you tell me more about it?
 - b. If not, what will you do if you are financially allowed to make some changes to the current reference service models?
- 12. Is there anything else you would like to share that we didn't cover?

The interviews were recorded for narrative analysis. Key points were highlighted and compared with the respective quantitative data to identify underlying correlations or patterns. Excel was used to analyze the data.

KEY FINDINGS

To better interpret the survey data, the surveyed college libraries were divided into two groups in the data analysis section: 12 small colleges with an FTE (Full Time Equivalent Students) < 3000 (1 public and 11 private) and 9 medium/large colleges (4 public and 5 private) with an FTE > 3000 based on the Carnegie classification of higher education. Because some survey participants skipped certain section(s) of data, the number of college libraries may be less than 21 in some charts or data analysis.

I. The Impact on Reference Services in General

Reference services in academic libraries play a crucial role in supporting teaching and learning in colleges and universities. Because reference services inherently require human interaction and communication, the COVID-19 pandemic had a dramatic impact on these services and may have caused long-term effects on their delivery modality.

a. Reference Service Staff and Hours

The first challenge many reference services units are facing is a lack of staff. In FY2020, the number of library reference services staff across the 20 libraries that submitted data varied from 2 to 15.

Staffing issues were more pronounced at libraries in the medium/large colleges with an FTE>3000, according to the survey data. Among these colleges, 6 out of 9 libraries lost reference services staff, with an average staff loss of 33.89%.

In contrast, among the small colleges with an FTE<3000, only 4 out of 11 libraries lost reference services staff, and three of them lost one person. The fourth library lost 8 staff members. The average percentage of staff loss was 24.26%.

Figure 1 and **Figure 2** illustrate the changes in staff numbers at both FTE>3000 and FTE<3000 colleges between FY2020 and FY2023.

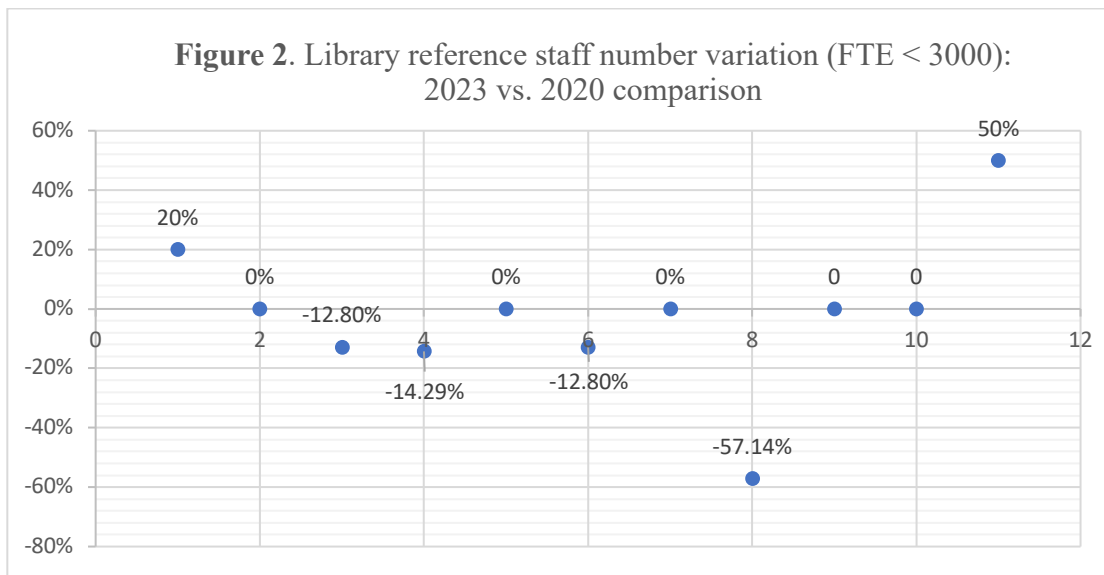
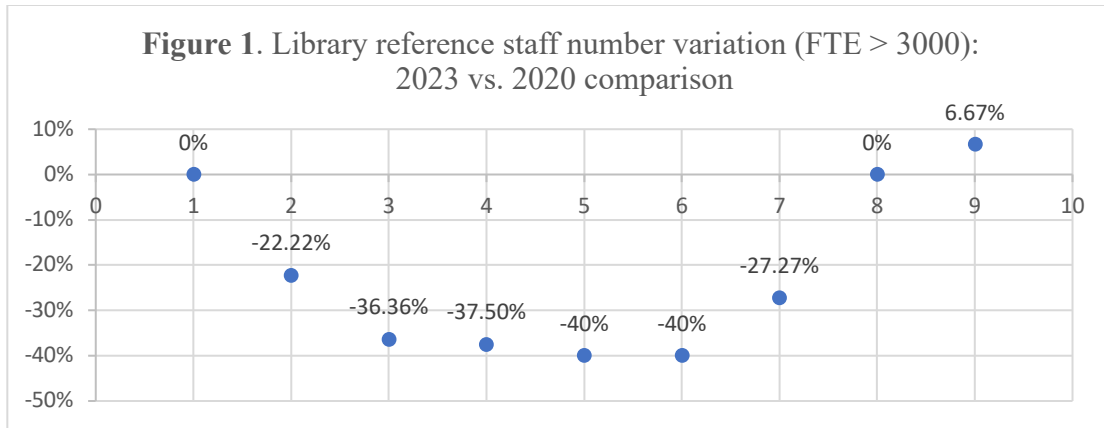
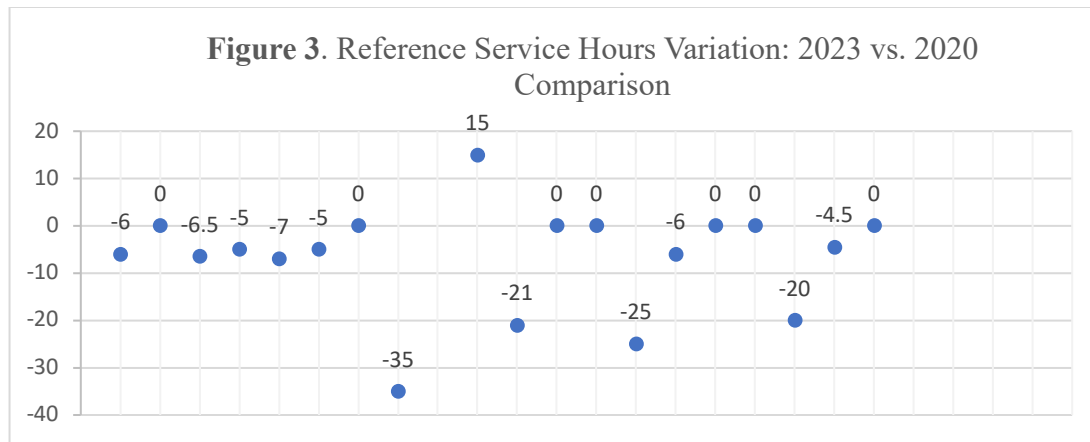


