



Library Services During COVID-19 Pandemic: The Perspective Of Puerto Rican Academic Librarians

Ana I. Medina-Hernández

Abstract:

This study aimed to review how an academic library in Puerto Rico supported the demands of technology-assisted education during the COVID-19 pandemic. This study identified the challenges of providing virtual library services during public health emergencies. Likewise, librarians described their experiences with virtual reference services. The study uses a case study as a research design. Data collection was through a virtual focus group. The results indicate that the main challenges were technology availability issues, fragile Internet infrastructure, a lack of digital skills for remote work, and vulnerabilities in leadership and institutional planning. Librarians identified weaknesses in the technological infrastructure and staff skills as challenges during emergencies. This research helps generate more knowledge about the impact of digital services from Puerto Rican academic libraries in support of technology-assisted education initiatives during the COVID-19 pandemic. Furthermore, understanding librarians' perspectives regarding challenges and needs during emergencies helps develop new service policies and strengthen procedures to improve working conditions for these professionals.

To cite this article:

Medina-Hernández, A. I. (2024). Library Services During COVID-19 Pandemic: The Perspective Of Puerto Rican Academic Librarians. *International Journal of Librarianship*, 9(1), 95-108. <https://doi.org/10.23974/ijol.2024.vol9.1.360>

To submit your article to this journal:

Go to <https://ojs.calajol.org/index.php/ijol/about/submissions>

Library Services During COVID-19 Pandemic: The Perspective Of Puerto Rican Academic Librarians

Ana I. Medina-Hernández, Universidad de Puerto Rico, Carolina Campus, Puerto Rico

ABSTRACT

This study aimed to review how an academic library in Puerto Rico supported the demands of technology-assisted education during the COVID-19 pandemic. This study identified the challenges of providing virtual library services during public health emergencies. Likewise, librarians described their experiences with virtual reference services. The study uses a case study as a research design. Data collection was through a virtual focus group. The results indicate that the main challenges were technology availability issues, fragile Internet infrastructure, a lack of digital skills for remote work, and vulnerabilities in leadership and institutional planning. Librarians identified weaknesses in the technological infrastructure and staff skills as challenges during emergencies. This research helps generate more knowledge about the impact of digital services from Puerto Rican academic libraries in support of technology-assisted education initiatives during the COVID-19 pandemic. Furthermore, understanding librarians' perspectives regarding challenges and needs during emergencies helps develop new service policies and strengthen procedures to improve working conditions for these professionals.

Keywords: Academic libraries, Virtual reference, COVID-19, Higher education, Library services

INTRODUCTION

The University of Puerto Rico in Carolina (UPRCA) was founded in 1974 as part of the University of Puerto Rico (UPR) System. Currently comprised of 11 units, this is the only public higher education system in Puerto Rico and offers 14 academic programs, including ten bachelor's degrees and four associate degrees. Degree offerings span eight schools and departments, representing hotel and restaurant administration, office administration technologies, design, criminal justice, natural sciences, business administration, education, and engineering technologies. As reported in the Self-study of 2021, the institution serves a population of approximately 2,373 students from the city of Carolina and other adjacent areas east of the island. Exceptional events have occurred in Puerto Rico during the last five years: Hurricane María (September 2017), earthquakes (December 2019 and January 2020), and the COVID-19 pandemic (University of Puerto Rico at Carolina, p.3). These events impacted physical and technological infrastructure, teaching activities, and library services.

In 2020, the World Health Organization (WHO) declared an international public health emergency due to the COVID-19 epidemic. In March of the same year, WHO established that the disease had already spread globally and characterized it as a pandemic. From that point onwards, WHO took measures to curb the spread of the disease owing to its high fatality rate. As there were no medicines for treatment or vaccines to immunize the population, lockdowns were considered a safety measure to protect citizens.

According to data from the World Bank (2020), the COVID-19 pandemic has posed a threat to global education through school and university closures and the economic crisis resulting from the response to this emergency. Academic and research activities in higher education institutions were significantly affected. The World Bank estimates that by April 2020, more than 220 million university students will be affected by the interruption and closure of their institutions.

This study aims to review how the Learning Resource Center (LRC) of the UPRCA supported the demands of technology-assisted education during the COVID-19 pandemic. Through this, we aimed to identify the challenges in providing library services during a public health emergency. LRC provides a virtual reference service through the *LibAnswers* platform. Students can access them through different web applications and social networks. This service proved highly popular and beneficial during the pandemic and seeks to describe the experiences of academic librarians with remote work and virtual reference services.

