

**The incorporation of web technologies by university libraries in the Southern African Development Community to implement user-centred services**

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## Declaration

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I, Joseph Megameno Ndinoshiho, hereby declare that the work on which this thesis is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university. I authorise the University to reproduce for the purpose of research either the whole or any portion of the contents in any manner whatsoever.

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## **Dedication**

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I dedicate this thesis to the memories of my beloved parents, Rev. Samuel and Maria Ndinoshiho. While they have departed this earth, the ethos of perseverance, patience and hard work they have instilled in me inspired me to work diligently on the thesis until its logical conclusion.

This thesis is also dedicated to my beloved wife, Lydia, and my children, Nangula, Tangi and Samuel. Their unwavering support and words of encouragement carried me through the work I did to complete the thesis. Thank you so much for your understanding and cooperation and for being tolerant of my busy schedule, sacrificing family time to work on this thesis.

Last but not least, I dedicate this thesis like to my siblings for being there for me, motivating me to complete this thesis.

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Finally, let me thank the Almighty God for giving me the necessary strength and opportunity to contribute to scientific knowledge.

## **Abstract**

University libraries exist to support the strategic objectives of their parent universities by providing access to quality and relevant scholarly and scientific information in support of the curricula and research programmes. In fulfilling their core functions, university libraries are increasingly adopting an array of web technologies to deliver quality services to their user community. The aim of this study was to investigate the incorporation of web technologies into the services of university libraries in the Southern African Development Community (SADC) region in order to develop a user-centred model for the deployment of web technologies in university libraries. To achieve this aim, the study was underpinned by the Unified Theory of Acceptance and Use of Technology (UTAUT).

The proliferation of information in the electronic environment, along with increased user preference to access digital information, has made the incorporation of web technologies in university libraries a necessity, not an option. These transformative developments are accompanied by increased user demands for user-centred services. These advances justify the significance of this study, as well as the user-centred model developed for the incorporation of web technologies in university libraries which constitutes the original contribution of the research to scientific knowledge.

This study falls within a pragmatic paradigm and followed a mixed method research approach, combining both quantitative and qualitative research strategies in data collection and analysis. The population of this study comprised university libraries in the SADC member states whose language of communication is English. Since this population was fairly small in size, quantitative data were collected from the entire population using a questionnaire. Microsoft

Excel 2016 was used to analyse the quantitative data. Qualitative data were also collected from librarians via interviews with purposive sampling being used to select the participants. Another set of the population involved undergraduate and postgraduate students from selected universities from whom qualitative data were collected by means of focus group discussions. Purposive sampling was used to select participants in the focus group discussions. Qualitative data were analysed following the thematic qualitative analytical approach.

The findings of this study showed that the majority of university libraries in the SADC region have incorporated numerous web technologies for information discovery, for information sharing and promoting library services, for interactive library services, and for content management. The findings also revealed that the UTAUT constructs, namely, performance expectancy, effort expectancy, social influence, and facilitating conditions have had a major influence on the incorporation of web technologies by university libraries, and on librarians' and students' use of these tools. A few university libraries were found to be ill-equipped with information and communication technology (ICT) infrastructure and equipment to facilitate the use of web technologies. This study further established that the UTAUT constructs and the Library 2.0 construct of user-centredness can inform the development of a user-centred model for the incorporation of web technologies by university libraries. The study revealed that the majority of students consider web technologies to be vital tools, enabling them to access study and research information, and to share and publish information with their fellow students, their lecturers and librarians. The study culminated in the design of a user-centred model for the incorporation of web technologies into university libraries services.

## Acronyms and abbreviations

CEMAC	Central African Economic and Monetary Community
CM	Critical mass
COMESA	Common Market for Eastern and Southern Africa
DOI	Diffusion of innovation
EAC	East African Community
ECOWAS	Economic Community of West African States
FGD	Focus group discussion
FGDs	Focus group discussions
ICT	Information and communication technology
ICTs	Information and communication technologies
IDI	ICT Development Index
IL	Information literacy
IM	Instant Messaging
ITU	International Telecommunication Union
MPCU	Model of Personal Computer Utilisation
OCLC	Online Computer Library Centre
OPAC	Online Public Access Catalogue
PEU	Perceived ease of use
PP	Perceived playfulness
PU	Perceived usefulness
SADC	Southern African Development Community
SARUA	Southern African Regional Universities Association
SCT	Social cognitive theory

TAM	Technology Acceptance Model
TPB	Theory of planned behaviour
TRA	Theory of reasoned action
TW	Trustworthiness
USA	United States of America
UTAUT	Unified theory of acceptance and use of technology
VSAT	Very small aperture terminal
Wi-Fi	Wireless fidelity

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## CHAPTER 1

### INTRODUCTION TO THE STUDY

#### 1.1 Background to the study

University libraries have the primary mandate of providing access to quality scholarly and scientific information in support of the curricula and research agenda of their parent universities. They also play a pivotal role in providing instruction to their users in order to enable them to use the information services and resources optimally (Julien, Gross & Latham, 2018:191), as well as perform additional scholarly roles including research data management, bibliometrics (Corrall, Kennan & Afzal, 2013:666), and scientometrics. Moreover, university libraries are expected to communicate regularly with their users and stakeholders to disseminate an array of pertinent information, including alerting their users to their information facilities, services and resources, as well as any innovations they offer.

In fulfilment of their mandate, university libraries follow a rigorous process of selecting relevant digital and print information resources, and acquiring, organising, managing and providing access to such resources for the benefit of their users (Kuhlthau, 2004:1; Nguyen, Partridge & Edwards, 2012:336). University libraries have been adopting an array of technologies as they evolve to carry out their numerous functions in a more efficient and effective manner (Williams, 2020:137). Web technologies have been no exception to this, as libraries have always been early adopters of new technologies as they are developed (Mahmood & Richardson, 2013:508; Wordofa, 2014:263).

There is a variety of web technologies that have attracted application in library services. These include web-scale discovery tools, such as Primo from Ex Libris, EBSCOhost Discovery,

WorldCat introduced by OCLC and Summon owned by ProQuest “that searches a single, centralised index containing metadata from a variety of sources, such as article databases and local library collections” (Foster, 2018:330). Other web technologies employed in libraries include Facebook (recently renamed Meta), Twitter, RSS feeds, wikis, blogs, Instagram, Instant Messaging and YouTube. These offer unprecedented opportunities for online networking and collaboration, and the sharing of information, providing libraries with good opportunities to engage and communicate with users (Harrison & others, 2017:250). Today’s technology is developing at a fast pace, which requires librarians to keep abreast of the ever-changing web technologies. This is particularly important, as a vast volume of information has become widely available through the Internet with the result that “the need to overcome the information overload is greater today than ever” (Hallis, 2017:371).

Advances in web technologies have profoundly transformed the ways in which organisations and people share, exchange, create and publish information in electronic environments (Boateng & Liu, 2014:121; Oyieke & Dick, 2017:263). Noh (2015:786) argues that “libraries, by nature, are very similar to living organisms in that they are influenced by external pressures to constantly evolve, including, in this case, changing information technology environments and a greater reliance on web-based services”. Bronstein (2007: 59) asserts that

as a Libraries, once having a monopoly on the delivery of information were now considered by users as a very small piece of the information pie. These developments have prompted a radical change in the “information paradigm” that has shifted from a systems-oriented approach that focuses on how the systems work and get used to a user-centred approach that examines the system only as seen by the user and centres its attention on the users’ information needs and behaviour. user-oriented institution, a library should always place the user at the centre of its services.

Morris (1994:20) affirms that “library services as we know them need to be conceptualised in terms of a user-centred approach”. It is therefore imperative for librarians to continuously strive to understand, through research, user behaviour with respect to evolving web technologies.

This understanding needs to be accompanied by concrete efforts aimed at building the necessary capacity among librarians so that they may respond intelligently to users' expectations by introducing innovative web services, customised to different user information needs.

It should, however, be borne in mind that simply incorporating web technologies in library services will be meaningless, unless they are based on an in-depth understanding of their capabilities and how they may best be applied in libraries. Understanding user perceptions and expectations of these technologies is imperative to inform the incorporation of web technologies in library services and enable university libraries to introduce user-centred services enhanced with web technologies. This study seeks to shed light on the factors that influence the incorporation of web technologies in the services of university libraries in the Southern African Development Community (SADC) region, and how these factors may contribute to the creation of user-centred services in these libraries.

Since an understanding of local facilitating conditions affecting the incorporation of web technologies is critical, it is necessary to review the extent to which the environment in these countries enables the incorporation of web technologies by university libraries. According to the (International Federation of Library Associations and Institutions [IFLA], 2017), “new technology will both expand and limit who have access to information”. For these reasons, investment in the information and communication technology (ICT) infrastructure in SADC member states – a necessary condition for the meaningful incorporation and use of web technologies in libraries – is succinctly reviewed.

The literature provides concrete evidence to suggest that the SADC region has been making notable strides in improving ICT infrastructure. For example, several years ago, Ranganathan and Foster (2011:6) observed that the SADC region was the highest in terms of access to ICT services when compared to other African regional economic communities. They substantiated this assertion by giving specific examples, such as that by then the Internet subscribers per 100 inhabitants in the SADC region was 0.53 compared to 0.24 in the Economic Community of West African States (ECOWAS); 0.06 in the Central African Economic and Monetary Community (CEMAC); 0.09 in the Common Market for Eastern and Southern Africa (COMESA), and 0.05 in the East African Community (EAC) (Ranganathan & Foster, 2011:50).

A recent study presented consistent findings that, compared to other African regional economic communities, the SADC region fares well in ICT infrastructure and Internet use (Effiom, 2020:164). These findings are also congruent with the results released by the International Telecommunication Union in 2017, which revealed that a number of SADC member states such as Mauritius, Seychelles, South Africa, Cape Verde, Botswana and Namibia were ranked among the top ten ICT Development Index (IDI) countries in Africa (International Telecommunication Union [ITU], 2017:69).

The IDI is a composite index developed by the ITU to measure and compare developments in ICT across the countries in the world (ITU, 2017:25). The IDI is divided into three sub-indices, namely, ICT access, ICT use and ICT skills. While the ICT access sub-index measures infrastructure and readiness, the use sub-index measures ICT intensity and the skills sub-index captures ICT capability or use (ITU, 2017:26–27). Within the SADC region, Internet penetration varies greatly between member states. The ITU annual report for the year 2017

provided statistical information that illustrated a disparity on the intensity of ICT usage in the SADC member states. This is depicted in Table 1.1 as released by the ITU in its 2017 annual report.

SADC member states	% of individuals using the Internet	Fixed broadband subscriptions per 100 inhabitants	Active mobile-broadband subscriptions per 100 inhabitants
Angola	13.0	0.5	17.1
Botswana	39.4	2.8	67.9
Cape Verde	48.2	3.0	70.0
Congo (Dem. Rep.)	6.2	0.0	14.2
Lesotho	27.4	0.1	36.9
Madagascar	4.7	0.1	10.5
Malawi	9.6	0.0	18.5
Mauritius	53.2	16.9	51.7
Mozambique	17.5	0.1	48.5
Namibia	31.0	2.2	66.1
Seychelles	56.5	14.9	22.6
South Africa	54.0	2.8	58.6
Swaziland	-	-	-
Tanzania	13.0	0.3	9.2
Zambia	25.5	0.2	32.2
Zimbabwe	23.1	1.1	38.1

Figure 1.1: ICT use indicators for the SADC member states (2017)  
Source: ITU (2017: 142-145).

Table 1.1 clearly indicates that out of sixteen SADC member states there were only three whose percentage of individuals using the Internet was below 10%. It is worth noting that countries on the African continent have joined hands and made strides by investing in fibre optic undersea cable to facilitate fast Internet network connection. Wordofa (2014:264) observed that “in recent years, there have been an unprecedented number of investment projects in submarine fibre networks to expand Africa’s Internet infrastructure and international connectivity, significantly boosting the continent’s share of international bandwidth”. Mapulanga (2012:222) noted that “the submarine network has enabled many institutions of higher learning to migrate from VSAT [Very Small Aperture Terminal] satellites to the optic

terrestrial connectivity”. These positive developments offer university libraries in the SADC region the opportunity to improve services through the use of modern web technologies. Owing to the rapid development in ICTs and global Internet network connectivity, it can be argued that the improvement in Internet connectivity and use in SADC member states is expected to continue.

With the widespread use of mobile technologies, access to information has become pervasive. SADC member states compare well in mobile cellular penetration, surpassing other regional communities on the African continent. Sonko (2014:62) observed that the mobile phone is in the lead when it comes to mobile devices in Africa. Mobile technologies, which include laptops, tablets and mobile smartphones, empower people to execute many tasks that could previously only be done with desktop computers (Sonko, 2014:56–57). Ofili and Emwanta (2014:196) note that “developments which cut across mobile and web technologies are constantly impacting library and information services”. Mobile technologies facilitate easy access and exchange of information. Adzobu, Okyere and Banji (2021:368) acknowledge the high prevalence of mobile technologies in Africa and encourage librarians to use such technologies in the delivery of online library services. Ocran, Underwood and Arthur (2020:6) note that mobile technologies are useful in academic libraries to forge stronger collaboration between the librarian and the user.

Mobile technologies present opportunities for people in Africa to access information wherever there is Internet access. The International Telecommunication Union Measuring Information Society Report for the year 2016 indicated that Africa as a whole showed considerable improvements in mobile cellular and mobile broadband penetration (ITU, 2016:47). The final edition in the series of the International Telecommunication Union Measuring Information

Society Report for the year 2018 also noted that 76.4% of the world population owns a mobile phone and that the mobile cellular subscriptions globally now exceed the world population (ITU, 2018:5). Mobile cellular technology has the potential to broaden access to the Internet in rural communities. The explanation by Calandro, Stork and Gillwald (2012) that “mobile Internet requires less ICT skills, less financial resources and does not rely on electricity at home compared to computer or laptop and generally Fixed-Internet access” accounts for this progress.

Mobile Internet can play a facilitating role in enabling library users, wherever they are located, to easily access relevant information through the web technologies incorporated by their university libraries. According to Hey (2007, quoted by Akeriwa, Penzhorn and Holmner, 2014:291), “mobile devices have proved to be convenient and practical in terms of mobility and ease of access to information anywhere, anytime”. These benefits clearly make mobile Internet more attractive to individuals, since it allows them to access information anywhere, anytime as long as they have access to the Internet. This is particularly important for the university library’s outreach services, as they can enable university students and staff alike to use their mobile devices in order to access the library’s digital resources through the web, even when they are located in remote villages where the Internet is accessible.

Given the poor ICT development and lack of electrical power supply in some African rural communities, mobile phones constitute an important communication tool through which university students and staff can continue to access the library services offered through web technologies. Palumbo (2014:185) contends that “the availability of the mobile phone in Africa has allowed many there to take advantage of innovative applications to obtain beneficial information, primarily utilizing text messaging”. As web technologies, Wi-Fi and smartphones

become more widely available and used in the SADC region, library users will enjoy enhanced access to information and an opportunity to share a variety of information in different formats. This presents great potential for university libraries to extend their services beyond the physical library building.

Notwithstanding these achievements, some rural communities in the SADC region are still confronted by a number of challenges relating to ICT access and use. Highlighting some of the key challenges, Munyoka and Maharaj (2017:4) allude to an inadequate and unreliable electrical power supply, telecommunication regulatory challenges, licensing issuing bottlenecks, inadequate funding for ICT projects, and bureaucracy in governing the ICT decision-making process. However, the developments in ICT and mobile phone technology highlighted in this section are indicative of the fact that most countries in the SADC region offer an enabling environment for the effective utilisation of web technologies.

While a satisfactory enabling environment for the use of ICT tools exists in most SADC member states, it may not automatically lead to the incorporation and actual utilisation of web technologies by university libraries in this region. Therefore, there is a need to conduct research, the findings of which could inform planning, and policy making as well as decisions by university libraries in the SADC region around the incorporation of these tools in their services. University libraries in the SADC region should use the ICT development to their advantage and incorporate web technologies in their services. The value of web technologies in university libraries is that they can successfully be employed to improve efficiency in information service delivery and outreach activities (Abok & Kwanya, 2016:148). Web technologies have “the ability to present huge amounts of diverse, complex, multimedia information that is richly interconnected and cross-referenced through hypermedia links”

(Hiremath & Kenchakkanavar, 2016:707). This ability presents university libraries with opportunities to introduce user-centred services which can be offered through appropriate web technologies. An examination of university libraries' websites in the SADC region indicated that they have mostly incorporated web technologies such as Facebook, Twitter, Sierra, EbscoHost Discovery, WorldCat Discovery and RSS Feeds. The next section presents the problem statement for this study.

## **1.2 Problem statement**

The incorporation of web technologies in libraries has been investigated from different perspectives. However, many studies have focused mostly on investigating which of the web technologies have been adopted, their extent and purposes of usage by libraries (Linh, 2008; Harinarayana & Raju, 2010; Coelho, 2011; Chu & Du, 2012; Boateng & Liu, 2014; Abok & Kwanya, 2016; Williams, 2020). In contrast, little research has been conducted to investigate the factors that influence the incorporation of web technologies in university libraries in order to facilitate user-centred library web-based services. Kim (2012) and Chen, Yen and Hwang (2012) investigated factors affecting the usage of some web technologies in South Korea and Taiwan respectively, while Mpoeleng, Totolo and Jibril (2017) examined influential factors in the usage of some web technologies at the University of Botswana Library.

While these studies provide useful insights on the incorporation and use of web technologies in library contexts, they do not cover the aspect of how these technologies can be deployed to implement user-centred library services. Furthermore, these studies focus solely on Web 2.0 tools. Given this gap in knowledge, more research that examines the factors that influence university libraries to incorporate a variety of web technologies in their services and how these technologies can be harnessed to facilitate user-centred library services is needed. Mwai

(2016:87) asserts that in their quest to provide customer-focussed services, libraries are reconfiguring their services to conform to user-centred principles. Therefore, user-centredness should be the foundation upon which library services are conceptualised and implemented. Ugwu and Onyancha (2019:277) argue that user-centredness is important in a library to ensure compatibility between library services and user needs. This important aspect gave the impetus for this study to examine how web technologies could be employed to enhance library web-based services.

The actual incorporation of web technologies to improve library services is largely skewed toward university libraries in developed countries (Chua & Goh, 2010:210; Tripathi & Kumar, 2010:203; Mahmood & Richardson, 2013:518). Unlike university libraries in developed countries, those in developing nations have been slow to incorporate web technologies to improve the quality of library services (Baro, Ebiagbe & Godfrey, 2013:10; Lwoga, 2014:184). This holds true for most of the university libraries in the SADC region where this study was located (Mabweazara & Zinn, 2016:9; Mwantimwa & Nkhoma-Wamunza, 2017:18). However, an exception has been noted in South Africa where the extent of the incorporation of web technologies into library services has been well documented (Pienaar & Smith, 2008; Baro, Ebiagbe & Godfrey, 2013; Williams, 2020), even though the focus of these studies did not cover user-centredness in implementing web technologies.

Makori (2012:37) observed that university libraries in Southern Africa have made progress in incorporating web technology tools in their services. Notwithstanding this observation, there is a knowledge gap in the factors that influence the incorporation of web technologies by SADC university libraries for the purpose of implementing user-centred library services. To fill this knowledge gap, this study sought to examine the factors that influence the deployment of web

technologies by university libraries in the SADC region, and how these technologies are incorporated to facilitate the delivery of user-centred services in these libraries.

### **1.3 Research aim and objectives**

The aim of this study was to investigate the incorporation of web technologies into the services of university libraries in the SADC region in order to develop a user-centred library service model. To achieve this aim, the study integrated the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis & Davis, 2003) and the Library 2.0 theory (Maness, 2006) in order to:

- ascertain which web technologies were incorporated in the services of university libraries in the SADC region;
- determine the factors that influenced the university libraries in this region to incorporate web technologies in their services;
- examine the perceptions of users of the library services enhanced by web technologies; and,
- develop a user-centred library service model based on the findings of the study.

### **1.4 Research questions**

This study was guided by the following research questions:

1. What web technologies are incorporated in the services of university libraries in the SADC region?
2. What factors influenced the university libraries in the SADC region to incorporate web technologies in their services?
3. What are the perceptions of users towards the library services enhanced by web technologies?

4. How can these factors be used to develop a user-centred library service model?

### **1.5 Overview of the theoretical framework**

In order to address the research questions, the study drew on UTAUT (Venkatesh & others, 2003) and the Library 2.0 theory (Maness, 2006). In the UTAUT, Venkatesh and others (2003) theorise that four constructs, namely performance expectancy, effort expectancy, social influence, and facilitating conditions, play a pivotal role in influencing user acceptance and actual use of technology, with these constructs being moderated by the variables of gender, age, experience and voluntariness (Venkatesh & others, 2003:446–447).

The UTAUT was formulated taking into account several constructs generated in several theories, such as the theory of reasoned action, the theory of planned behaviour, the technology acceptance model and the diffusion of innovation theory (Venkatesh and others, 2003:467; Dulle & Minishi-Majanja, 2011:33). The proponents of UTAUT saw some weaknesses in the previous theories, and consequently, UTAUT was formulated to harmonise these theories in order to enhance the explanatory factors of the acceptance and use of technology (Oye, Iahad & Rahim, 2014:256; Williams, Rana & Dwivedi, 2015:44). Definitions and more details of the UTAUT constructs are given in Chapter 2.

The concept Library 2.0 was introduced by Michael Casey (2005) on his Library Crunch blog, as a response to how Web 2.0 technologies could be applied in the library environment (Casey, 2005). Thus, the term Library 2.0 “describes the relationship between Web 2.0 and libraries” (Williams, 2020:139). According to Maness (2006) Library 2.0 is user-centred, socially rich and communally innovative and offers a multimedia experience. Casey and Savastinuk (2006) affirm that “the heart of Library 2.0 is user-centred change”. It is therefore reasonable to argue

that Library 2.0 is a user-centred theory that brings about great interaction between the user and the librarian in sharing and creating information. It affords libraries an opportunity to implement web-based services that take into account changing user information searching habits and how they collectively create content. Library 2.0 theory is thus useful in informing research that seeks to gain a better understanding of how the incorporation of web technologies in libraries opens up opportunities for user-centred services.

### **1.6 Significance of the study**

The significance of this study lies in the fact that web technologies and enabling devices such as smartphones are considered to be important technologies that are transforming information service delivery. Commenting specifically on social media, Akeriwa, Penzhorn and Holmner (2014:285) acknowledge that they are important technologies used in academic libraries to improve web-based information services. In addition, web-scale discovery tools have enabled libraries to provide users with an opportunity to search multiple library collections through a single search interface (Djenno & others, 2014:264; Sonawane, 2017:28). University libraries incorporate these tools to primarily improve the quality of services to the user community. There is therefore a great need to continuously conduct studies that investigate the implications of the various web technologies for university libraries.

The following specific reasons serve as motivational factors for this study:

- Web technologies develop and change at a very fast pace and they have major implications for shaping the future of library services. This justifies the need to gain an in-depth understanding of how university libraries incorporate web technologies to implement user-centred services. It is also important to continue to seek a better

understanding about which of the many web technologies are suitable in library services.

- University libraries do not operate in isolation. They operate in an environment influenced by several dynamic factors, changing from time to time. This calls for librarians to investigate the factors associated with the incorporation of web technologies in library services regularly, as this can inform the policymaking and planning, decision-making and development of user-centred library services.
- University libraries exist to serve their users but, for any library service to be meaningful and useful to the users, it has to be developed with the users in mind. Understanding the importance of the user experience is imperative and thus research geared to an enhanced understanding of what library users consider important in the implementation of web technologies for user-centred information services is valuable.
- In addition, understanding users' perceptions of these technologies can contribute to the development of a user-centred model that can inform the incorporation of web technologies by university libraries.
- In general, this study contributes to the body of knowledge relating to the incorporation of web technologies in university libraries for the purpose of creating user-centred services for the benefit of the user community.

### **1.7 Delimitations and limitations in research**

In research, the concept of delimitation refers to “the limits inherent in the use of a particular construct or population” (Locke, Spirduso & Silverman, 2007:16). This concept is extremely important in research as it clarifies and sets the boundary for a specific study in order to eliminate any possible ambiguity about its scope.

In contrast, the concept of limitation in research refers to any restrictive conditions and/or weaknesses which are beyond the control of the researcher (Locke, Spirduso & Silverman, 2007:16). This is further reinforced by Connaway and Powell (2010), who point out that in the limitation of the study “the researcher is stating what the research can and cannot do” (Connaway & Powell, 2010:300).

The importance of mentioning the limitations of the study is that they have a major influence on the validity of the results and conclusions of the study (Kumar, 2014:273). For this reason and to avoid possible misunderstandings, the limitations and delimitations of this study are provided in Sections 1.7.1 and 1.7.2 respectively.

### **1.7.1 Delimitation of the study**

This study is confined to the university libraries in the SADC member states whose language of communication is predominantly English. In terms of institutional scope, the focus of this study is university libraries. National, public, community and school libraries are excluded since their missions and mandates differ from those of university libraries. With respect to the scope of the language of communication, university libraries in the SADC region whose websites are in languages other than the English language do not form part of this study. This is because the researcher is not conversant with the French and Portuguese languages which are used in university libraries in francophone and lusophone SADC member states.

### **1.7.2 Limitations of the study**

There are several limitations in this study which are noted and acknowledged as follows:

- Firstly, the sample consisted of university libraries whose websites are written in the English language. The language barrier was the main determining factor restricting the researcher to focus on university libraries in anglophone SADC member states.
- Secondly, this study employed a questionnaire, individual interviews and focus group discussion as data collection instruments. Unlike direct observation, these instruments rely upon self-reported data from respondents. This presents a potential for bias because respondents may make inaccurate or exaggerated responses. Because of the wide sample and the great distances between the research sites, observations were not possible in spite of their capacity to provide a high degree of granularity in human behaviour (Beck & Manuel, 2008:110). However, the threats arising from bias were minimised and counteracted by ensuring that relevant questions were formulated and follow-up questions were posed to participants in the subsequent interviews with librarians and focus group discussions with undergraduate and postgraduate students held at selected universities in the SADC region.
- The third limitation included time, financial constraints and travel restrictions imposed due to the Covid-19 pandemic health protocols and regulations. All these prevented the researcher from physically visiting the university libraries investigated for this study, rather opting to use technologies in data collection.

### **1.8 Overview of the research design and methodology of the study**

While the full description about the research design and methods is presented in Chapter 4 (Research Design and Methodology), this section introduces and highlights key aspects of the research design and methods employed to address the research questions raised by this study. In terms of its philosophical stance, this study falls within a pragmatic paradigm. It followed a mixed-method research approach and combined both quantitative and qualitative research

strategies in data collection. In applying a mixed-method approach, the quantitative method was dominant over the qualitative method. These methods were implemented in sequence and data were merged only at the interpretation stage. As such, this study followed the partially mixed sequential methods (Leech & Onwuegbuzie, 2009:269) as explained in detail in Chapter 4, Section 4.3.1 (Research Design).

The population of this study is defined as the university libraries in the SADC member states. For the quantitative phase of this study, purpose sampling was used to draw university libraries whose language of communication is English. The data in this phase were collected with an online questionnaire that was completed by librarians who played a role in the implementation of the web technologies in their respective university libraries.

Another set of the population of this study involved undergraduate and postgraduate students from two universities from whom qualitative data were collected by means of focus group discussions. The original plan was to conduct students' focus group discussions at three universities but this could not materialise owing to the restrictive measures instituted by SADC member countries because of the Covid-19 pandemic. The sampling method used in this phase was purposive sampling.

A pre-test study was conducted at one private tertiary institutions in Namibia in order to ensure that the research instruments were free of misunderstandings and ambiguity. In terms of data analysis, quantitative data were analysed using Microsoft Excel 2016, whereas qualitative data were analysed following the qualitative analytical approach proposed by Marshall & Rossman (2011).

The validity of this study was enhanced by harmonising questions in the data collection instruments, mapping them to key concepts in the research questions raised by this study, as uncovered in the literature review, and supported by the theories underpinning the study. All these aspects, including how ethical issues were treated in the study, are discussed in more detail in Chapter 4 (Research Design and Methodology).

### **1.9 Clarification of broad concepts**

Depending on the context in which concepts or terms are used, it is common for people to interpret them differently. This means that in different contexts a concept may mean different things to different people. Therefore, in order to avoid ambiguity and prevent misunderstandings, the broad concepts used in this study are defined and clarified in as follows:

#### **Incorporation of web technologies**

In this study, the incorporation of web technologies refers to the integration and actual usage of web technologies to perform certain tasks relating to library services and operations.

#### **User-centred services**

This study has adopted the definition of user-centred services offered by Ugwu and Onyancha, who defined the term as “a services model that puts the user at the centre of library and information services and outlines transformative processes of meeting his or her needs” (Ugwu & Onyancha, 2019:276).

#### **Web technologies**

In this study the term “web technologies” is defined by the researcher as web-based tools offered by the library through application software and web tools that facilitate content

discovery, content creation, interactive communication, dissemination and the exchange of information in a variety of formats (textual, images, video and audio) over the Internet. For the purpose of this study, web technologies include tools that facilitate the provision of web-based library services developed throughout the evolution of the web, including what has come to be known as Web 1.0, Web 2.0, Web 3.0 and Web 4.0. This is a broad definition that includes web technologies that can be used in the library for the purpose of facilitating the provision of, access to and sharing of information in library settings.

### **1.10 Structure of the dissertation**

The following outline indicates the way in which the chapters of this study are presented:

**Chapter 1 (Introduction)** sets the scene by presenting the background to the study, and stating the research problem, research aims and research questions. It also highlights the significance, delimitations and limitations of the study. It further gives an overview of the theoretical framework underpinning this study, the research design and methods employed, as well as clarifying the broad concepts. The chapter concludes with a summary.

**Chapter 2 (Theoretical Framework)** describes the theoretical framework underpinning this study. It starts with a clarification of the concepts of theory and theoretical framework in research contexts. It discusses several theoretical models (Theory of Reasoned Action, Theory of Planned Behaviour, Technology Acceptance Model, and the Diffusion of Innovation Theory) that are relevant to the incorporation of technology in organisations, before shifting the focus to discuss and justify the UTAUT and Library 2.0 theory that underpin this study. It then discusses how these theories are integrated to help achieve the aim of this study. The research questions raised by this study are aligned to the corresponding constructs of UTAUT

and Library 2.0 theory. The chapter concludes with key insights from the discussion of the theoretical framework.

