

Potentials for Establishing Collaborative Virtual Reference Services at the University of Dar es Salaam and Constituent College Libraries

*Mohamed Kassim 

Information Studies Department, University of Dar es Salaam – Tanzania

Email: kassim.mohamed@udsm.ac.tz

Faraja Ndumbaro 

Information Studies Department, University of Dar es Salaam – Tanzania

Email: faraja.ndumbaro@udsm.ac.tz

Evans Wema 

Information Studies Department, University of Dar es Salaam – Tanzania

Email: wemafr@gmail.com

Debora Mbilinyi

Information Studies Department, University of Dar es Salaam – Tanzania

Email: deborambilinyi3@gmail.com

Ally Bitebo 

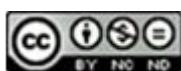
College of Information and Communication Technologies (CoICT),
University of Dar es Salaam - Tanzania

Email: allybitebo@udsm.ac.tz

Abstract

This study evaluates the feasibility of establishing collaborative virtual reference services between the University of Dar es Salaam library and its constituent college libraries. Using qualitative and quantitative methods, the study found that many library users utilise electronic devices for various purposes, including accessing library services, indicating readiness for virtual services. The study suggests various virtual reference options, including Zoom, email, real-time chat, social media, and web forms, along with the necessary technological infrastructure. Despite challenges such as understaffing and unreliable internet, the libraries have a skilled workforce with vast experience in delivering reference services. The weaknesses identified in this study underscore the necessity for the University library and its constituent college libraries to collaboratively pool their resources to offer more efficient and cost-effective virtual reference services. This would enhance the fundamental functions of their parent institution, that is, teaching, research, consultancy, and

*Corresponding Author



community services. Overall, given the confirmation of the libraries' strong IT infrastructure, skilled personnel, and established track record in reference service provision, it can be concluded that the libraries are well-prepared to implement collaborative virtual reference services that cater to the varied needs of their users.

Keywords: Reference service, Virtual reference service, Collaborative reference services, Library services, Academic libraries, Tanzania

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Introduction

The advent of Information and Communication Technologies (ICTs) has led to a significant transformation in libraries worldwide, impacting the resources and services available to library users (Nicholas & Sterling, 2014; Poluru et al., 2012; Veeranjanyulu & Prabhakar, 2015; Yilmaz, 2012). One of the services that has gained prominence is the provision of online virtual reference services by libraries, offering users an alternative to conventional in-person reference assistance (Greenberg & Bar-Ilan, 2015). Globally, academic libraries are adopting technological advancements to enhance their users' access to virtual reference services (Breitbach & DeMars, 2009; Khan & Tazeem, 2016; Platt & Benson, 2010). Virtual reference services encompass reference assistance that is conducted electronically and synchronously or asynchronously, allowing library users to interact with reference librarians using computers or other electronic gadgets without the need for a physical presence (Nilsen & Ross, 2006; Poluru et al., 2012). These services have the potential to be delivered either as a standalone operation or in collaboration with other libraries (Yilmaz, 2012; Weak & Luo, 2014). While a standalone operation involves offering a virtual reference service at a single location, a collaborative one involves a network of libraries utilising their combined knowledge and collections to cater to the needs of library users across all member institutions (Shaw & Spink, 2009).

Academic libraries, whether working independently or in collaboration with others, can gain numerous advantages from utilising virtual reference services. The utilisation of these services has, for instance, enabled libraries globally to offer improved and high-quality reference services around the clock, seven days a week (Khan & Tazeem, 2016; Peters, 2010; Poluru et al., 2012), and anywhere. Libraries have also been able to enhance their provision of reference services to both in-library users and those outside the library, including those who do not typically belong to the library's service community (Khan & Tazeem, 2016). Additionally, virtual reference services are highly compatible with the learning preferences of young and tech-savvy library users. According to Chow and Croxton

(2014), this particular generation has been immersed in the Internet and social media culture since their early years, making such services highly advantageous for them. In particular, unlike a standalone virtual reference service, a collaborative one has been shown to efficiently address the information needs of both the library and the library users (Yilmaz, 2012). Collaborative virtual reference services have also proven to be cost-effective, particularly in distributing staffing duties, expanding service availability, facilitating professional and community growth, enabling access to expert knowledge, providing access to distinctive resources, and reducing potential risks associated with new services (Weak & Luo, 2014).

Various factors have led libraries to introduce virtual reference services. These factors include, among others, the significant increase in distance learning and the proliferation of electronic resources (Yang & Dalal, 2015). Furthermore, there has been a noticeable shift in the learning styles and attitudes of students, as they have become increasingly sophisticated, technologically adept, and mobile (Ramadhan et al., 2024; Sweet & Rael, 2023; Veeranjanyulu & Prabhakar, 2015). Virtual reference services also play a crucial role during times of crisis when individuals are unable to access the library physically. Evidence from research (Campbell et al., 2020; Ismail et al., 2023; Shikali et al., 2023); for instance, many libraries in various countries temporarily suspended their services in response to the COVID-19 pandemic. Consequently, libraries have been compelled to change the way they provide reference services to maintain their relevance in the rapidly changing information landscape (Chow & Croxton, 2014; Peters, 2010; Stenson & Forsberg, 2015) and ensure uninterrupted access to library services for their users, even in times of crisis (Campbell et al., 2020; Garvey, 2021; Shikali et al., 2023).