Furthermore, it assesses how certain elements, such as technology infrastructure and service platform design, impact academic librarians' perceptions of remote work. This study attempts to generate more knowledge about the impact of digital services provided by Puerto Rican academic libraries in support of technology-assisted educational initiatives during the COVID-19 pandemic. Likewise, the gathered information will legitimize the essential role of academic libraries in distance education.

LITERATURE REVIEW

Academic Libraries during the COVID-19 Emergency

The onset of the pandemic has significantly impacted the operation and provision of services in academic libraries. Like other workplaces, they had to close to comply with the social distancing measures required to prevent contagion. Library administrators and other employees could not plan to meet the pandemic's challenges (Deol & Brar, 2021). In crisis scenarios such as this, academic libraries naturally expand their efforts in quantity and quality to meet the service demands of the communities they serve. Consequently, many of these academic units were quick to consider using advanced technologies to ensure access to information (Hamad et al., 2022; Dube & Jacobs, 2023). Among the adjustments made during the pandemic for the continuity of operations in academic libraries, the literature details nine categories of services: 1) virtual information literacy and teaching support; 2) research support; 3) website reorganization; identification of open resources through collaborative efforts; and the development of video tutorials; 4) provision of information and literacy on public health safety topics; 5) virtual reference; 6) remote access to bibliographic resources and the development of thematic guides; 7) wellness and self-care activities; 8) interlibrary loans and resource lending; and 9) digitization of information resources (Ashiq et al., 2023; Ayeni et al., 2021). These efforts demonstrate libraries' commitment to their communities and validate their importance in supporting distance education and other activities related to research, learning, and teaching.

The continuity of services has brought significant challenges for libraries and librarians remotely. Ashiq et al. (2023) state that the main challenges identified in academic libraries include a lack of telecommuting culture and technology handling skills, workplace anxiety and stress, infodemic and changes in information-seeking behavior, and leadership and planning. Other challenges include the increased demand for access to digital resources and budget cuts to meet these needs (Chakraborty & Jana, 2021). Another significant challenge in developing countries is technological infrastructure, especially the availability of reliable technologies, access to broadband Internet, and a stable electrical power system (Tsekea & Chigwada, 2020; Chakraborty & Jana, 2021).

The literature reflects those librarians face various challenges, such as Internet access (Winata et al., 2021; Begum & Habiba, 2023), long working hours (Rafiq et al., 2021), and difficulties with the use and management of communication platforms and other technologies (Ayeni et al., 2021). Despite the vicissitudes of the pandemic, librarians have demonstrated resilience and commitment. According to Radford et al. (2021), many librarians were prepared for the transition to online work and served as change agents within their organizations by offering services to help users adapt to the new reality of online learning. Savaré (2023) recognizes that librarians develop an emotional involvement and engagement with patrons and among librarians. Therefore, there is no doubt that librarians demonstrate their social responsibility to ensure access to information for users in times of crisis.

Virtual Reference in Pandemic Times

At the beginning of the lockdown, universities started offering online courses, and libraries joined to support this effort through digital collections and virtual reference services. Virtual reference is not a new service in academic libraries, and it began to gain popularity in the early 2000s (Radford, 2020). Despite advances in the design and integration of communication tools, such as social media and co-browsing, virtual reference services are unknown or underutilized (Stormont, 2007; Radford et al., 2021). Reasons for the limited popularity of the service include its lack of simplicity and convenience for users (Stormont, 2007). In other words, the users of this service seek quick assistance and a user-friendly platform.

The pandemic, particularly the lockdown, changed virtual reference services favorably. At that time, all user attention shifted to this service because it was the only available means of interaction. Many libraries have begun to experience increased use of virtual reference services in their various communication modalities. Several studies on digital services during the COVID-19 pandemic in academic libraries have indicated that the most common method for providing reference services is email (Charbonneau & Vardell, 2022; Metha & Wang, 2020; Guo et al., 2020). Other studies have shown that chat communication has experienced significant growth compared to email and other available means (Abubakar et al., 2020; De Groote & Scoulas, 2021; Garvey, 2022). Other highly relevant communication methods include phone inquiries, social media, and instant messaging (Ishtiaq et al., 2020; Rafiq et al., 2021; Guo et al., 2020).