**Chapter 3 (Literature Review)** provides an overview of the web technologies commonly used in libraries and the factors that influence libraries to incorporate web technologies in their services. It also reviews user-centred library services and the perceptions of library users of web technologies and their application to libraries services. The key insights from the literature are also presented and the chapter ends with a summary of the key findings concerning the aspects examined in the literature review.

**Chapter 4 (Research Design and Methodologies)** examines several philosophical paradigms in research before identifying the paradigm within which this study is situated. It then describes the research design and methodologies identified as suitable for this study. It further defines the population of the study, and describes the sampling, data collection and data analysis methods employed in this study. The chapter then discusses issues relating to validity and reliability, as well as ethical issues, and concludes with a summary of the key discussions therein.

**Chapter 5 (Data Analysis and Presentation of Results)** provides a description of the methods used to analyse data. It then presents the results of the questionnaire first, followed by the results of the interviews conducted with librarians, and then the results of the focus group discussions conducted with undergraduate and postgraduate students. The results are presented in accordance with the research questions raised by this study. While the results gleaned from the quantitative data are presented in graphs with full descriptions, the findings obtained from

the qualitative data are presented in the form of key themes that emerged from the analysis, as well as illustrative verbatim extracts from the interviews and focus group discussions.

**Chapter 6 (Discussions and Interpretation of Key Findings)** discusses and interprets the results to provide answers to the research questions raised by this study. The results are presented in an integrative manner, meaning that both quantitative and qualitative data are merged at this stage. The discussions and interpretations are presented and organised into headings in accordance with the research questions raised by the study.

### **Chapter 7 (Summary of the Findings, Conclusions and Recommendations)**

This chapter summarises key findings and presents the conclusions drawn from this study, essentially answering the research questions. The conclusions are logically presented in accordance with the research questions. Based on the theories underpinning this study, and the findings and conclusions, the chapter then presents a user-centred model that represents the contribution of this study to the body of knowledge relating to the incorporation of web technologies by university libraries. The chapter then makes recommendations aimed at improving the incorporation of web technologies for delivering user-centred library services to users. The chapter concludes with suggestions for further related research.

### **1.11 Summary of Chapter One**

This introductory chapter sets the context for the entire study. It presented the background information on web technologies, and how they can be employed in improving the quality of library services. The explication of the research problem provided a clear indication that there is a gap in terms of the incorporation of web technologies in libraries in developing countries compared to those in developed nations, and the aspect of harnessing web technologies to

develop and implement user-centred library services. The chapter also specified the aims and objectives, as well as the research questions addressed by the study.

The need to develop a user-centred model for the incorporation of web technologies in libraries was justified. The chapter further gave an overview of the theoretical framework in which this study is situated. An overview of the research design and methodologies was also presented in this chapter before it clarified the meaning of the broad concepts used in the study. It also presented the chapter structure of the study. While Chapter 1 set the context for the study by introducing the aims, problem and research questions, the next chapter (Chapter 2) presents the theoretical framework underpinning this study.

## CHAPTER 2

### THEORETICAL FRAMEWORK

#### **2.1 Introduction**

This chapter presents and discusses the theoretical framework underpinning this study. In order to understand the incorporation of web technologies by university libraries in the Southern Africa Development Community (SADC) region and how these libraries employ web technologies to deliver user-centred services, this study relied upon the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis & Davis, 2003) and Library 2.0 theory (Maness, 2006). These two theories have been integrated to address the research questions raised by this study, as presented in Chapter 1, Section 1.4. While the first section of the chapter clarifies what is meant by theory and theoretical frameworks in research contexts, the second section discusses the theories and models that are relevant to technology adoption and usage in different environments. These theories include the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), the Theory of Planned Behaviour (TPB) (Ajzen, 1991) and the Technology Acceptance Model (Davis, 1989).

A discussion of these theories is necessary because the UTAUT was developed from these theories. It is therefore appropriate to discuss the precursor theories to UTAUT in order to give an account of the context within which UTAUT originated. The theoretical constructs associated with each of the preceding influential theories of technology usage are discussed and the gaps identified in each theory are highlighted. The third section discusses Library 2.0, a user-centred theory employed in this study to investigate the user's perspectives on the library services offered through web

technologies. The fourth section describes how the UTAUT and Library 2.0 have been integrated. Justification as to why these theories are deemed suitable to address the research questions of this study is also provided. In this section, research questions raised by this study are aligned to specific constructs of the theories employed. The chapter ends with a summary highlighting the main insights drawn from the theories on which this study is grounded.

## **2.2 The concepts of theory and theoretical framework in research**

Leary (2012:9) defines a theory as “a set of propositions that attempts to explain the relationships among a set of concepts”. It can also be viewed as “a set of interrelated constructs (concepts), definitions, propositions that present a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting particular phenomena” (Kerlinger & Lee, 2000:11). What these definitions suggest is that theories in research are developed in order to explain and/or predict relationships between the concepts describing phenomena.

Theories play a pivotal role in the research process as they give focus to a study, inform research planning and data collection, and are instrumental in explaining the research findings (Dulle & Minishi-Majanja, 2011:33; Ngulube, Mathipa & Gumbo, 2015:52). Situating a research project in an appropriate theoretical framework is essential to inform the entire research process with consequent implications for the soundness of the findings.

A theoretical framework can be defined as “any empirical or quasi-empirical theory of social and/or psychological processes, at a variety of levels (e.g., grand, mid-range, and

explanatory), that can be applied to the understanding of phenomena” (Anfara & Mertz, 2006:xxvii). This means that a theoretical framework encompasses validated and accepted theory or theories upon which a particular study is based. It helps to explain the phenomena under investigation, relates key concepts of the phenomena studied to relevant theories and helps guide the research process.

In addition, a theoretical framework “offers a vehicle to make generalisations to other contexts and provides an explanation for why people do and say what they do and say” (Bettis & Mills, 2006:70). A theoretical framework is thus an indispensable frame of reference in situating a research study in its appropriate discipline or subject and clarifies the boundary of a specific study (Henning, Van Rensburg & Smit, 2004:26). It comprises the theory or theories which frame a particular study (Kumar, 2014:57).

In addition, a theoretical framework describes, delimits and justifies the theories underpinning a particular research project. Moreover, a theoretical framework can provide unambiguous explanations and predictions of relationships between several factors in a particular study. It also provides a supportive background to research, as it relates the concepts and variables of a particular study to existing theories. This investigation into the concepts of theory and theoretical framework leads to a discussion in the next section of the theories that have influenced UTAUT, as one of the theories deemed appropriate to address the research questions of this study.

### **2.3 Theories relevant to the incorporation of technology in organisations**

There are a number of theories that have been employed to predict, understand and explicate the application of technology in a variety of contexts. The theories that have

been developed to explain technology application draw from theories that explain behaviours toward a particular action. According to Cheung and Vogel (2013:163), the main theories applied in studies of individuals' behaviour are the Theory of Reasoned Action (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980), the Theory of Planned Behaviour (Ajzen, 1991; Mathieson, 1991) and the Technology Acceptance Model (Davis, 1989; Davis, Bagozzi & Warshaw, 1989).

The Diffusion of Innovation Theory (Rogers, 1983; 2003) is another important theory that has been applied to understand the incorporation and use of technology in organisational services and operations. Accordingly, these theories are discussed in the subsequent sections in an attempt to explain the selection of the candidate theory.

### **2.3.1 Theory of Reasoned Action**

The Theory of Reasoned Action (TRA) is rooted in social psychology, particularly in research conducted by Fishbein and Ajzen from 1975 onwards (Venkatesh & others, 2003; Chuttur, 2009). The TRA “posits that behavioural intentions, which are the immediate antecedents to behaviour, are a function of salient information or beliefs about the likelihood that performing a particular behaviour will lead to a specific outcome” (Madden, Ellen & Ajzen, 1992:3). Citing Fishbein and Ajzen (1975), Hsu and Lin (2008:66) state that the TRA “advocates that a person’s behaviour is predicted by intentions and that the intentions are jointly determined by the person’s attitude and subjective norm concerning his or her behaviour”. This suggests that attitudes and social pressure are attributes that have a great influence on the prediction of individuals’ behaviour to perform a particular act. The TRA is graphically depicted in Figure 2.1.

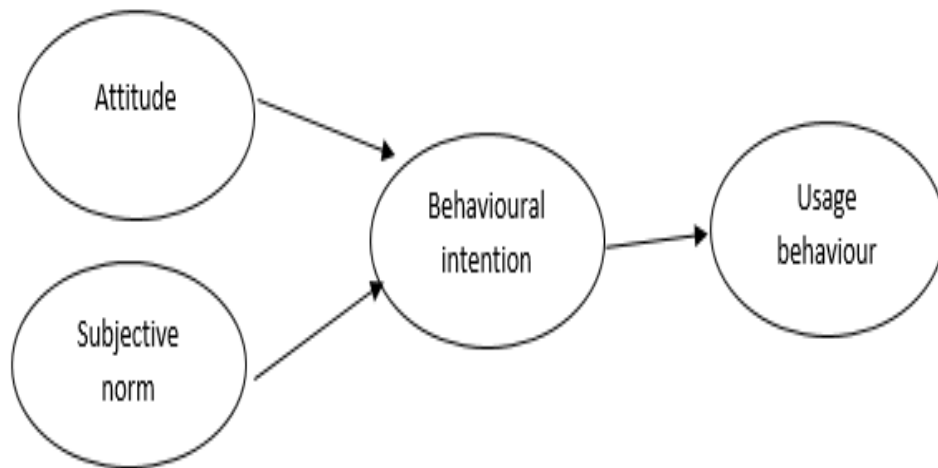


Figure 2.1: The Theory of Reasoned Action Graphical Model  
 Source: Ramayah, Rouibah, Gopi & Rangel (2009:1224)

It is clear from Figure 2.1 that attitude toward behaviour and subjective norms are the TRA constructs that influence an individual to perform a certain action. Attitude is defined as a “positive, negative, or neutral effect toward an object or behaviour” (Thornburg & Pryor, 1998:119). According to Fishbein and Ajzen (1975, quoted by Venkatesh and others (2003:428)), subjective norm is defined as “the person’s perception that most people who are important to him [or her] think that he [or she] should or should not perform the behaviour in question”. Subjective norm is therefore associated with the influence exerted on an individual to perform an action, as a result of social pressure.

The TRA has been extensively studied and accepted as a useful and influential theory in gaining a deeper understanding of people’s behaviours within different contexts (Davis, Bagozzi & Warshaw, 1989:983), and is considered one of the most influential theories in predicting human behaviour within different contexts (Venkatesh & others, 2003:428). The TRA has been used in a number of studies as an independent theory

and sometimes combined with other theoretical frameworks seeking to understand the acceptance and/or use of several types of technology. For example, as early as 1989, Davis, Bagozzi and Warshaw (1989) combined the TRA and Technology Acceptance Model (TAM) theories to examine user acceptance of computer technology. Peslak, Ceccucci and Sendall (2010) employed the TRA as a model to investigate the use of Instant Messaging (IM) behaviour.

Despite its use in technology acceptance research, the TRA model fails to recognise other factors that could influence individuals' behaviours such as environmental factors (Armitage & Christian, 2003:191). Cheung and Vogel (2013:163) argue that "even if a person is highly motivated by positive attitudes and norms, he or she may not actually perform certain behaviour because of a feeling of a lack of control over his or her own activities". This aspect of behavioural control is a significant weakness detracting from the comprehensiveness of the theory.

The TRA also fails to acknowledge further factors that may influence individuals to perform a particular behaviour. These may include, for example, the expected benefits accrued and/or the difficulties an individual may face in performing a given behaviour. As the development of theories is a continuing process, further research evolved pointing to the inherent weaknesses associated with the TRA as highlighted above. For example, theories such as TAM and UTAUT were developed specifically to deepen our understanding of the usage of technology. It is for the above reasons that the TRA was found inadequate to address the research questions of this study as stated in Chapter 1, Section 1.4. The next section discusses the Theory of Planned Behaviour that was developed to improve the TRA.

### 2.3.2 Theory of Planned Behaviour

According to Ajzen (1991:181), “the theory of planned behaviour is an extension of the theory of reasoned action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) made necessary by the limitations of the original model in dealing with behaviours over which people have incomplete volitional control”. The Theory of Planned Behaviour (TPB) postulates that “attitude, subjective norm and behavioural control are direct determinants of behavioural intention, which in turn affects behaviour” (Taylor & Todd, 1995:147).

The TPB has broadened the TRA by introducing an additional measure of perceived behavioural control as a determinant of both behavioural intention and behaviour (Armitage & Christian, 2003:191). Unlike the TRA, the TPB has three determinants, namely, attitudes, subjective norms and perceived behavioural control, which explain behavioural intentions. Perceived behavioural control takes into account personal constraints, thus explaining why intentions do not always lead to expected outcomes (Armitage & Conner, 2001:472). The TPB is illustrated below in Figure 2.2.

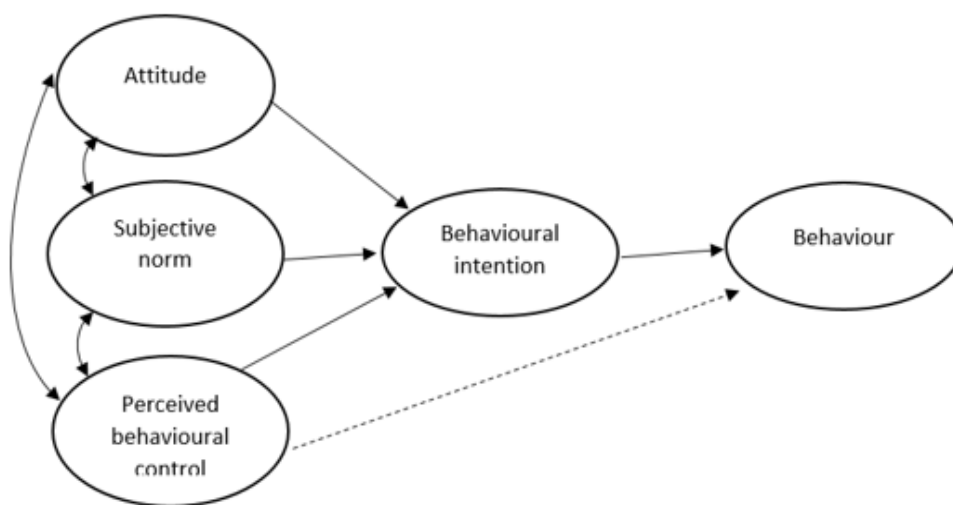


Figure 2.2: Graphical model of the Theory of Planned Behaviour  
Source: Ajzen (1991:182)

Citing Ajzen (2001), Tariq, Sajjad, Usman and Amjad (2017:189) assert that perceived behavioural control involves internal factors such as information and the necessary skills to perform certain actions, as well as external factors such as social support, time and financial resources. In addition

When people believe that they have little control over performing the behaviour because of a lack of requisite resources, then their intentions to perform the behaviour may be low even if they have favourable attitudes and/or subjective norms concerning performance of the behaviour (Madden, Ellen & Ajzen, 1992:4).

The above statements justify the inclusion of the perceived behavioural control construct and clearly indicate that this additional construct allows the consideration of a wide variety of factors that could influence an individual to perform an action. The TPB has strengthened the TRA model by taking into account the perceived behavioural control as one of the factors that could be influential in predicting and explaining individuals' behaviours in performing a task, thus enhancing the power of the TRA.

The TPB has seen practical application in research that sought to strengthen an understanding of the usage of technology. For example, Al-Debei, Al-Lozi and Papazafeiropoulou (2013) applied the TPB model to explain and predict the use of Facebook in Jordan, while Zamani-Miandashti, Memarbashi and Khalighzadeh (2013:124) employed the TPB model to investigate Internet usage behaviour among undergraduate agricultural students at Shiraz University in Iran. While the TPB model has been used in previous research on technology acceptance, this study requires a different model to comprehensively address its research questions.

There is evidence to support the use of TPB in technology research. However, the employment of any theoretical model in a research project will be greatly dependent

upon its research questions. The research questions for this study (Chapter 1, Section 1.4) are such that they require a model befitting the incorporation of web technologies to implement user-centred information services. This is the main reason why TPB was found to be unsuitable to address the research questions of this study.

### **2.3.3 Diffusion of innovation theory**

Diffusion research is rooted in studies about the adoption of agricultural innovations by farmers in the United States of America (USA) (Holland, 1997:390). Rogers (2003) made reference to an investigation into the diffusion of corn seeds among Iowa farmers in the USA, and specifically observed that diffusion research has its origins in the rural sociology research studies of the 1940s. Wejnert (2002:298) noted that the applicability of Diffusion of Innovation (DOI) theory spread to a wide spectrum of other disciplines such as education, health, marketing, economics, political science, and communication and technology. According to Yi, Jackson, Park and Probst (2006:351), DOI theory “posits that the rate of adoption is partially determined by perceived attributes of an innovation, called innovation characteristics, and proposes several attributes potentially important across diverse innovation adoption domains”. DOI theory explicates the innovation adoption process, the criteria used by adopters in adopting an innovation, and the types of adopter who are likely to adopt an innovation through the process of dissemination.

It is important to clarify the meaning of the term “diffusion” at this early stage. Soffer, Nachmias and Ram (2010:213) define diffusion as “the process, over time, by which an innovation is conveyed through certain channels among the members of a social system”. The key components in the concept of diffusion are innovation, the channel

of communication, time and the social system. Rogers (2003:12) defines innovation as “an idea, practice or object that is perceived as new by an individual or other unit of adoption”. Straub (2009:626) states that the perception of novelty is what matters most, irrespective of whether the practice or object is objectively new. This implies that in the context of innovation theory, an idea, practice or object does not have to be necessarily new to qualify as an innovation.

With respect to the rate of adoption, Rogers (2003:15) defines it as “the relative speed with which an innovation is adopted by members of a social system” and specifies the characteristics that affect the rate of adoption as: relative advantage, compatibility, complexity, trialability and observability, as explained below.

- Relative advantage – “the degree to which an innovation is perceived as better than the idea it supersedes”
- Compatibility – “the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters”
- Complexity - “the degree to which an innovation is perceived as difficult to understand and use”
- Trialability – “the degree to which an innovation may be experimented with, on a limited basis”
- Observability – “the degree to which the results of an innovation are visible to others” (Rogers, 2003:15–16).

While these characteristics are widely recognised as being influential in adopting or rejecting an innovation, other researchers have incorporated more characteristics. For

example, Moore and Benbasat (1991) include voluntariness, which they define as “the extent to which [the] use of the innovation is perceived as being voluntary or of free will” (Moore & Benbasat, 1991:195). Corrocher (2011:548) points out that even the risk associated with a particular innovation could influence the rate of adoption. Therefore, apart from the DOI characteristics, there are other factors that can influence the rate of adoption of a particular innovation.

Like the previously discussed models, the DOI theory has also been applied in technology adoption research. For example, Rutherford (2008) used the DOI theory to identify the types of social software adopted by public libraries in New Zealand and the USA. Neo and Calvert (2012) employed the DOI theory to explore the factors that influence public libraries in adopting or rejecting Facebook. But, as with other models, the DOI theory has limitations too. As Rogers (2003:105) notes, “although diffusion research has made numerous important contributions to our understanding of human behaviour change, its potential would be even greater were it not for certain shortcomings and biases”. These include the fact that DOI “is primarily descriptive rather than prescriptive, it does not tell how to facilitate adoption but rather why adoption occurs” (Straub, 2009:632).

Minishi-Majanja and Kiplang’at (2005:223) argue that DOI does not provide guidance on how to fast-track the rate of adoption or the basis for predicting outcomes. Moreover, Karahanna, Straub and Chervany (1999:186) observed that the DOI theory is silent on how the attitude is formed, and how it influences the adoption or rejection of technology. Despite its weaknesses, Neo and Calvert (2012:227) insist that DOI is a useful theory in gaining an understanding of the processes concerned with technological

innovations. While DOI seems a plausible candidate theory to answer the research questions of this study, it was developed to guide studies in a variety of contexts as opposed to theoretical models that were specifically developed for information technology contexts. It is for this reason that DOI was not chosen as the theoretical framework upon which this study is grounded. The next section discusses the TAM which was specifically developed to enhance understanding of technology acceptance and use.

### **2.3.4 Technology Acceptance Model**

The Technology Acceptance Model (TAM) was developed by Davis (1986) as “an adaptation of the TRA specifically tailored for modelling user acceptance of information systems” (Davis, Bagozzi & Warshaw, 1989:985). It was conceived to predict and explain determinants of information technology acceptance and usage at a workplace (Venkatesh & others, 2003:428).

The TAM theorises that “the users’ behaviour of using technology is determined by their behavioural intention, which is influenced by their perceived ease of use and usefulness of the technology” (Kim, 2012:693). As illustrated in Figure 2.3, the TAM constructs are perceived usefulness and perceived ease of use.

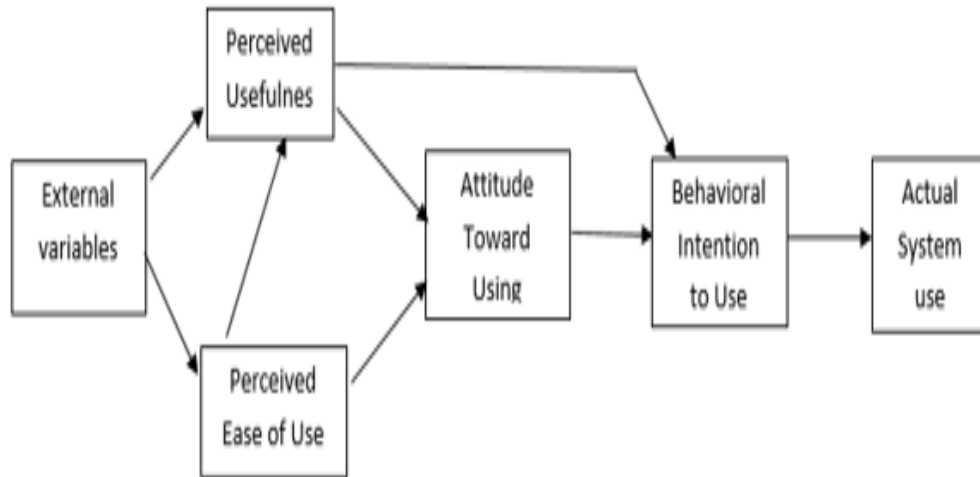


Figure 2.3: Technology Acceptance Model  
 Source: Davis, Bagozzi and Warshaw (1989:985)

While perceived usefulness (PU) is defined as “the degree to which a person believes that using a particular system would enhance his or her job performance”, perceived ease of use (PEU) refers to “the degree to which a person believes that using a particular system would be free of effort” (Davis, 1989:320). Park, Roman, Lee and Chung (2009:197) affirm that TAM was developed to measure user perceptions of the usefulness and ease of use of technology. The TAM is therefore aimed at providing a better understanding of the user’s acceptance and use of various technologies.

The TAM has been widely applied in several studies investigating the use of technologies, including web technologies. For example, Lee and Lehto (2013) applied the TAM to uncover behavioural factors that influence intention to use YouTube. Kim (2012) used the TAM as a model in a study that explored the acceptance and use of social software tools in South Korea, Park and others (2009) tested the applicability of TAM in using a digital library system, and Hong, Thong, Wong and Tam (2002:115) found the TAM appropriate in understanding students’ intention to use a digital library.

These are clear examples of the suitability of TAM in investigating technology deployed in library settings.

As with other theoretical models, TAM has not been spared criticism by researchers.

For example, Bagozzi referred to the following shortcomings associated with the TAM:

The absence of a sound theory and method for identifying the determinants of PU and PEU, as well as other bases for decision making, the neglect of group, social and cultural aspects of decision making, the reliance on naïve and over-simplified notions of effect and emotions, and finally the over dependence on a purely deterministic framework without consideration of self-regulation processes (Bagozzi, 2007:245).

Rauniar Rawski, Yang and Johnson (2014:8) acknowledge that “TAM was developed with an original emphasis on the design of systems characteristics and fails to take into account some salient characteristics of social media”. For example, the legal and ethical implications arising from the use of web technologies by media are not captured in the TAM. With many web technologies, anyone with an interest can self-publish information. This substantiates the need for more research to validate the adequacy and appropriateness of the original TAM in explaining the acceptance and usage of web technologies.

Fenech (1998:630) observed that the TAM constructs alone, namely PU and PEU, pose some limitations in predicting the acceptance and usage of the World Wide Web. To counteract such limitations, Rauniar and others (2014:25) proposed additional constructs such as trustworthiness (TW), critical mass (CM), perceived playfulness (PP) and social networking site capability (CP) for TAM. These observations reflect the need for more research on this theoretical model in order to deepen understanding of the factors that influence the usage of technologies. Because of the limitations

associated with the TAM, the UTAUT discussed in the following section was devised to combine various characteristics from other related models.

### **2.3.5 Unified Theory of Acceptance and Use of Technology**

Credited to Venkatesh and others (2003), the Unified Theory of Acceptance and Use of Technology (UTAUT) was conceptualised to address the weaknesses associated with various fragmented theoretical models of the acceptance and use of technology. The UTAUT model consists of four constructs, namely, performance expectancy, effort expectancy, social influence, and facilitating conditions, which influence user acceptance and actual use of technology – these constructs are moderated by the variables of gender, age, experience and voluntariness (Venkatesh & others, 2003:447). The UTAUT is the result of longitudinal empirical evaluation and the comparison of eight previously competing theoretical models, and it has integrated 32 constructs from the eight models previously developed (Oye, Iahad & Rahim, 2014:256).

According to Oh and Yoon (2014:717), the eight previous theoretical models on which the UTAUT was based are the

- Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975)
- Technology Acceptance Model (TAM) (Davis, 1989)
- Theory of Planned Behaviour (TPB) (Ajzen, 1991)
- Model of Personal Computer Utilisation (MPCU) (Thompson, Higgins & Howell, 1991)
- Motivational Model (Davis, Bagozzi & Warsaw, 1992)
- Combination of TAM and the TPB (Taylor & Todd, 1995)
- Social Cognitive Theory (SCT) (Compeau & Higgins, 1995)

- Diffusion of Innovation Theory (DOI) (Moore & Benbasat 1991; Rogers, 2003).

The need to synchronise the various fragmented models has been noted by researchers. For example, referring to the existence of the various competing models, Williams, Rana and Dwivedi (2015:443) state that the situation has led to confusion among researchers, as they often employ characteristics across a variety of competing models and theories. Bhatiasevi (2016:800) notes the confusion resulting from the use of different terminologies to explain similar concepts. Oh and Yoon (2014:716) support the need for an integrated view, arguing that many studies have considered the aspect of individuals' information technology acceptance from divergent perspectives, employing different theories in a wide range of service industries, which causes confusion.

The proponents of the UTAUT recognised the need to harmonise several theories that have been used in explicating technology acceptance and use, arguing that UTAUT aims “to integrate the fragmented theory and research on individual acceptance of information technology into a unified theoretical model that captures the essential elements of eight previously established models” (Venkatesh & others, 2003:467). This is one of the important strengths attributed to UTAUT, and it can therefore be regarded as a comprehensive effort to harmonise major theories on behavioural intention and technology acceptance.

The research that resulted in the formulation of UTAUT was motivated to compensate for the weaknesses associated with previous models. It has been reported that UTAUT outperforms the previously well-established eight models (adjusted variance ( $R^2$ ) of

70%) (Venkatesh & others, 2003:467). This has enhanced the predictive ability of the usage of technology, and is a strong motivation to apply UTAUT in this study. While UTAUT is a powerful theoretical model, the contributions made by preceding theories should also be recognised.

Compared to the TAM and the TRA, the UTAUT leads to a much better understanding of the factors that influence the incorporation of technology into services, including social impact, intent, innovation and user behaviour (Shu & Chuang, 2011:853). Straub (2009:627) points out that UTAUT is primarily intended to provide answers to questions about the application of technology. Gruzd, Staves and Wilk (2012) recognise that UTAUT is “a widely adopted technology acceptance theory used to explain why some people are more or less likely to adopt and use a particular information technology”. It is for these reasons, and the appropriateness of UTAUT to the research questions of this study, that UTAUT was adopted as one of the theories that underpin this study.

The choice of UTAUT in this study was largely motivated by its comprehensiveness and appropriateness to explain the factors that influence the incorporation of web technologies in services. UTAUT is illustrated below in Figure 2.4 and its four constructs are discussed in the next section with explanations of how they are applied in this study. As depicted in Figure 2.4, performance expectancy, effort expectancy and social influence factors have a direct influence on behavioural intention, which affects the use behaviour. In contrast, the facilitating conditions construct directly affects the use behaviour.

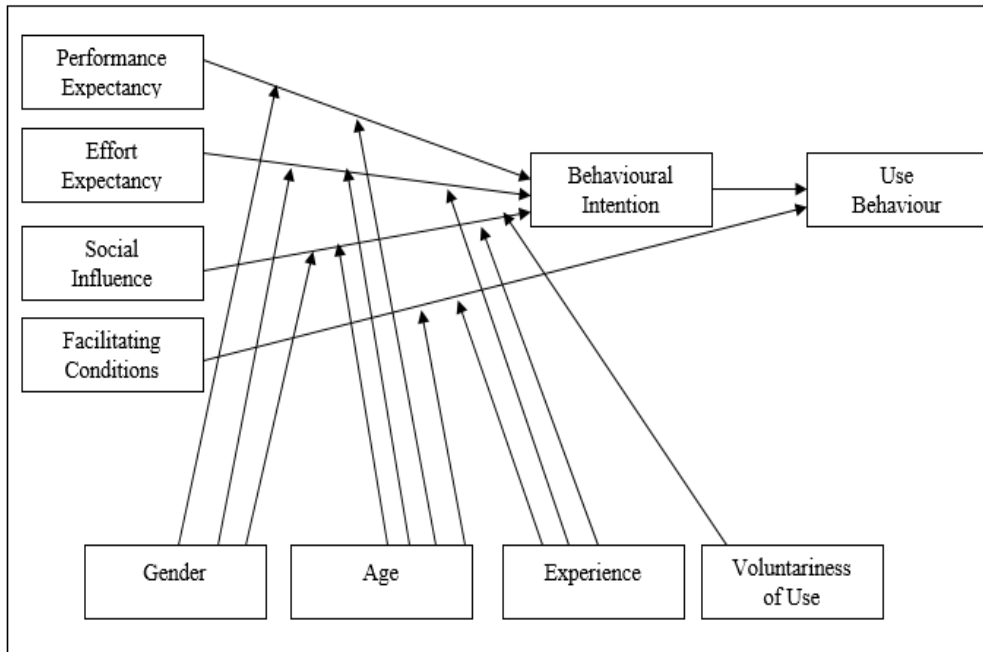


Figure 2.4: Unified Theory of Acceptance and Use of Technology (UTAUT)  
Source: Venkatesh and others (2003:447)

### 2.3.5.1 Performance expectancy

According to Venkatesh and others (2003:447), performance expectancy is “the degree to which an individual believes that using the system will help him or her to attain gains in job performance”. This refers to the extent to which one thinks that using a specific technology or system will be useful and offers benefits for improving his or her performance of specific tasks.