Although collaborative virtual reference services have a long-established history in academic libraries, as indicated by various past studies (e.g., Khan & Tazeem, 2016; Poluru et al., 2012). Many academic libraries in developing nations, such as Tanzania, have not yet adopted this reference service model. Specifically, despite the numerous benefits associated with collaborative virtual reference services for library users, the University of Dar es Salaam library and its affiliated college libraries have predominantly continued to provide traditional reference services to their varied user base, including students, teaching staff, and researchers. Under this traditional model of reference service delivery, the libraries have primarily taken a reactive approach, focusing on assisting users within the physical confines of the libraries. However, this approach has posed several challenges to university libraries in recent years, particularly due to the changes brought about by institutional reform programmes implemented at the university since the early 2000s. Since the initiation of the reform programmes, the university has undertaken various transformative actions, including the establishment of new academic departments and educational programmes, as well as experiencing a continuous increase in student enrolment over time (see Provini, 2012; University of Dar es Salaam, 2023). Specifically, in the academic year 2016/2017, the University hosted 29,125 students, while in the academic year 2021/2022, the enrolment number rose to 45,462 students (University of Dar es Salaam, 2023). This represents a significant increase of 16,337 (35.9%) students. Additionally, the university has embraced



technologies in its teaching and learning practices, including the adoption of a blended teaching and learning model that combines in-person instruction on campus with online methodologies (Mtebe et al., 2011, 2021).

These changes have posed challenges for the university library and its constituent college libraries in delivering reference services to their users. For instance, with the university's expanded academic programs and growing student population, it is not feasible for all users to personally visit the library for reference purposes. Furthermore, as the university undergoes transformative changes, there arises a necessity for the university library and its constituent college libraries to adopt a more sophisticated approach to meet the evolving reference demands of its users. By doing so, they will effectively support the university's teaching, learning, and research activities. This is an area where university libraries can leverage the virtual reference service. This will allow their users to access information services remotely and the librarians to work from various service points to meet users' needs. Additionally, libraries can leverage the collaborative nature of virtual reference services by forging alliances that enable them to share resources, thereby enhancing their digital services and expanding their outreach to their communities. However, for the university libraries to implement these services, it is essential to conduct research that delves into the varied requirements of the potential user population, as well as their level of preparedness for such a service. The successful implementation and utilisation of collaborative virtual reference services in academic libraries hinges on the active involvement and collaboration of all stakeholders (Abubakar, 2021). Libraries must have a comprehensive understanding of their users to effectively cater to their reference information needs and ensure the long-term viability of the service provided. As put forth by Greenberg and Bar-Ilan, (2015), the use of virtual reference services is contingent upon the informational needs to assess the foundational requirements and contextual readiness for implementing collaborative virtual reference services within university libraries. The findings of this study may also have significant practical relevance for other academic libraries that share similar attributes with the University of Dar es Salaam library and its constituent college libraries.

Related literature

Libraries play a crucial role in offering reference services to their users, along with other administrative tasks. Reference services are primarily designed to assist library users in identifying the most suitable resources and understanding how to utilise them effectively. This personalised assistance helps users obtain relevant information tailored to their specific needs (Veeranjaneyulu & Prabhakar, 2015). Traditionally, this assistance was provided through direct interaction with users visiting the library in person. However, as mentioned previously, the emergence of ICTs, particularly the Internet, has brought about noteworthy transformations in libraries, including the implementation of virtual reference services

(Nicholas & Sterling, 2014; Veeranjanyulu & Prabhakar, 2015). With these services, libraries can reach their users through modern communication channels on the Internet, without the constraints of in-person interactions that were prevalent in the past (Fan et al., 2017; Nicholas & Sterling, 2014; Yilmaz, 2012). The literature (Breitbach & DeMars, 2009; Poluru et al., 2012; Yang & Dalal, 2015) demonstrates that numerous platforms such as QuestionPoint, Ask a Librarian, Springshare, LibChat, Zoho, LibraryH3lp, LiveChat, LivePerson, Tutor.com and Oracle are commonly utilized in academic libraries to offer virtual reference services to their users. Research by Khan et al. (2017) and Tsang & Chiu (2022) has provided additional evidence supporting the preference for social media platforms, such as Facebook, WhatsApp, X (formerly Twitter), and online chat, among library users. These platforms are favoured for their convenience and are consequently utilised by libraries in providing virtual reference services. Conversely, channels such as phone, email, Zoom, Skype, and web forms are rarely used for this purpose, as highlighted in the literature.

An optimal virtual reference service should offer expert reference assistance to patrons regardless of their location or the time of day. However, it is often impractical for a single library to have sufficient staff resources to run a 24/7 virtual reference service and address a wide range of inquiries (Jin et al., 2007). This, however, can be addressed if libraries collaborate to provide support for virtual reference services. As put forth by Weak and Luo (2014), as budgets shrink and ICT-facilitated connections grow, libraries may consider collaboration as a viable option for delivering both reference and other library services. In addition to providing administrative and routine support, collaborative virtual reference services enable users from one college library to access services offered at another unit or main library, thereby removing obstacles related to time and distance (Radford et al., 2017). Furthermore, collaborative virtual reference services offer libraries the opportunity to extend their service hours and engage in the exchange of knowledge and experiences with one another (Jin et al., 2007; Weak & Luo, 2014).

Despite the inherent benefits associated with collaborative virtual reference services, numerous obstacles impede their effective implementation. Evidence from various literature (Abubakar, 2021; Madu et al., 2018; Weak & Luo, 2014) highlights the diverse challenges that academic libraries face in adopting collaborative virtual reference services. In his study, for instance, Abubakar (2021) highlighted that while the adoption and utilisation of virtual reference services in academic libraries, particularly in developed nations, is skyrocketing, the progress of such services in developing countries has been moderate. This, according to Abubakar (2021) is attributed to the various challenges faced by these libraries, including the expensive nature of Internet services, limited access to the Internet, insufficient technological resources, and a lack of digital literacy among potential users of virtual reference services. Additionally, other studies such as Madu et al. (2018) have noted inadequate power and energy, poor funding, non-functional library websites, and ineffective policy implementation as other factors hindering effective adoption of virtual reference services in many academic libraries. Similarly, Khan et al. (2017) identified a shortage of adequately trained personnel specifically assigned to deliver virtual reference services in



numerous academic libraries, consequently impeding the successful implementation of such services. Additional obstacles that impeded the successful implementation of virtual reference services included the absence of formal collaborative efforts among university libraries (Khan et al., 2017) strategies for handling local inquiries, cultural disparities, and issues related to software and technology (Weak & Luo, 2014).