During the pandemic, research related to challenges and opportunities in academic libraries during emergencies surfaced. Regardless of geographic location, common themes can be observed, such as technological challenges, budget limitations, lack of digital skills among library staff, and issues related to planning. Likewise, studies reveal strategies devised by academic libraries in response to a sudden pandemic. There has been an increasing integration of tools, such as social media to streamline communication, video conferencing applications to train students and

employees, and the integration of open-access bibliographic resources to support teaching and research needs.

RESEARCH METHODOLOGY

The following study uses the case study as a research design. Data collection was through a virtual focus group. In addition, it used data from an online questionnaire submitted by the library administration. The virtual focus group used a guide of 11 questions to inquire about 1) preparedness for facing the challenges of remote work, 2) the attributes of the virtual reference platform, 3) the support tools available for using the platform, and 4) interaction with colleagues in terms of support and solidarity. The online questionnaire delivered to librarians consisted of 13 questions, of which three were for collecting demographic data, and 10 were for 1) assessing satisfaction with the virtual reference platform, 2) investigating which mode of communication is preferred, and 3) describing their experiences in providing completely remote services.

The library staff comprises six professors with an American Library Association (ALA) accredited degree in Library and Information Science and three assistant librarians with over ten years of experience. Librarians participating in the study were prominent in virtual reference services during the pandemic. Of the respondents, 67% were faculty librarians, and 33% were assistant librarians. Most respondents were between the ages of 31 and 60, and gender representation was 67% female and 33% male.

FINDINGS

The arrival of the pandemic brought about abrupt changes in all academic institutions, both public and private. Due to the need to reduce the risk of coronavirus transmission, various components of work life, such as task organization and distribution, service structure, and peer relationships, have changed dramatically. Academic libraries were no exception, as they had to deal with many barriers and challenges for which they were unprepared. Part of the data for this analysis comes from a questionnaire administered to all staff by the library during the lockdown. The questionnaire data were cross-referenced with the participants' responses in the focus provided.

Library Preparedness for Pandemic Challenges

One of the objectives of this study was to assess how prepared libraries faced the challenges brought about by the COVID-19 pandemic. The researcher asked participants about their opinions on this matter. For most of them, the library was unprepared for an event like the pandemic (Table 1). They based their arguments on the unprecedented nature of the confinement situation, for which no contingency plans were foreseen, unlike other events, such as hurricanes or tropical storms, which allow for prior preparations and modifications to service offerings and work organization due to existing emergency plans or policies. As one participant expressed, there was a need to improvise "on the fly" to adjust the work processes. However, other librarians believed that the library was prepared to face the challenges of the pandemic because it had the necessary technologies to continue services. Examples include electronic reservations, where some teaching materials were digitized; the website's databases for accessing other digital information sources; and virtual reference services, where library participants could communicate with the library if they required assistance.

Table 1. Library Preparedness for Pandemic Challenges

Participant	Responses
1	"...from that point of view, no, but we did have the technology to respond".
2	"...the library at that time, just like I understand that any other library, was not prepared to provide services as they have always been offered on campus".
5	"...the library was unprepared for that because it happened suddenly, and we had to improvise on the fly".

Likewise, to delve further into the topic, librarians were asked whether they felt prepared to deal with the challenges brought about by the pandemic. In some responses, librarians categorically expressed not feeling prepared to work with the emerging scenario at that time (Table 2). Anxiety emerged as a familiar feeling among workers, as one participant expressed that anxiety manifested due to the abrupt shift from in-person to virtual work. According to the participants, anxiety developed for various reasons, such as the lack of access to the library's printed bibliographic resources, the unavailability of technology in their homes, and the lack of knowledge in handling digital tools for providing services remotely. The librarians acknowledged that they did not feel prepared to adapt to the process despite the library having several tools to continue services. In other words, the tools were insufficient for the magnitude of the event they experienced. Librarians expressed a sense of helplessness and inability to cope with the transition from in-person to virtual.

Table 2. Librarians' Perception of Their Preparedness for Remote Work

Participant	Responses
1	"...from the standpoint of my experience, yes, I was prepared."
2	"...I didn't feel prepared to work, despite having worked here for many years... not having the physical resources... that created anxiety for me."
4	"The library was prepared, but there was a certain anxiety among the employees... since everything happened quite abruptly, the shift from in-person to virtual... initially, there was a lot of anxiety and fear regarding the use of technology."
5	"No, I wasn't prepared because at one point... the library wasn't prepared for that."