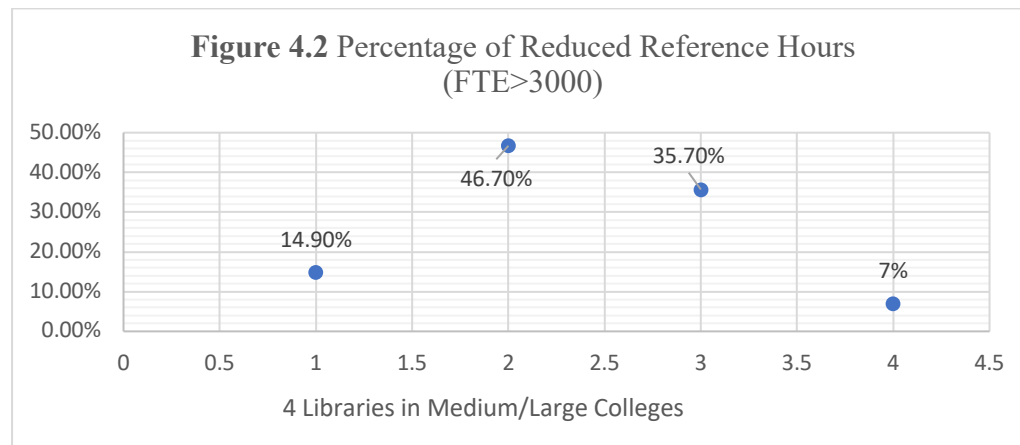
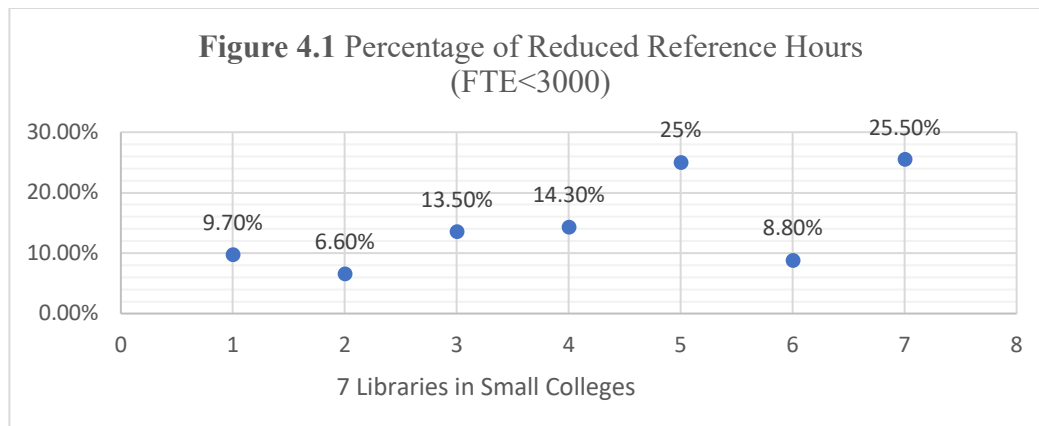
Figure 3 shows the changes to reference service hours between FY2020 and FY2023.

In terms of reference service hours, 19 libraries reported data for all four years in the survey. During the first year of the pandemic (FY2021), most libraries worked hard to maintain the same hours or even extended their hours, with only five libraries slightly reducing service hours. However, this trend did not last long. Over the next two years, more libraries reduced their service hours. By FY2023, 11 libraries (7 in small colleges and 4 in medium/large colleges) had reduced reference service hours compared to FY2020. The average reduced time was 9.6 hours. In addition, 7 libraries experienced no changes, and one library saw a 15-hour increase.