Overall, the literature review indicates that collaborative virtual reference services are not a novel concept, as numerous libraries worldwide have already adopted this form of reference service as reported in various studies (Jin, et al., 2007; Poluru, et al., 2012; Yilmaz, 2012; Nicholas, & Sterling, 2014; Stenson, & Forsberg, 2015; Radford, 2017). However, the review of the literature has also highlighted a significant lack of extensive research on collaborative virtual reference services in developing nations, particularly in Tanzania, with the majority of existing studies originating from the global north. Considering that many academic libraries in developing countries, such as Tanzania, have yet to adopt this service, context-specific research is essential to assess their preparedness and inform feasible and sustainable implementation strategies. The present study, therefore, aims to assess the foundational requirements and contextual readiness for implementing collaborative virtual reference services in academic libraries in Tanzania, with a particular focus on the libraries of the University of Dar es Salaam.

Methodology

Research design and approach

The study was based on a baseline survey to assess the needs for establishing collaborative virtual reference services at the University of Dar es Salaam library and its constituent college libraries. This survey employed a combination of qualitative and quantitative research methods for gathering, processing, analysing, and presenting data. Quantitative data was collected through a blend of self-administered questionnaires and online surveys targeting various groups of library users. On the other hand, qualitative data were obtained through key informant interviews with the library directors. This approach was deemed pertinent to the study as it facilitated the capture of both quantitative patterns in user preparedness and qualitative insights on institutional and infrastructural challenges.

Study setting

The research was conducted at the University of Dar es Salaam (UDSM). This study was part of a broader project aimed at establishing collaborative virtual reference services between the UDSM Library and its constituent college libraries. The UDSM consists of three constituent colleges, six campus colleges, seven schools, as well as various institutes and centres (University of Dar es Salaam, 2022). Data collection for the study took place at

the University of Dar es Salaam's Mwalimu Nyerere main campus, Mkwawa College of Education (MUCE), Dar es Salaam College of Education (DUCE), and Mbeya College of Health and Allied Sciences (MCHAS). The survey population consisted of all users of the University of Dar es Salaam library and its constituent college libraries, including teaching staff, researchers, and students. External library users who are not affiliated with the university community were excluded from this population. The rationale for focusing on library users in this research stems from their status as primary stakeholders of the university library, as their informational needs directly influence the utilisation of library services, including collaborative virtual reference services. Therefore, it was considered essential to obtain their perspectives on the preparedness of the university libraries to implement such collaborative virtual reference services.

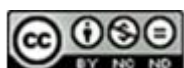
The study utilised multi-stage sampling techniques that combined both probability and non-probability sampling methods. Initially, a stratified random sample was used to select researchers, academics, and students to participate in the user survey. The population was divided into strata based on the departments of staff and the course programs of students before selection. This stratification was essential due to the study's focus on a diverse array of library users, including undergraduate and postgraduate students, academic staff, and researchers from various departments and programs. These distinct groups exhibit varying information needs, levels of digital literacy, library usage frequency, and expectations regarding reference services. Thus, stratifying them was crucial in ensuring that the perspectives of each group category were sufficiently represented, thereby facilitating more precise and inclusive findings. In particular, library directors and heads of constituent college libraries were purposefully chosen based on their positions and responsibilities. The study encompassed a total of 414 individuals who utilised the library services. Among them, 230 participants were from the main campus, 50 from MUCE, 64 from DUCE, and 70 from MCHAS (see Table 1). Out of the 414 respondents, four were designated as heads of the libraries being studied.

Table 1: Respondents' college affiliations (n=414)

Respondents' affiliation	Frequency	Percentage
UDSM Main Campus	230	55.6
MUCE	50	12.1
DUCE	64	15.6
MCHAS	70	16.9

Data collection and analysis

Various data collection techniques were employed in this study. These methods included distributing survey questionnaires to library users and conducting interviews with key informants, specifically library directors and heads. The baseline survey utilised two primary data collection tools: a questionnaire guide and an interview guide. The questionnaire guide consisted of three sections: respondents' demographic information,



technological advancements that enhance the delivery of virtual reference services, and the impact of virtual reference services on teaching and learning. The analysis of quantitative data involved the utilisation of the International Business Machine-Statistical Product for Service Solution (IBM-SPSS version 26) software to extract descriptive statistical information such as frequencies and percentages. These findings were then presented in the form of tables and graphs. On the other hand, the analysis of qualitative data employed the thematic analysis method, whereby themes and patterns within the data were identified. The results of this analysis were presented in narrative form, allowing for a more in-depth understanding of the qualitative data.

Results

Respondents' demographic information

The analysis encompassed four distinct categories of demographic information on the respondents: gender, age group, college affiliation, and categorisation of library users. A comprehensive summary of the findings is presented in Table 2.