Measures Taken by the Library for Continuity of Operations

Another element evaluated during this study was the measures taken by the library to ensure continuity of services during the lockdown. From the information provided by the participants, three categories of measures that contributed to continuity emerged: the distribution of work, integration of technology to organize work, and peer mentoring (Table 3). When users requested textbook access, the librarians mentioned the assignment of books from the reserve collection for

digitizing content. This measure worked to share the workload among employees more equitably. Similarly, they established a shift system for the "Ask Your Librarian" service to cover extended hours, including evenings and Saturdays, attempting to emulate the in-person service hours offered by the library. The shift system distributed the workload among librarians, making it possible to address the needs of document digitization, participation in meetings, and other teaching and administrative tasks. The second measure identified among librarians was integrating the technology used to organize work. In this particular case, the incorporation of tools, such as mobile apps for scanning (*Camscanner*), web applications for working with PDF documents (*IlovePDF*), and platforms for storing and sharing files (*Google Drive*) stood out. The knowledge and use of these tools facilitated document digitization tasks and the organization and distribution of materials among staff.

Table 3. Measures to ensure the continuity of library work

Distribution of work	Technology integration for work organization	Peer mentoring
Assignment of reserve books among librarians.	Mobile apps to digitize documents.	Webinars
Shift system for virtual reference service.	Web applications for document edition.	Telephone support
	Cloud services for document sharing and management.	Individual counseling

Similarly, such tools allow faster user support through a virtual reference service. The last measure taken by the library was peer mentoring, which arose spontaneously as a supportive resource for colleagues to present alternatives to facilitate service tasks. The main strategies were training in learning new working tools and individual counseling. These strategies proved to be a positive initiative of support during the more challenging stages of the lockdown when anxiety and tension emerged because of fully remote work. This support extended beyond the library, as some librarians assisted other institutional employees and faculty members with limited technological skills.

The testimonies of librarians provide exciting information about the actions that took place within the internal part of the services. The measures mentioned by the staff highlight their commitment to ensuring that library services are available with minimal interruptions. Additionally, there is an initiative to collaborate and organize work to facilitate tasks and streamline services. However, peer mentoring stood out among these measures, demonstrating solidarity among colleagues.

The experiences of librarians providing services during the pandemic

Challenges

Librarians identified three main categories of challenges: 1) technology access, 2) technological skills, and 3) personal challenges. Technology access challenges encompass all issues related to the lack of equipment and necessary communication infrastructure for remote work. Technological skill challenges gather problems associated with a need for more competence in managing resources, applications, and platforms available for the continuity of tasks. Personal challenges group individuals or specific situations that impact job performance (Table 4).

Table 4. Challenges identified by library staff

Technology and infrastructure	Technology skills	Personal
Lack of computer equipment	Lack of knowledge in using the virtual reference platform.	household chores and family health care
Internet connection	Difficulties using mobile devices to digitize.	
Electricity service interruptions		

Like other work scenarios in the academic field, librarians experience a series of complications during the transition from in-person to remote work. From the comments provided, the most notable challenge was the lack of equipment for remote work. Several staff members resorted to requesting institutional equipment to fulfill their duties. Meanwhile, other librarians had to use their devices to provide virtual reference services and digitize materials. The lack of technology was the second most challenging factor for the library staff. For certain staff members, unfamiliarity with the platform and the lack of support materials available for its use made it difficult to integrate into work during the initial stage of the lockdown. However, other librarians experienced an additional workload because they had to support colleagues and institutional employees who needed to gain the skills to handle technology. Several participants said it was common for colleagues to train each other to learn specific tools and master the necessary skills for remote work. From this perspective, librarians play a prominent role as advisors and mentors to other peers, becoming valuable resources for their respective academic institutions. Among the personal challenges observed was the complex scenario for some employees, who had to combine remote work with other domestic and family challenges.