Compared to FY2020, the 7 small college libraries reduced a few hours, with an average reduction rate of 14.77% in FY2023. The 4 libraries in medium/large colleges reduced their hours by an average of 26.08%, with two of them reducing more than a third of their hours.

Figures 4.1 and 4.2 show the percentage of reduced reference hours for the 11 libraries in two groups.



According to the data from the interviews, the main reasons for reducing service hours were budget cuts and staff shortages. Seven out of the 12 interviewed librarians mentioned their

libraries had hiring freezes, and five of them relied on student workers to cover part or all of the reference desk hours. Two librarians noted that they lacked staff to perform their duties in a meaningful and effective way. Seven libraries hire student workers to assist with reference services and make librarians available on-call, allowing them to focus on research consultations, instruction, and other duties.

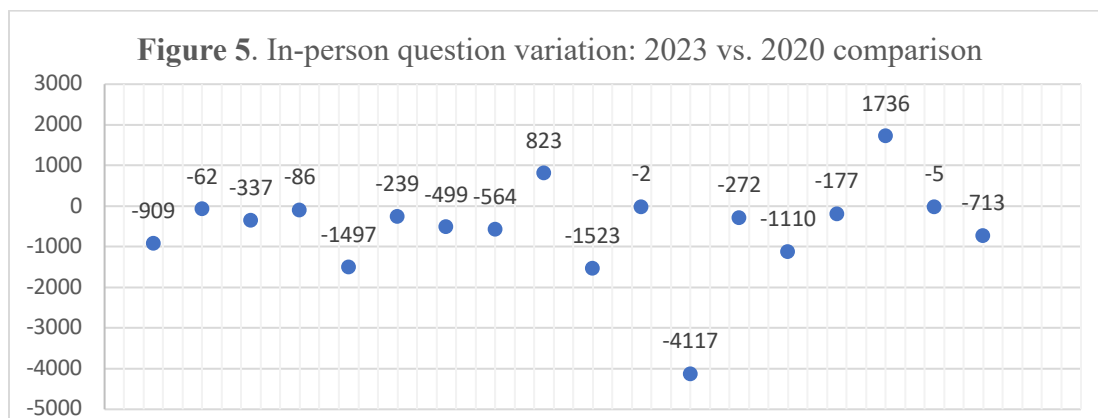
The impact of the COVID-19 pandemic on reference staff hiring and service hours varied across liberal arts college libraries, depending on budget conditions. Fewer small college libraries lost staff members after the pandemic, but most of them reduced reference service hours by a small percentage. In contrast, more medium/large college libraries lost staff members, but only a few of them significantly reduced reference service hours. Hiring student workers to cover reference desk hours has become a practical solution for some libraries.

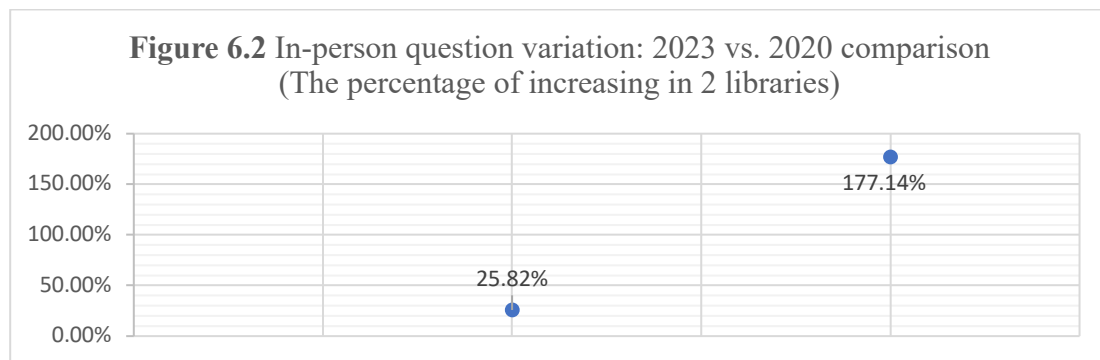
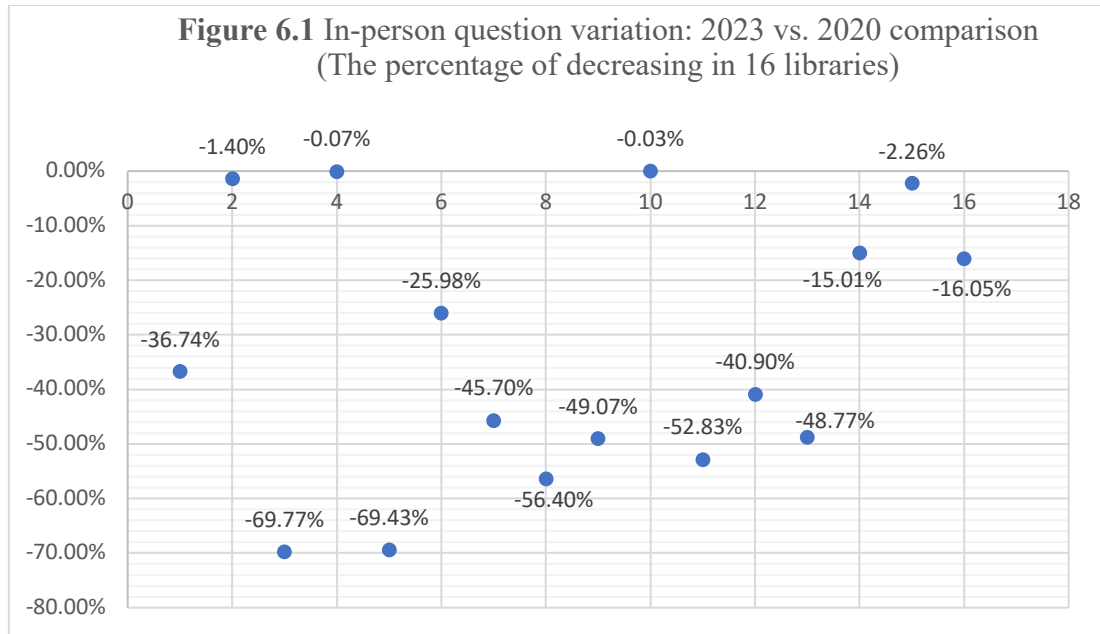
b. In-person and Chat Reference Service