Table 2: Respondents' demographic information (n=414)

	Frequency	Percentage
Gender		
Male	241	58.2
Female	173	41.8
Users Age Groups		
20 - 24	157	37.9
25 - 29	85	20.5
30 - 34	48	11.6
35 - 39	46	11.1
40 - 49	50	12.1
50 - 54	22	5.3
55 - 59	4	1
Respondents' affiliation		
UDSM Mwalimu Nyerere Main Campus	230	55.6
MUCE	50	12.1
DUCE	64	15.6
MCHAS	70	16.9
Library users categories		
Undergraduate	232	56
Postgraduate	84	20
Academic staff	61	15
Non-academic staff	35	9

The results depicted in Table 2 demonstrate that a considerable proportion (58.2%) of the participants in the study were male. Furthermore, the results indicate that the majority (58.4%) of the respondents were aged 20 to 24 and 25 to 29 years. A majority (55.6%) of participants were from the University of Dar es Salaam's Mwalimu Nyerere Main Campus. The majority of respondents were pursuing undergraduate studies (56%), while a slightly smaller number were postgraduate students.

Technological advancement toward facilitating virtual reference services

The study aimed to compare the various technologies available for enhancing collaborative virtual reference services in libraries and to assess the extent to which library users adopt and utilise these technologies in their teaching and learning activities. The aim was to gather information that could assist in making informed decisions about the technological platforms that could be adopted for providing virtual reference services. Different aspects were analysed for this purpose. These included the electronic devices most frequently used by library users to access and utilise information services and resources, the frequency of usage of these services and resources at UDSM libraries, and the academic-related activities conducted by users on electronic devices.

Most commonly used electronic devices to access information services and resources

The respondents were asked to specify the electronic devices they use to access and use information services and resources. This study aims to investigate the relationship between the technologies that support electronic reference services and users' use of electronic devices. The results are illustrated in Figure 1:

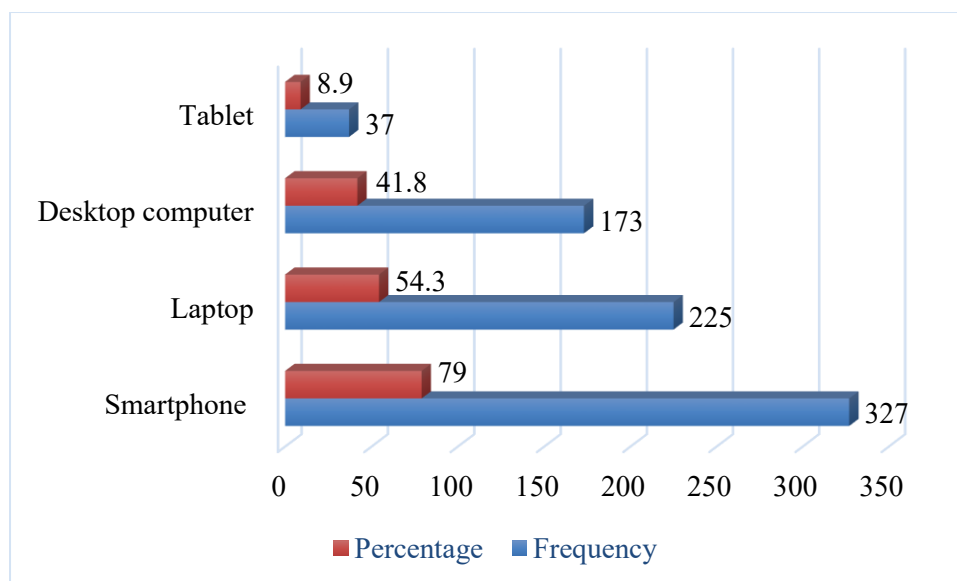
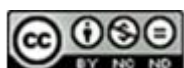


Figure 1: Electronic devices used mainly by library users (n=414)



The results exemplified in Figure 1 demonstrate that library users utilise various electronic devices. Nevertheless, despite the availability of diverse electronic devices, a significant majority (79%) of the participants preferred smartphones as the primary means of accessing information. Subsequently, laptops (54.3%) and desktop computers (41.8%) were identified as the subsequent popular choices among the respondents.

Frequency of using electronic devices in accessing and using information services and resources

Respondents were further asked how often they use electronic devices to access and use information services and resources. The results are illustrated in Table 3:

Table 3: Frequency of using information services and resources (n=414)

Use of E-devices	Frequency	Percentage
Very Often	277	65.7
Often	95	22.9
Sometimes	45	10.9
Rarely	2	0.5
Never	0	0

The results in Table 3 reveal that a majority of the respondents (65.7%) expressed a high frequency of utilising the services and resources offered. In comparison, a significant portion reported using them frequently (22.9%). Conversely, only a small number of respondents stated that they used the libraries infrequently, with none of them claiming to have never used the libraries' services and resources.

Academic-related usage of electronic devices

To gain further insights into the utilisation of electronic devices for accessing and utilising information services and resources, respondents were also requested to list academic-related reasons for using such devices. This was done to delve deeper into the particular aspects where electronic devices are employed. The results are presented in Table 4:

Table 4: Specific purposes of using electronic devices (n=414)

Use of E-devices	Frequency	Percentage
Searching and retrieving information	389	94
Information Sharing	291	70.3
Creating information content	262	63.3
Preparation of assignments	106	25.6
Examination preparations	94	22.7
Managing information	57	13.7

Preparing lecture notes	41	9.1
For research purposes	39	9.4

The results in Table 4 indicate that the electronic devices were used for different purposes. Among these purposes, information searching and retrieval processes were the most prevalent, accounting for 94% of the activities. Additionally, information-sharing practices were also quite common, representing 70.3% of the activities, followed by the creation of information content at 63.3%. In addition to these information-related activities, electronic devices were also employed to aid in assignment preparation (25.6%), examination preparation (22.7%), and managing information content (13.7%).