Within the context of this study, performance expectancy is contextualised to mean the degree to which librarians and students believe that using web technologies incorporated by their university libraries will help them in their job performance and in achieving their research and educational goals respectively. It has to do with the belief of librarians and students in the value that web technologies are perceived to bring to library services. Performance expectancy is a multidimensional construct and is rooted in several constructs from other theories and models, as summarised in Table 2.1 below.

Table 2.1: Performance expectancy: root constructs, definitions, and scales

Construct	Definition	Items
Perceived usefulness (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989)	The degree to which a person believes that using a particular system would enhance his or her job performance.	<ol style="list-style-type: none"> <li>1. Using the system in my job would enable me to accomplish tasks more quickly.</li> <li>2. Using the system would improve my job performance.</li> <li>3. Using the system in my job would increase my productivity.</li> <li>4. Using the system would enhance my effectiveness on the job.</li> <li>5. Using the system will make it easier to do my job</li> <li>6. I would find the system useful in my job.</li> </ol>
Extrinsic motivation (Davis, Bagozzi & Warshaw, 1992)	The perception that users will want to perform an activity because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay or promotion.	<ol style="list-style-type: none"> <li>1. Extrinsic motivation is operationalised using the same items as perceived usefulness from TAM (items 1 through 6 above).</li> </ol>
Job-fit (Thompson, Higgins, & Howell, 1991)	How the capabilities of a system enhance an individual's job performance.	<ol style="list-style-type: none"> <li>1. Use of the system will have no effect on the performance of my job (reverse scored).</li> <li>2. Use of the system can decrease the time needed for my important job responsibilities.</li> <li>3. Use of the system can significantly increase the quality of output on my job.</li> <li>4. Use of the system can increase the effectiveness of performing job tasks.</li> <li>5. Use can increase the quantity of output for the same amount of effort.</li> <li>6. Considering all tasks, the general extent to which use of the system could assist on the job. (Different scale used for this item.)</li> </ol>
Relative advantage (Moore & Benbasat, 1991)	The degree to which using an innovation is perceived as being better than using its precursor.	<ol style="list-style-type: none"> <li>1. Using the system enables me to accomplish tasks more quickly.</li> <li>2. Using the system improves the quality of the work I do.</li> <li>3. Using the system makes it easier to do my job.</li> <li>4. Using the system enhances my effectiveness on the job.</li> <li>5. Using the system increases my productivity.</li> </ol>

Outcome expectations (Compeau & Higgins, 1995)	Outcome expectations relate to the consequences of the behaviour.	If I use the system... <ol style="list-style-type: none"> <li>1. I will increase my effectiveness on the job.</li> <li>2. I will spend less time on routine job tasks.</li> <li>3. I will increase the quality of output of my job.</li> <li>4. I will increase the quantity of output for the same amount of effort.</li> <li>5. My co-workers will perceive me as competent.</li> <li>6. I will increase my chances of obtaining a promotion.</li> <li>7. I will increase my chances of getting a raise.</li> </ol>
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Source: Venkatesh and others (2003:448–449)

The performance expectancy construct was used in this study to address the research questions relating to the types of web technology incorporated in library services and the factors that influence the university libraries investigated in this study to incorporate web technologies in services for the benefit of their users. The performance expectancy construct is also used to uncover the benefits that the library users believe they derive from using web technologies incorporated in their university library services. Thus, this construct examines their belief that web technologies are useful in improving performance in terms of the provision of and access to information. An identification of such factors provides useful insights to address the research questions of this study. More specifically, the performance expectancy construct helped to establish whether incorporating web technologies enabled each library in the sample to:

- interact with users more quickly
- improve the delivery of information literacy instructions
- enhance the creation and sharing of information with the users
- improve library outreach programmes and activities
- minimise information overload
- provide library services timeously

- provide the selective dissemination of information more effectively, and
- improve the quality of library services overall.

### **2.3.5.2 Effort expectancy**

Effort expectancy is defined as “the degree of ease associated with the use of the system” (Venkatesh & others, 2003:450). In this study, effort expectancy is operationalised to mean the degree to which librarians and students find it easy to use web technologies incorporated by their university libraries. This construct seeks to address issues about the ease of use, difficulties, familiarity and user-friendliness associated with using web technologies in performing and accomplishing specific tasks.

A key question here is: do librarians and students find it easy to use web technologies incorporated into library services? Logically, the more a technology is easy to use the more likely it is that users will be motivated to use it. By contrast, a difficult-to-use technology will require users to put more effort into learning and acquiring the necessary skills, which, in turn, could likely be a disincentive to users.

The specific questions asked were whether librarians and library users find it easy to:

- use web technologies in the delivery of library services
- learn how to use web technologies
- use web technologies in outreach services
- understand web technologies, and
- navigate web technologies.

A question was also asked as to whether librarians and library users require much training to use web technologies. These same issues were explored in the focus group discussions with undergraduate and postgraduate students. In other models that were developed prior to UTAUT, effort expectancy is associated with the constructs indicated in Table 2.2.

Table 2.2: Effort expectancy: root constructs, definitions and scales

Construct	Definition	Items
Perceived ease of use (Davis, 1989; Davis, Bagozzi & Warshaw, 1989).	The degree to which a person believes that using a system would be free of effort.	<ol style="list-style-type: none"> <li>1. Learning to operate the system would be easy for me.</li> <li>2. I would find it easy to get the system to do what I want it to do.</li> <li>3. My interaction with the system would be clear and understandable.</li> <li>4. I would find the system to be flexible to interact with.</li> <li>5. It would be easy for me to become skilful at using the system</li> <li>6. I would find the system easy to use.</li> </ol>
Complexity (Thompson, Higgins & Howell, 1991).	The degree to which a system is perceived as relatively difficult to understand and use.	<ol style="list-style-type: none"> <li>1. Using the system takes too much time from my normal duties</li> <li>2. Working with the system is so complicated it is difficult to understand what is going on.</li> <li>3. Using the system involves too much time doing mechanical operations (e.g. data input).</li> <li>4. It takes too long to learn how to use the system to make it worth the effort.</li> </ol>
Ease of use (Moore & Benbasat, 1991).	The degree to which using an innovation is perceived as being difficult to use.	<ol style="list-style-type: none"> <li>1. My interaction with the system is clear and understandable.</li> <li>2. I believe that it is easy to get the system to do what I want it to do.</li> <li>3. Overall, I believe that the system is easy to use.</li> <li>4. Learning to operate the system is easy for me.</li> </ol>

Source: Venkatesh and others (2003:451)

### 2.3.5.3 Social influence

Social influence is defined as “the degree to which an individual perceives that important others believe he or she should use the new system” (Venkatesh & others, 2003:451). This study operationalised social influence as the degree to which librarians and students believe that fellow librarians and students think that they should use web technologies incorporated by their university libraries. This construct is associated with behavioural intention and deals with the influence exerted on individuals to use technology.

Social influence is a relevant construct because people and institutions do not live in isolation; there is always a complex social system comprising various stakeholders within which individuals and institutions operate that may influence the incorporation of technology in services. In other models, social influence is related to the constructs indicated in Table 2.3.

Table 2.3: Social influence: root constructs, definitions and scales

Construct	Definition	Items
Subjective norm (Ajzen, 1991; Davis, Bagozzi & Warshaw, 1989; Fishbein & Ajzen, 1975; Mathieson, 1991; Taylor & Todd, 1995).	The person’s perception that most people who are important to him [or her] think he [or she] should or should not perform the behaviour in question	<ol style="list-style-type: none"> <li>1. People who influence my behaviour think that I should use system.</li> <li>2. People who are important to me think that I should use the system.</li> </ol>
Social factors (Thompson, Higgins & Howell, 1991).	The individual’s internalisation of the reference group’s subjective culture, and specific interpersonal agreements that the individual has made with others, in specific social situations	<ol style="list-style-type: none"> <li>1. I use the system because of the proportion of co-workers who use the system.</li> <li>2. The senior management of this business has been helpful in the use of the system.</li> <li>3. My supervisor is very supportive of the use of the system for my job.</li> <li>4. In general, the organisation has supported the use of the system.</li> </ol>

Image (Moore & Benbasat, 1991).	The degree to which use of an innovation is perceived to enhance one's image or status in one's social system	<ol style="list-style-type: none"> <li>1. People in my organisation who use the system have more prestige than those who do not.</li> <li>2. People in my organisation who use the system have a high profile.</li> <li>3. Having the system is a status symbol in my organisation.</li> </ol>
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Source: Venkatesh and others (2003:452)

In this study, the social influence construct was used to identify the factors that influence university libraries to incorporate web technologies in services for the benefit of the users. It is also used to ascertain factors that influence librarians and library users to use certain web technologies. In the research instruments, the social influence construct is covered by several questions exploring these influences. These questions are intended to uncover social pressure exerted on these libraries to incorporate web technologies in services, and on librarians and users to use web technologies.

#### 2.3.5.4 Facilitating conditions

Facilitating conditions are defined as “the degree to which an individual believes that an organisational and technical infrastructure exists to support [the] use of the system” (Venkatesh & others, 2003:453). This study contextualised facilitating conditions to mean the degree to which librarians and students believe that their universities and libraries have the necessary organisational and ICT infrastructure to support their usage of web technologies incorporated by their libraries. Related concepts from other models are presented in Table 2.4.

Table 2.4: Facilitating conditions: root constructs, definitions and scales

Construct	Definition	Items
Perceived behavioural control (Ajzen, 1991; Taylor & Todd, 1995).	Reflects perceptions of internal and external constraints on behaviour and encompasses self-	<ol style="list-style-type: none"> <li>1. I have control over using the system.</li> </ol>

	efficacy, resource facilitating conditions, and technology facilitating conditions.	<ol style="list-style-type: none"> <li>2. I have the resources necessary to use the system.</li> <li>3. I have the knowledge necessary to use the system.</li> <li>4. Given the resources, opportunities and knowledge it takes to use that system, it would be easy for me to use the system.</li> <li>5. The system is not compatible with other systems I use.</li> </ol>
Facilitating conditions (Thompson, Higgins & Howell, 1991).	Objective factors in the environment that observers agree make an act easy to do, including the provision of computer support	<ol style="list-style-type: none"> <li>1. Guidance was available to me in the selection of the system.</li> <li>2. Specialised instruction concerning the system was available for assistance with system difficulties.</li> <li>3. A specific person (or group) is available for assistance with system difficulties.</li> </ol>
Compatibility (Moore & Benbasat, 1991).	The degree to which use of an innovation is perceived as being consistent with the existing values, needs and experiences of potential adopters	<ol style="list-style-type: none"> <li>1. Using the system is compatible with all aspects of my work.</li> <li>2. I think that using the system fits well with the way I like to work.</li> <li>3. Using the system fits into my work style.</li> </ol>

Source: Venkatesh and others (2003:454)

The facilitating conditions construct relates to the enabling environment and hence in this study it helped to answer the research question about the environmental factors that influence the use of web technologies. Questions included in the research instruments about facilitating conditions include whether home institutions, that is, universities, provide the necessary technological infrastructure and support, and encouragement to incorporate and use web technologies in the professional work carried out by their libraries. It also helped to discover the existence of policy frameworks to facilitate the effective use of web technologies, and to ascertain the security and ethical issues associated with the use of web technologies.

### **2.3.5.5 Moderating variables**

As depicted in the UTAUT model (Figure 2.4), the core constructs, namely, performance expectancy, effort expectancy, social influence and facilitating conditions, are moderated by the variables of gender, age, experience and voluntariness of use (Venkatesh & others, 2003:469). These moderators were considered inapplicable in this study because the questionnaire used to collect the main data was administered to library staff responsible for spearheading the implementation of web technologies in university libraries in the SADC region, as opposed to individual librarians selected according to different sampling methods.

### **2.4 Library user-centred theory**

The user-centred theory that complemented the UTAUT to address the research questions of this study is Library 2.0. It is important to indicate here that an examination of websites of university libraries in the SADC region showed that they have not deployed web 3.0 and 4IR technologies. Hence, this study is underpinned by Library 2.0. Maness (2006) defines Library 2.0 as “the application of interactive, collaborative, and multimedia web-based technologies to web-based library services and collections”. Meanwhile, Holmberg, Huvila, Kronqvist-Berg and Widen (2009:677) state that Library 2.0 is “a change in interaction between users and libraries in a new culture of participation catalysed by social web technologies”. This means that Library 2.0 offers users an opportunity to participate in library activities by giving their inputs through web technologies. Maness (2006) proposed the following four essential elements that underpin the theoretical foundation of the Library 2.0:

1. *User-centredness*. This can be viewed as a participatory library where users participate in library activities by creating content to make their inputs on library

services through web technologies. The creation and consumption of content is dynamic and allows for introducing customer-driven library services.

2. *Multimedia experience.* Collections and services in the Library 2.0 environment are accessed in various formats, including video and audio. This allows for the exchange of information in different formats using various devices.
3. *Socially rich.* The library virtual environment comprises both users and library staff using various web technologies to communicate. Users are essentially immersed in the library virtual environment through the library websites.
4. *Communally innovative.* The library recognises the needs of the community it serves. It develops responsive and inclusive services, taking into account the changing information needs of the community.

While Library 2.0 is intrinsically associated with Web 2.0 technologies (Connor 2007:6; Kelly, Bevan, Ackerman, Alcock & Fraser, 2009:312; Lwoga 2013:289), its emphasis on user-centredness makes it suitable for the purpose of this study. Sodt and Summey (2009) argue that library services that take into account user needs can be considered as Library 2.0, reasoning further that some of the services provided by the library conform to the concept of Library 2.0 even before it was proposed, as long as such services are user-centred (Sodt & Summey, 2009:105). It can therefore be argued that the Library 2.0 theory presents elements that are the hallmarks of the user-centred services expected in libraries, which embrace web technologies to provide effective services to their users.

The idea of Library 2.0 is to enable library users to access the library services offered through web technologies anywhere, as long as they have Internet access and

appropriate devices. It is for the above-stated reasons that Library 2.0 is employed in this study to address users’ perspectives on web technologies incorporated by university libraries in the SADC region, and ultimately achieve the aim of this study, namely, developing a user-centred model for the incorporation of web technologies in these libraries. The next section discusses how UTAUT and Library 2.0 theory have been integrated into this study.

## 2.5 Integration of the UTAUT and Library 2.0 theories

The need to integrate the two theories, namely UTAUT and Library 2.0, stems from the aim of this study which was to develop a user-centred model for the incorporation of web technologies in university libraries in the Southern Africa Development Community (SADC) region. To achieve this aim, the research questions raised by this study (see Chapter 1, Section 1.4) investigated issues of incorporation of web technologies in university libraries, as well as important factors perceived by the users in using web technologies. Table 2.5 below shows the relationship between the research questions, theories, constructs, respondents and research instruments.

Table 2.5: Relationship between the research questions, theories, constructs, respondents and research instruments

Research question	Theory	Construct	Respondents	Research instrument
1. What web technologies are incorporated in the services of university libraries in the SADC region?	UTAUT	<ul style="list-style-type: none"> <li>Performance expectancy</li> <li>Social influence</li> </ul>	Librarians who played a role in digital services	<ul style="list-style-type: none"> <li>Questionnaire</li> <li>Individual interviews</li> </ul>
			Undergraduate and postgraduate Students	<ul style="list-style-type: none"> <li>Focus group discussions</li> </ul>

<b>2. What factors influenced university libraries in the SADC region to incorporate web technologies in their services?</b>	UTAUT	<ul style="list-style-type: none"> <li>• Performance expectancy</li> <li>• Efforts expectancy</li> <li>• Social influence</li> <li>• Facilitating conditions</li> </ul>	Librarians who played a role in digital services	<ul style="list-style-type: none"> <li>• Questionnaire</li> <li>• Individual interviews</li> </ul>
			Undergraduate and postgraduate Students	<ul style="list-style-type: none"> <li>• Focus group discussions</li> </ul>
<b>3. What are the perceptions of users towards the library services enhanced by web technologies?</b>	Library 2.0	<ul style="list-style-type: none"> <li>• User-centredness</li> </ul>	Librarians who played a role in digital services	<ul style="list-style-type: none"> <li>• Questionnaire</li> <li>• Individual interviews</li> </ul>
			Undergraduate and postgraduate Students	<ul style="list-style-type: none"> <li>• Focus group discussions</li> </ul>
<b>4. How can these factors be used to develop a user-centred model for implementing web-based library services?</b>	UTAUT Library 2.0	<ul style="list-style-type: none"> <li>• Performance expectancy</li> <li>• User-centredness</li> <li>• Multimedia experience</li> </ul>	Librarians who played a role in digital services	<ul style="list-style-type: none"> <li>• Questionnaire</li> <li>• Individual interviews</li> </ul>
			Undergraduate and postgraduate Students	<ul style="list-style-type: none"> <li>• Focus group discussions</li> </ul>

UTAUT satisfactorily addresses the library’s perspectives in terms of influential factors for the incorporation of web technologies. It also delves into users’ perceptions regarding the performance and effort expectancies of web technologies incorporated in their respective university library services. In contrast, Library 2.0 deals with the users’ perspectives on the web technologies incorporated in their library services. Thus, Library 2.0 was employed to give insights into the aspects of user-centredness of web technologies in library services. Table 2.5 maps the relationships of the research questions to UTAUT and Library 2.0 and their corresponding constructs. It further

shows the relationship between the units of analysis (respondents) and the research instruments employed to collect the necessary data.

## **2.5 Summary**

An examination of all the theories indicates that no one size fits all, as choosing an appropriate theory for a research project will be dependent upon the research aims and research questions. It is for this reason that the UTAUT and Library 2.0 were deemed the most appropriate theories supporting the aims of this study as presented in Chapter 1, Section 1.3. These theories are fit for the purpose of developing a user-centred model for the incorporation and use of web technologies in SADC university libraries. The next chapter presents the literature review on the incorporation and use of web technologies in university libraries.

## **CHAPTER 3**

### **LITERATURE REVIEW**

#### **3.1 Introduction**

This chapter presents a review of the relevant literature whose purpose is to highlight key insights arising from the findings and conclusions of related studies that have examined aspects pertinent to the incorporation and use of web technologies in a library environment. In terms of scope, the review is confined to the incorporation and usage of web technologies by university libraries, but it also highlights factors influencing the incorporation and use of web technologies in other types of libraries. Several key themes that have direct relevance to the research questions raised by this study (see Chapter 1, Section 1.4) emerged from the literature review. These themes can be grouped broadly into the following categories which also constitute the foundation upon which the literature review for this study is structured and developed:

1. Historical overview of web technologies
2. Web technologies incorporated in library services
3. Factors influencing university libraries to incorporate web technologies in their services
4. User perceptions of the library services enhanced by web technologies.
5. User-centred services in library settings

#### **3.2 Historical overview of web technologies**

The evolution of web technologies is manifested through several phases which describe the key functions and accruable benefits associated with the development of specific web technologies. The historical developmental phases of web technologies have been labelled as

Web 1.0, Web 2.0, Web 3.0, Web 4.0 and, of late, the Fourth Industrial Revolution (4IR). According to Aghaei, Nematbakhsh and Farsani (2012:1), Web 1.0 is a web of cognition; Web 2.0 is a web of communication; Web 3.0 is a web of cooperation and Web 4.0 is a web of integration. In this study these are clustered together and fall within the definition of web technologies. While the development of web technologies from Web 3.0 onwards does not form part of this study, an overview of Web 3.0, Web 4.0 and the 4IR is given here to illustrate the historical development of web technologies that can be applied in library services.

Web 1.0 was developed based on the concept of the read-only web, and its design was such that users could only read content displayed on a particular web page and could not add or edit such content (Ahmed, 2015:6). This means that with Web 1.0 it was possible only to read textual information or images or data published on web pages. No opportunities for interaction and content creation were possible with this first generation of web technologies. In contrast, Web 2.0 offers opportunities for online interaction and collaboration. Anderson (2012:15) labelled Web 2.0 as a read-write web, and Peltier-Davis (2009:18) characterised it as a place “where users are both consumers and producers of online content”. Web 2.0 facilitates the active participation of users in information creation, rather than just being consumers of information (Deodato, 2014:734).

In describing the historical development of web technologies, Rudman and Bruwer (2016:133) assert that “initially, there were the static informative characteristics of the early Web, referred to as Web 1.0, which progressed into the more interactive experience of Web 2.0”. Tella and Oladapo (2016:507) state that Library 2.0, a term intrinsically associated with Web 2.0, provides possibilities for libraries to introduce services that are user-centred. The third generation in web technologies development has been described as Web 3.0, which is

associated with the concept of the read-write-execute web (Naik & Shivalingaiah, 2008:501). Hendler (2009:111) defines Web 3.0 as “semantic web technologies integrated into, or powering, large-scale web applications”. Web 3.0 represents another shift in organising and accessing information in the sense that it integrates the semantic web, Web 2.0 tools and artificial intelligence (Kwanya, Stilwell & Underwood, 2013:191). Anderson (2012:297) argues that “the semantic web is, at least in part, an attempt to represent knowledge in a way that allows computers to automatically come to conclusions and make decisions as a result of a certain type of reasoning”. Web 3.0 is not limited to browsers, it is a sophisticated web characterised by the multi-device, multi-channel and multidimensional throughput of information (Creps & Kimppa, 2015:727). Perrin (2017) states that Web 3.0 offers the possibility of addressing a key challenge faced by librarians confined to text only searches, explaining that

[w]ith a robust semantic web, users would be able to browse the Internet by topic, not simply search for text. The disambiguation of concepts becomes easy, allowing users to specify exactly what kind of thing they are looking for, even if other things share that name. This would speed up the process of gathering facts for research topics, eliminating the need to read hundreds of articles or web pages. The semantic web allows the human race to shift some of the responsibility for thinking and reasoning to a computer program (Perrin, 2017:364).

Web 3.0 can therefore be viewed as another elevated level of web technology development that can enhance the key library function of providing access to information through linked data. The fourth generation in the evolution of web technologies has been assigned the term Web 4.0. According to Choudhury (2014:8099), “Web 4.0 can be considered as an ultra-intelligent electronic agent, symbiotic web and ubiquitous web”. Noh (2015:789) states that Web 4.0 is more symbiotic, and is an intelligent web that enables interactions between people and between people and machines, and that it facilitates personalised information services. This suggests

that Web 4.0 elevates information access to a high level by enabling machines to automatically provide information based on an individual's expressed information needs.

The 4IR constitutes the convergence of a variety of technologies including “robotics, artificial intelligence, cloud computing, big data, linked data, 3D printing, biotechnology and the integration of technology with the human body” (Frederick, 2016:10). Chigwada and Chisita (2021:3) note that “the 4IR has greatly affected the way library and information centres conduct their daily activities in ensuring that the dynamic and diverse needs of users are met”. This is a transformative technology that has the potential to enhance access to information and data in all formats. While some concerns have been expressed that the 4IR may replace librarians' jobs, Hussain (2020:1) is more optimistic, reasoning that the 4IR, if librarians embrace it, presents libraries with an opportunity to enhance their services.

The discussion above describes developments that have been shaping web technologies. Such developments present ample opportunities for university libraries to not only broaden but also to simplify access to information and sharing of data. Web technologies “demand staff whose focus shifts wholly to information access rather than emphasising the procedures which are designed to facilitate information access such as acquisition, cataloguing and lending” (Byrne, 2008:371). Developments in web technologies call for librarians to continuously sharpen their skills and respond to such dynamic developments by planning and implementing appropriate technologies to improve access to information and data, and ultimately enhance job performance for the benefit of their users.

### **3.3 Web technologies incorporated in library services**

It is recognised that not all web technologies were purposely developed to fulfil a specific function in the provision of library services. However, even those that have not been purposely

developed for a library environment may have functionality features that have attracted interest among the Library and Information Science (LIS) researcher and practitioner communities. Collins and Quan-Haase (2014:50) observed that scholars and practitioners have shown great interest in continually gaining a better understanding of the opportunities and challenges that web technologies present to libraries. This is because librarians are eager to implement web technologies in order to provide effective services and improve the convenience demanded by library users in accessing information (Williams, 2020:137).

The literature search revealed that libraries have incorporated different types of web technology in their services. It also became apparent from the literature review that university libraries employ web technologies for information sharing, the promotion of library services, collaborative work, online reference services and training (Mahmood & Richardson, 2011:370; Makori, 2012:36; Baro, Idiodi & Godfrey, 2013:180; Jones & Harvey, 2019:13), as well as those that were purposely developed for information discovery in library settings (Shi & Levy, 2015:717; Ngo, Hennesy & Knabe, 2019:228).

The next section not only mentions the types of web technology incorporated by university libraries in the Southern Africa Development Community (SADC) region, but also briefly discusses the purposes for which they are deployed.

### **3.3.1 Web technologies used for sharing information and marketing library services**

In their review of the periodical literature published in the Emerald database between the years 2007 and 2011, Singh and Gill (2013:180) note that web tools such as blogs, IM, mash-up, multimedia sharing tools, podcasts, really simple syndication (RSS) feeds, social networking sites (SNSs), social bookmarking and wikis have been incorporated in libraries. Similarly,

Tripathi and Kumar (2010:200) found that RSS, blogs, podcasts, IM and wikis constituted the types of web technology incorporated by academic libraries in Australia, Canada, the United Kingdom (UK) and the United States of America (USA). In China and Nigeria, Si, Shi and Chen (2011:656) and Akwang (2021:5), respectively, reported similar results. These web technologies, commonly known as social media, are mostly used for sharing information, marketing and promoting library services, facilitating collaborative work, as well as alerting users to new publications and acquisitions.

Mahmood and Richardson (2011:369) found that RSS was the most widely used social media in the 100 academic libraries they studied in the USA. Similar research (Shoniwa & Hall, 2007:72; Harinarayana & Raju, 2010:85; Si, Shi & Chen, 2011:655) has reported that RSS was the most popular web tool incorporated by many university libraries. These findings are, however, incongruent with those of Akwang (2021:5), who reported that RSS feeds were one of the least used web tools by librarians in university libraries in Akwa Ibom State in Nigeria. Apart from Akwang's study, the literature revealed the increased deployment of RSS feeds in libraries. This finding is not surprising because this tool can fulfil important functions in university libraries such as providing regular information updates to selected individuals, including academics, researchers and postgraduate students. In addition, the RSS tool enables university libraries to provide selective dissemination of information (SDI). SDI employs such methods to distribute bibliographic references and new publications received in the library to selected researchers (Bates, 1996:157).

Kim and Abbas (2010:215) argue that subscription to RSS allows users to receive library information updates even if they do not visit the library website. Lwoga (2014:195) has shown how RSS feeds allowed the Muhimbili University of Health and Allied Sciences (MUHAS)

Library in Tanzania to enhance its service delivery by providing user-centred services targeted to specific user groups who share common interests. Several other researchers (Linh, 2008:643; Chua & Goh, 2010:208; Wordofa, 2014:274) reported that libraries have employed RSS to

- publicise new acquisitions
- provide information about latest events, lectures and news
- update users on electronic resources
- alert users when papers or journals of interest emerge, and
- generally, update the users on a variety of library activities.

It is evident that RSS feeds have practical application within the library working environment, corresponding well with the Unified Theory of Acceptance and Use of Technology (UTAUT) construct of performance expectancy and the Library 2.0 principle of user-centredness. RSS feeds are useful in today's world where people are often overwhelmed by the large amount of information available on the web. Therefore, the RSS tool is not only useful for managing the dissemination of information but also to minimise the effect of information overload (Harinarayana & Raju, 2010:75).

Notwithstanding the powerful utility of RSS, it should be stressed again that the actual choice of which web technologies a university library deploys may be influenced by various factors. In addition, by their nature, many of the web technologies need to be updated in a sustainable manner, otherwise users may lose interest in continuing to use them. Therefore, a commitment on the part of the library is essential to regularly update information on their web technologies. This will allow users to access the latest information quickly.

Other web technologies that have grown in popularity are some of the social networking sites (SNSs) such as Facebook (recently renamed Meta) and Twitter, as evidenced in several studies. For example, a study that investigated the application of several web technologies in selected libraries in Tanzania found that Facebook was the most frequently used tool (Muneja & Abungu, 2012). Baro, Ebiagbe and Godfrey (2013:15) reported similar results in Nigeria and South Africa, where they found that Facebook was the most frequently used web technology for various library-related purposes by university librarians in these two countries. These results are consistent with the findings of another study that concluded that Facebook and Twitter were the most frequently used web tools in the top 82 university libraries in sub-Saharan Africa (Wordofa, 2014:275). Boateng and Liu (2014:126) found that Facebook and Twitter were the most popular social media in the top 100 academic libraries in the USA. Several other studies (Xie & Stevenson, 2014:509; Tella & Oladapo, 2016:511; Zohoorian-Fooladi & Abrizah, 2014:162) have reported similar results.

A number of researchers have also written about the value of SNSs in libraries. For example, Dickson and Holley (2010:477) noted that “they provide new platforms for reaching students beyond the traditional library building and website by allowing students to access librarians and the library’s resources without leaving the comfort of the web sites they use the most”. It is evident that Facebook and Twitter have become popular web technologies, surpassing many other SNSs in terms of volume of use. Collins and Quan-Haase (2014:63) attribute the popularity of Twitter to its ease of use and its relatively low maintenance. Lwoga (2014:196) noted that the MUHAS Library in Tanzania employed Facebook to inform users about information literacy instruction, conferences and the acquisition of new information resources. Other studies (Wordofa, 2014:274; Boateng & Liu, 2014:127) provide findings that are in harmony with the results reported above.