The pandemic strongly affected in-person reference services, turning chat reference services into the primary service platform during the lockdown. This shift may have affected some students' information-seeking behaviors. Even after campuses reopened, these changes might have had lasting effects.

Survey data was collected from 18 libraries (9 w/h FTE>3000 and 9 w/h FTE<3000). These libraries reported four-year statistics for in-person reference service. Additionally, 14 libraries (8 w/h FTE>3000 and 6 w/h FTE<3000) reported four-year statistics for chat service. All the libraries experienced dramatic fluctuations in the number of questions from both the in-person and chat service.

Compared to FY2020, 16 libraries reported a decrease of in-person reference questions in FY2023, with half of them experiencing a decrease of more than 40%. However, two medium/large private college libraries saw a significant increase of in-person reference questions, and a slight decrease in chat usage. Figures 5, 6.1 and 6.2 illustrate the changes of in-person questions between FY2020 and FY2023.



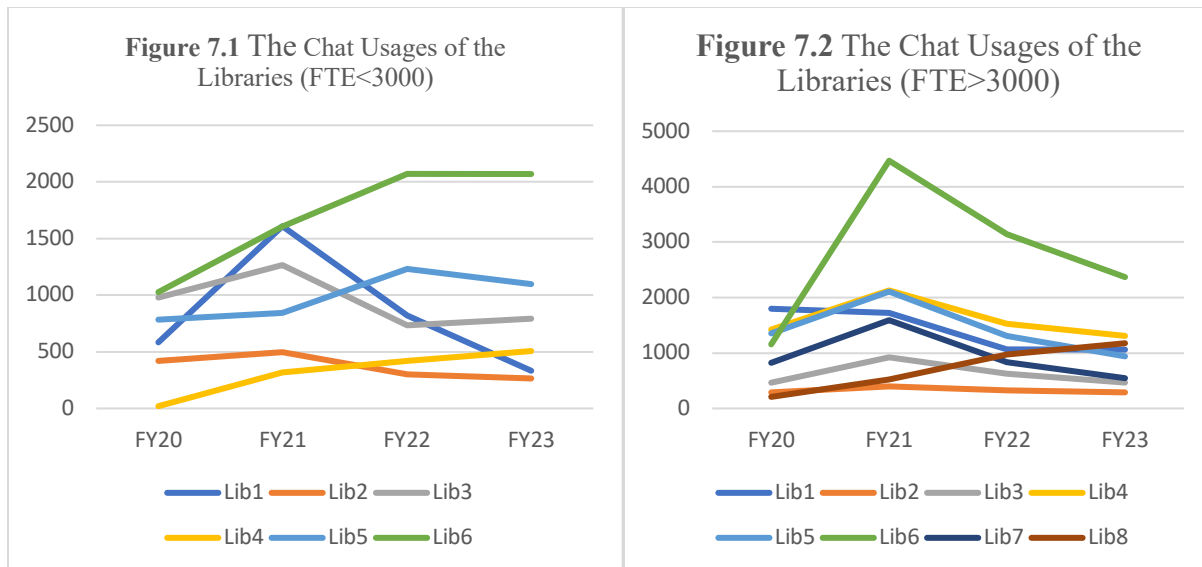


In the interviews, two librarians suggested that a lack of staff might be a reason for the decline in the in-person reference questions at their libraries. One said: “Because we cannot staff the desk, then they’re less likely to come to us.”

Another librarian mentioned that fewer professors required research projects during the pandemic. “It’s been a difficult time getting back into the habits of conducting research or assigning the research projects.”

One library has been keeping track of different types of questions received and found that research-related reference questions requiring a librarian’s input were very low. Some librarians felt that a barrier existed when students sought help, while others believed that students were more inclined to communicate virtually rather than in-person. Four librarians noted that it was a challenge to understand why there has been such a decline of in-person reference services.

On the other hand, chat usage is more diverse across campuses of different sizes. **Figures 7.1** and **7.2** show the shifts the chat usage from FY2020 to FY2023.



Among the small college libraries (FTE<3000), three showed a steady increase in chat usage. In contrast, three others saw a decline, with chat usage falling below pre-pandemic levels after a spike in FY2021 during the lockdown.

Among the libraries at the medium/large colleges (FTE>3000), 7 out of 8 had a significant increase in chat usage in FY2021. However, three libraries' chat usages reverted back to pre-pandemic levels in the past few years. Two libraries saw usage fall below pre-pandemic levels, although their in-person questions either increased or remained steady. One library's usage declined slightly but still stayed above the pre-pandemic level. Lastly, one library's usage continued to grow thereafter.