Library staff support in facilitating access to and use of information services for teaching and learning

Library staff are essential stakeholders in facilitating teaching and learning processes at the University. The study aimed to gather views from respondents regarding the level of assistance provided by the library staff in this aspect. A Likert scale comprising very helpful, helpful, somewhat helpful, and not helpful responses was used for this purpose. Results are presented in Figure 2:

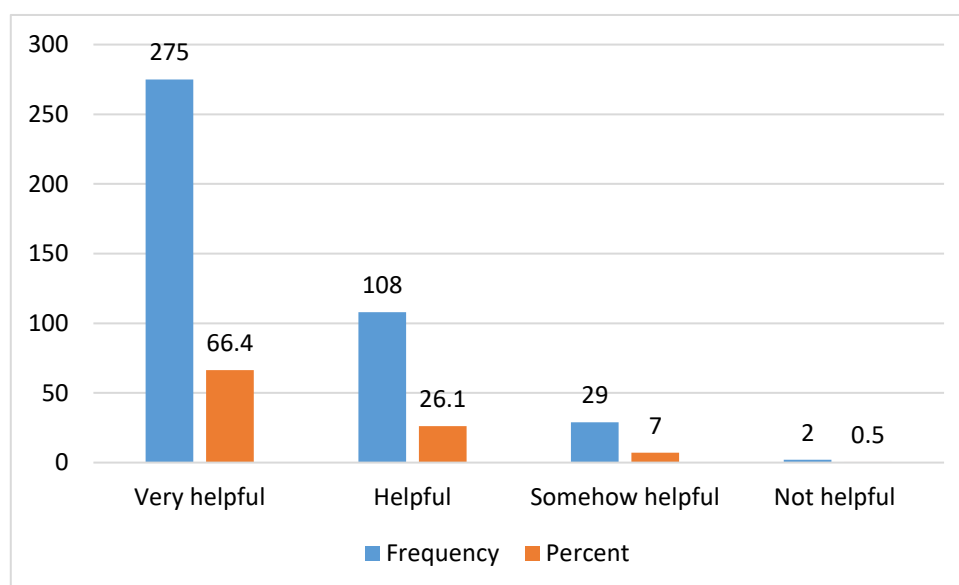


Figure 2: Library Staff Support (n=414)

Results, as depicted in Figure 2, show that the vast majority of participants perceive library staff as either beneficial (66.4%) or at least helpful (26.1%). A small number of respondents (7%), however, reported insufficient support, while only a negligible proportion indicated that library staff were not helpful (0.5%) concerning this matter.

Library users' experiences with library staff assistance

As a follow-up question on the extent to which library staff support teaching and learning processes, respondents were asked to indicate incidents where they were assisted by library staff. This feedback is vital, as it highlights service gaps, user expectations, and preferred communication methods, all of which inform the design of a user-centred, collaborative virtual reference service. The results from the respondents show that they had a wide range of experiences of assistance from the library staff, as Table 5 further illustrates:

Table 5: Users' experiences in getting assistance (n=383)

Users' experiences with staff assistance	Frequency	Percentage
Information searching and retrieval	137	37.8
Accessing wireless Internet	89	23.2
Information literacy sessions	82	21.4
Use of online public access catalogue (OPAC)	71	18.5
Instructions during research week	49	12.8
Providing basic orientation to the library	46	12
Allocating physical documents	45	11.7
Use of reference management software	32	8.3
Readers' advisory service	28	7.3
Library rules and regulations	12	3.1

Results from Table 5 indicate that a notable percentage of library users (37.8%) received assistance from library staff in conducting searches and retrieving information from online databases. This was followed by a relatively minor portion of respondents who indicated that they received support from librarians in accessing wireless Internet (23.2%) and undergoing information literacy training (21.4%). Although the participants also acknowledged receiving assistance from librarians in various other areas, albeit at a comparatively lower rate, as Table 5 demonstrates, only a few of them acknowledged receiving guidance in understanding the library rules and regulations to be followed while in the library or utilising its resources.

Library users' expectations of the collaborative virtual reference services to be provided by the library

In consideration of the diverse needs, personal beliefs, and expectations of library users regarding information services and resources, respondents in this study were asked to indicate their expectations for the provision of virtual reference services by University libraries. Similar to the question on users' experience, this one was also considered

important in facilitating the design of a user-centred collaborative virtual reference service. The results are presented in Table 6.

Table 6: Library users' expectations of collaborative virtual reference services (n=414)

Use of specific library services/resources	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I expect adequate hours of service provision by the library	112 (27.1%)	187 (45.2%)	86 (20.8%)	23 (5.5%)	6 (1.4%)
I expect the library staff to assist me with my teaching information needs	93 (22.5%)	203 (49%)	97 (23.4%)	16 (3.9%)	5 (1.2%)
I expect the library staff to assist me with my research needs	72 (17.4%)	206 (49.3%)	103 (24.9%)	29 (7%)	4 (1%)
I expect the library to help me advance in my academic field	78 (18.8%)	192 (46.4%)	108 (26.1%)	34 (8.2%)	2 (0.5%)
I expect the library to help me stay abreast of developments in my field(s) of interest through the provision of information	77 (18.6%)	182 (44%)	115 (27.8%)	33 (8%)	7 (1.6%)
I expect the library to reorient its mode of service delivery to reflect changes in teaching and learning approaches	97 (23.4%)	190 (46%)	92 (22.2%)	30 (7.2%)	5 (1.2%)

Generally, the results indicated that the respondents were highly expecting the library to allocate adequate hours of service provision and to assist users with their teaching



information and learning needs. Results further show that respondents expect libraries to reorient their service delivery modes to reflect changes in teaching and learning approaches.