Current trends suggest that Facebook and Twitter will continue to be popular tools in facilitating the exchange of information and building relationships, particularly among young people. Unlike Facebook and Twitter, other web tools such as YouTube, Pinterest and Instagram “necessitate skills other than just the ability to work the application, for example the ability to shoot videos for YouTube or to take photos for Instagram, as well as access to equipment, e.g. cameras, needed to do this” (Jones & Harvey, 2019:12). Nevertheless, these tools can be instrumental in promoting the library and by so doing increasing awareness of library’s services and resources among users.

The extensive use of Facebook and Twitter, especially among young people, provides strong evidence of their popularity. Since the popularity of Facebook appears to be growing among the student population, university libraries should promote their services and activities through Facebook. Lwoga (2014:190) found that 72.4% of students at Muhimbili University of Health and Allied Sciences in Tanzania had personal accounts on Facebook. Similarly, Devi and Tevera (2014:23) found that a large proportion of health science students (78%) at the University of Swaziland were using Facebook. These findings indicate a considerable number of students using Facebook and further reinforce the view that Facebook is indeed a globally appealing tool to many university students.

However, the literature also revealed that a number of university libraries have deployed some web technologies, particularly SNSs, which are not actively used. For example, Collins and Quan-Haase (2014:57) observed that some of the university libraries they studied in Canada had a number of dormant web technologies. This suggests that university libraries have to make

concerted efforts to market and publicise all the web tools they make available. The next section discusses web technologies employed by libraries specifically for information discovery.

### **3.3.2 Web technologies employed for library information discovery**

According to Trapido (2016:10), library discovery products include online public access catalogues (OPACs), discovery layers and web-scale discovery tools. Trapido (2016:10) further describes these products as follows:

- OPACs are a user interface of an integrated library system (ILS).
- Discovery layers are user interfaces, separated from an ILS, that have enhanced functionalities such as faceted navigation and ranking of relevant search results and can search the institutional repository.
- Web-scale discovery tools have advanced functionalities and features that can search OPACs, institutional repositories and electronic databases subscribed by the library through a single search interface.

Web-scale discovery tools are the latest tools for searching the different digital library collections (Djenno, Insua, Gregory, & Bratley, 2014:264). The review of the literature revealed that university libraries have incorporated web-scale discovery tools to satisfy library users' expectations (Hamlett & Georgas, 2019:230) by searching multiple library collections through a single search interface (Djenno & others, 2014:264). A library web-scale discovery tool may be defined as “a search engine that builds on unified indexes of licensed scholarly information, searches across multiple library databases provided by different vendors” (Shi & Levy, 2015:717). The most commonly used web-scale discovery tools in university libraries are EbscoHost discovery, WorldCat discovery, Ex-Libris Primo and Summon discovery (Ngo, Hennesy & Knabe, 2019:228). These tools “attempt to combine traditional MARC21 records

from the catalogue with other types of metadata that can include a combination of full-text articles” (Allison & Mering, 2018:1).

Guajardo, Brett and Young (2017:16) note that the traditional OPAC and databases search functionalities no longer meet library users’ expectations as they prefer a one-click search to get the information they need from multiple library collections. Many libraries in the world have invested in web-scale discovery tools replacing or complementing the traditional OPAC or federated search tools (Bhebhe & Ngwenya, 2016:168). A one-search interface to search multiple library collections has encouraged libraries to deploy web-scale discovery tools. As Galbreath, Merrill and Johnson (2021:1) state “the one-stop shopping model of discovery environments is one of their most alluring features as it closely resembles searching the open web”. Many university libraries in the world have deployed web-scale discovery tools to provide access to scholarly electronic information in a more efficient manner. Djenno and others (2014:264) assert that “in the continual quest to provide a simple search interface for the information available in multiple formats through academic library websites many libraries have implemented the latest generation of search products, known as discovery tools”.

Allison and Mering (2018:4) report that many Association of Research Libraries (ARL) have deployed web-scale discovery tools such as Primo, Summon, EbscoHost discovery, Encore Duet and WorldCat discovery to improve access to information in digital formats. In Zimbabwe, Bhebhe and Ngwenya (2016:173) found several university libraries that had employed web-scale discovery tools. In addition, the University of Houston Libraries have incorporated and over time changed several web-scale discovery tools with the view to assessing which of these tools can suit their goal of improving user access to digital collections (Guajardo, Brett & Young, 2017:16). Galbreath, Merrill, and Johnson (2021:1) raise a concern

about a large number of publications that can be retrieved from a search query, arguing further that this may require the users to sift through the sheer volume of results before eventually getting what is relevant. Despite this concern, many libraries have found web-scale discovery tools useful for improving access to scholarly information from distinct library collections.

To summarise this section, it can be argued that while web technologies are increasing in diversity, it should be noted that not all types of web technologies are appealing to librarians. Some are more popular than others, and this can be attributed to various factors, including some of the UTAUT constructs such as performance expectancy, effort expectancy and social influence. The literature indicates that apart from web-scale discovery tools that are purposely developed for libraries, RSS, blogs, wikis, IM, podcasts and SNSs are some of the web tools that are frequently used in libraries (Chua & Goh, 2010:206). This finding implies that it is the potential value and functionality features of each web technology that would most likely influence university libraries to incorporate a specific web technology in their services. The next section discusses the factors that influence university libraries to incorporate and use web technologies.

### **3.4 Factors influencing university libraries to incorporate web technologies**

University libraries are continuously being influenced by various factors to incorporate and use web technologies. These include, but are not limited to, new developments and dynamic changes in information and communication technologies, the shift to electronic publishing trends and scholarly communication, information-seeking behaviours, as well as changes in higher education. It is generally acknowledged that the accruable benefits derived from technology are likely to have a bearing on organisations' and people's adoption and usage of a particular technology. The term "usage" is used here to indicate habitual use as commonly used

by researchers investigating the relationship between web technologies and the people who adopt them (Taylor & Todd, 1995; Baro, Ebiagbe & Godfrey, 2013).

The review of the literature revealed that researchers have used a number of technology acceptance and use theories to investigate the factors that influence libraries to incorporate and/or use a number of web technologies. For example, Pinigas, Cleopas and Phiri (2018) investigated students' acceptance of e-resources in Zimbabwe state university libraries and their study was underpinned by UTAUT2, an extended version of the original UTAUT. A study by Izuagbe, Ifijeh, Izuagbe-Roland and Olawoyin (2019) that assessed the perceived usefulness of social media in private university libraries in Nigeria, was informed by the extended version of the technology acceptance model (TAM2) as a theoretical lens.

A study by Williams, Saunderson and Dhoest (2021) that explored the universities of Antwerp and Limpopo students' perceptions of the adoption of Facebook and Twitter in a university library setting, was underpinned by UTAUT. Similarly, Mensah and Onyancha (2022) employed UTAUT as a theoretical framework for their study that examined the factors that influenced librarians and library users (students and academic staff) in university libraries in Ghana to adopt and use social media. The review of the literature also demonstrated a dearth of research specifically investigating the influential factors in the incorporation and use of web technologies by university libraries, and how such factors can be exploited to implement user-centred library services enhanced by web technologies.

It is, however, important to note that the UTAUT has attracted favourable attention in research that seeks to understand the adoption and actual use of technologies. Gruzd, Staves and Wilk (2012:2347) confirmed that the UTAUT constructs, namely, performance expectancy, effort

expectancy, social influence and facilitating conditions, are appropriate in predicting scholarly usage of web technologies. In addition, Mabweazara and Zinn (2016:7) reported that the usage of web technologies by librarians at the University of the Western Cape in South Africa and the National University of Science and Technology in Zimbabwe was influenced by various factors such as management support, Internet access, infrastructure and equipment, social media policy, flexible organisational policies and pressure from clients. These aspects are covered well by the UTAUT constructs.

A study in Kenya revealed that perceived usefulness, ease of use and management support have a direct influence on ICT usage in Kenyan higher education (Macharia & Pelsler, 2014:706). In Nigeria, Oye, Iahad and Rahim (2014:265) reported that usefulness, ease of use influenced academic staff at the Adamawa University to accept and use technology. In the USA, Nah and Saxton (2012:306) revealed that web capabilities and external pressures were key influential factors in the usage of web technologies by non-profit organisations. These factors have a good fit with the constructs in UTAUT (Venkatesh & others, 2003), one of the theories that underpinned this study along with the Library 2.0 theory (Maness, 2006). The sections that follow present the review of the literature pertaining to the UTAUT constructs, namely, performance expectancy, effort expectancy, social influence and facilitating conditions and the Library 2.0 theory construct of user-centredness. The UTAUT constructs are discussed in the next section.

### **3.4.1 Performance expectancy**

Performance expectancy is contextualised in this study as the degree to which librarians and students believe that using the web technologies incorporated by their university libraries will help them in their job performance and in achieving their educational or research goals

respectively. The review of the literature revealed that many librarians consider web technologies to be useful tools in the delivery of library services. For example, a recent study by Akwang (2021) found that a great majority of librarians (98%) in university libraries in Akwa Ibom State in Nigeria indicated that Web 2.0 tools “enhance their job performance, promote library activities, and support interaction and collaboration among users” (Akwang, 2021:4). Similarly, Mensah and Onyanha (2022:330) reported that library staff and users in university libraries in Ghana they studied consider social media to be useful tools for improving access to library services and resources, and facilitating efficient communication.

Moreover, Khan, Masrek, Mahmood and Qutab (2017:1234) found that usefulness was a significant influential factor in the adoption of digital reference services by librarians at Pakistani universities. Mabweazara and Zinn (2016:7) found that over 75% of librarians at the University of the Western Cape in South Africa and the National University of Science and Technology in Zimbabwe were influenced by the usefulness of web technologies. Usefulness is a variable in the TAM which is equivalent to the construct of performance expectancy in the UTAUT. These findings suggest that librarians across many university libraries hold positive views on web technologies and regard such tools as useful in improving library operations and the delivery of library services.

Some of the research reviewed for this study focused on students as the subject of analysis. For example, Gitau and Omwenga (2016:208) found that performance expectancy was an influential factor in the usage of web technologies in e-learning by students and staff in selected public universities in Kenya. Moorthy and others (2019:136) revealed that performance expectancy had a major effect on undergraduate students’ usage of the digital library at a private university in Malaysia. In addition, Williams, Saunderson and Dhoest (2021:12)

revealed that students at the universities of Antwerp in Belgium and Limpopo in South Africa consider Facebook and Twitter beneficial in improving the sharing of information and promoting library activities. As such, performance expectancy played an important role in students' usage of the social media incorporated by the University of Antwerp.

Surprisingly, students at the University of Limpopo did not enjoy the benefits offered by social media as their university library had not incorporated such tools owing to the university's restrictive policy (Williams, Saunderson & Dhoest, 2021:12). This is a surprising finding because the use of social media permeates all spheres of life and is now widespread in many university libraries. Nevertheless, Jones and Harvey (2019:12) also referred to librarians' concerns about institutional controls dictating, for example, the type of social media a library should adopt.

Research by Pinigas, Cleopas, and Phiri (2018:188) had different findings from the above-mentioned researchers, as they found that performance expectancy was not a significant factor in influencing the intention of undergraduate and postgraduate students at selected Zimbabwean state university libraries to adopt e-resources. This finding is also surprising because e-resources comprise library authenticated peer-reviewed publications that students ought to find useful for their studies and research projects. There may, therefore, be other factors such as poor Internet connectivity and inadequate ICT equipment that may explain this contradictory finding.

In summary, the literature has shown that performance expectancy plays a significant role in influencing librarians and students to use web technologies. This construct seeks to explain whether the web technologies incorporated by libraries are beneficial for librarians and library

users. The accruable benefits associated with these tools should determine their deployment in library services. Therefore, librarians need to align each web technology to the task it is expected to perform (Chu & Du, 2012:70). This suggests that web technologies can only be successful in library settings if the purposes of such tools are clearly articulated and the potential benefits are known before deployment. The next section discusses another UTAUT construct, namely effort expectancy.

### **3.4.2 Effort expectancy**

Effort expectancy is operationalised in this study as the degree to which librarians and library users find it easy to use web technologies incorporated by their university libraries. The requisite skills component relates to the effort expectancy in the UTAUT construct. Skills are important because web technologies incorporated by university libraries will be meaningless unless staff and the library users have the requisite skills to use them. Del Aguila-Obra and Padilla-Meléndez (2006:96) stress the need for training as one of the important considerations when a new technology is to be deployed.

Training is of paramount importance since it can ensure the effective usage of web technologies, which can lead to the efficient performance of tasks. Chu and Du (2012:70) point out that lack of skills is one of the stumbling blocks in the successful implementation of some of the web technologies in university libraries. Nyakweba, Bukirwa, Sendikadiwa and Ratanya (2021:10) reveal that 80% of library users at public university libraries in the western region of Kenya found the OPAC difficult to use, compared to only 20% who found it easy to use. These findings suggest that in order to fully reap the benefits offered by web technologies, librarians and users have to dedicate sufficient time and commitment to learning how to use new technologies. Furthermore, librarians need to be flexible and committed to learning and

adapting to new web technologies as they emerge, as a lack of skills among library staff will have a negative impact on the library's capacity to achieve the goal of improving the services enhanced by web technologies.

It became apparent from the literature that ease of use of web technologies influenced librarians and students to use such tools. For example, Khan and others (2017:1234) found that ease of use was a significant influential factor in the adoption of digital reference services by librarians at a Pakistani university. In addition, Jones and Harvey (2019:11) reported ease of use as one of the benefits librarians consider in using social media, while Pinigas, Cleopas and Phiri (2018:188) reveal that the effort expectancy factor inversely influenced the intention of undergraduate and postgraduate students at selected Zimbabwean state university libraries to adopt e-resources. This implies that these students would adopt e-resources irrespective of whether they were easy to use or not. In addition, Mensah and Onyancha (2022:330) found that ease of use and less effort influenced library staff's and the library users' adoption and usage of social media in university libraries in Ghana.

Williams, Saunderson, and Dhoest (2021:12) reported that students at the University of Antwerp in Belgium and the University of Limpopo in South Africa found Facebook and Twitter easy to use and accessed such tools via their smartphones. A study by Moorthy and others (2019) showed inconsistent findings in that they found no relationship between effort expectancy and students' intention to use the digital library. They attributed this finding to the fact that digital natives, who constituted their subject of analysis, may already be knowledgeable about web technologies, and many may have gained the necessary experience and skills to use web technologies effectively prior to their university enrolment, resulting in their finding these tools easy to use (Moorthy & others, 2019:136–137).

In summary, the literature suggests that web technologies are typically easy to use and that most web tools are prevalent in many aspects of life. Some librarians and students alike are accustomed to using web tools not only in university settings but also in their personal life. Consequently, they benefit from prior learnt knowledge when they are required to use web technologies to search for academic and research information from a university library. The next section discusses the UTAUT construct of social influence.

### **3.4.3 Social influence**

Social influence is operationalised in this study to mean the degree to which librarians and students believe that fellow librarians and students think that they should use web technologies incorporated by their university libraries. Social influence is one of the key UTAUT constructs and is associated with the influence exerted on librarians and library users by stakeholders and other external and internal factors to incorporate and use web technologies.

As an external factor, social influence has the power to explain pressure from other libraries to incorporate web technologies, as well as the image and reputation the library portrays to the world. Harrison, Burress, Velasquez and Schreiner (2017:254) argue that such influences lead libraries to consider using web technologies in order to retain legitimacy among their peers. This is indicative of the influence exerted by other libraries to incorporate web technologies in their services. Libraries may therefore imitate one another to conform to contemporary trends and best practices relating to the incorporation and usage of web technologies.

As an internal factor, social influence has been reported to have an effect on librarians' and library users' use of web technologies. For example, Moorthy and others (2019:136) found that social influence had a major effect on undergraduate students' usage of the digital library at

private universities in Malaysia. Pinigas, Cleopas and Phiri (2018:188) found that the social influence factor strongly influenced the intention of undergraduate and postgraduate students at selected Zimbabwean state university libraries to adopt e-resources.

Akwang (2021:4) found that the majority of librarians (55%) in university libraries in Akwa Ibom State in Nigeria were influenced to adopt and use Web 2.0 tools by fellow librarians, while 72% were influenced by the library users. This finding contradicts that of Mensah and Onyanha (2022:330), who reported that social influence was not an influential factor for the library staff's and library users' adoption and usage of social media in Ghanaian university libraries. Williams, Saunderson, and Dhoest (2021:12) reported that the University of Antwerp in Belgium supported students' use of Facebook and Twitter incorporated by their university library. Senior management at the University of Limpopo in South Africa, in contrast, did not support the adoption and use of Facebook and Twitter in their library. This suggests that even if students at this university are influenced to use Facebook and Twitter, they cannot use such tools for accessing and sharing library-related information.

In summary, the literature suggests that social influence may or may not influence librarians and students to use certain web technologies, and this may be dependent on the perceived usefulness they attach to a specific web technology. The next section discusses another UTAUT construct, namely, facilitating conditions.

#### **3.4.4 Facilitating conditions**

This study contextualises facilitating conditions to mean the degree to which librarians and students believe that their universities and libraries have the necessary organisational and ICT infrastructure to support their usage of the web technologies incorporated by their libraries.

Facilitating conditions within an organisation include management support, levels of ICT infrastructure and equipment, and training offered to librarians and students to use web technologies effectively.

Management support is an important factor, as leaders play a pivotal role in inspiring their institutions to succeed in implementing innovations, including web technologies. A lack of management support will stifle endeavours to incorporate web technologies and implement user-centred services. Oh and Yoon (2014:727) reported that facilitating conditions influence the usage of Internet services. It can be argued that if facilitating conditions are not favourable, this may discourage users from using web technologies and reaping the benefits derived from these tools. Positive attitudes by users may also have a major impact on the usage of web technologies.

Jantz (2012:8) states that “turbulence and change in the external environment can create situations in which the organisation must innovate in order to survive”. This assertion holds true for university libraries wishing to harness the profound transformative power of web technologies. It is clear that facilitating conditions is an important UTAUT construct that has implications for the effective incorporation of web technologies in university libraries. External influential factors that can be considered under facilitating conditions include government policies under which the university libraries in the sample operate. If, for example, a particular government has restrictive policies and regulations, it will negatively influence the university libraries’ incorporation of web technologies. The opposite situation – i.e. the provision of enabling conditions by governments – will likely influence university libraries to incorporate and use web technologies with enthusiasm.

The review of the literature also revealed that facilitating conditions are key enablers that influence the usage of web technologies by librarians and students. For example, Mensah and Onyancha (2022:330) found that library staff and library users consider facilitating conditions, such as enabling facilities and resources as well as skills, to be important influential factors in their usage of social media. Moreover, Williams, Saunderson and Dhoest (2021:13) reported that the University of Antwerp in Belgium has the necessary ICT infrastructure to facilitate students' use of Facebook and Twitter. In contrast, the University of Limpopo in South Africa has limited Internet access and this may explain why the use of social media is restricted at this university.

Moorthy and others (2019:136) revealed that facilitating conditions had a major effect on undergraduate students' usage of the digital library at a private university in Malaysia. Surprisingly, Pinigas, Cleopas and Phiri (2018:189) found that facilitating conditions did not have a significant influence on the intention of undergraduate and postgraduate students at selected Zimbabwean state university libraries to adopt e-resources.

Nakhoda and Tajik (2017:544) found that the need for retraining, reluctance to experience new change, and lack of interest were some of the key factors that influenced library staff at the Tehran University library to resist technological change. Cervone (2011:97) offers a number of strategies to counteract resistance to change, including aligning the change to organisational strategic objectives, communicating and motivating the change effectively, and engaging continuously with all stakeholders.

Despite the excitement about the incorporation of web technologies in university libraries, some of those on the African continent face many challenges in harnessing the potential offered

by web technologies. For example, Kwanya, Stilwell and Underwood (2012) observed that inadequate ICT infrastructure, unstable bandwidth, the shortage of technical skills, the absence of supportive policies and a shortage of funds were the main challenges facing libraries in Kenya in their use of web technologies. These findings are consistent with the results of other studies carried out to examine the incorporation of some of the web technologies in some African university libraries (Makori, 2012:37; Baro, Ebiagbe & Godfrey, 2013:16). Reinforcing these findings, a study conducted by Lwoga (2014) reported several challenges that impede the successful implementation of web technologies tools at the MUHAS Library in Tanzania:

These include inadequate number of computers, unstable Internet connectivity, insufficient electricity; inadequate awareness and Internet skills; inadequate financial resources; a shortage of trained ICT and library staff; and a lack of supportive policy/guidelines, authentication, security, and ownership of intellectual property of Web 2.0 services (Lwoga, 2014:197).

It is regrettable that some university libraries on the African continent face a number of serious challenges that impede their staff and users from reaping the benefits offered by web technologies. Some of the challenges highlighted such as inadequate ICT infrastructure and limited funding (Jain & Akakandelwa, 2016:149) may be beyond the control of these university libraries. Where such problems exist, the libraries are likely to suffer the consequences, as such problems can hinder positive developments pertaining to effective use of web technologies.

The successful use of web technologies is heavily dependent on sound and robust ICT infrastructure and equipment. Consequently, the availability of modern ICT infrastructure at the regional, national and institutional levels has a significant influence on the usage of web technologies. Arthur, Adu-Manu and Yeboah (2013:77) reported that ICT infrastructure and policies were among the factors that influenced lecturers in private universities in Ghana to adopt and eventually use web technologies for teaching and learning purposes. Tripathi and

Kumar (2010:203) found a low usage of podcasts in academic libraries and attributed this to the lack of high-speed Internet connectivity, among other factors. Linh (2008:642) ascribed the low usage of podcasts to the lack of audio equipment, and the need to have soundproof rooms where users could utilise this tool. All these factors play an important role in facilitating and incentivising the usage of web technologies.

### **3.5 Ethical, security and privacy implications of the use of web technologies**

As with other technological tools, the introduction of web technologies has raised several ethical issues that users must take into consideration. The ethical and security issues relating to the use of web technologies include privacy concerns, such as identity theft and surveillance, misuse of data, and online relationships that can be manipulated to harm users emotionally and materially (Wasike, 2013:8). Hazari and Brown (2013:32) support this view, arguing that “interaction in social media and networking environments gives rise to issues such as privacy and security”. These concerns are justified given the fact that many of the web technologies allow users to disclose sensitive information, including personal data, on their social networking profiles.

Research has also explained that users frequently divulge personal data on the web without much forethought (Young & Quan-Haase, 2009:265). This finding is consistent with a study by Fogel and Nehmad (2009), who investigated risk-taking, trust and privacy concerns relating to the use of social networking sites by college students. They found that almost all students who provided their phone numbers and home addresses “allowed anyone and not just approved friends to view their profile” (Fogel & Nehmad, 2009:159). These findings suggest that in a web technology environment, users interact freely and are likely to share personal details on social networking platforms with little regard for security concerns. This situation makes it

important for librarians to sensitise users to ethical and privacy issues when they use the web technologies incorporated by their university libraries.

Several social networking platforms such as Facebook and Twitter present more privacy concerns than search engines because they oblige users to disclose their identity and personal information when they log in (Hazari & Brown, 2013:32). Such disclosure of personal information could potentially aggravate cybersecurity threats and compromise users' privacy (Kisekka, Bagchi-Sen & Raghav Rao, 2013:2722). Therefore, despite their many benefits, web technologies can also be used irresponsibly to advance improper conduct and unethical behaviours.

To counteract unethical behaviours, university libraries are advised to maintain an online environment “in which people perceive a high control over information by making their management and motivation for requested data clear and transparent, increasing their trust in online social network systems” (Taddei & Contena, 2013:825). It is advisable to strike a balance between doing nothing and trying to gain a deeper understanding of the risks associated with implementing web technology services (Cvetkovic, 2009:16). Librarians can play an important role by frequently updating their knowledge about the risks associated with the use of web technologies, and accordingly alert their users to such risks.

It is also important to note that the providers of web technologies have not turned a blind eye to ethical and privacy issues, having put measures in place to ensure that users maintain ethical behaviours on web technology platforms. For example, Facebook clarifies users' rights and responsibilities, and has a statement on data policy (Facebook, 2022). Additionally, many web technology sites such as YouTube (2022) and Twitter (2021) provide comprehensive

information on copyright and have uploaded privacy policies for users to become acquainted with. It is thus imperative to make sure that all users of web technologies in libraries understand the associated security and privacy concerns. While the legitimate concerns about privacy and security issues relating to web technology usage linger on, the incorporation of these technologies in libraries is unlikely to decline. Mahmood and Richardson (2011:372) predict that libraries will continue to deploy web technologies in order to improve the quality of services. Peltier-Davis (2009) earlier argued that the proponents of the interactive web technologies “predict that the Library 2.0 model for service will ultimately replace traditional, one-directional service offerings that have characterized libraries for centuries” (Peltier-Davis, 2009:18).

It is very important for librarians to be mindful of the user needs before incorporating web technologies into their web-based services. A deeper understanding of user needs can be achieved by conducting research into users’ interest in using different types of web technology to access library services. Litt (2013:1655) states that social media users need to be equipped with skills that will enable them to make informed decisions about which personal information they can share, and how they should share such information on web technology platforms. There could be many users who fail to familiarise themselves with copyright and privacy issues arising from web technologies. This is where university libraries are expected to play an important role in user education. The next section discusses the user-centred services in library settings.

### **3.6 User-centred services in library environment**

The concept of user-centred services is not new to the library and information science (LIS) sector. According to Dalrymple (2001:155), Douglas Zweizig (1976) authored an article,

entitled “With our eye on the user”, which urged LIS researchers to not only gain a better understanding of public library usage but also to implement and deliver services with public library users in mind. While this particular research was conducted many years ago, it is still relevant in today’s library services. Kautonen and Nieminen (2018:2) observe that libraries are embracing user-centred design (UCD) approaches in their implementation of information services to meet the ever-changing information needs of their users.

A UCD can be viewed as “both a design philosophy and a process focused on optimising interfaces in response to how people work, rather than expecting people to alter their work habits to accommodate the demands of the interface” (Tempelman-Kluit & Pearce, 2014:617). Bronstein (2007:60) notes that a user-centred approach is manifested in the nature of information professionals’ roles. Mason (1990) argues that the role of librarians is “to get the right information from the right source to the right client at the right time in the form most suitable for the use to which it is to be put and at a cost that is justified by its use” (Mason, 1990:125). In performing these roles, librarians are increasingly paying more attention to user-centred services to provide quality services that satisfy the information needs of their users (Mwai, 2016:87). According to McLaughlin (2015:33), “libraries are evolving, borrowing user-centred design techniques from the information technology world for technology and user interface improvements”. University libraries now take advantage of new developments in web technologies to create and offer user-centred services to their users.

Ugwu and Onyancha (2019: 276) define user-centred services as a “services model that puts the user at the centre of library and information services and outlines transformative processes of meeting his or her needs”. Connaway, White, Lanclos, Le Cornu and Hood (2013:20) emphasise that “in order to develop library systems and services that will meet the varied needs

and situations of today's information seekers, it is necessary to identify how, why, and under what circumstances individuals use various available systems and services". This underscores the importance of the goal of empowerment of users to participate in and contribute to library activities.

Tidal (2012:90) acknowledges the necessity to collect and evaluate users' information-seeking behaviours if the library is to provide user-centred services. The literature suggests that traditional libraries may have regarded information as the heart of the library, resulting in users having to navigate library space to access such information (Nguyen, Partridge, & Edwards, 2012:338). Connaway, Dickey and Radford (2011:179) assert that in the past, systems and services dominated the development of library services, but in the modern era, the implementation of library services must be informed by the users' needs.

Contrasting views also emerged from the literature, suggesting that libraries have always been user-oriented institutions. For example, Walker (2018:295) contends that the library was conceived with the user in mind and as such its services are designed to respond to users' needs irrespective of the adopted enabling technology, arguing further that if libraries were only places to store information resources, they would be called archives. Despite these contrasting views, it can be argued that the user-centred approach in libraries has intensified because the information sector has become competitive, challenging libraries to introduce innovative services to meet the changing needs of the users (Ugwu & Onyancha, 2019: 275).

Jones and Harvey (2019) urge libraries to avoid developing library services without the users' inputs, emphasising further that "there must be, therefore, a dialogue with users to ascertain what their needs are, otherwise there is a possibility of channelling efforts in the wrong

direction” (Jones & Harvey, 2019:2). Moreover, Stephens and Collins (2007:255) argued that libraries have passed the time when they used to decide what is best for the user; instead, the user becomes an important stakeholder in library development (Nguyen, Partridge, and Edwards, 2012:338). It can therefore be inferred that the drive towards a user-centred approach to service delivery enables libraries to provide customised services based not only on their users’ information needs but also on the users’ information searching habits. Web technologies can help university libraries to implement user-centred services. Bhebhe and Ngwenya (2016:168–169) note that libraries are attracted by web-scale discovery tools because such tools facilitate user-centred services.

One of the user-centred approaches associated with the use of web technologies in the library environment is the Library 2.0 model. Since its origin, the term Library 2.0 has attracted heated debate by researchers in their efforts to define it (Holmberg, Huvila, Kronqvist-Berg & Widen, 2009:670). Nguyen, Partridge, and Edwards (2012:339) viewed Library 2.0 as a controversial term, preferring to use the term participatory library in describing a library that places emphasis on user-centredness. As the debate of what exactly Library 2.0 unfolded, Crawford (2006) found seven definitions of the term.

In defining Library 2.0, some researchers focused more on technology (Bradley, 2006; Maness, 2006), while others placed more emphasis on user-oriented library services enabled by web technologies (Casey & Savastinuk, 2006; Holmberg Huvila, Kronqvist-Berg & Widen, 2009; Lwoga, 2013). However, there is general consensus among researchers (Nguyen, Partridge, & Edwards, 2012:340; Lankes, Silverstein & Nicholson, 2007:23) that the core of Library 2.0 is a user-centred approach to library services where the users actively participate in the development of library services by giving their views and inputs.