Facilitating conditions in remote work scenario

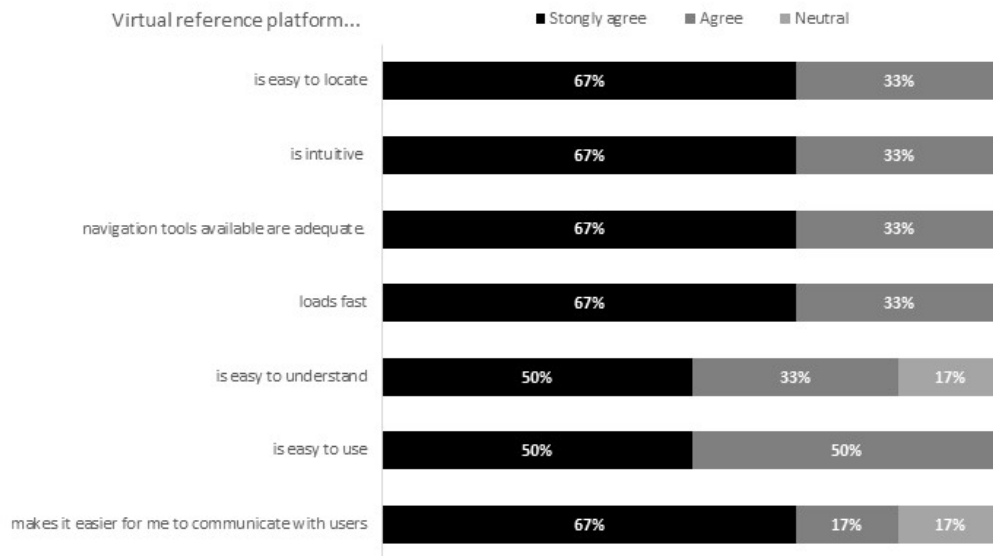
When the staff addressed the challenges of remote work, problems with access to equipment and skills in handling technology emerged as the main issues. Closely related to this situation is the facilitating conditions of work, which refers to the set of resources available to facilitate tasks in the work area, such as virtual reference platforms, reference materials, and human support resources. The researcher questioned the library staff about the availability of tools and their relationships with their peers in the support network.

First, librarians evaluated the virtual reference platform regarding accessibility and design, considering criteria such as localization, intuitiveness, navigation, and speed. Most staff fully agreed or agreed that the service platform was easy to locate, intuitive to start working with, had appropriate navigation options, and operated quickly (Figure 1). The second element assessed was the platform's functionality, considering criteria such as ease of understanding, use, and

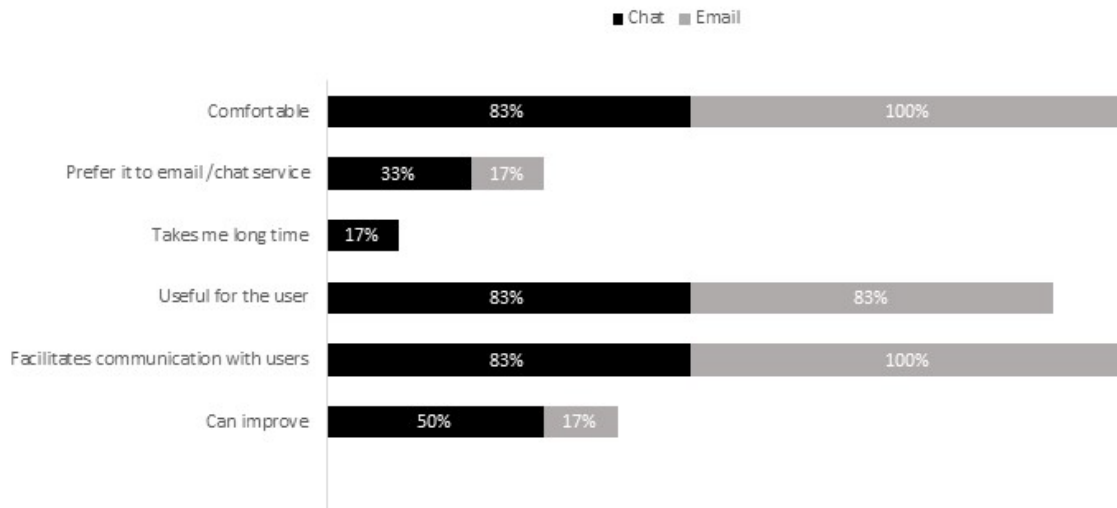
communication utility. Fifty percent of the librarians fully agreed that the platform met their expectations for all criteria for ease of use. Meanwhile, 33% indicated agreement that the platform was easy to understand and practical for communication, contrasting with 17% who remained neutral on these criteria. Finally, 50% of respondents agreed that the platform was easy to use.

Figure 1

Evaluation of virtual reference platform in terms of accessibility, design and ease of use



On the other hand, librarians could assess and compare chat and email consultation modalities based on the following criteria: complexity, convenience, preference, and utility (Figure 2). All library staff members agreed that the virtual reference service in both modalities—email and chat—was neither complicated nor uncomfortable. Regarding convenience, all participants considered the email service (100%) more convenient than the chat service (83%). However, 17% of librarians indicated that chat services required considerable consultation time. Regarding preference, 33% of the participants preferred chat and 17% preferred email. Other evaluated factors included the platform's utility as a user communication tool. 83% of the librarians believe that the platform in both service modalities is helpful for the user, while 100% expressed that email is a good communication tool compared to 83% for chat.