Role of virtual reference services in facilitating teaching and learning

The study also collected information on the role of collaborative virtual reference services in facilitating teaching and learning processes among library users. This information was collected to assess the extent to which participants in the studied libraries recognise the advantages of collaborative virtual reference services in addressing their diverse information needs. With this domain, various key elements, including the significance of collaborative virtual reference services in the teaching and learning process, as well as users' suggestions for potential virtual reference services and specific technologies to be adopted when implementing them, were examined.

Importance of collaborative virtual reference services

Respondents were further asked to rate the importance of collaborative virtual reference services in supporting teaching and learning activities at the University. This was carried out to capture the perspectives of library users regarding how the implementation of collaborative virtual reference services would enhance teaching and learning processes at the University. The results are summarised in Table 7:

Table 7: Importance of virtual reference services (n=414)

Importance	Frequency	Often
Very important	338	81.6
Important	62	15
Moderate important	13	3.1
Not important	1	0.3

As illustrated in Table 7, among the 414 participants surveyed, a substantial number (81.6%) emphasised the high importance of this service. Very few respondents (0.3%), on the other hand, expressed a different opinion regarding its relevance to the educational process. These results align with the feedback obtained during interviews with key informants, who emphasised the need for implementing collaborative virtual reference services in the University Libraries. One informant specifically said:

We have never been part of any collaborative virtual reference services, but I believe it is something that could help us better serve our clients. Such an initiative will enable us to integrate our reference services and easily share our resources and materials, thereby facilitating the University's core activities of teaching, learning, and research.

This evidential statement further emphasises the importance of having collaborative virtual reference services at the University to enhance the dissemination and accessibility of scholarly information to the University community.

Users' suggestions on virtual reference services

Libraries worldwide offer a range of virtual reference services in various forms and types. The selection of these forms is not a straightforward decision, but rather a complex process that involves considering multiple factors, one of which is users' preference for the same. Therefore, it was deemed crucial to gather feedback from library users regarding their preferred types and forms of virtual reference services that the libraries should integrate. The results are summarised in Table 8:

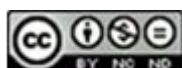
Table 8: Types of virtual reference services preferred by library users (n=414)

Suggested Collaborative Virtual Reference Services	Frequency	Percentage
Email services	307	74.2
Social media platform	260	62.8
Zoom or Microsoft virtual reference services	211	51
Real-time chat service	177	42.8
One-on-one telephone reference services (dedicated hotline telephone)	151	36.5
Webform	42	10.1

The results indicate that email services (74.2%), social media platforms (62.8%), video-supported reference services such as Zoom and MS virtual reference services (51%) and real-time chat services (42.8%) were the most preferred types of virtual reference services. Notably, these services were also highly recommended by key informants, with one of them noting:

There are many virtual reference services to implement. Some of the most popular virtual reference tools used by many large university libraries include Instant Messaging (IM), Short Message Service (SMS), Chat, Email, Web Forms, Voice Over Internet Protocol (VOIP), and Virtual Worlds. I think we can utilise any of the services I have mentioned to help our users access all the information resources we have.

Overall, the results suggest that library users have a diverse range of recommendations, indicating the need to consider the establishment of various forms of virtual reference services.



Recommended specific technologies for supporting the provision of virtual reference

Besides types of virtual reference services, users were also asked to recommend specific technologies to be adopted and implemented by the libraries. Results, as demonstrated in Table 9, reveal that a majority of the technologies were either strongly recommended or recommended by users. As indicated in Table 9, the technologies receiving high recommendations include Google Forms, image and video sharing technologies, social network platform technologies, and collaborative working tools:

Table 9: Users' recommended technologies (n=414)

Technologies	Strongly recommended	Recommended	Neutral	Not recommended
Social networking such as Facebook, Google+, Myspace	236 (57%)	111 (27%)	51 (12%)	16 (4%)
Blogging such as WordPress, Blogger 2	147 (36%)	133 (32%)	113 (27%)	21 (5%)
Microblogging such as Twitter	137 (33%)	120 (29%)	124 (30%)	33 (8%)
Collaborative tools such as Google Docs, Wiki, Mendeley, Dropbox	197 (48%)	154 (37%)	48 (11%)	15 (4%)
Social tagging and bookmarking, such as Diigo, RSS	151 (37%)	138 (33%)	107 (26%)	18 (4%)
Scheduling and meeting tools such as Doodle, Google Calendar	142 (34%)	168 (41%)	86 (21%)	18 (4%)
Conferencing tools such as Skype, Viber, Line, Imo, Google Duo	176 (42%)	145 (35%)	66 (16%)	27 (7%)
Image and video sharing such as YouTube, SlideShare, Flickr	211 (51%)	118 (29%)	63 (15%)	22 (5%)
Podcasts and Vodcast	160 (39%)	114 (27%)	96 (23%)	44 (11%)
Google Forms	217 (53%)	130 (31%)	45 (11%)	22 (5%)

Library readiness in establishing collaborative virtual reference services

The participants in this study were asked to express their views on whether the University of Dar es Salaam library and the constituent college libraries are adequately prepared to establish collaborative virtual reference services. Two key elements, namely the readiness of the libraries and their areas of strength and weakness, were examined for this purpose. Results, as depicted in Figure 3, illustrate that a significant majority (69%) of the participants believe that the University libraries are well-prepared and competent in establishing collaborative virtual reference services.