Overall, more medium/large college libraries experienced increased chat usage during the pandemic lockdown period than small college libraries. However, most libraries saw peak chat usage in FY2021, after which usage either returned to or fell below pre-pandemic levels, with only a few libraries able to maintain growth.

In summary, the pandemic had a lasting impact on in-person reference services in most libraries, and librarians are still working to understand the reasons behind these changes. Meanwhile, these libraries have recognized the importance of chat reference services and achieved positive results during this unique period.

c. Research Consultation

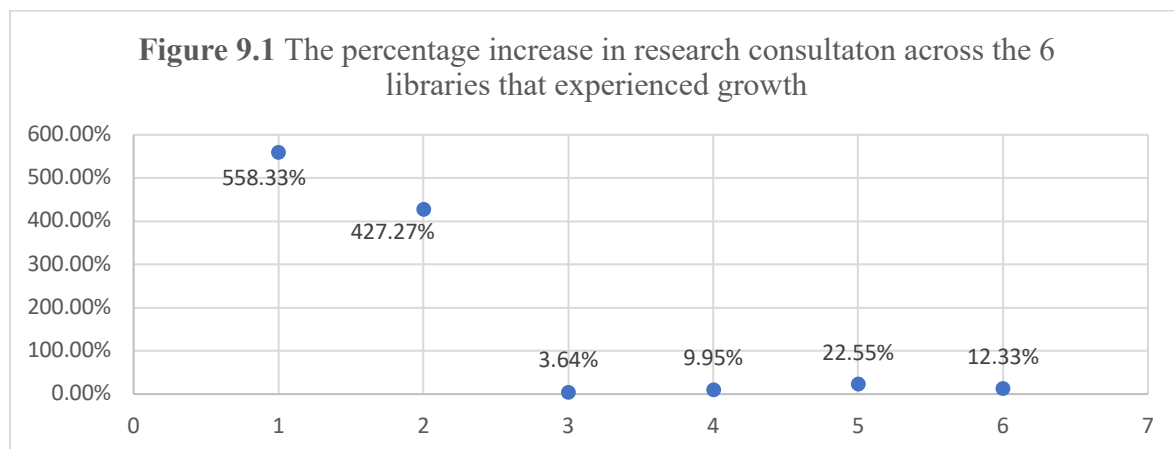
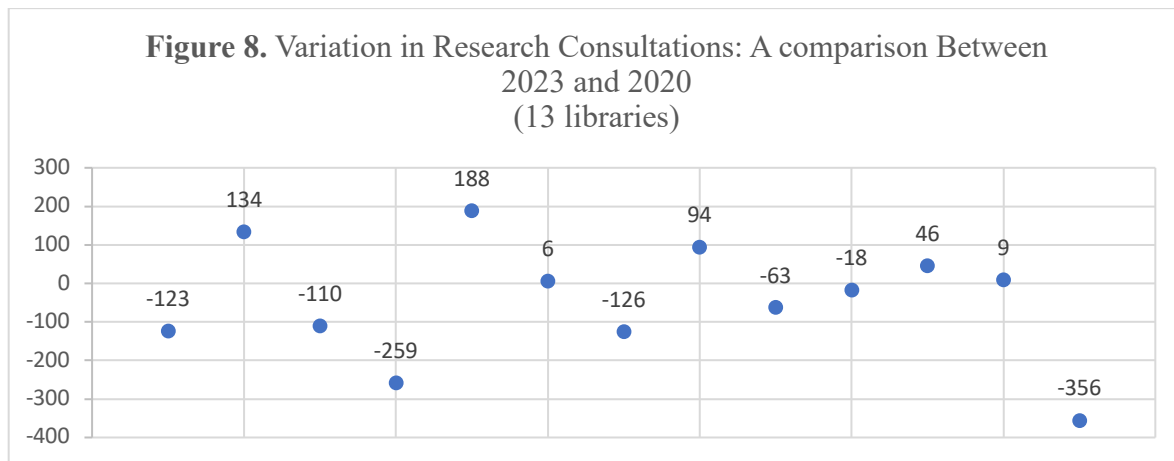
During the pandemic lockdown, virtual research consultations through Zoom became more popular. Among the 12 libraries where the interviewed librarians work, 10 provided data on four years of research consultation, while one library reported data for FY2022 and FY2023. All of these libraries use some kind of integrated appointment booking system, such as LibCal or Google Calendar, which helps reduce barriers and increase appointment booking.