Walker (2018:294) argues that “the concept of Library 2.0 is centred on a model of library services focused on user-centred change that provides tools that encourage two-way interaction between library users and staff, and it allows for both physical and virtual library spaces to be more collaborative and interactive”. In support of this view that the heart of Library 2.0 is user-centred change, Casey and Savastinuk (2006) emphasise that it is a participatory model that affords the library user an opportunity to continuously contribute to the development and evaluation of physical and virtual library services with a view to effectively satisfying the users’ information needs. Thus Library 2.0 is not only confined to technologies but also to library spaces and facilities that are user-centred.

Lwoga (2013:289) reasons that “Library 2.0 is a model for constant and purposeful change, whereby it empowers library users through participatory and user-driven services”. Tella and Oladapo (2016:507) assert that the Library 2.0 model presents an opportunity for libraries to use web technologies to provide interactive and user-centred services. All these researchers have confirmed that applying the Library 2.0 concept to its fullest will enable the library to improve existing services which can be useful and appreciated by the users. The next section discusses the perceptions of the users towards the library services implemented with web technologies.

### **3.7 Users’ perceptions of the library services incorporating web technologies**

It is imperative for librarians to understand the perceptions of users towards web technologies (Hamade, 2013:396). This can enable libraries to introduce services that are customised to their users’ information needs and searching habits. The literature has revealed that students have a positive attitude towards web technologies. For example, Jowitt (2008:324) found that students

have positive perceptions of the podcast technology used to provide online information literacy tutorials at the Universal College of Learning in New Zealand.

In Ghana, Asiedu and Badu (2018:177) concluded that acceptance and popularity of web technologies is high among students at the University of Ghana and Kwame Nkurumah University of Science and Technology. Arif, Ameen and Rafiq (2018:527) note that students consider web technologies as useful tools that help them to achieve their academic activities more efficiently. In India, Bhatt and Kumar (2014:599) found that the majority of students (66.4%) had positive perceptions of social networking sites and they believed that librarians can improve library services and help them with academic work through these tools. It is evident from these findings that students view web technologies in a positive light and would use them if afforded an opportunity by their libraries. The next section is a summary of the chapter highlighting the insights from the literature.

### **3.8 Summary**

The review of the literature has provided valuable insights for this study. It is evident from the literature that university libraries are continuously incorporating a variety of web technologies with the intention of improving the quality of their services. Web technologies that are frequently incorporated in many university libraries include library web-scale discovery tools, such as EbscoHost discovery, WorldCat discovery, Ex-Libris Primo and Summon discovery, and social media such as RSS feeds, Facebook, Twitter and YouTube.

The literature has further revealed useful findings about the key factors that influence the incorporation of web technologies in university libraries. It has also substantiated the suitability of the UTAUT constructs in helping to address the research questions of this study. It further

established that the UTAUT constructs, namely, performance expectancy, effort expectancy, social influence and facilitating conditions, are indeed influential in the usage of web technologies. These factors have been instrumental in formulating the questions posed in the research instruments (see Appendices 1, 3 and 6: Questionnaire, Interviews Guide and Focus Group Discussions Guide respectively).

The review further elucidated the concept of user-centred services in library settings, revealing that changes in higher education, ICTs and the competitive information environment, as well as user information-seeking behaviours have intensified the need for libraries to introduce innovative user-centred services. The literature further indicated that library users have positive perceptions of web technologies and their integration in libraries in order to improve service delivery. It also became clear that integrating web technologies into library services is no longer an option but a necessity for university libraries. This is because most students, especially the digital natives, make extensive use of technologies in their daily lives. The next chapter (Chapter 4) discusses the research design and methodologies followed in order to address the research questions raised by this study.

## **CHAPTER 4**

### **RESEARCH DESIGN AND METHODS**

#### **4.1 Introduction**

Chapter 4 describes the research design and methods employed by the researcher in order to answer the research questions raised by this study as presented in Chapter 1, Section 1.4. Research methodology is a systematic way to solve a research problem scientifically and it “encompasses research methods as well as the logic behind the chosen methods of the study” (Kothari, 2004:8). This chapter discusses the method and procedure that are adopted in the present study. The discussions are made under the following sub-headings: paradigm of research, research design, population of the study, sample and sampling procedure, research instruments, validity and reliability of instrument, data collection procedure, and method of data analysis.

#### **4.2 Philosophical paradigms**

It is well recognised that distinct research approaches, designs and methodologies do not exist in isolation but are necessarily associated with corresponding philosophical paradigms. Punch (2014:14) defines a paradigm as “a set of assumptions about the world, and about what constitute proper topics and techniques for inquiring into that world”. A paradigm has also been described as a frame of reference to aid researchers in comprehending and observing phenomena being studied (Babbie, 2010:33). These definitions suggest that a paradigm in research refers to a set of well-established assumptions within which a particular research project is located.

Different scholars have used distinct terms to refer to philosophical paradigms. For example, Cohen and Manion (1994:38) used the term ‘philosophical motivation’, while Heywood and Stronach (2005:116) referred to ‘philosophical approaches’. In contrast, Creswell and Creswell (2018:6) used the term ‘philosophical worldviews’. Since their definitions overlap, it is clear that these terms are used interchangeably in the literature. However, for consistency of purpose, the term ‘philosophical paradigm’ is adopted in this study.

Scholars have classified the different philosophical paradigms to help guide and inform the research process in terms of research approaches and designs. A classification of philosophical paradigms proposed by Creswell and Creswell (2018) is presented in Table 4.1.

Table 4.1: Four worldviews or [philosophical paradigms]

<b>Post-positivism</b>	<b>Constructivism</b>
<ul style="list-style-type: none"> <li>• <b>Determination</b></li> <li>• <b>Reductionism</b></li> <li>• <b>Empirical observation and measurement</b></li> <li>• <b>Theory verification</b></li> </ul>	<ul style="list-style-type: none"> <li>• Understanding</li> <li>• Multiple participant meanings</li> <li>• Social and historical construction</li> <li>• Theory generation</li> </ul>
<b>Transformative</b>	<b>Pragmatism</b>
<ul style="list-style-type: none"> <li>• <b>Political</b></li> <li>• <b>Power and justice-oriented</b></li> <li>• <b>Collaborative</b></li> <li>• <b>Change-oriented</b></li> </ul>	<ul style="list-style-type: none"> <li>• Consequences of actions</li> <li>• Problem-centred</li> <li>• Pluralistic</li> <li>• Real-world practice-oriented</li> </ul>

Source: Creswell and Creswell (2018:6)

Researchers need to make their philosophical paradigm explicit in their research project. Philosophical paradigms help a researcher to assess whether the proposed research is worth conducting, and whether the methods chosen are appropriate to accomplish the required results (Morgan, 2014:34). Moreover, according to Punch (2014), paradigms address important questions in research such as the following:

- “What the reality is like (ontology)

- What the relationship is between the researcher and that reality (epistemology); and
- What methods can be used for studying the reality (methodology)?” (Punch, 2014:15).

All these questions are pivotal in guiding the processes necessary for carrying out a scientific research project. It is also worth noting that several scholars have debated the merit of combining the different research approaches associated with distinct philosophical paradigms in one research project. Some scholars have even referred to this debate as the paradigm war, as noted by Evans, Coon and Ume (2011:277). Highlighting the paradigmatic debates, Creswell and Plano-Clark (2011:25) note that the argument by scholars is whether or not qualitative and quantitative data could be blended. This argument is being advanced against the background of the seeming irreconcilability of the paradigms associated with these two data categories.

Expressing that same line of thinking, Ngulube (2012:118) asserts that “the argument was that the two worldviews were based on different ontological (nature of reality), epistemological (nature of knowledge), axiological (values in inquiry) and methodological (process of research) assumptions which rendered the two paradigms incompatible”. This debate continues to attract the attention of scholars, particularly the proponents of mixed methods research (Johnson & Onwuegbuzie, 2004:14; Greene, 2008:10; Cameron, 2011:100; Harrits, 2011:151; Ma, 2012:1860; Teddlie & Tashakkori, 2012:779; Creswell, 2014:6; Morgan, 2018:271).

The paradigm debate appears to have matured with the passing of time because there is now a recognition that both quantitative and qualitative approaches to research can complement rather than compete with each other. Creswell (2010:46) observes that there has been an increase in both researchers and fields that have embraced and applied a mixed methods approach. Combining both approaches can achieve a deeper understanding of the phenomena being

studied (Onwuegbuzie & Leech, 2004:770; Venkatesh, Brown & Bala, 2013:24). The following paragraphs briefly discuss the four different philosophical paradigms presented in Table 4.1 and justify the selection of the most suitable philosophical paradigm for this study.

Post-positivism has its roots in the positivism paradigm, which is why it has been referred to as “the intellectual heir to positivism” (Teddlie & Tashakkori, 2009:69). According to Creswell (2014:7), post-positivists “hold a deterministic philosophy in which causes determine effects or outcomes”. This paradigm, associated with quantitative methodologies, was dominant during the 1950s to mid-1970s (Denscombe, 2008:271). Citing Guba and Lincoln (1994), Punch notes that in positivism the belief is “that objective accounts of the world can be given and that the function of science is to develop descriptions and explanations in the form of universal laws” (Punch, 2014:17). This indicates that the positivist paradigm attaches great importance to the relationship between objectivity and truth. Morgan emphasised that quantitative research is usually deductive, objective and general (Morgan, 2014:9), meaning that a post-positivist paradigm places a strong emphasis on theory testing and verification, and empirical observation and measurement. These distinctive principles associated with the post-positivism make this paradigm inappropriate for this study.

A constructivist paradigm assumes that individuals derive meaning from and experience reality in the world in which they live (Creswell & Creswell, 2018:8). In this paradigm, “realities are local, specific and constructed; they are socially and experientially based, and depend on the individuals” (Punch, 2014:17). The constructivist philosophical paradigm gained momentum as a viable alternative to the post-positivism during the mid-1970s to 1990s and is associated with qualitative methodologies (Denscombe, 2008:271).

Qualitative research focuses on research purposes and goals that are inductive, subjective, and contextual (Morgan, 2014:9). Unlike the deductive approach, the inductive method is an approach whereby theory is expected to emerge from the data, meaning that qualitative research typically involves generating new theories from observations rather than having predetermined ideas such as the hypotheses commonly used in quantitative research (Creswell & Creswell, 2018:4). Qualitative research gives emphasis to meanings and perspectives of the subject of analysis, and the researcher is immersed in the research process. Since this paradigm is exclusively associated with qualitative research, it could not be considered suitable on its own for the present study as it needed to collect both quantitative and qualitative data.

The transformative paradigm “arose during the 1980s and 1990s from individuals who felt that the post-positivist assumptions imposed structural laws and theories that did not fit marginalised individuals in society or issues of power and social justice, discrimination, and oppression that needed to be addressed” (Creswell, 2014:9). In this philosophical paradigm “an explicit connection is made between the process and outcomes of research and the furtherance of a social justice agenda” (Mertens, Bledsoe, Sullivan & Wilson, 2010:196). This implies that the principles of this paradigm relate to the research aspects addressing marginalised communities in societies, such as the underprivileged in terms of economic status, race, disability, sexual orientation, ethnicity, specific illness, etc. It is an appropriate paradigm to help in gaining a deeper understanding of underlying factors pertaining to social justice, inequality and human rights issues. As such, its research orientation is not congruent with the research aim of this study.

The pragmatic paradigm was chosen as the suitable philosophical paradigm for this study. It has been defined as “a philosophy in which meaning of actions and beliefs is found in their

consequences” (Morgan, 2014:26). According to Creswell (2014:10), this paradigm “arises out of actions, situations and consequences rather than antecedent conditions as in post-positivism”. It is strongly associated with mixed methods research (Cameron, 2009:141). Morgan has further clarified the distinctive attributes of pragmatism as follows: In contrast to philosophies that emphasise the nature of reality, pragmatists emphasise the nature of experience. In place of questions about the nature of truth, pragmatists focus on the outcomes of action. Instead of concentrating on individuals as isolated sources of beliefs, pragmatists examine shared beliefs (Morgan, 2014:27-28).

Morgan (2014:37) further argues that the pragmatic paradigm is suitable for research in the social sciences in general and mixed methods research in particular. Johnson, Onwuegbuzie and Turner (2007:113), Denscombe (2008:273), Johnson and Gray (2010:72) and Creswell and Plano-Clark (2011:41) are also in agreement that pragmatism is the appropriate philosophical orientation underpinning mixed methods research. It is clear that pragmatism provides an opportunity for researchers to combine or mix research methods.

It is also evident that pragmatism originates from the premise that some research questions cannot adequately be answered by quantitative or qualitative research alone. Accordingly, its strengths in reconciling the different research approaches in one particular research project make it a suitable paradigm for this study. The next section discusses and describes the research design employed in this study.

### **4.3 Research design and methodology**

According to the *Sage dictionary of social research methods*, research design is “a design or strategy that justifies the logic, structure and principles of the research methodology and

methods and how these relate to the research questions, hypothesis or proposition” (Jupp, 2006:265). The same dictionary defines methodology as “the philosophical stance or worldview that underlies and informs a style of research” (Jupp, 2006:175). However, there is a consensus among researchers that the terms ‘research design’, ‘research methodology’ and even ‘research methods’ can be confusing. Notwithstanding the possible confusion referred to above, a clear distinction can be made between these terms. For example, Kumar (2014:122) defines research design as the “road map that you decide to follow during your research journey to find answers to your research questions as validly, objectively, accurately and economically as possible”. In contrast, methodology is more procedural and is concerned with the techniques employed by the researcher for data collection (David & Sutton, 2011: 205). Thus, research methodology concentrates on the research process whereas research design focuses on the nature of study to be conducted and the results thereof (Babbie & Mouton, 2009:75; Gorard, 2010:239; Bryman, 2012:46).

While the characteristics that distinguish research design from research methodology are obvious, more confusion arises in distinguishing the term ‘research methodology’ from ‘research methods’. Mackenzie and Knipe (2006) express their astonishment that some research texts offer no definitions for the terms ‘methodology’ or ‘methods’. Some have used these terms interchangeably and yet others have provided conflicting meanings. The clarification by Kothari and Garg (2014:6-7) is useful, namely, research methods focus on techniques employed by the researcher in data collection and analysis to derive meaningful insights and conclusions from them, while research methodology focuses on how to conduct scientific research. From the above discussion, it can be reasoned that while research design more broadly encompasses the overall plan for executing a research project, research

methodology involves the procedures and practical steps for carrying out the research project. Research methods focus on the techniques and tools employed in collecting the necessary data.

#### **4.3.1 Research design**

As stated above, this study followed a mixed methods research design. Johnson and Onwuegbuzie (2004:17) define mixed method research as “the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study”. There is general consensus among scholars that qualitative research involves open-ended questions which mostly generate word-based narrative results (Glitz, 1997:385; Creswell & Creswell, 2018:4). By contrast, quantitative social science research generates data by using closed items in questionnaires, the responses and results of which are usually shown in the form of numbers and measurements (Gorard, 2010:238). Despite these two research approaches being distinctive, combining them in a single study has proved useful in many instances.

According to Tashakkori and Creswell (2007, quoted by Teddlie & Tashakkori, 2009:7), in mixed methods research “the investigator collects and analyses data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or program of inquiry”. Therefore, as its name implies, this method comprises research that integrates or mixes quantitative and qualitative research strategies and data in a single research project or a multi-phased study.

In this study, both quantitative and qualitative methods were employed in data collection. The proponents of the mixed methods approach have discussed different types of mixed methods design, with varying degrees of complexity (Greene, 2008:14-15; Teddlie & Tashakkori,

2009:139; Creswell, 2010:51-53; Creswell & Creswell, 2018:218). These discussions have focused mainly on whether the different methods are implemented separately or simultaneously, or whether one method plays a dominant role over the other, and how the results from both the quantitative and qualitative data are integrated in a single study. Johnson and Onwuegbuzie (2004:22) provide an illustrative example of the different types of mixed methods research design, as shown in Figure 4.1. This study followed the QUAN + qual format because the quantitative approach was dominant over the qualitative approach.

		Time Order Decision	
		Concurrent	Sequential
Paradigm Emphasis Decision	Equal Status	QUAL + QUAN	QUAL → QUAN QUAN → QUAL
	Dominant Status	QUAL + <u>quan</u>	QUAL → <u>quan</u> <u>qual</u> → QUAN
		QUAN + <u>qual</u>	QUAN → <u>qual</u> <u>quan</u> → QUAL

Figure 4.1: Mixed method design matrix with mixed method research designs  
Source: Johnson and Onwuegbuzie (2004:22)

In clarifying the abbreviations and symbols used in Figure 4.1, Johnson and Onwuegbuzie (2004:22) explain that “qual stands for qualitative, quan stands for quantitative; + stands for concurrent; → stands for sequential; capital letters denote high priority or weight; and lower case letters denote lower priority or weight”. For example, the symbol QUAN → qual shows the dominance of the quantitative approach in a single study, whereas the symbol QUAL → QUAN would mean that both approaches enjoy equal status.

Leech and Onwuegbuzie (2009:269) offer a more elaborate and comprehensive typology of mixed methods research designs, shown in Figure 4.2, and give full details about the different dimensions of the mixed methods research approach. These include:

- ‘Mixing Dimension’ that describes whether the research is partially mixed methods or fully mixed methods
- ‘Time Dimension’ that spells out whether the research is concurrent or sequential, and
- ‘Emphasis Dimension’ that clarifies whether the research is of equal status or one approach is dominant over the other.

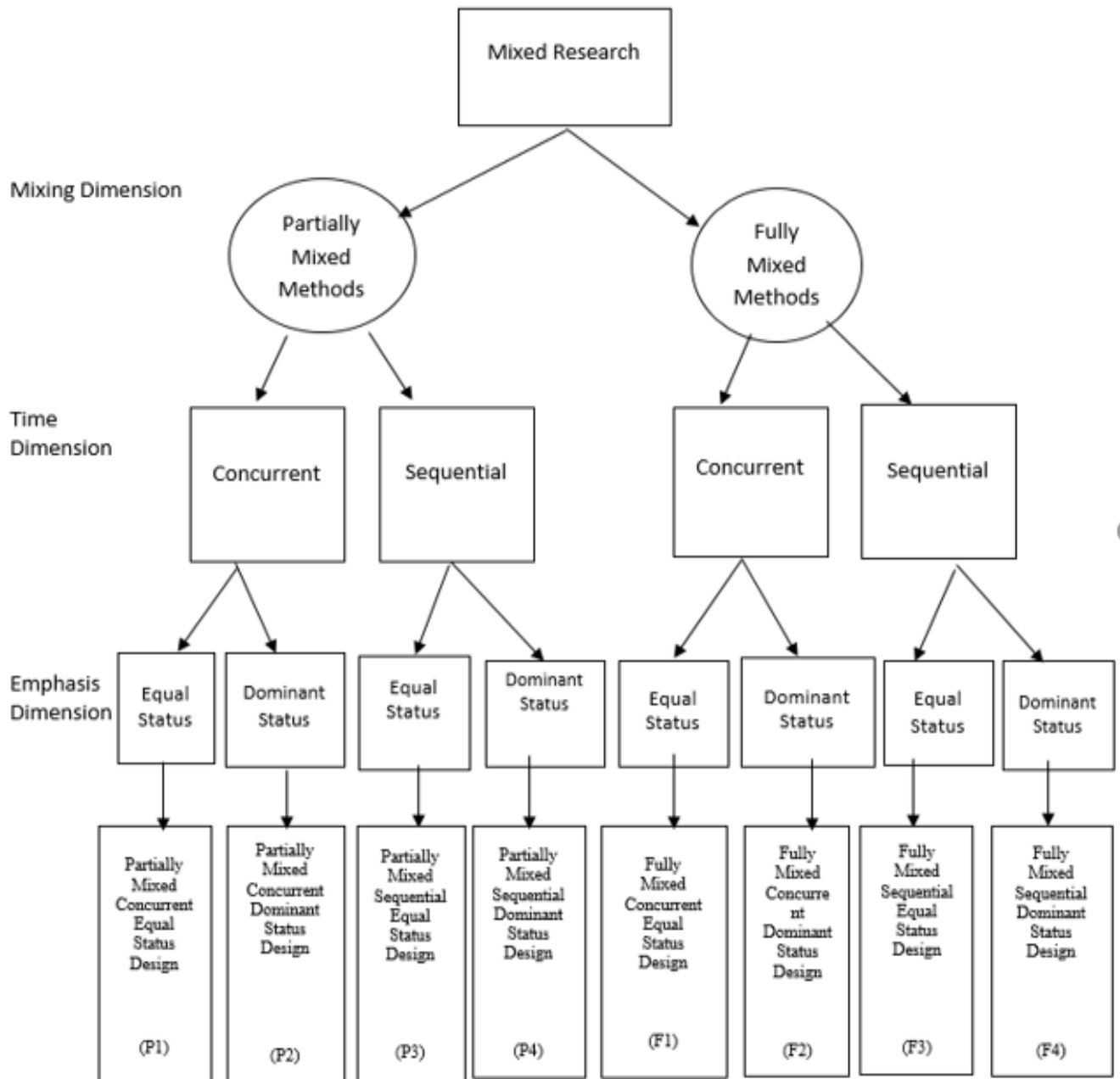


Figure 4.2: A typology of mixed methods research design  
 Source: Leech & Onwuegbuzie (2009:269)

With respect to the distinction between fully and partially mixed methods design, Leech and Onwuegbuzie (2009:267) explain that fully mixed methods would include research designs that combine quantitative and qualitative methods in at least one stage of the research process. By contrast, partially mixed methods involve implementing both quantitative and qualitative methods separately and the data are integrated only at the interpretation stage. In terms of the 'Time Dimension', a mixed methods study can either follow sequential or concurrent designs. As its name implies, a sequential design is when "one type of data provides a basis for the collection of another type of data" (Cameron, 2009:114). In this case, usually one method is used first before another method is implemented in a single multi-phased research project.

A concurrent or parallel mixed method is the opposite of a sequential design, namely, the collection of quantitative and qualitative data more or less simultaneously before integrating the data to facilitate the interpretation of the entire set (Creswell, 2014:15). The 'Emphasis Dimension' is concerned with whether one method plays a dominant role in the research project and is related to the weight given to one approach, for example the quantitative method over the qualitative method or vice versa. Based on the above explanation, this study followed a partially mixed sequential dominant status design. This is congruent with the design "in which the researcher first conducts quantitative research, analyses the results and then builds on the results to explain them in more detail with qualitative research" (Creswell, 2014:15). In this study, the quantitative data were collected first and then the collection of qualitative data followed, meaning that the quantitative approach was dominant in relation to its qualitative counterpart. Moreover, data integration only occurred at the interpretation stage, hence the congruity with the partially mixed sequential dominant status designs.

While acknowledging that it is the research question(s) of a particular study that will determine the research methods to be employed, several researchers have accentuated the benefits of the mixed methods research design. For example, advocating for the notion that mixed methods research leads to a better understanding of the phenomenon under investigation, Greene (2008) argues that it can be instrumental in “unsettling the settled, probing the contested, challenging the given, engaging multiple, often discordant perspectives and lenses” (Greene, 2008:98). Furthermore, Fidel (2008:266) states that “using MMR [mixed methods research] allows researchers to address issues more widely and more completely than one method could, which in turn amplifies the richness and complexity of the research findings”. This is a powerful statement demonstrating the various benefits that can be derived from employing mixed methods research design.

Research reported in the literature also indicates that mixed methods research can be used to investigate complex phenomena in the information science field. For example, Ma (2012:1866) observed that “mixed methods research that combines large-scale data analyses and a detailed description of community of practice may provide us with a richer understanding of information and information-related phenomena”. Ngulube (2012:128) notes that the mixed methods approach is an appropriate research design to investigate complex topics in the information science field. One of the advantages of using a mixed methods approach in research is that “the quality of a study can be improved when the biases, limitations, and weaknesses of a method following one approach are counterbalanced, or compensated for” (Fidel, 2008:265). These are important strengths of the mixed methods research.

Although important strengths are offered by a mixed methods research design, as indicated above, Morgan (2014) cautions that it is not sufficient reason to integrate qualitative and

quantitative methods in one research project merely to compensate for weaknesses associated with each of these methods. There must also be a clear linkage between the research methods and the research questions that provides a solid justification for applying a mixed methods research approach (Morgan, 2014:27). Johnson and Onwuegbuzie (2004:17-18) advise that what is important is that the research question and research methods are a response to the practical steps taken by the researcher to collect and analyse data that help to answer the research questions of a study. Greene (2007) argues that “social inquiry begins with a substantive intention or purpose and a substantive set of questions [and therefore] methodology is ever the servant of purpose, never the master” (Greene, 2007:97). This means that research questions have to be determined first before one considers appropriate research methods. Considering the research questions raised by this study, coupled with advantages of combining research approaches, an explanatory partially mixed sequential method is deemed the most appropriate research design to follow in this study.

#### **4.3.2 Research methodology**

Babbie and Mouton (2009:75) state that research methodology deals with the research techniques or tools employed in sampling, data collection and the analysis of the results of a particular study. In terms of data collection, this study employed a questionnaire, individual interviews and focus group discussions as data collection methods. While a questionnaire was used to collect data of a quantitative nature, individual interviews and focus group discussions were used to collect qualitative data. The next section defines the population of this study, discusses the sampling methods employed to gather both quantitative and qualitative data, and describes the data collection tools in more detail.

#### **4.4 Population**

According to Welman, Kruger and Mitchell (2009:52), the population of a study “encompasses the total collection of all units of analysis about which the researcher wishes to make specific conclusions”. It can also be defined as the subjects of analysis from which the sample of the study is drawn (Babbie & Mouton, 2009:174). The population of this study is defined as the university libraries in Southern African Development Community (SADC) member states. Thus, non-university libraries in the SADC region were excluded from the empirical study.

The following steps were undertaken to identify the university libraries that formed part of the population of this study.

- Firstly, a Google search was carried out on 20 June 2020 to ascertain whether there is a single directory that lists universities in the SADC region. This search did not yield the required results. Had such a list existed, it would have constituted a sampling frame for this study. Bernard (2000:147) defines a sampling frame as “a list of units of analysis from which you take a sample and to which you generalize”. This means a study population or a list of sampling units from which the sample is selected or drawn.
- Secondly, the SADC website <https://www.sadc.int/> was also visited on 20 June 2020 to identify active member states of this regional body. This yielded a list of 15 SADC member states, namely, Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, United Republic of Tanzania, Zambia and Zimbabwe.
- Thirdly, the SARUA website <http://www.sarua.org/> was visited on 20 June 2020 to identify universities in SADC member states. This website proved useful as it listed universities under each of the 15 SADC member states, yielding a list of 151 universities.

Since the researcher does not understand the Portuguese and French languages, 97 university libraries were excluded in this study based in the language. The university libraries excluded were from lusophone countries (Angola and Mozambique) and francophone countries (Democratic Republic of Congo and Madagascar). Consequently, only university libraries in the SADC region whose language of instruction is predominantly English were selected for the empirical research. The language of instruction of each of the university retrieved thus had to be verified. This was achieved by examining the language used on each of the university library websites that fell within the population definition of this study. Subsequently, library home pages were searched. University libraries whose websites are in languages other than the English language were excluded because the researcher could not understand the content of their websites.

#### **4.5 Sampling methods**

According to Leedy and Ormrod (2015:176), a sample is subset of a study's population that is specifically chosen to address the research questions. While it would be ideal to investigate the entire population of the study, it becomes practically impossible in some cases, especially when the population is large. This is because researchers are often confronted with limited time and financial resources.

Enumerating some of the advantages of sampling, Bless, Higson-Smith and Sithole (2013:163) state that collecting research data from a sample would be less time consuming and less costly. This implies that instead of gathering research data from the entire population, it is often more economical to draw the necessary research data from a portion of the population, the sample.

Several probability and non-probability methods have been developed for sampling purpose. Probability or random samples are those in which each individual has the same probability or chance of being selected or included in the sample (Bernard, 2000:147; Creswell & Creswell, 2018:150). In contrast, non-probability sampling occurs “when the probability of including each element of the population in a sample is unknown” (Bless, Higson-Smith & Sithole, 2013:166). While the types of probability sampling method include simple random sampling, systematic sampling, stratified sampling and cluster sampling, non-probability samples include accidental or incidental samples, quotas sample, purposive samples, snowball samples, self-selection samples and convenience samples (Welman, Kruger & Mitchell, 2009:56)

Probability sampling is associated with a quantitative research approach and employs a scientific technique to draw a representative sample from the population of the study. Conversely, non-probability sampling is associated with qualitative research and the researcher usually selects a few participants from which the necessary data are gathered and studied in depth. Creswell and Plano-Clark (2011:173) affirm that “in qualitative research, the inquirer purposefully selects individuals and sites that can provide the necessary information”. Expounding on the distinction between probability and non-probability sampling methods, Teddlie and Yu (2007:83) state that probability sampling is aimed at generating a huge quantity of information from many sampled units, cautiously chosen as representative of the entire population of the study. In contrast, non-probability sampling will result in information of greater depth, gathered from carefully selected respondents or informants.

#### **4.5.1 Sampling methods used in this study**

As stated in the discussion of the research design in Section 4.3.1, this study followed a mixed methods research design, combining both qualitative and quantitative research to gather the

necessary data required to answer the research questions. Teddlie and Yu (2007:78) assert that “mixed methods sampling strategies involve the selection of units or cases for a research study using both probability sampling to increase external validity and purposive sampling strategies to increase transferability”. The population of this study, that is, the number of the university libraries in the SADC region is 151. However, only 54 university libraries whose language of communication is English were sampled. The questionnaire employed to collect quantitative data was sent to all 54 university libraries whose language of communication is English. This means that for the quantitative phase of this study, a sample was drawn based on the language of communication.

The qualitative phase of this study involved individual interviews and focus group discussions. Individual interviews were conducted via the Zoom video conferencing application with six librarians from three purposively sampled universities. Four focus group discussions were conducted with undergraduate and postgraduate students from two purposively sampled universities. While the original plan was to conduct six focus group discussions with students, only four were conducted because of the unavailability of students at two of the selected universities as a result of Covid-19 restrictions. The Covid-19 shutdowns in different SADC countries were implemented at different times in late 2020 and early 2021 when these data were collected (see Section 4.6.3 for a description of how the focus group discussions were conducted).