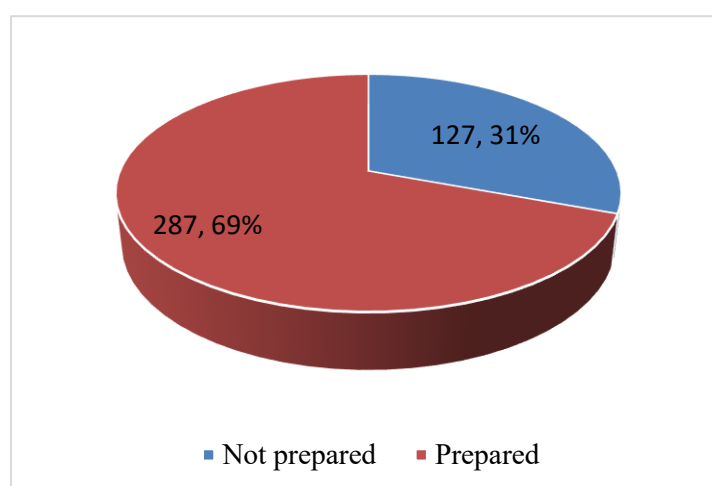
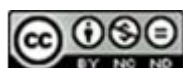


Figure 3: Libraries' preparedness in establishing collaborative virtual reference services (n=414)

Regarding the strengths and weaknesses in implementing collaborative virtual reference services, the findings presented in Table 10 indicate that over 50% of respondents believe that University libraries have a robust IT infrastructure in place to facilitate these services. Additionally, nearly half of the respondents feel that the libraries have well-trained staff who are capable of providing effective collaborative reference services. On the other hand, only 27.5% believe that the libraries' extensive experience in offering reference services can be considered a strength in implementing collaborative virtual reference services.

Table 10: Areas of strengths and weaknesses in collaborative virtual reference service provision

Areas of strength (n=287)	Frequency	Percent
Well-established IT infrastructure	158	55
Well-trained library staff	137	47.7
Libraries' long experience in providing reference services	79	27.5



Areas of weakness (n=127)		
Poor internet connectivity	93	73.2
Unreliable power supply	51	40.1
Outdated IT facilities and infrastructure	46	36.2
A limited number of staff	14	11
Lack of harmonised guidelines	2	1.6

Table 10 presents three primary categories of weaknesses: IT and technical-related weaknesses, human resources-related weaknesses, and user-related weaknesses. The data in Table 10 indicates that a significant proportion of respondents (73%) identified poor internet connectivity as a major weakness that could hinder the implementation of collaborative virtual reference services by libraries. Additionally, a relatively moderate percentage of respondents expressed concerns about unreliable power supply and outdated IT facilities and infrastructure as major weaknesses (40.1% and 36.2%, respectively) that could also impact the implementation of collaborative virtual reference services. However, only a small number of respondents considered limited staff numbers and a lack of harmonised guidelines as weaknesses in the implementation of these services.

Users' anticipated challenges in using collaborative virtual reference services

The inception of collaborative virtual reference services at the University of Dar es Salaam is expected to enhance teaching, research, and learning opportunities. However, it was also anticipated that this initiative would present certain challenges. The findings regarding the expected challenges of implementing a collaborative virtual reference service at the University of Dar es Salaam are presented in Figure 4:

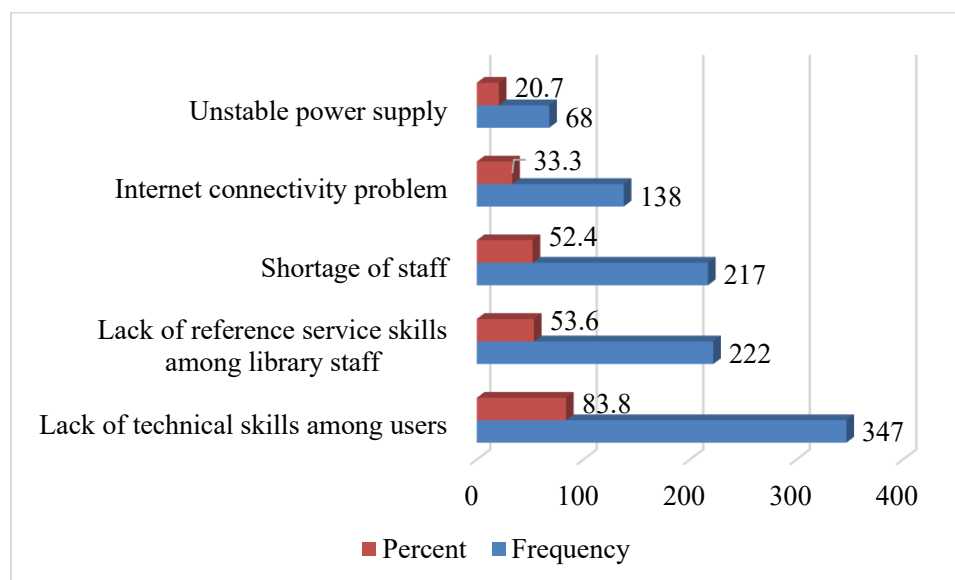
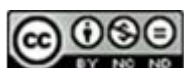


Figure 1: Anticipated challenges in the provision of collaborative virtual reference

The data presented in Figure 4 illustrates a wide range of possible obstacles. These obstacles include technical, human resources, and administrative elements. More specifically, a significant number of participants highlighted the insufficient technical expertise among potential users of collaborative reference services as a key challenge that libraries will encounter during the implementation of this service. Additionally, over half of the respondents highlighted the lack of reference skills among library staff and understaffing in the libraries under study as significant hurdles to the successful implementation of collaborative reference services. Furthermore, issues such as internet connectivity issues and unreliable power supply, as indicated in Table 10, were also recognised as significant challenges that could impede the implementation of collaborative reference services by the libraries under investigation.