Figure 2*Evaluation of communication modalities available in the virtual reference platform*

According to the opinion of the library staff, the virtual reference service platform is an intuitive tool with an understandable design for the operator. Overall, librarians positively evaluated the platform as a work tool; some emphasized that their experience with it was rewarding and a great alternative to address the COVID-19 emergency. Regarding other necessary resources for work, librarians expressed that at the beginning of the lockdown, they needed the support tools to fulfill their duties (see Table 4). They emphasized that they depended on their equipment to work on tasks, such as addressing queries through the platform and digitizing content. In the early months of the pandemic, institutions needed portable equipment to provide to students and employees who did not have equipment at home. However, the situation improved one year after the pandemic began when the institution purchased laptops and mobile data devices (hotspots) for Internet connectivity and made them available to all academic community members. Another aspect of this category was access to supporting materials, such as guides and tutorials on using the platform.

The last aspect considered in this section was peer support networks; librarians expressed communication and solidarity among colleagues (Table 5). Library staff provide support through phone calls and messaging applications to provide guidance and face challenges while using the platform. In the focus group, librarians emphasized that the organization of work shifts and the distribution of books in digitization were practical measures to promote teamwork and communication among colleagues. As expressed in the previous section, peer training is another measure of supportive solidarity among library staff. This spirit of solidarity extended to students and other academic community members, as some librarians pointed out that they often addressed inquiries unrelated to library services but aimed at resolving needs from other institutional offices.

Table 5. Peer support networks

Participant	Responses
1	"Well, honestly, it was excellent." "...through phones, through WhatsApp, through other Facebook platforms, we communicated, and so, we could, you know, respond to different challenges that were coming..."
2	"...for me, it was successful and gratifying, and I add that I even became a counselor simultaneously. We provided mutual support, and as we have always characterized ourselves in times of difficulties, I can say that we were a great team, like a big family."
3	"...we are supportive and can set aside our differences and focus on supporting each other... we all depend on each other to share the workload..."

Impact of remote service during the pandemic on librarian professional development

The virtual reference service was not a recent innovation introduced by the pandemic. Despite being available in the library for many years, not all staff members worked with it. Virtual references have become a work alternative for some staff members to engage in remote work. As expressed by some librarians, interacting with the platform at the beginning of the pandemic was somewhat challenging because they were unfamiliar with its operation. However, their skills improved as time passed, changing their perceptions of the platform and remote work. The experience of providing virtual reference during the COVID emergency period was a milestone in the professional careers of the library staff. Most librarians (see Figure 3) agreed that the experience of working with virtual reference services was enriching and contributed to professional growth. They also expressed that they faced minimal difficulties and could adapt to providing remote services.

However, in the focus group (Table 6), other exciting ideas emerged about the different perspectives of the staff regarding the experience of virtual reference services and their impact at a professional level. According to the testimony of the participating librarians, remote work motivated them to explore and become more familiar with the library's databases and be aware of other information resources that support users' information needs. Others indicated that the situation prompted them to further train themselves in managing the virtual reference platform to support student services. Finally, some highlighted that the virtual reference service and positive user feedback allowed them to become more diligent in the service process.

Table 6. Impact of remote work on professional development

Participant	Responses
1	"...the fact that we were entirely virtual forced us to pay more attention to the news, to be more informed on the different electronic resources available, to see the latest arrivals and try to serve the student with the most recent information. It made us much more aware about databases than we were before..."
4	"I think virtual reference services made us more agile because now we can attend to one, two, and even more chats simultaneously. However, sometimes, in-person service does not have to be torn between the two. It has made us learn the databases better."

In summary, from the perspective of library staff, the virtual reference platform met expectations in terms of accessibility, design, and ease of use. The staff agreed that the platform's tools allowed them to provide good user services and facilitate their daily work. Chat was the staff's favorite among the communication modalities offered by the platform because of its immediacy. Most respondents expressed that peer support networks were crucial in adapting from in-person to remote work. This emergency event prompted librarians to explore other aspects of the service that they had not considered in the ordinary in-person services. Remote work motivated some staff members better to understand the digital sources available in the collection and explore other open-access resources that are useful for addressing the needs of the academic community. For these reasons, the staff stated that the experience of providing virtual references during the COVID-19 emergency was an enriching opportunity for their professional development.