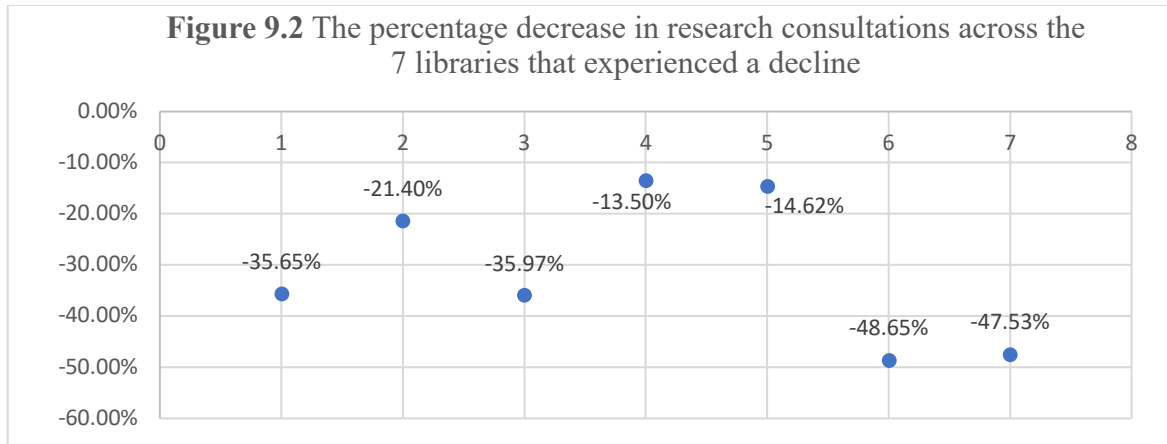
From FY2020 to FY2023, 5 libraries saw an increase in consultations, while the other 5 libraries experienced a slight decrease. One librarian noted that while the total number of consultations had dropped slightly, they had managed to increase their reach to distance education

students through Zoom. Three librarians mentioned that they were focusing more on the research appointment model rather than the traditional desk model.

Librarians shared that offering research consultations with both virtual/in-person options and team/individual options helped increase engagement with graduate students, online students, and faculty. Marketing the research consultation service during instruction sessions also contributed to a higher number of consultations. Collaborating with professors and making research consultations a required part of the assignment further boosted engagement. Thus, both the appointment booking system and marketing play crucial roles in promoting research consultation services during and after the pandemic.

The survey data tells a similar story. Thirteen libraries reported four years of research consultation data in the survey. About half the libraries (6) saw an increase, while the other half (7) saw a decrease. However, two of these libraries experienced an increase during the lockdown, followed by a decline after the campus reopened. **Figures 8, Figures 9.1** and **9.2** illustrate the changes in the number of research consultations between FY2020 and FY2023.





In terms of percentages, the libraries that experienced a decline in service had a relatively small and narrow range of decreasing rates, which range from 13.50% to 48.65%. In contrast, the libraries that saw an increase had a wide range of growth rates, from 3.64% to 558.33%. Two libraries reported increases of over 100%, with growth rates of 427.27% and 558.33%. Both libraries participated in the interview portion of the study and reported that the use of an appointment booking system and marketing efforts had a significant impact.

Overall, the use of Zoom and other virtual meeting tools during the pandemic made the research consultation service more popular and helped librarians reach more online and graduate students. Additionally, the implementation of the online booking system was another key factor in promoting the service.

II. Concerns About the Rise of AI Technology

Several librarians discussed the challenges posed by the rise of AI during the interviews. “We need to think about its impact on librarianship in general,” one spoke.

The primary concern expressed by interviewees was the potential for students to plagiarize by using AI tools for assignments. One librarian explained: “The challenge for us is to learn how to deal with AI as a new technology and how to integrate it into our work and how to talk to students about it.” Another librarian suggested: “More collaboration with professors could help design assignments differently, encouraging students to demonstrate and understand the research process better rather than simply cranking out a research paper.”

Another concern raised by librarians is the misinformation generated by AI. Some students believe that ChatGPT will provide them with everything they need, leading them to think they no longer need to ask for help. This, in turn, challenges the traditional reference service model. Understanding how to determine what is true and how to use prompts to obtain unbiased information will be the key in helping students use AI effectively, correctly, and ethically.

One librarian remarked: “Our opportunities are limitless if the faculty can work with us and if we can work with the faculty.” Collaboration will be more important than ever in turning the challenges of AI into opportunities to advance new teaching pedagogy.

III. Reconnecting With Students After the COVID-19 Pandemic

The COVID-19 pandemic disrupted school routines for over two years. Remote and hybrid instruction, along with the lack of social interaction, have affected many students' academic achievements, communication skills, and mental health. Most librarians in the interviews expressed concerns about changes in academic standards and the rising mental health issues among students. As a result, they have been working hard to reconnect with students and help them succeed in their college journeys. Below are some observations shared by librarians from the interviews.

First, some students have less patience and more stress than before. One librarian observed a student crying during a research consultation due to feeling unprepared and struggling to keep up with academic work. Second, some students seem to lack communication skills when interacting with professionals on campus. They have difficulty advocating for themselves or understanding how to engage with professionals outside of their professors, and they are more reluctant to make a face-to-face request for help. Third, some professors have cut the research components or assignments to accommodate the virtual or hybrid instruction model. One librarian noted, "It was hard to know how many professors were actually assigning research papers or projects." As a result, librarians found that many students did not understand the purpose of reference services or what they could ask for.

To reconnect with students, reference librarians shared their unique experiences as frontline workers. One librarian explained that they often check in with students' well-being at the reference desk and may help them connect with other campus resources by making mediated appointment requests. In some libraries, librarians used instruction sessions as a way to connect students back to reference services. They noticed that the number of reference questions increased in tandem with the number of instruction sessions. Four other librarians mentioned that promoting library research appointments during instruction sessions resulted in a higher number of research consultations. One librarian added that they placed cards with a QR code linking to the research consultation booking page in the classroom to encourage more appointments. Finally, a few librarians successfully connected with students through professors, who required students to book research consultations as part of their research projects.