According to David and Sutton (2011:232), in purposive sampling “the units are selected according to the researcher’s own knowledge and opinion about which ones they think will be appropriate to the topic area”. Unlike the scientific random sampling methods used in quantitative research, focus groups rely on purposive sampling and are well suited to a

qualitative research approach (Walden, 2006:223). Students who participated in the focus group discussions were recruited with the assistance of librarians at their respective universities. Thus, these librarians helped to identify students who provided the best information about what factors they consider important in the use of web technologies incorporated by their library.

#### **4.6 Data collection**

As the term implies, data collection is the actual process of gathering the necessary data that will be analysed to answer the research questions raised by a particular study (Beck & Manuel, 2008:88). Bless, Higson-Smith and Sithole (2013:182) argue that “a research project stands or falls on the quality of the data on which it is based”. It then follows that data collection has a major bearing on whether a research project will succeed in achieving its objectives.

In the present study, the three data collection methods (questionnaires, interviews and focus group discussions) were deemed appropriate for gathering the necessary data to help answer the research questions. The multiple data collection strategy adopted in this study afforded an opportunity to collect the necessary data, allowing for a deep understanding of the incorporation of web technologies in university libraries in the SADC region.

##### **4.6.1 Questionnaire**

Bless, Higson-Smith and Sithole (2013:394) define a questionnaire as “an instrument of data collection consisting of a standardised series of questions relating to the research topic to be answered in writing by participants”. A questionnaire is one of the data collection methods suitable for gathering specific information from respondents for the purpose of achieving the research aims and objectives. Welman, Kruger and Mitchell (2009:174) argue that only

pertinent questions should be included in the questionnaire, meaning that a questionnaire must contain unambiguous questions tailored to the research questions raised in a particular study. In conformity with this, the questionnaire developed and employed in this study was informed by corresponding research questions, insights from the literature and the constructs of the theoretical frameworks, namely, the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis & Davis, 2003) and Library 2.0 theory (Maness, 2006), that informed this study.

There are a number of options for administering a questionnaire. These include, but are not limited to, mailed questionnaires, collective administration and online questionnaires. While mailed questionnaires can be distributed by mail, collective administration involves distributing the questionnaire to participants gathered at one place, for example in a classroom. An online questionnaire is facilitated by technology, distributing it either by email or by uploading it on a website and requesting respondents to complete it (Kumar, 2014:179-180). The choice of which option to use will largely be influenced by various factors such time, cost, and location and the ease of access by respondents.

The questionnaire's strengths include the benefits of reaching out to a large group of respondents including geographically dispersed respondents. It has also proved to be cost-effective in terms of expense and time; it offers anonymity to the respondents, respondents can complete it in their own time, and data collected with a questionnaire can be quickly analysed with software (Gray, 2009:338). Flick (2011:111) states that "questionnaires are appropriate for a study when (a) the knowledge about the issue allows you to formulate a sufficient number of questions in an unambiguous way, and (b) a large number of participants will be involved".

These advantages have made the questionnaire a popular and widely used research instrument for data collection in social science research.

For this study, an online questionnaire was chosen as the most cost-effective method for collecting the quantitative data. This is because the research participants were geographically dispersed across various countries in the SADC region. Apart from this, it also allowed the collected data to be automatically imported into data analysis software (David & Sutton, 2011:244). The questionnaire was carefully developed to correspond to the research questions raised by this study, mapping them to the UTAUT and Library 2.0 constructs. In addition, questions that sought answers from the respondents were formulated in an unambiguous manner in order to minimise possible misunderstandings or misinterpretations. The questionnaire was developed using Likert scale to measure the extent to which the respondents strongly agreed or agreed; and strongly disagreed or disagreed with statements about incorporation and use of web technologies in their libraries. Kumar (2014:204) state that “Likert scale, is based upon the assumption that each statement/item on the scale has equal attitudinal value, importance or with in terms of reflecting an attitude towards the issue in question”.

An online questionnaire was developed and administered using the Research Electronic Capture Software (Redcap) software during October 2020. The questionnaire comprised questions adapted from the UTAUT (Venkatesh & others, 2003) validated scale and were modified where necessary to suit the objectives of this study (see Appendix 1 for the questionnaire). The questionnaire was automatically distributed via the Redcap software to the Heads of User Services departments and copied to the Heads (University Librarian or Director Library Services as they are commonly known) of the university libraries investigated in this

study. They were requested to pass the questionnaire to a library staff member responsible for web technologies. By virtue of their positions these staff members were well suited to provide a holistic view on the incorporation and use of web technologies in their respective libraries.

Email addresses of these recipients were obtained from the contact details on the websites of the university libraries investigated by this study. Baro, Ebiagbe and Godfrey (2013:13) used the same approach to obtain the email addresses of their respondents in, university libraries in South Africa and Nigeria. The covering letter (see Appendix 1) which introduced this research project, underscored the importance of having respondents from a department that is responsible for incorporating and implementing web technologies in the university libraries investigated in this study.

#### **4.6.2 Interviews**

According to Punch (2014:144), “the interview is the most prominent data collection tool in qualitative research”. Bless, Higson-Smith and Sithole (2013:392) define ‘interview’ as “a data collection technique based on a series of questions relating to the research topic to be answered by research participants”. It can also be interpreted as “a person-to-person interaction, either face to face or otherwise, between two or more individuals with a specific purpose in mind” (Kumar, 2014:176). What these definitions suggest is that in the research context, an interview is a method of collecting data from research participants by means of a conversation.

Zhang and Wildermuch (2009:222) state that “interviews are a widely used tool to access people’s experiences and their inner perceptions, attitudes, and feelings of reality”. Reinforcing this view, Kumar (2014:144) asserts that “it is a very good way of accessing people’s perceptions, meanings, definitions of situations and constructions of reality”. The interview is,

thus, a well-recognised method of collecting qualitative data with a view to gain in-depth understandings of how people perceive the complex issues they experience in either their working or social lives.

Interviews require more time, can be costly, and the quality of the data can be influenced by various factors such as the skills of the interviewer, the quality of interaction and also the location where the interview is conducted (Kumar, 2014:182). With advances in information and communication technology, individual interviews can be conducted using Internet technology in real time. David and Sutton (2011:312) observe that several Internet technological tools such as email, discussion boards, Internet forums and chat room technologies can facilitate communication in real time and can be used for interview purposes. Technology is thus an important enabler of interaction and can be cost-effective, especially in situations where the research participants cannot be easily accessed owing to their geographical location.

Data collection tools for interview can be designed in various ways. Interviews can take the form of structured, semi-structured or unstructured interviews (Punch, 2014:145). Kumar (2014:178) points out that “in a structured interview the researcher asks a predetermined set of questions, using the same wording and order of questions as specified in the interview schedule with each respondent”. Conversely, in a semi-structured interview there are no predetermined questions, but the interview is guided by a number of broad questions or themes (David & Sutton, 2011:121). In unstructured interviews, questions are not pre-determined, but the interviewer selects appropriate topics to guide the discussion during the interview (Punch, 2014:145).

While an interview schedule is commonly used in structured interviews, semi-structured interviews use an interview guide. Beck and Manuel (2008:88) states that with an interview schedule, the interviewer asks the predetermined questions verbatim, while an interview guide allows for more flexibility as long as all the pertinent topics are listed and covered to provide proper direction to the interview.

The type of interview used for the purpose of collecting qualitative data for this study was a semi-structured interview. This type of interview affords the researcher an opportunity to probe respondents, allowing the latter to elaborate on their responses and allowing the former to seek clarification when necessary (Gray, 2009:370). Since this type of interview is not strictly structured, it allows for follow-up questions to the answers provided by the respondents. This flexibility offers benefits in terms of affording in-depth understanding of the topic.

An interview guide developed to collect qualitative data for this study (see Appendix 3) encapsulated the key themes related to the research questions raised by this study. It was framed in such a way that it could elicit key information about key concepts in the research questions. Interviews only took place after participants signed the informed consent form (see Appendix 4). Table 4.2 below gives information about the date of the interviews and the respondents.

Table 4.2: Individual interviews details

<b>Date interviews were conducted</b>	<b>Participant</b>
10-12-2020	Librarian
11-12-2020	Librarian
10-03-2021	Librarian
11-03-2021	Librarian
15-06-2021	Librarian
09-03-2021	Librarian

As stated already above, the university libraries investigated in this study are geographically spread out throughout the SADC region. In order to counteract the disadvantage associated with costs involved in collecting interview data from dispersed respondents, and the Covid-19 pandemic restrictions, all the interviews were conducted via the Zoom video conferencing software. The six respondents, who participated in the interviews were recruited with the assistance of University Librarians from the university libraries that were purposively sampled for interviews. An informed consent form for the interview was sent to participant librarians by email for their consent and signature before the interviews were conducted. Zoom interview sessions were tape recorded with the Zoom recording feature, after the librarians interviewed had given consent to record the discussions.

#### **4.6.3 Focus group discussions**

A focus group is an interactive discussion held between a moderator and a group of individuals to gather research data on a specific subject or defined related topics (Hennink, Hutter & Bailey, 2011:139). According to Krueger and Casey (2000:10), a focus group will involve participants with common characteristics who participate in a focused discussion with the purpose of gaining an in-depth understanding of a particular topic. Focus group discussions (FGDs) offer robust group interactions and provide an enabling environment to probe for more details and ask for clarity when necessary (Glitz, 1997:386). FGDs are useful tools to obtain insights about people's perceptions, feelings, meanings and definitions of different aspects and constructions of reality (Walden, 2006:223). These correspond well with one of the objectives of this study, namely, to ascertain users' perceptions of library services enhanced by web technologies.

The optimal size for a focus group has been suggested by several scholars. For example, while Glitz (1997:386) advises an ideal focus group size of six to ten individuals, Von Seggern and Young (2003:274) recommend a size of four to twelve participants. In contrast, Hennink, Hutter and Bailey (2011:139) suggest between six to eight participants. In order to derive maximum benefits from a focus group discussion (FGD), its size has to be chosen carefully. On one hand, a small focus group will allow all participants to share their insights, while on the other, a large enough group is important to obtain diverse views and insights (Krueger & Casey, 2000:10). Despite the varying views on an ideal focus group size, a range of four to twelve participants can be considered optimal.

For the purpose of this study, FGD guides (see Appendices 6 and 7 for undergraduate and postgraduate students, respectively) were developed to gather insights from undergraduate and postgraduate students at two purposively sampled universities investigated by this study. Students who participated in the FGDs were selected with the assistance of librarians at the purposively sampled university. The criteria used to select undergraduate and postgraduate students included representation from first year to the last year of registration. Four FGDs were conducted separately for undergraduate and postgraduate students during the first quarter of 2021. Table 4.3 below shows the date the FGD was conducted, the size of each group, and the level of study.

Table 4.3: Focus group discussions details

<b>Date FGD was conducted</b>	<b>Number of student participants</b>	<b>Level of study</b>
27-05-2021	10	Undergraduate
23-06-2021	9	Postgraduate
26-06-2021	6	Undergraduate
29-06-2021	5	Postgraduate

The size of the FGDs were balanced to obtain diverse insights and at the same time allow participants to actively participate in the discussion about their perceptions of the web technologies incorporated by their libraries. In order to recruit participants for the FGDs, librarians from universities where the FGDs were conducted were asked to assist. Subsequently, informed consent forms were emailed in advance to students who were identified to participate in the FGDs, which took place after the students had signed the forms (see Appendix 8). FGDs were recorded with the consent of the participants.

#### **4.7 Pre-test**

Pre-testing involves probing whether the questions in the research instrument are clear, unambiguous and would be understood and interpreted as intended by respondents (Kumar, 2014:191). It is a method used to ascertain in advance the clarity of the research instrument for the respondents. The online questionnaire employed for collecting quantitative data and the interview guide used for collecting qualitative data for this study were pre-tested with library staff members at a private university in Namibia. The pre-test for the FGD guide was conducted with students at the same university.

The purpose of the pre-test was to identify possible misunderstanding of questions in the questionnaires, interviews and focus group discussion guides. It was also necessary to ensure that any ambiguity and possible misinterpretation of the questions were eliminated. Only minor amendments involving reformulating some questions in the research instruments were made after the pre-test. The pre-test also helped to calculate the time required to complete the questionnaire, conduct the interviews and the FGDs, and the participants were informed accordingly.

## **4.8 Data analysis**

According to Bernard (2000:419), “analysis is the search for patterns in data and for ideas that help explain why those patterns are there in the first place”. This implies that data analysis involves examining data systematically to make sense of what such data mean and ultimately interpreting them for the purpose of reaching useful conclusions for the research project. Bless Higson-Smith and Sithole (2013:21) advise that research data must be well organised and verified for accuracy once they had been collected. The process of verifying the accuracy of data before the analysis begins is very important as it helps to ascertain the completeness and relevance of data.

As stated in Section 4.3.1, both quantitative and qualitative approaches were followed in order to meet the objectives of this study. Consequently, this necessitated the use of data analysis procedures suitable for both quantitative and qualitative data. The data collected with the online questionnaire are of quantitative nature and were analysed using the Microsoft Excel 2016. The qualitative data collected by means of interviews and FGDs were analysed using a qualitative analytical approach proposed by Marshall and Rossman (2011). This analytical procedure involves seven phases, that is, “(1) organising the data, (2) immersion in the data, (3) generating categories and themes, (4) coding the data, (5) offering interpretations through analytic memos, (6) searching for alternative understandings, and (7) writing the report or other format for presenting the study” (Marshall & Rossman, 2011:209). This approach helped in extracting key themes that represented qualitative insights relevant to the research questions investigated by this study.

With regard to merging the results, the researcher followed the approach described by Creswell (2014) which is known as side-by-side comparison. Using this approach, the researcher first

reports the quantitative results and then discusses the qualitative findings that either corroborate or contradict the quantitative results (Creswell, 2014:222). Taking into account the research questions investigated by this study, the method described above is appropriate for integrating the quantitative and qualitative results.

#### **4.9 Validity and reliability**

Punch (2014:240) emphasises the importance of reliability and validity as two psychometric characteristics when measuring research instruments. Reliability “refers to the stability or consistency of measurements; that is whether or not the same results would be achieved if the test or measure was applied repeatedly” (Lewin, 2005:216). It is the capability of measurement instruments to generate results that are consistent (Sarantakos, 2005:88). Connaway and Powell (2010:63) contend that “if the study design of a research is reliable, then its findings should be repeatable or replicable and generalizable beyond one study”. Commenting on the reliability of research instrument, Kumar (2014:2016) argues that a research instrument can be regarded as reliable if it can produce similar results when it is used more than once to collect similar information or data under similar circumstances. This means that a research instrument that produces equivalent results if it is administered twice or more to the same research participants can be considered to have achieved the test of reliability. This is a clear indication that the consistency of research instruments is at the centre of reliability and ultimately the credibility of the research results.

Validity is defined by Babbie and Mouton (2009:122) as “the extent to which an empirical measure adequately reflects the real meaning of the concept under consideration”. Validity is concerned with the degree to which a research instrument measures what it is intended to measure (Lewin, 2005:216). As Sarantakos (2005:83) argues, “validity tells the researcher

whether an instrument measures what is supposed to measure and whether this measurement is accurate and precise”. This suggests that the aspect of appropriateness of the research instrument is the cornerstone on which the concept of validity in research context can be judged. In turn, this has a major influence on the legitimacy of the research results and the conclusions thereof.

Connaway and Powell (2010:60) state that for a research project to be regarded as valid, its conclusions must be accurate and for it to be considered reliable, its findings should be repeatable. However, “a measure can be reliable (always generate the same result) but not valid (not measure the intended concept)” (Lewin, 2005:216). The importance of the concepts of validity and reliability in research lies in the fact that they have major implications for the quality of research findings and conclusions.

It should, however, be noted that validity and reliability do not have the same implications for qualitative and quantitative research (Creswell, 2014:201). Kumar (2014:220) echoes this sentiment and argues that the approaches used to ascertain validity and reliability are different in quantitative and qualitative research, and that these concepts are more established in quantitative research. For example, in quantitative research concepts or constructs are usually predetermined and defined before research starts. Consequently, this makes it easier to explicitly develop and define the corresponding measure of validity. On the other hand, qualitative research begins “with self-created, and hopefully acknowledged, beliefs about phenomena of interest that change and develop as studies progress” (Dellinger & Leech, 2007:319).

The following strategies clarify how the threats arising from validity and reliability have been addressed in research instruments developed for both the quantitative and qualitative phases of this study. Validity was addressed by aligning questions to key concepts as indicated in the research questions of this study. This is congruent with the advice of Kumar (2014:213) who argues that one of the strategies to ascertain the validity of a research instrument is to ensure that each question in the research instrument is logically linked to a research objective of the study. The constructs of the theoretical frameworks, namely, UTAUT and Library 2.0 theory, underpinning this study also informed the formulation of the questions posed to the respondents. Consequently, this ensured that the questions asked in the questionnaire, interviews and FGDs were formulated in such a way that they directly responded to key aspects investigated in this study.

Babbie and Mouton (2009) highlight several strategies that researchers can use in order to guard against unreliability in research. These include adopting previously used research instruments with a proven track record, asking participants relevant questions that they are likely to be able to answer, and ensuring that the questions are articulated clearly (Babbie & Mouton, 2009:121-122). These strategies were adopted to counteract the threats associated with reliability in research. Ridenour and Newman (2008:57) emphasise that triangulation may be considered as a reliability check. In the social sciences, the term ‘triangulation’ refers to the use of more than one research method or tool to study a particular phenomenon (Connaway & Powell, 2010:146).

As explained in Section 4.6 of this study, three research tools (questionnaire, interviews and FGDs) were triangulated in order to collect the necessary data. In this sense, triangulation of data collection methods helped to neutralise threats to reliability. The strategies and steps

outlined above helped to minimise concerns and threats relating to the validity and reliability of the data collection methods employed in this study. The next section discusses ethical issues relating to the empirical procedures followed in this study.

#### **4.10 Research ethics**

According to Gorman and Clayton (2005:43), “all research subjects have ethical rights: to be consulted, to give or withhold consent, and to confidentiality”. Connaway and Powell (2010:93) underscore the importance of ethics in social and behavioural research. Accordingly, the following steps were taken to handle ethical concerns:

- a) Designed research instruments with questions that are not harmful to participants in any way.
- b) Obtained ethical clearance from the Department of Knowledge and Information Stewardship, Faculty of Humanities, University of Cape Town (see Appendix 9.1) where the degree for which this study is being undertaken, is registered.
- c) Obtained permission from the University of Cape Town to access staff and students for research purposes (see Appendices 9.1.1 and 9.1.2).
- d) Obtained permission to conduct research by universities investigated in this study (see Appendices 9.2 to 9.23).
- e) Obtained informed consent prior to administering the research instruments.
- f) Fully explained the research objectives of the study to the participants.
- g) Informed participants about the purpose of the study and that participation in this study was voluntary and participants had the right to withdraw at any time without coercion or pressure.
- h) Fully respected anonymity of the participants as they were not required to give their names.

- i) Fully respected confidentiality by strictly using the data collected for research purposes only.

The above steps helped to address issues pertaining to ethics in research.

#### **4.10 Chapter Summary**

This chapter presented detailed descriptions of the research methodology and research design. It discussed the philosophical orientation underpinning this study, and the specific research methodologies or techniques employed in data collection. These included an online questionnaire, individual interviews and FGDs. The chapter also described the tools and strategies employed to collect and analyse the data collected.

In addition, the chapter explained the study population and expounded on the sampling methods and procedures used for both the quantitative and qualitative phases of this study. It also discussed the concepts of validity and reliability in research and described the strategies adopted to minimise the threats associated with measurement validity and reliability in this research. Finally, the chapter discussed the steps taken to address ethical issues in this study and evaluation of the research methodology. The next chapter focuses on data analysis and the presentation of the results.

## CHAPTER 5

### DATA ANALYSIS AND PRESENTATION OF RESULTS

#### 5.0 Introduction

This chapter presents the results from the analysis of the quantitative and qualitative data collected for the purpose of addressing the aim and objectives of this study. The overall aim of this study was to investigate the incorporation of web technologies into the services of university libraries in the SADC region in order to develop a user-centred library service model.

In order to address this purpose, the study pursued the following objectives:

- ascertain which web technologies were incorporated in the services of university libraries in the SADC region;
- determine the factors that influenced the university libraries in this region to incorporate web technologies in their services;
- examine the perceptions of users of the library services enhanced by web technologies;
- and examine how these factors can be used to develop a user-centred model for implementing web-based library services;

The quantitative data were collected using a questionnaire that was administered to university librarians in the Southern African Development Community (SADC) region via the Research Electronic Data Capture (REDCap) software. The quantitative data were analysed with the Microsoft Excel 2016, after they were imported from the REDCap software. The qualitative data were collected by means of individual interviews and focus group discussions (FGDs). These data were analysed using a qualitative analytical approach proposed by Marshall and Rossman (2011), which involves organising the data; generating categories and themes; coding

the data; interpreting data; searching for alternative understandings; and writing the report (Marshall & Rossman, 2011:209). The qualitative data were collected during the Covid-19 pandemic which led to travel restrictions and related protocols, consequently, Zoom software was employed. The results from an analysis of the quantitative and qualitative data are reported separately, with the former being presented first and followed by the latter.

## **5.1 Quantitative data results**

A variety of quantitative data was collected and analysed to address the research questions raised by this study. These include the demographic data about positions held by the respondents and the roles they played in the incorporation of web technologies into their university libraries. Data on the types of web technologies incorporated by these libraries were also collected. The factors that influenced these libraries to incorporate web technologies and how these factors can be used to develop a user-centred library service model for implementing web-based library services constituted a large proportion of the quantitative data collected for this study. The results that emerged from the quantitative data analysis are logically presented and organised in accordance with the research questions raised by this study, accompanied where necessary by of graphs and tables.

### **5.1.1 Response Rate and Demographic information**

A total of 27 out of 54 university libraries responded to the online questionnaire, representing a response rate of 50%, considered adequate for analysis and reporting in surveys (Babbie & Mouton, 2009:261). Regarding what position the respondents occupied in their libraries, the results revealed that they occupied varied ranks. Thirteen respondents (39%) were University Librarian; 4 (13%) held the position of Deputy University Librarian; 6 (18) were Systems Librarian, and 10 (30%) held other positions, including Head Librarian: Technical Services;

Head of Information Resources Management; Head: Reference Services; Reference Librarian; Library Instructor; Librarian: Scholarly Communication; Library Manager: Research Support Services: Library Officer; Cataloguer and Library Technical Assistant.

The respondents were also asked to indicate the role they played in incorporating web technologies into their library services. The results in Table 5.1 below show that more than half of the respondents 22 (51.2%) were coordinators of digital services in their libraries, followed by coordinators of web technologies 9 (20.8%). Heads of user services 6 and chairpersons of library web technology committees 6 were equally divided with (14.0%) each. These results indicate that all the respondents played some role in the incorporation of web technologies in their respective university libraries.

Table 5.1: *Respondents' roles in the incorporation of web technologies*

<b>RESPONDENTS' ROLE IN INCORPORATING WEB TECHNOLOGIES</b>	<b>RESPONSE N</b>	<b>PERCENTAGE</b>
Coordinator: Library Digital Services	22	51.2
Head: User Services	6	14.0
Coordinator: Library web technologies	9	20.8
Chairperson: Library web technologies committee	6	14.0
Total	43	100.0

Source: Field data, 2021

The respondents were further asked to indicate other roles they played in the incorporation of those web technologies in their libraries but not listed in the questionnaire. Other roles cited included providing access to e-content, managing digitalisation projects, coordinating virtual reference services and providing web technology instruction to the library users.

## Main Findings:

This section presents the main findings according to four objectives of the study.

### 5.1.2 Objective 1: Web technologies incorporated by university libraries in SADC

To accomplish the objective one of the study, the respondents were asked to indicate the types of web technology incorporated by their university libraries. The results in Table 5.2 below reveal that Facebook was the most frequently incorporated web technology with 19.9%, followed by Twitter (14.9%), EbscoHost Discovery (12.8%), YouTube (12.1%), and then WorldCat Discovery (7.1%). The results further show that Instant Messaging and RSS Feeds were equally divided with 5.7%; Wikis and WordPress share the same proportion of 4.3%; Instagram 2.8%; while Primo and Summon Discovery equally share 2.1%. The least used web technology was Pinterest with 0.7%.

Table 5.2: Web technologies incorporated by university libraries investigated

<b>WEB TECHNOLOGIES INCORPORATED BY UNIVERSITY LIBRARIES</b>	<b>RESPONSES</b>	<b>PERCENTAGE</b>
Blogs	8	5.7
EbscoHost Discovery	18	12.8
Facebook	28	19.9
Instagram	4	2.8
Instant Messaging	8	5.7
Pinterest	1	0.7
Primo	3	2.1
RSS Feeds	8	5.7
Summon Discovery	3	2.1
Twitter	21	14.9
Wikis	6	4.3
WordPress	6	4.3
WorldCat Discovery	10	7.1
YouTube	17	12.1
Total	141	100.0

Source: Field data, 2021

The respondents cited other web technologies that they have incorporated into their university libraries but were not included in the list in the questionnaire. These included Chatbot, AskUs chat service, podcast, vodcast, padlets, libguides, dspace, WhatsApp, encore duet application, proquest 360 core, SFX link resolver, and ask a librarian' service.

### **5.1.3 Objective 2: Factors influencing the incorporation of web technologies by university libraries**

The second research objective sought to determine the factors that influence the incorporation of web technologies by university libraries based on the constructs of the theoretical frameworks underpinning this study, namely, the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis & Davis, 2003) and Library 2.0 theory (Maness, 2006).

The UTAUT constructs employed in this study are performance expectancy, effort expectancy, social influence and facilitating conditions, while the relevant construct in the Library 2.0 is user-centredness. The results pertaining to these constructs are presented in figures in the following sections. The figures with the results on the factors that influenced university libraries to incorporate web technologies are presented labelled in accordance with the question items in the questionnaire and organised in the order of how the questions are listed in the questionnaire.

#### **5.1.3.1 Performance expectancy**

Performance expectancy was applied in this study to evaluate the degree to which the respondents believe that incorporating web technologies in their library helps to improve the library's user services and efficiency in internal processes.

Various aspects pertaining to performance expectancy were examined. The respondents were asked to indicate the degree to which they agreed or disagreed with the statement that *web technologies are useful in improving library user services*.

As illustrated in Figure 5.1 below, the results reveal that the majority of respondents (63.6%) strongly agreed and 33.3% agreed with the statement. These results show that altogether the respondents who either agreed or strongly agreed that web technologies are useful in improving library user services accounted for 96.9%. None of the respondents disagreed or strongly disagreed with this statement, while a small proportion of the respondents (3.1%) indicated that they neither disagreed nor agreed.

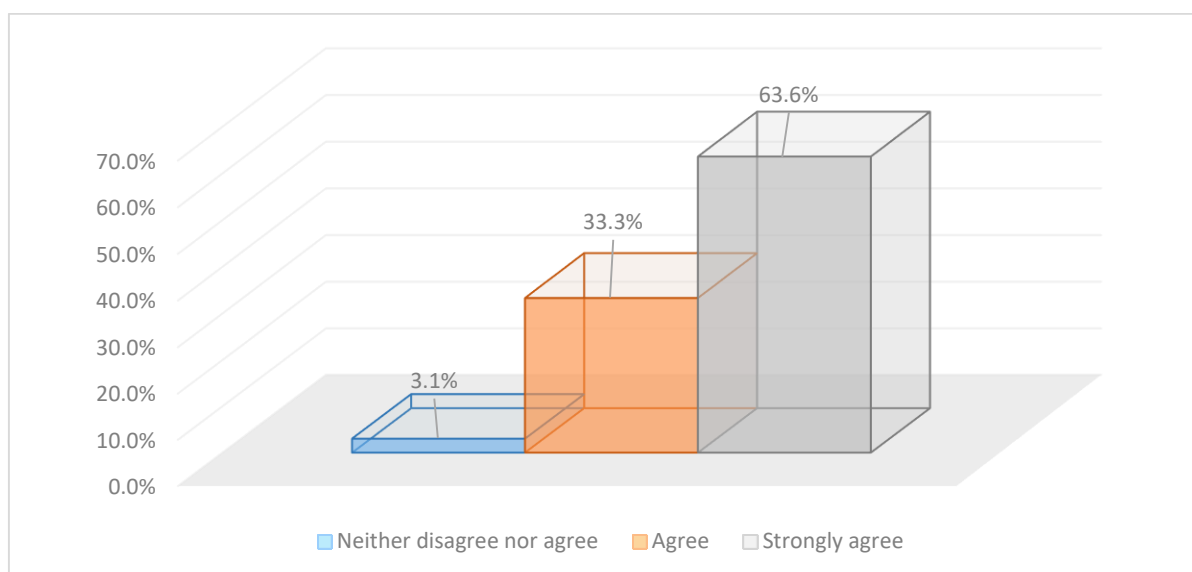


Figure 5.1: Usefulness of web technologies in improving library user services

The respondents were also questioned to indicate their level of agreement or disagreement with the statement that *web technologies help the users to easily discover information from the library*. The results, as depicted in Figure 5.2 below, demonstrate that the respondents who agreed and those who strongly agreed with the statement were equally divided with 48.5%

each. The combined results for those who strongly agreed and agreed show that the greatest proportion of respondents (97%) either agreed or strongly agreed that web technologies are helpful in information discovery from the library. None disagreed or strongly disagreed with this statement, while only 3.0% said they neither disagreed nor agreed.