DISCUSSION

The results of this study present librarians' perceptions regarding the challenges and opportunities of providing remote services during the COVID-19 emergency. The main challenges identified were related to issues of technology availability, vulnerable Internet infrastructure, and fragile electrical systems. These challenges align with the findings of other studies conducted in developing countries, where the lack of technological infrastructure and instability in communication networks have affected the provision of remote services to users (Tsekea & Chigwada, 2020; Chakraborty & Jana, 2021).

As part of the objectives, this study surveyed the librarians' perceptions of the library's preparedness to face the challenges brought about by the pandemic. The librarians' perspective was different, as the majority maintained that the library was unprepared due to the suddenness of the events. The librarians' perceptions align with others found in the literature, stating that libraries do not have time to identify the necessary means to address the complications of working remotely (Radford et al., 2021; Rafiq et al., 2021) or face problems related to planning and leadership (Ashiq et al., 2023).

Due to the novelty of the emergency event, the study aimed to delve into librarians' feelings about their perception of remote work. First, librarians acknowledged that they needed to prepare for remote work. Second, three main categories of challenges related to remote work were identified: 1) technology access, 2) technological skills, and 3) personal challenges. Some librarians expressed that the telecommuting situation triggered anxiety regarding using specific technologies and the lack of bibliographic resources to meet the service demands of the academic community. Similarly, there was an overload of work for library staff, particularly with activities related to digitization and providing technical support to other colleagues and faculty members. Other staff members reported family emergencies that complicated the balance between work and family. These results align with other recent studies identifying that academic library staff experience anxiety and frustration, affecting their ability to perform efficiently and productively (Metha & Wang, 2020; Begun & Habiba, 2023).

Regarding their experience providing virtual reference services, librarians said they were positive. The staff believes that the platform is an accessible tool that is easy to use and has a user-friendly design. In general, librarians understand that the platform is handy to users in its two service modalities. Concerning facilitating work conditions, librarians stated that at the beginning of the lockdown, they had to rely on their equipment to fulfill their work responsibilities. However,

peer support networks proved to be a positive element in librarians' work experience, demonstrating solidarity among colleagues during difficult times. Regarding the impact of remote work on professional development, librarians expressed that their experience motivated them to explore digital collections more thoroughly to support users' information needs. Others indicated that the situation prompted them to further training in managing the virtual reference platform. This confirms that despite their challenges, librarians are resilient and creative professionals (Radford et al., 2021).

CONCLUSION

This study highlights the challenges brought about by the COVID-19 pandemic in educational institutions. The findings revealed vulnerabilities in leadership and institutional planning at the onset of an emergency. Understanding the perspectives of librarians regarding their challenges and needs during emergency events is valuable for developing new service policies and strengthening procedures to enhance the working conditions of these professionals. This study provides relevant data for the future development of virtual library services that support distance education and other technology-assisted education modalities. Similarly, it underscores the importance of developing new strategies to create digital collections, content digitization, and digital content curation to enhance access to materials and meet the information needs of students and educators. The situation arising from the pandemic highlights the need to continue the professional development of librarians to enhance their technological skills. The challenges identified in this study and the literature emphasize the importance of improving the budgetary conditions of libraries to invest in better technological infrastructure and digital information sources.

References

- Abubakar, M. K. (2021). Implementation and use of virtual reference services in academic libraries during and post COVID-19 pandemic: A necessity for developing countries. *Library Philosophy and Practice*, 1–18.
- Ashiq, M., Jabeen, F., & Mahmood, K. (2022). Transformation of libraries during Covid-19 pandemic: A systematic review. *The Journal of Academic Librarianship*, 48(4), 102534. <https://doi.org/10.1016/j.acalib.2022.102534>
- Ayeni, P. O., Agbaje, B. O., & Tippler, M. (2021). A systematic review of library services provision in response to COVID-19 pandemic. *Evidence-Based Library and Information Practice*, 16(3), 67–104. <https://doi.org/10.18438/eblip29902>
- Balbin, D. J. S., & Lascano, E. A. (2023). Pandemic narratives of library and information centers in Baguio-Benguet. *Digital Library Perspectives*, 39(4), 571–603. <https://doi.org/10.1108/DLP-01-2023-0004>
- Begum, S. M., & Habiba, U. (2023). Are library professionals overcoming the COVID-19 pandemic challenges in the current reality? *Digital Library Perspectives*, 39(4), 420–443. <https://doi.org/10.1108/DLP-01-2023-0009>
- Chakraborty, S., & Jana, S. (2021). Challenges and opportunities of academic libraries in India because of COVID-19. *Annals of Library & Information Studies*, 68(2), 110–118.