On the other hand, the use of remote communication tools such as Zoom has helped librarians reconnect with and better serve distant education students post-pandemic, expanding the access platforms for library reference services. One librarian said: "I Zoom with those students all the time for research consultations because now we have the setup and everybody knows how to use it. It's completely changed how we can interact with students that aren't on campus. So that's been a nice perk of that change and flexibility."

In summary, the pandemic has brought both challenges and opportunities. Checking students' well-being, promoting reference services through instruction, collaborating with faculty, and providing virtual research consultations are all simple and effective ways to begin reconnecting with students.

IV. Rebranding and Remodeling

The challenges and opportunities presented by the pandemic have prompted many reference librarians to rethink and potentially rebrand or remodel their services.

“We can think a bit more holistically about the research services we are going to offer,” was said by one librarian.

Another librarian noted that the term “reference” feels outdated and suggested that libraries should use language that resonates more with students. In recent years, a few libraries have renamed “reference librarian” to titles such as “Research & Teaching Librarian” or “Teaching & Learning Librarian.” Some libraries have also rebranded the reference desk as the “research desk” or “research help desk.” While some libraries have already made these changes, others are still considering them.

In terms of remodeling, the most popular idea is merging the access service and reference service desk into a single service unit. According to the interview data, four libraries had already implemented a unified service desk, either before or after the pandemic. Three libraries are considering it. One library is contemplating removing the reference desk entirely to create additional study space for students, while another is considering a mobile information desk on wheels for pop-up reference service. Additionally, several libraries are opting to hire and train student workers to cover part or all of reference desk hours.

One size does not fit all. Merging the service desks requires ongoing training for desk staff, while a mobile service desk involves technical considerations regarding hardware. Regardless of the rebranding or remodeling decisions libraries make, each must balance its organizational needs with those of its customers when designing future services (Schulte, 2011).

V. Outreach

During the interviews, librarians discussed outreach extensively, which has long been a core focus for reference services. After the pandemic, many librarians have dedicated significant efforts to outreach in order to revive reference services.

One popular strategy is strengthening connections with other campus offices, such as student affairs, accessibility services, and the writing and tutoring center. One librarian shared their experience of hosting a library workshop in collaboration with writing center tutors to help students understand the critical connection between library research and writing. Another librarian also discussed their success working closely with student service offices and the writing and tutoring center. By positioning reference services within the context of students' lives, they were able to secure more research consultation appointments. One librarian received a compliment from a student: “It’s really specific to an individual or a small group’s studies, projects, or research papers; and it is very customized and tailored, less generic.”

Some librarians mentioned creating more asynchronous opportunities. They developed videos, self-guided tutorials, and online scavenger hunts, which they embedded into the course management system as an alternative way to provide asynchronous reference services. Additionally, the use of chat reference combined with Zoom has made remote reference services more convenient than ever before.

Other strategies shared by the librarians included promoting reference services at orientation events and instruction sessions. They also collaborated with campus groups such as first-generation student organizations and connected with faculty to inform them about the services available.

Overall, librarians are not only seeking more in-person outreach opportunities on campus, but are also developing new web tools to reach more users virtually.

VI. Limitation

This study has several limitations. Firstly, the scope of the research is limited to regional liberal arts colleges due to a lack of funding and support, which necessitated keeping the research on a small, feasible scale. Secondly, the sample size is relatively small because the response rate to the survey was low. The limited number of participants may reduce the generalizability of the findings and affect the statistical power of the analysis. Finally, interview participants may have biases, as those who chose to participate could differ systematically from those who did not. Therefore, caution should be exercised when interpreting the findings.

Despite the small sample size, this study provides valuable insights into the trends in college library reference services post-pandemic and offers an important preliminary understanding that can guide future research.

VII. Discussion

This research aims to identify the changes and challenges academic library reference services have experienced during and after the COVID-19 pandemic. It also seeks to examine how these changes have affected the accessibility of reference services. The two components of this research—the quantitative data from the survey and qualitative data from the interviews—complement each other in answering these questions. Whether private or public, small or large, commuter or residential, libraries serving different college communities face distinct challenges. However, some issues are common across institutions.

Undoubtedly, the first major issue is integration with AI. Librarians are often at the forefront of embracing new technologies and are working to redesign reference service duties and incorporate AI tools in the new era of information seeking. As colleges adapt to the AI era, library reference services have many opportunities to contribute to the design of new curricula and pedagogies, as well as to provide research support from a different perspective. With the challenges posed by the rise of AI, the author believes that library reference services will continue to evolve in response to these trends. It will be demonstrated that, despite advances in technology, the guidance of information professionals remains essential to ensure that technology serves its intended purpose of supporting learning and research.

The second issue is the need for creativity in service delivery. “How do we build a whole new culture of services using the tools we already have in innovative ways? How can we enhance chat services by incorporating features like Zoom? How can we increase the visibility of virtual resources, such as online tutorials, to make them more accessible?” These are some of the questions librarians are asking. There is much that can be done to maintain the vitality of library reference services in the future.

The third issue is the need to integrate libraries into the broader campus context. In the post-pandemic era, many libraries have realized the importance of collaborating with other service offices on campus. More libraries have begun hosting workshops and having librarians provide reference services in writing or tutoring centers. Some libraries are reaching out to new service groups, such as the First-Generation Students office, the Office of Multicultural Affairs, and

various student groups, for collaborative efforts. Others are working with faculty to design future assignments that minimize the impact of AI. In summary, we need to step outside the library building and create a library-focused network that promotes our services and supports education in an inspiring manner.