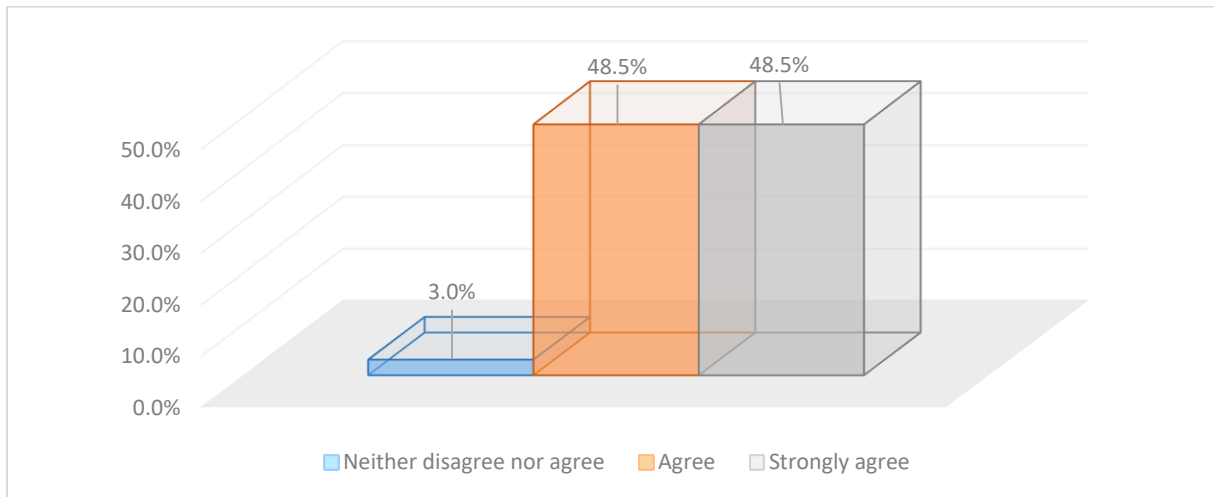


Figure 5.2: Helpfulness of web technologies in discovering information from the library

On the question about whether *web technologies enable the library to interact with users quickly*, the results show that the majority of the respondents (60.6%) strongly agreed, while 33.3% agreed (Figure 5.3 below). It is evident that the majority of the respondents (93.9%) either concurred or strongly concurred that web technologies facilitate quick interaction between librarians and the users, while none disagreed or strongly disagreed with this statement, and those who stated that they neither disagreed nor agreed accounted for only 6.1%.

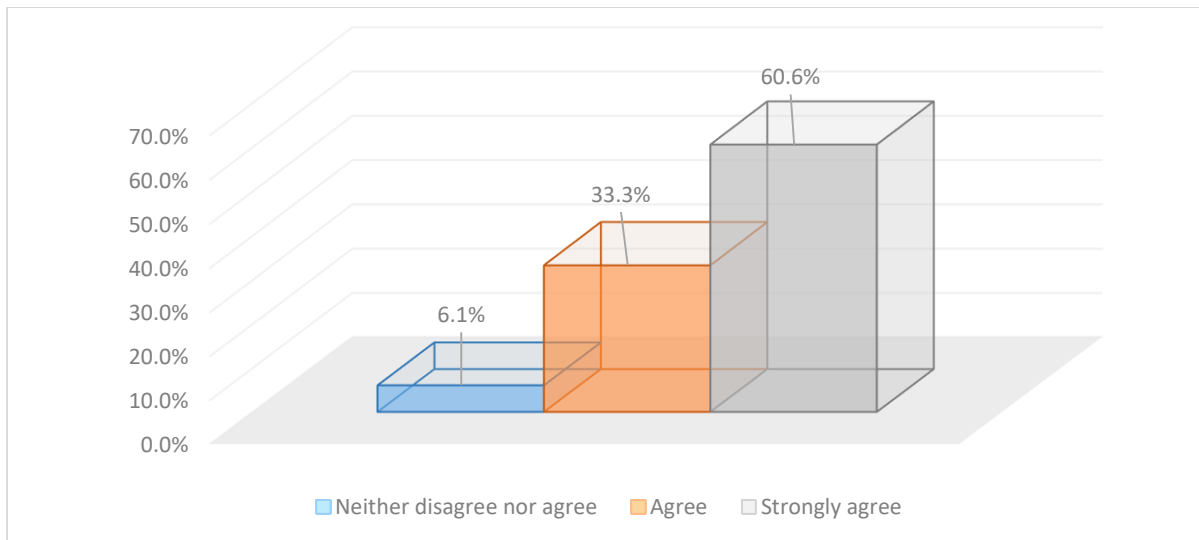


Figure 5.3: Web technologies enabling quick interaction between librarians and users

The respondents were further asked to indicate the degree to which they agreed or disagreed with the statement that *web technologies improve the delivery of information literacy instruction to library users*. The results presented in Figure 5.4 below indicate that the respondents who agreed and those who strongly agreed with the statement are equally divided with 45.5% each. This means those who were in agreement with the statement represented 91% of the respondents. None disagreed or strongly disagreed with the abovementioned, while 9% neither disagreed nor agreed.

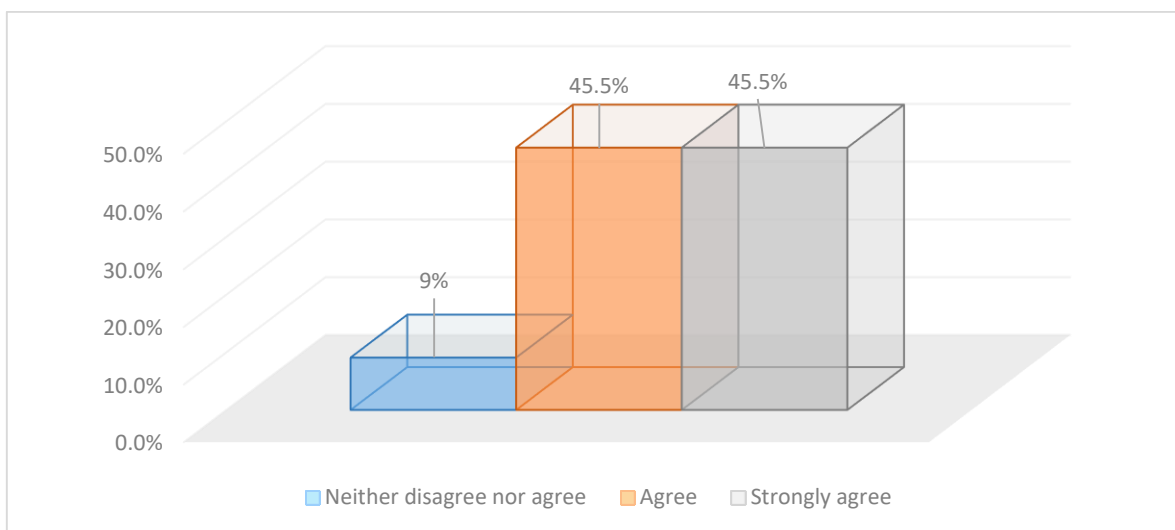


Figure 5.4: Improving delivery of information literacy instruction with web technologies

With regard to the question about whether *web technologies enhance the creating and sharing of information with the library users*, the majority of the respondents (54.5%) said they strongly agreed and 45.5% indicated that they agreed, as shown in Figure 5.5 below. It is evident from these results that all the respondents (100%) agreed that web technologies play an instrumental role in creating and sharing information with library users.

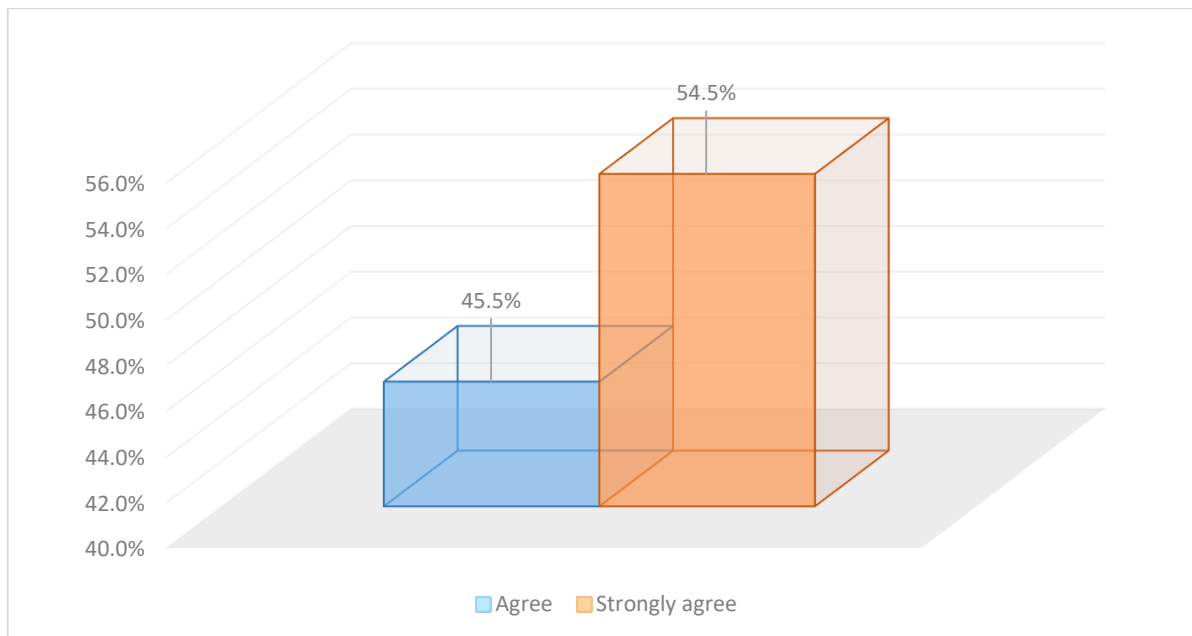


Figure 5.5: Enhancing the creating and sharing of information with web technologies

The respondents were also asked to indicate the degree to which they agreed or disagreed with the statement that *web technologies enhance the library's outreach activities*. As depicted in Figure 5.6 below, the majority of the respondents (51.5%) said they strongly agreed and 36.4% asserted that they agreed.

If the proportion of those who agreed and those who strongly agreed is combined, the results show that a significant percentage of respondents (87.9%) was in agreement that web technologies are crucial in the implementation of library outreach activities. None disagreed or strongly disagreed that web technologies play a key role in outreach activities, although (12.1%) admitted that they neither disagreed nor agreed.

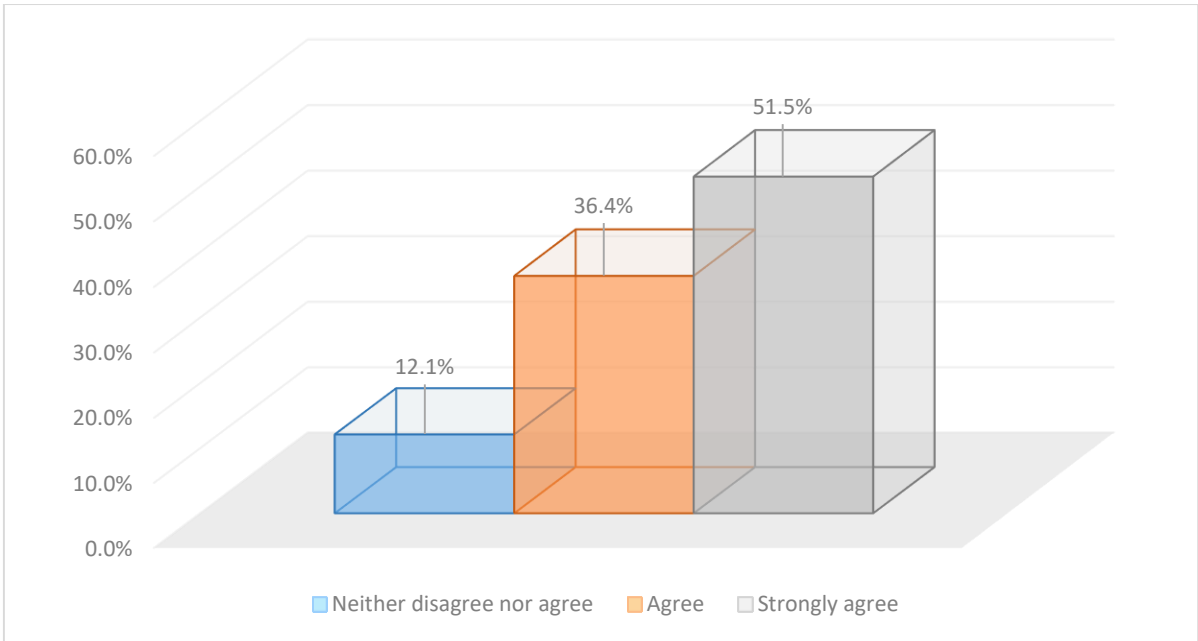


Figure 5.6: Enhancing library outreach activities with web technologies

The respondents' level of agreement or disagreement with the statement *that security concerns discourage the library from incorporating web technologies into services* was also assessed. As shown in Figure 5.7 below, only a small proportion of the respondents (3.1%) strongly agreed, while 12.1% agreed with the statement. This means that a mere 15.2% of the respondents regarded security issues as a disincentive for incorporating web technologies into their library services.

In contrast, the majority of the respondents (51.5%) disagreed and 9.1% strongly disagreed that security concerns deter their libraries from incorporating web technologies into services. This shows that 60.6% of the respondents disagreed with the statement. The respondents who were uncertain about whether the security concerns discouraged their libraries from incorporating web technologies accounted for 24.2%, indicating that they neither disagreed nor agreed.

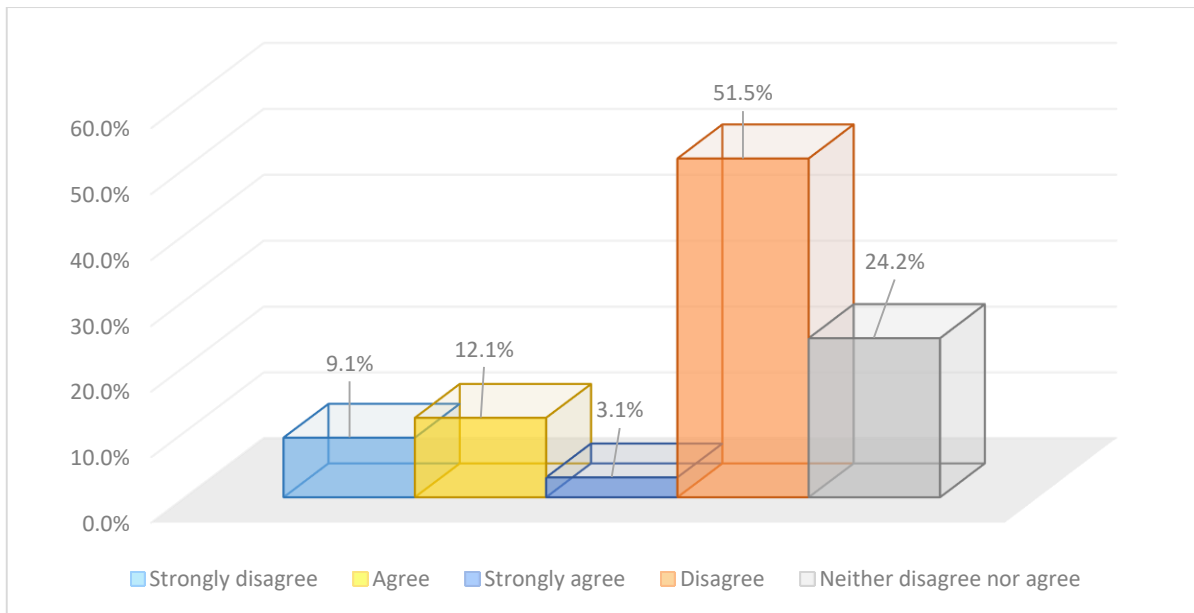


Figure 5.7: Security concerns on the incorporation of web technologies in libraries

The respondents were also asked to indicate the degree to which they agreed or disagreed with the statement that *there is much risk in sharing information with users via web technologies*.

The results indicated in Figure 5.8 below reveal that 45.5% of the respondents disagreed, while 6.1% strongly disagreed with the statement. The results further show that 27.3% of the respondents agreed and none strongly agreed with the above statement, while those who neither disagreed nor agreed represented 21.1%.

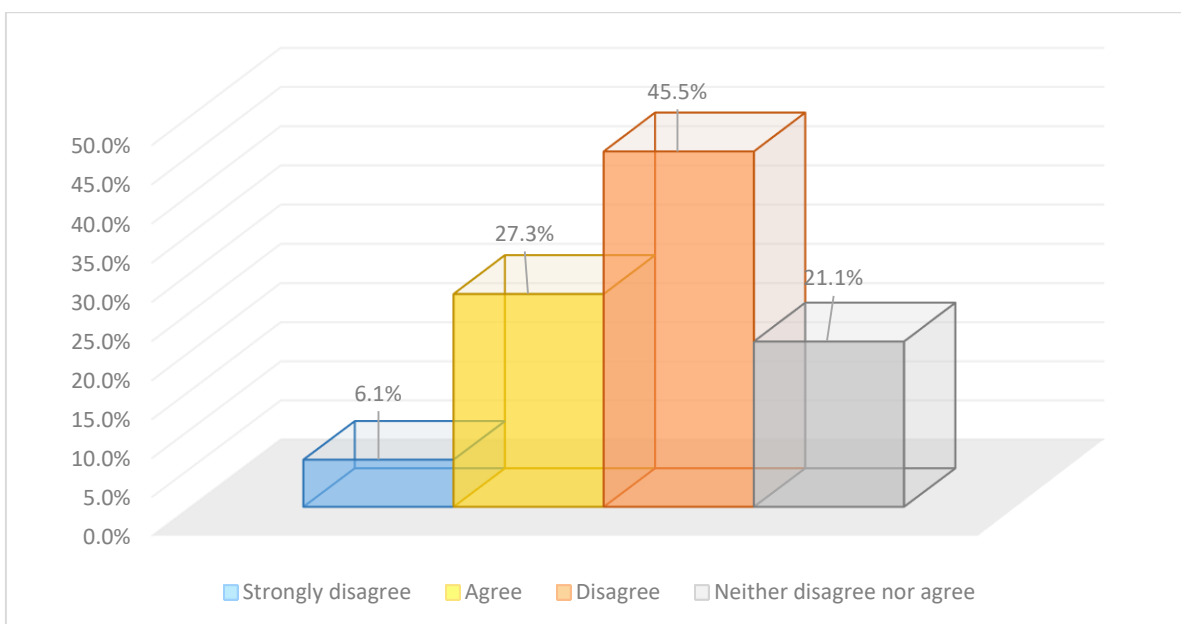


Figure 5.8: Risk in sharing information with library users via web technologies

The respondents were also asked to indicate the level of their agreement or disagreement with the statement that *library staff believe that using web technologies is time consuming*. As shown in Figure 5.9 below, most of the respondents (57.6%) disagreed and 12.1% strongly disagreed about the notion that using web technologies is time consuming. From these results, it is also clear that the majority of the respondents (69.7%) were not in agreement (either disagreed or strongly disagreed) that using web technologies is time consuming. Only 9.1% of the respondents agreed and those who neither disagreed nor agreed accounted for 21.2%.

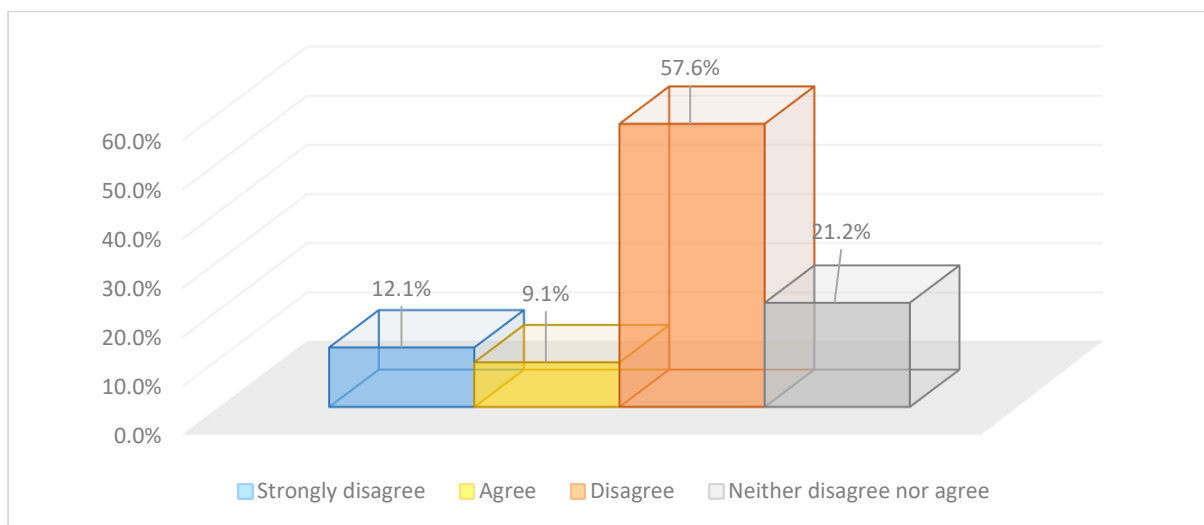


Figure 5.9: Librarians' beliefs regarding the use of web technologies being time consuming

With the vast information now available online, information overload has become a matter of great interest and concern among users of academic information. Therefore, the respondents were asked to indicate whether *using web technologies leads to information overload*.

The results presented in Figure 5.10 below reveal that the majority of the respondents (57.6%) disagreed and 9.1% strongly disagreed with the statement. Another 9.1% of the respondents agreed but none strongly agreed with such a statement, while 24.2% neither disagreed nor agreed.

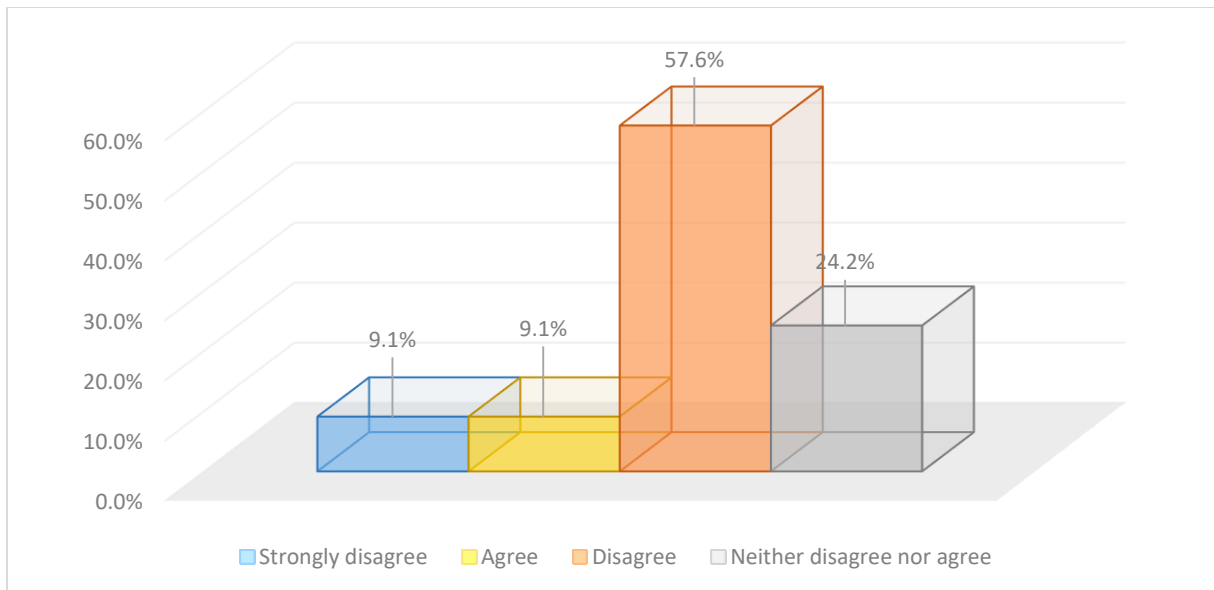


Figure 5.10: Librarians' beliefs on whether using web technologies leads to information overload

The respondents were also asked to indicate their level of agreement or disagreement with the statement that *user-centricity is the most important principle underlying the incorporation of web technologies in their libraries*. The results depicted in Figure 5.11 below show that the majority of the respondents (66.7%) agreed and 24.2% strongly agreed with the statement, while only 3.0% disagreed, none strongly disagreed and 6.1% neither disagreed nor agreed.

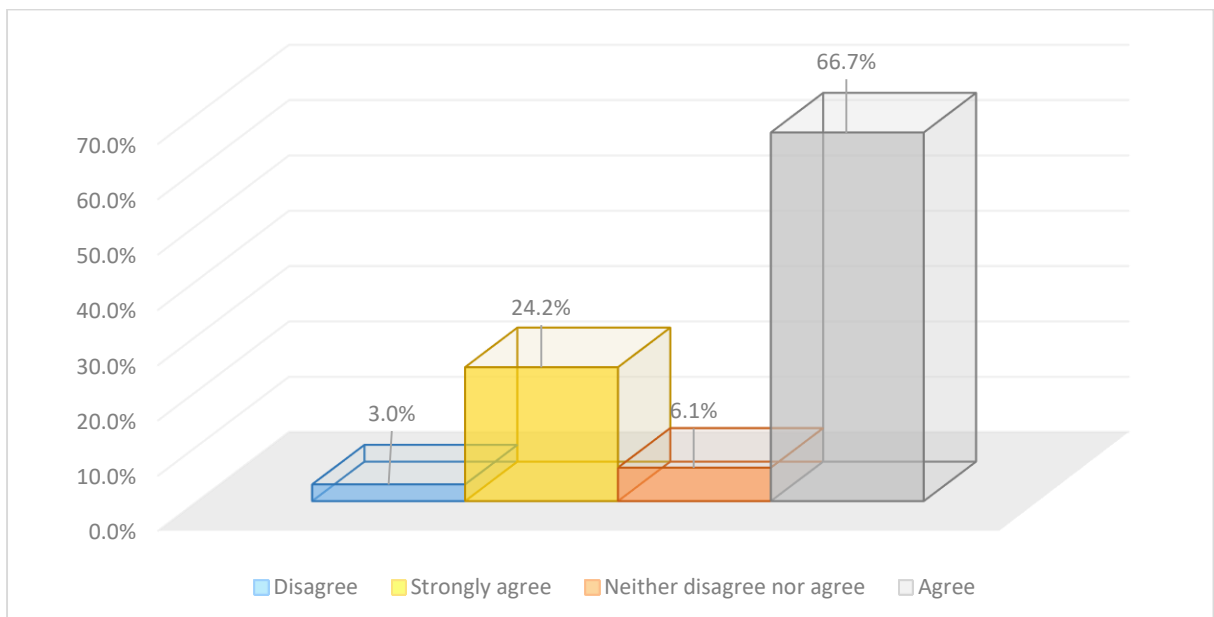


Figure 5.11: Librarians' beliefs on user-centricity as an important principle in incorporating web technologies

The respondents were asked to indicate the degree to which they agreed or disagreed with the statement that *overall, web technologies improve the quality of library's user services*. As shown in Figure 5.12 below, the majority of the respondents (57.6%) strongly agreed and 42.4% agreed with this statement. The results further reveal that none of the respondents disagreed or strongly disagreed with the statement that web technologies improve the quality of library user services, and none was neutral on this question.

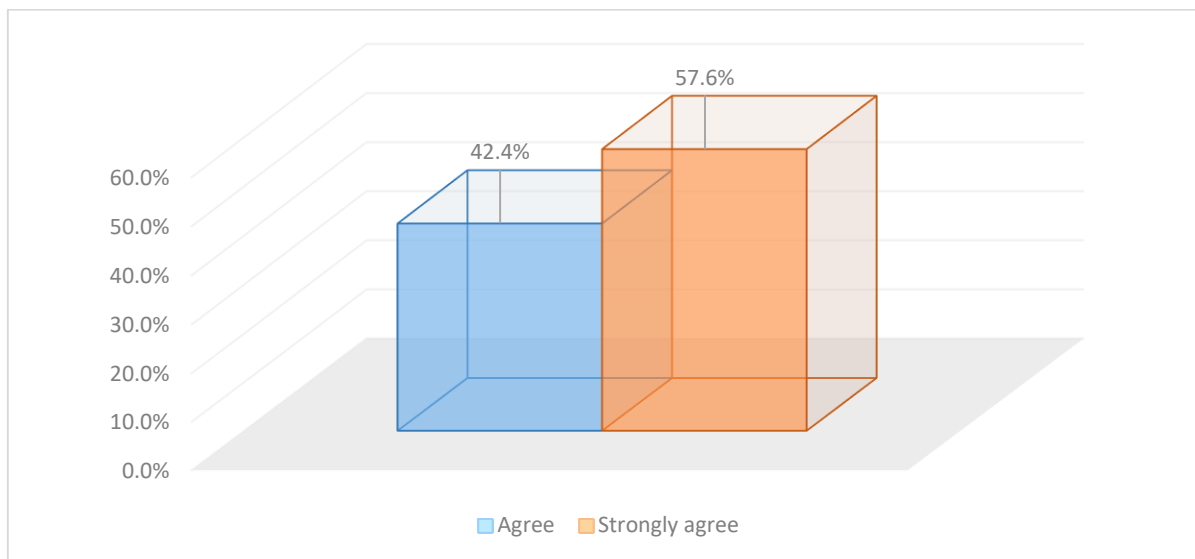


Figure 5.12: Overall improvement of quality of library services by web technologies

### 5.1.3.2 Effort expectancy

As one of the relevant UTAUT constructs of this study, effort expectancy was examined as part of the factors that influence the incorporation of web technologies by university libraries. Several aspects relating to effort expectancy have been analysed and the results are reported in this section. The respondents were asked to indicate the degree to which they agreed or disagreed with the statement that *library staff find it easy to use web technologies in the delivery of library services*. As displayed in Figure 5.13 below, 69.7% of the respondents agreed and 9.1% strongly agreed with this statement. It is evident from these results that a large proportion of the respondents (78.8%) either agreed or strongly agreed that they find it is easy to use web technologies for the purpose of delivering library services. In contrast, only 9.1% of the

respondents disagreed and no one strongly disagreed with the statement, while 12.1% neither disagreed nor agreed.