- Charbonneau, D. H., & Vardell, E. (2022). The impact of COVID-19 on reference services: A national survey of academic health sciences librarians. *Journal of the Medical Library Association*, 110(1), 56–62. <https://doi.org/10.5195/jmla.2022.1322>
- De Groot, S., & Scoulas, J. M. (2021). Impact of COVID-19 on the use of the academic library. *Reference Services Review*, 49(3/4), 281–301. <https://doi.org/10.1108/RSR-07-2021-0043>
- Deol, N., & Brar, K. S. (2021). The pandemic of COVID 19 and role of academic libraries. *Library Philosophy and Practice (e-journal)*, 5099. <https://digitalcommons.unl.edu/libphilprac/5099>
- Dube, T. V., & Jacobs, L. (2022). Academic library services extension during the COVID-19 pandemic: Considerations in higher education institutions in the Gauteng Province, South Africa. *Library Management*, 44(1/2), 17–39. <https://doi.org/10.1108/LM-04-2022-0039>
- Garvey, M. (2021). Virtual reference amid COVID-19 campus closure: A case study and assessment. *Reference Services Review*, 49(2), 132–150. <https://doi.org/10.1108/RSR-01-2021-0005>
- Guo, Y., Yang, Z., Yang, Z., Liu, Y. Q., Bielefield, A., & Tharp, G. (2020). The provision of patron services in chinese academic libraries responding to the COVID-19 pandemic. *Library Hi Tech*, 39(2), 533–548. <https://doi.org/10.1108/LHT-04-2020-0098>
- Hamad, F., Al-Fadel, M., & Fakhouri, H. (2022). The role of academic libraries and information specialists during times of health crises in Jordan: The COVID-19 pandemic case. *Digital Library Perspectives*, 38(4), 476–492. <https://doi.org/10.1108/DLP-02-2021-0009>
- Mehta, D., & Wang, X. (2020). COVID-19 and digital library services – a case study of a university library. *Digital Library Perspectives*, 36(4), 351–363. <https://doi.org/10.1108/DLP-05-2020-0030>
- Pandemia de COVID-19: Impacto en la educación y respuestas en materia de políticas.* (May 7, 2020.). World Bank. Retrieved July 15, 2023, from <https://www.bancomundial.org/es/topic/education/publication/the-covid19-pandemic-shocks-to-education-and-policy-responses>
- Radford, M., Costello, L., & Montague, K. (2020). Chat reference in the time of COVID-19: transforming essential user services. *Information Services*. <https://hdl.handle.net/2142/108820>
- Radford, M. L., Costello, L., & Montague, K. (2021). Surging virtual reference services: COVID-19 a game changer. *College & Research Libraries News*. <https://doi.org/10.5860/crln.82.3.106>
- Savarè, C. (2023). How the digital library of the Università degli Studi di Milano faced the COVID-19 crisis: A case study. *Digital Library Perspectives*, 39(4), 444–453. <https://doi.org/10.1108/DLP-12-2022-0104>
- Self-Study Report.* (2021). University of Puerto Rico at Carolina. <http://www.uprc.edu/wp-content/uploads/sites/20/2022/06/Self-Study-Report-2021-and-appendixes.pdf>
- Stormont, S. (2007). Looking to connect: Technical challenges that impede the growth of virtual reference. *Reference & User Services Quarterly*, 47(2), 114–119.
- Tseke, S., & Chigwada, J. P. (2020). COVID-19: Strategies for positioning the university library in support of e-learning. *Digital Library Perspectives*, 37(1), 54–64. <https://doi.org/10.1108/DLP-06-2020-0058>
- Winata, A. P., Fadelina, R., & Basuki, S. (2020). New normal and library services in Indonesia: A case study of university libraries. *Digital Library Perspectives*, 37(1), 77–84. <https://doi.org/10.1108/DLP-07-2020-0059>

About the author

Ana I. Medina-Hernandez - With a Ph.D. in Library and Information Science from the Complutense University of Madrid and a master's degree in Information Sciences from the University of Puerto Rico, Río Piedras Campus. Currently serving as a Librarian II at the Learning Resources Center of the University of Puerto Rico in Carolina. Correspondence to the author: ana.medina1@upr.edu

ORCID ID: <https://orcid.org/0000-0002-4726-3022>