Discussion

The study explored the possibility of introducing collaborative virtual reference services at the University of Dar es Salaam library and its constituent college libraries. In general, the study's findings indicate that both the university library and the constituent college libraries possess the capability to adopt collaborative virtual reference services, thereby enhancing the accessibility of their information resources for users. A substantial majority of the participants regarded collaborative virtual reference services as highly significant and believed that their implementation would bring a noteworthy advancement in improving educational practices and academic pursuits within the university. Specifically, the study's findings indicate that the majority of library users regularly utilise multiple electronic devices to access different library services. The prevalence of using such devices, as evidenced in several other studies (Chaputula & Mutula, 2018; Jamogha & Jamogha, 2018),



is rising among library users, making it possible for the studied libraries to implement collaborative virtual reference services. These findings suggest that library users are proficient in using electronic devices for various purposes, including academic activities. This suggests that they will also possess the necessary skills to utilise collaborative virtual reference services when implemented by university libraries. The acquisition of these skills, as highlighted in previous studies (Etebu & Zacchaeus, 2022; Odede & Zawede, 2018), is essential for the efficient utilisation of different library services, including virtual reference services, through electronic devices.

Library staff play a pivotal role in accelerating the education process and creating a learning-friendly environment at the University. Their primary responsibility lies in assisting library users in accessing a diverse range of library resources, thereby fulfilling their academic information needs. The findings of this study reveal that the library staff in the studied libraries are supportive of their users, particularly when it comes to accessing various library services. This observation signifies that the librarians are committed to supporting their library users. Along with this, the study findings demonstrate that library users also expect librarians to extend this kind of support to enhance access to collaborative virtual reference services in a manner that maximises their utility. A noteworthy observation is that a significant number of respondents have indicated their expectations for librarians to assist in adapting service delivery methods to correspond with evolving teaching and learning strategies. This is particularly significant given the university's integration of technology into its educational practices, such as the implementation of a blended teaching and learning approach that combines face-to-face instruction with online methodologies (Mtebe et al., 2011, 2021). Therefore, librarians are tasked with supporting users in navigating these transformations. One way to achieve this is through the establishment of collaborative virtual reference services, along with other strategies.

Contrary to the findings from similar prior studies (Khan et al., 2017; Madu et al., 2018; Tsang & Chiu, 2022), this study's findings reveal a noteworthy proportion of participants expressing a preference for the implementation of email services, Zoom, or Microsoft virtual reference services. Nevertheless, the utilisation of these services in the context of virtual reference services is declining (Madu et al., 2018; Tsang & Chiu, 2022), likely attributed to their inconvenient nature and the growing inclination of numerous library users towards alternative platforms, particularly social media. However, apart from the previously mentioned platforms, this study has revealed that a significant number of participants also favoured social media platforms and real-time chat as their preferred virtual reference services. This aligns with previous studies (Abubakar, 2021; Chow & Croxton, 2014), which also highlighted library users' preference towards social media platforms for virtual reference services. The inclination towards these platforms may be due to their convenience in enabling library users to engage directly with librarians, resulting in immediate responses. Research evidence (Connaway et al., 2011) suggests that convenience is a primary factor

influencing users' selection of a particular service over alternative options. Additionally, it is apparent from the study's findings that a substantial number of participants favoured Google Forms, image and video sharing technologies, social network platform technologies, and collaborative working tools as specific technologies for supporting the provision of collaborative virtual reference services. It is, therefore, imperative for university libraries to thoroughly consider all these factors when implementing collaborative virtual reference services.

It is also important to highlight that, despite identifying areas of weakness and potential challenges that may hinder the implementation of collaborative virtual references in University libraries, a substantial majority of the participants in this study expressed confidence in the libraries' preparedness and competence to establish such services successfully. The evidence indicating that the University libraries possess a well-established IT infrastructure, proficient library staff, and an extensive background in delivering reference services suggests that the libraries are more capable of implementing collaborative virtual reference services. Nevertheless, to ensure the long-term viability of such a service, it is imperative to address various potential challenges identified in this study. Challenges such as limited technical proficiency among library users, inadequate reference service skills among library staff, understaffing issues, difficulties with internet connectivity, the persistent problem of unreliable power supply, and a lack of harmonised guidelines can hinder the effective implementation of collaborative virtual reference services. Several prior studies (Abubakar, 2021; Khan et al., 2017; Madu et al., 2018; Weak & Luo, 2013) have also recognised these challenges as significant factors that affect the successful implementation of such services. Therefore, it is crucial to address these challenges effectively to enhance the sustainability of collaborative reference services when significantly implemented.

Conclusion

This research has offered valuable insights and knowledge regarding the potential for establishing collaborative virtual reference services between the University of Dar es Salaam library and its constituent college libraries. The findings from this study indicate the importance of establishing such reference services within University libraries. The majority of participants in the study's utilisation of electronic devices suggest that University libraries could more easily offer collaborative virtual reference services to users who are proficient and interested in using such devices to access information services and resources. In light of the confirmation regarding the libraries' possession of robust IT infrastructure, competent personnel, and a track record of delivering reference services, it can be inferred that the libraries are adequately equipped to introduce collaborative virtual reference services to cater to the varying needs of their users. Various virtual reference services, along with supporting technologies, have been proposed in this study. It is imperative for University libraries to carefully consider these recommendations in order to offer reference services that are user-friendly and accessible. Additionally, the weaknesses and challenges identified in this study underscore the need for libraries to consolidate their resources for more



effective and cost-efficient services. One proposed solution is adapting a distributed staffing model, where personnel from different libraries work together to provide virtual reference services collaboratively.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest concerning the research, authorship, and/or publication of this article.

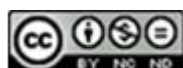
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