CONCLUSION AND FUTURE RESEARCH

The pandemic has posed a significant challenge to everyone. The corresponding measures seriously disrupted college routines and affected both the learning progress and mental health of college students. As an academic support service unit, most library reference departments faced challenges in delivering services. They experienced fluctuations in reference transactions across different platforms. However, they also made effective use of virtual tools to reach more patrons and continue supporting reference service models overall.

Given everything we have learned about student learning preferences and needs during the pandemic, it would be a missed opportunity to move forward without taking the time to reflect on how we can best serve our students (White, 2022).

Currently, librarians are eager to understand the decline in reference service requests, reassess the importance of the reference desk model, and rethink how students are approaching these service points. This could lead to potential rebranding or remodeling of reference services. However, these changes may not be sufficient given the rapid development of AI tools. It is time to think outside of the box. Just as it took years for us to adapt in the era of Google, it may take a similar amount of time to find the right ways to integrate with AI into supporting college education.

As libraries adapt to the post-pandemic world, it will be crucial to continue embracing innovation and technology while navigating ongoing challenges such as budget constraints and changing student behaviors. The future of reference services will continue to evolve as academic libraries balance traditional practices with the new demands of digital and hybrid environments.

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Appendix A

The List of 99 Candidate Institutions for the Study

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| 1. Albertus Magnus College | 51. Middlebury College |
| 2. American International College | 52. Mount Holyoke College |
| 3. Amherst College | 53. New England College |
| 4. Anna Maria College | 54. New England Institute of Technology |
| 5. Assumption University | 55. Nichols College |
| 6. Babson College | 56. Northern Vermont University |
| 7. Bates College | 57. Norwich University |
| 8. Bay Path University | 58. Plymouth State University |
| 9. Bentley University | 59. Post University |
| 10. Berklee College of Music | 60. Providence College |
| 11. Bowdoin College | 61. Quinnipiac University |
| 12. Brandeis University | 62. Regis College |
| 13. Bridgewater State University | 63. Rhode Island College |
| 14. Brown University | 64. Rhode Island School of Design |
| 15. Bryant University | 65. Rivier University |
| 16. Cambridge College | 66. Roger Williams University |
| 17. Castleton University | 67. Sacred Heart University |
| 18. Central Connecticut State University | 68. Saint Anselm College |
| 19. Champlain College | 69. Saint Joseph's College of Maine |
| 20. Clark University | 70. Saint Michael's College |
| 21. Colby College | 71. Salem State University |
| 22. College of Our Lady of the Elms | 72. Salve Regina University |
| 23. College of the Holy Cross | 73. Simmons University |
| 24. Connecticut College | 74. Smith College |
| 25. Curry College | 75. Southern Connecticut State University |
| 26. Dartmouth College | 76. Springfield College |
| 27. Dean College | 77. Stonehill College |
| 28. Eastern Connecticut State University | 78. Suffolk University |

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| 29. Emerson College | 79. Trinity College |
| 30. Emmanuel College | 80. Unity College |
| 31. Endicott College | 81. University of Bridgeport |
| 32. Fairfield University | 82. University of Hartford |
| 33. Fitchburg State University | 83. University of Maine |
| 34. Framingham State University | 84. University of Maine at Augusta |
| 35. Franklin Pierce University | 85. University of Maine at Farmington |
| 36. Goodwin University | 86. University of Massachusetts-Dartmouth |
| 37. Gordon College | 87. University of New England |
| 38. Granite State College | 88. University of New Haven |
| 39. Hult International Business School | 89. University of Saint Joseph |
| 40. Husson University | 90. University of Southern Maine |
| 41. Johnson & Wales University | 91. Wellesley College |
| 42. Keene State College | 92. Wentworth Institute of Technology |
| 43. Lasell University | 93. Wesleyan University |
| 44. Lesley University | 94. Western Connecticut State University |
| 45. Massachusetts College of Art and Design | 95. Western New England University |
| 46. Massachusetts College of Liberal Arts | 96. Westfield State University |
| 47. Massachusetts Maritime Academy | 97. Wheaton College |
| 48. MCPHS University | 98. Williams College |
| 49. Merrimack College | 99. Worcester Polytechnic Institute |
| 50. MGH Institute of Health Professions | 100. Worcester State University |

Appendix B

The Sample Survey Recruitment Email

Dear Head of Reference Services,

My name is XXX, a teaching & learning librarian from XXX University . I am conducting a research project sponsored by [Institute for Research Design in Librarianship](#). The IRB approved this research proposal as Exempt according to 45 CFR 46.101(b).

Because academic libraries' operations have been challenged by the new norms during and after the Covid pandemic time, **my project** is to get a clear picture of the challenges and opportunities

which the library reference services have as a result of the pandemic in order to better support the college teaching & learning in the post-covid era. To complete this research, I will need your help to provide some vital **statistical data of library reference/research services** through [the survey](#) by **Jan 15, 2024**.

Please help to take 10 to 15 minutes to complete [the survey](#). Your support will make a significant contribution to the library reference service community. I highly appreciate your time and support in advance.

Best regards,

XXX

About the Author

Shu Qian is a Teaching & Learning Librarian at Worcester State University in Massachusetts. She holds an MLIS from Florida State University. Her major responsibilities are managing research help services and providing information literacy instructions for the liaison departments.