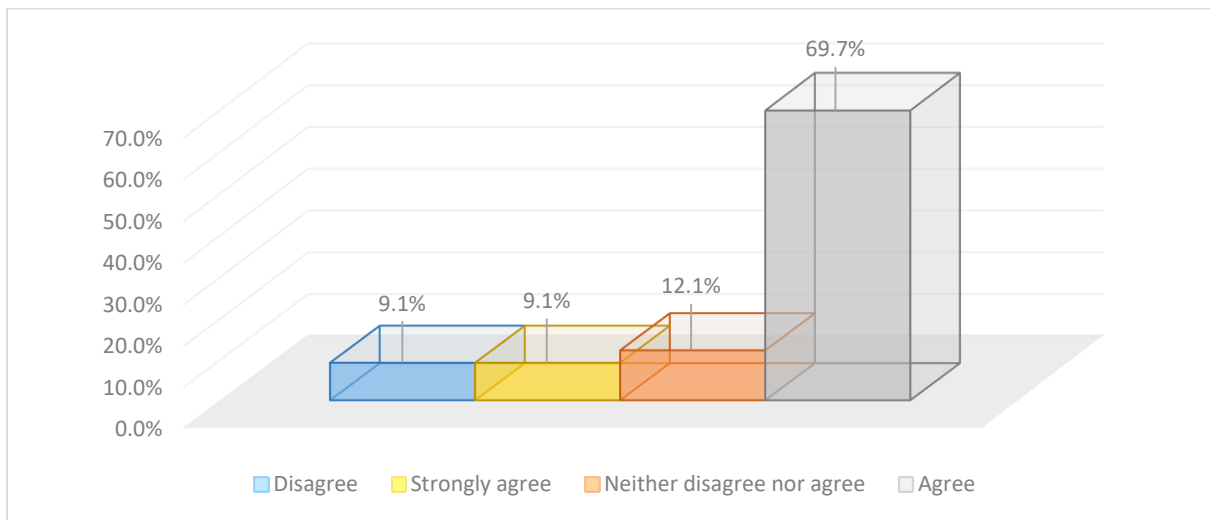


Figure 5.13: Ease of use of web technologies in the delivery of library services

The respondents were also asked to indicate their level of agreement and disagreement with regard to *the ease of learning how to use web technologies*. The results presented in Figure 5.14 below reveal that the majority of the respondents (60.6%) agreed and 9.1% strongly agreed that it is easy to learn how to use web technologies. Only 12.1% disagreed and none strongly disagreed with the statement, while 18.2% admitted that they neither disagreed nor agreed.

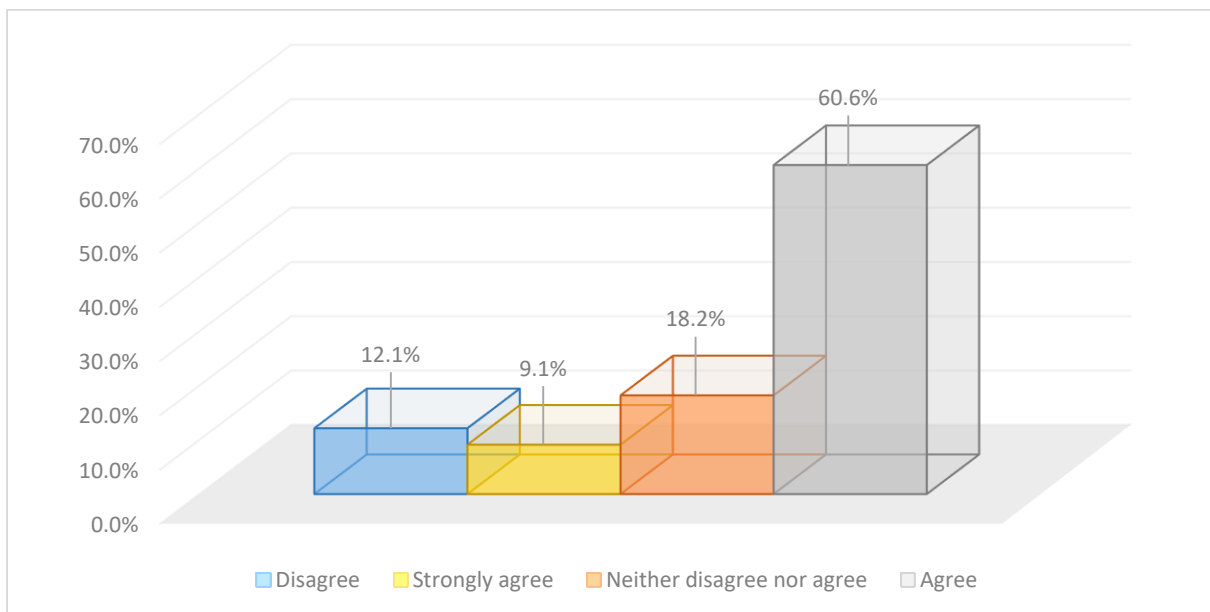


Figure 5.14: Ease of learning to use web technologies

The respondents were also specifically asked about the *ease of using web technologies in library outreach services*. Figure 5.15 below shows that 60.6% of the respondents agreed and 9.1% strongly agreed that they were easy to use. These results show that the majority of the respondents (69.7%) either agreed or strongly agreed with the statement. In contrast, only 6.1% disagreed and none strongly disagreed, while 24.2% reported that they neither disagreed nor agreed.

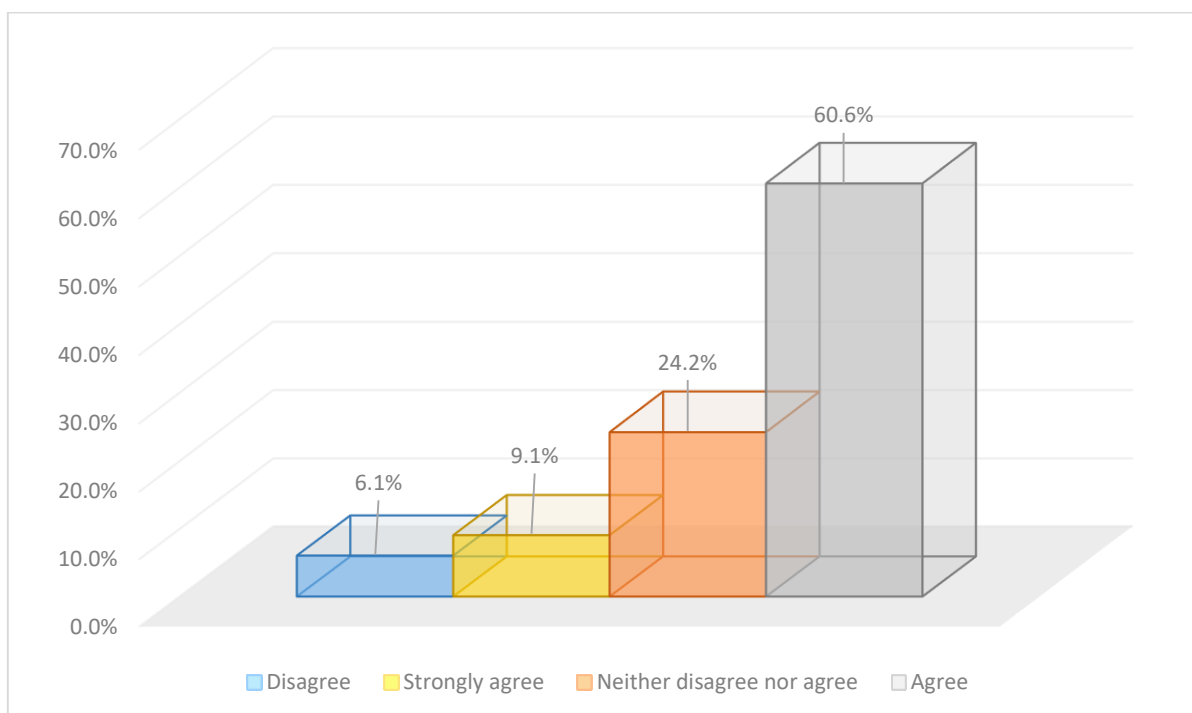


Figure 5.15: Ease of using web technologies in outreach services

With respect to the *ease of understanding web technologies*, the results presented in Figure 5.16 below show that 45.5% of the respondents said that they agreed and 9.1% strongly agreed with the statement that it is easy to understand web technologies. This is compared to only 9.1% and 3.0% who disagreed and strongly disagreed, respectively. Those who neither disagreed nor agreed accounted for 33.3%.

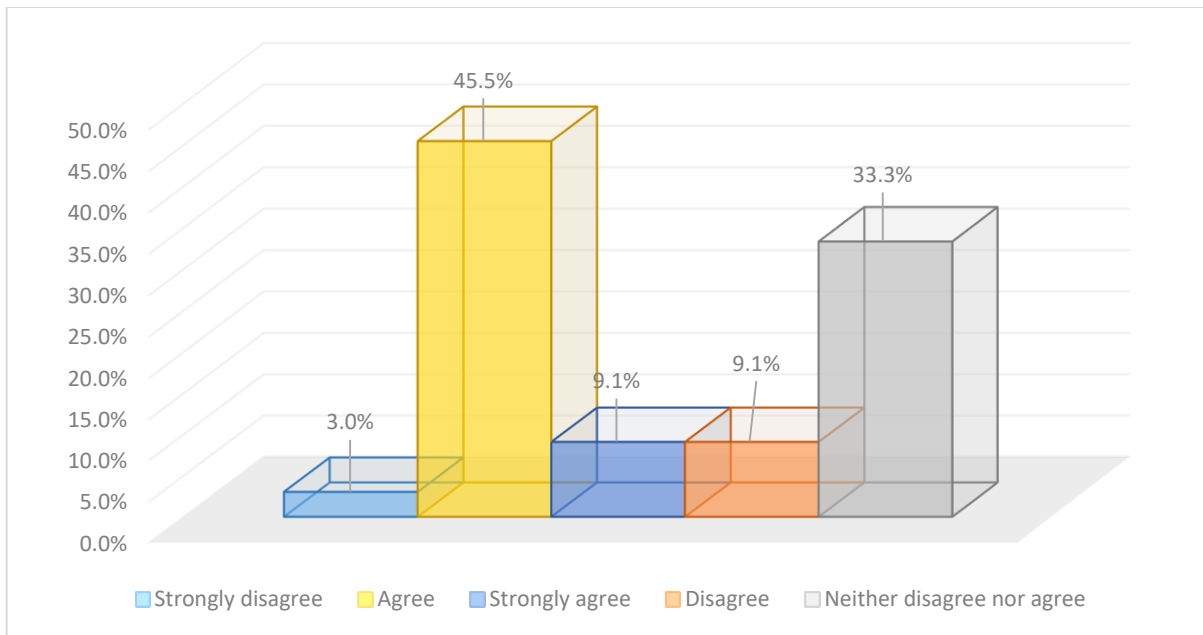


Figure 5.16: Ease of understanding web technologies

The respondents were further asked to indicate to what degree they agreed or disagreed with the statement that *it is easy to navigate web technologies*. The results depicted in Figure 5.17 below reveal that 48.5% of the respondents agreed and 12.1% strongly agreed that they find it easy to navigate these technologies. In contrast, 15.2% disagreed and none strongly disagreed with the statement, while 24.2% stated that they neither disagreed nor agreed.

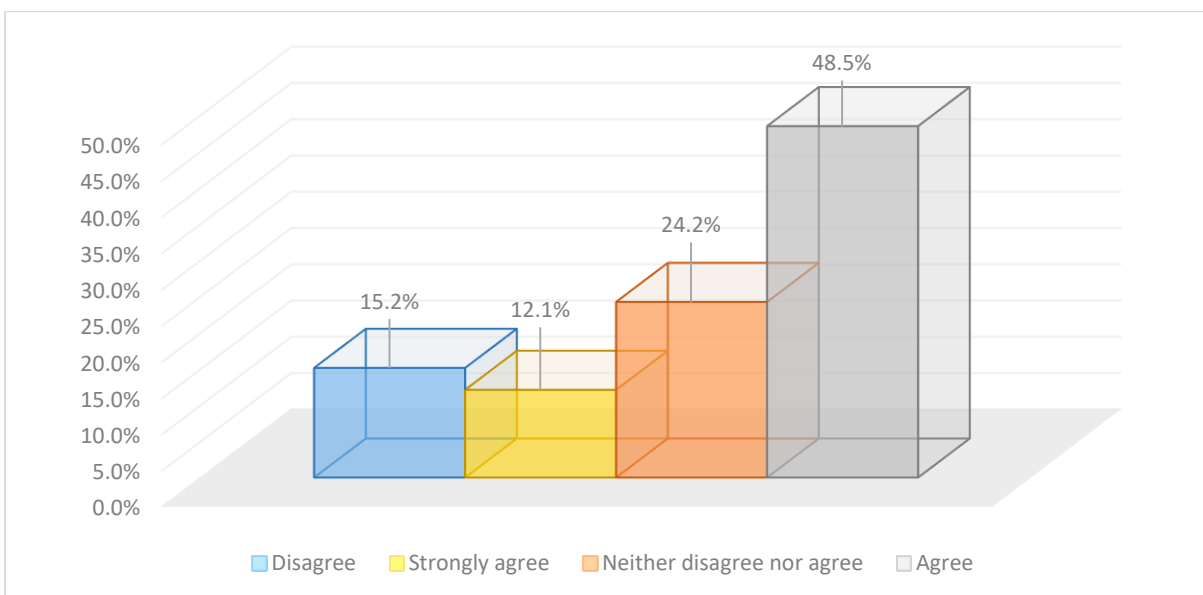


Figure 5.17: Ease of navigating web technologies

The respondents were also asked to indicate the degree to which they agree or disagree with the statement that *library staff do not require much training to use web technologies*.

The majority of the respondents (45.5%) disagreed and 9.1% strongly disagreed with the statement (Figure 5.18 below), implying that more than half of the respondents (54.6%) need training. By contrast, only a small number (15.1%) agreed, and none strongly agreed that staff do not require much training, while 30.3% indicated that they neither disagreed nor agreed.

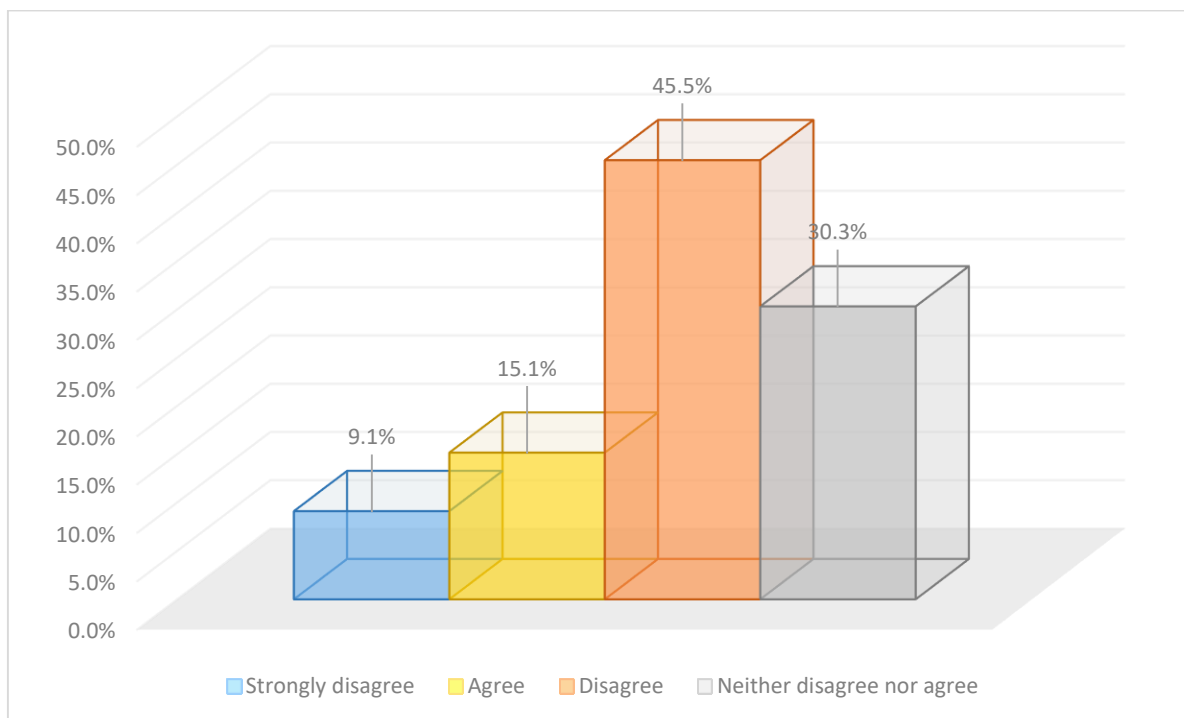


Figure 5.18: Librarian training in the use of web technologies

### 5.1.3.3 Social influence

Social influence measures the degree to which respondents perceive that stakeholders believe that university libraries should incorporate web technologies into their services. Several pertinent aspects concerning social influence have been examined in this study, and the results are presented in this section.

The respondents were asked to indicate the degree to which they agreed and disagreed with the statement that *library users exert influence on the library to incorporate web technologies into library services*. It can be seen clearly in Figure 5.19 below that the majority of the respondents (57.6%) agreed and 9.1% strongly agreed with this statement. These results show that respondents who either agreed or strongly agreed with the statement accounted for 66.7%. This is compared to a small proportion (9.1%) who disagreed and none who strongly disagreed with the statement, while 24.2% indicated that they neither disagreed nor agreed.

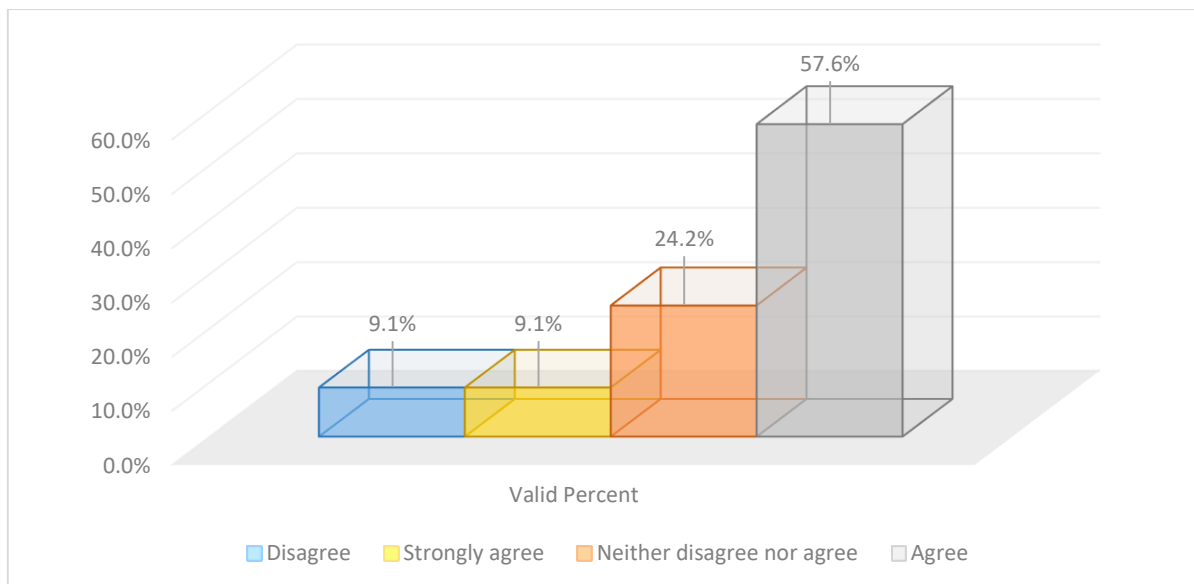


Figure 5.19: Users' influence on library incorporation of web technologies

The respondents were also asked to indicate their level of agreement or disagreement with the statement that *their university management supports the incorporation of web technologies into library services*. In Figure 5.20 below, the results show that 42.4% of respondents agreed and 48.5% strongly agreed with the statement. A great majority of respondents (91.2%) either agreed or strongly agreed with the statement. In contrast, only 6.1% of the respondents disagreed and none strongly disagreed with the statement, while only 3.0% of the respondents indicated that they neither disagreed nor agreed.

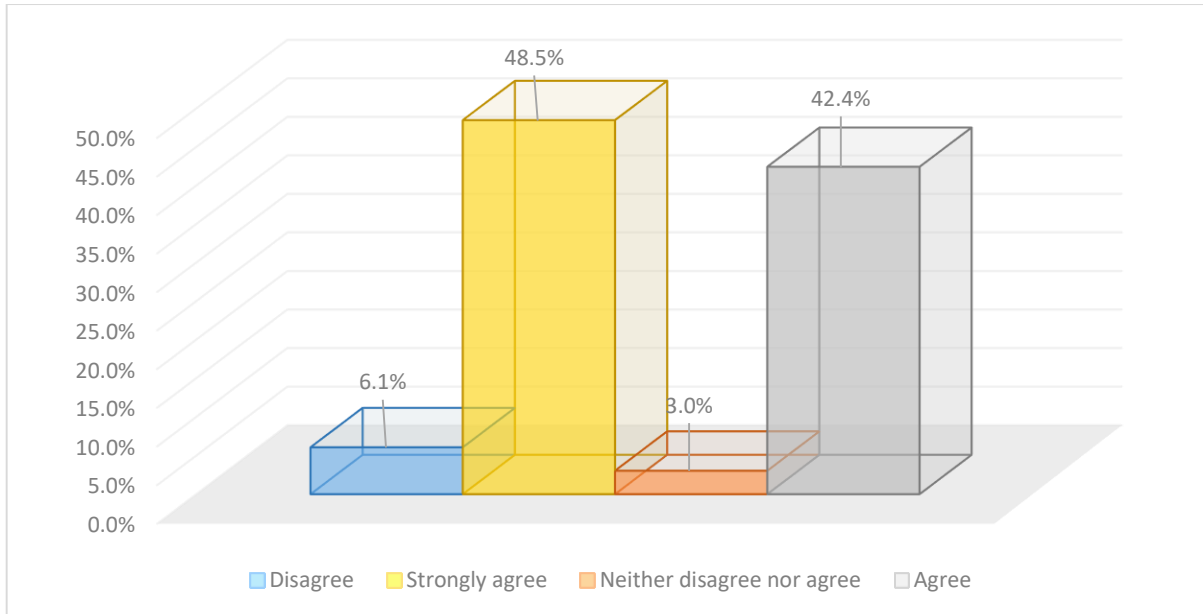


Figure 5.20: University Management support to library incorporation of web technologies

With respect to the influence of other librarians, the respondents were asked to indicate the degree to which they *believe that fellow librarians recommend the incorporation of web technologies into their library services*. The results in Figure 5.21 below show that the majority of the respondents 66.7% agreed and 21.2% strongly agreed with the statement. The results further show that none disagreed or strongly disagreed with the statement, while 12.1% said that they neither disagreed nor agreed.

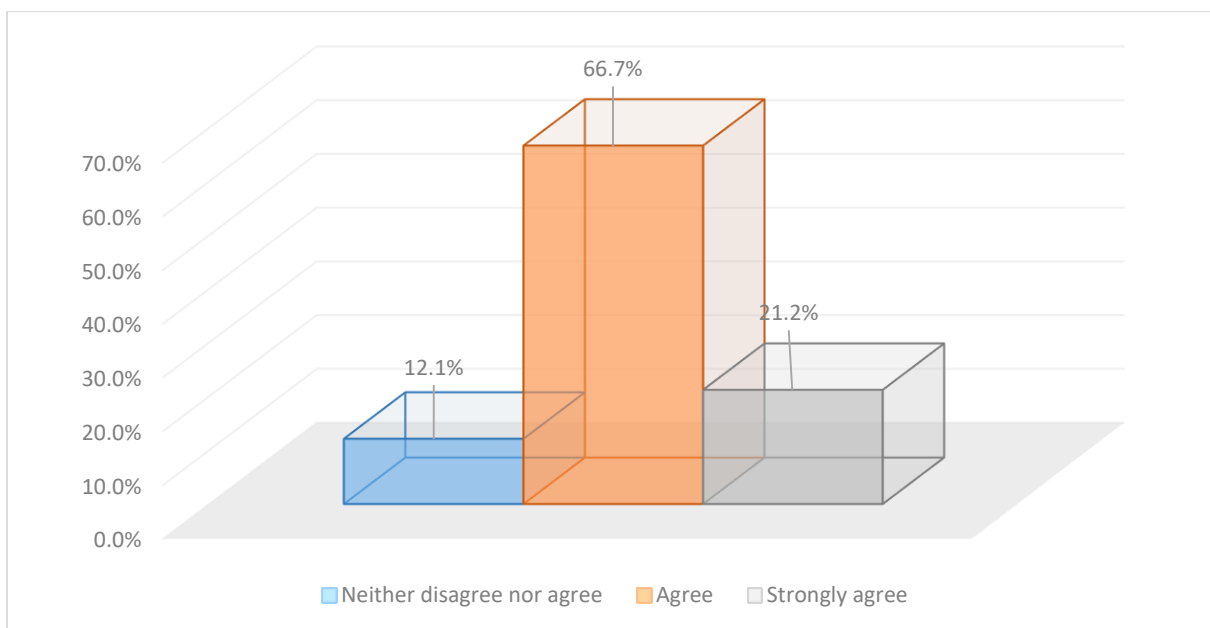


Figure 5.21: Fellow librarians' recommendations to incorporate web technologies

The respondents were further asked to indicate the degree to which they agreed or disagreed with the statement that *other libraries influence the incorporation of web technologies into their library services*. The results presented in Figure 5.22 below reveal that 45.5% and 30.2% of the respondents respectively agreed and strongly agreed with the statement. In contrast, only a handful of the respondents (6.1%) disagreed, and none strongly disagreed with the statement, while 18.2% stated that they neither disagreed nor agreed.

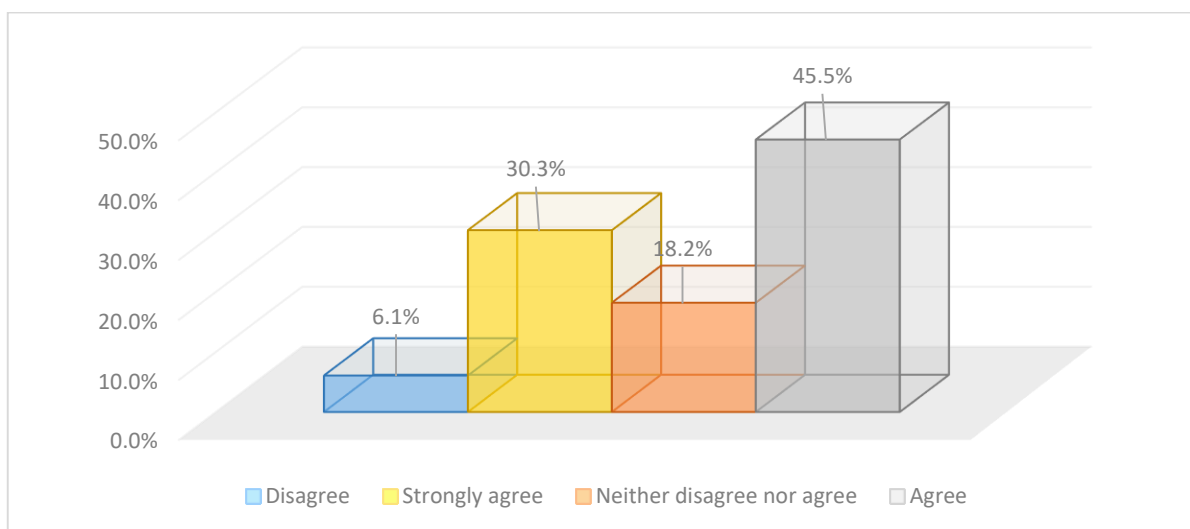


Figure 5.22: Other libraries influence on the incorporation of web technologies

The respondents were also asked to indicate whether image and reputation played a role in university libraries' incorporation of web technologies. From Figure 5.23 below, it is evident that the majority of the respondents (57.6%) agreed and (39.4%) strongly agreed that their library incorporates web technologies into services to improve image and reputation. The results of the respondents who either agreed or strongly agreed add up to 97%, showing a great majority of the respondents who agree that web technologies improve their library's image and reputation. The results further demonstrate that none disagreed or strongly disagreed with the statement, and only 3.0% of the respondents indicated that they neither disagreed nor agreed.

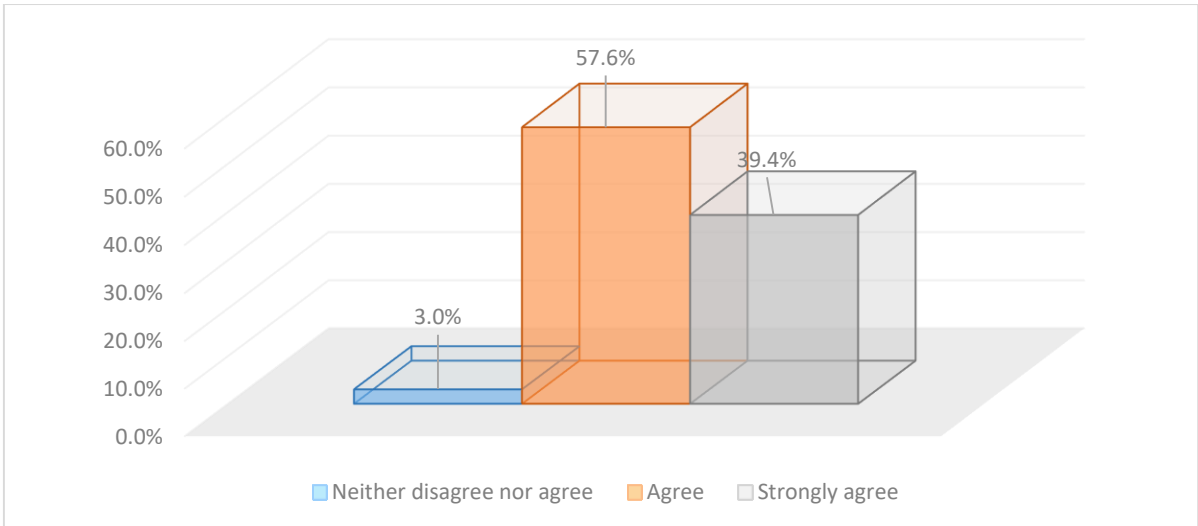


Figure 5.23: Web technologies' role in improving libraries' image and reputation

The respondents were also asked to indicate the degree to which they agreed or disagreed with the statement that *incorporating web technologies in their library services is consistent with their library's innovative culture*. As illustrated in Figure 5.24 below, 51.5% of the respondents strongly agreed and 42.4% agreed with the statement. These results reveal that a great majority of respondents (93.9%) either agreed or strongly agreed that the incorporation of web technologies is congruent with their library's innovative culture. In contrast, none disagreed or strongly disagreed with the above statement, although a small proportion of the respondents (6.1%) indicated that they neither disagreed nor agreed.

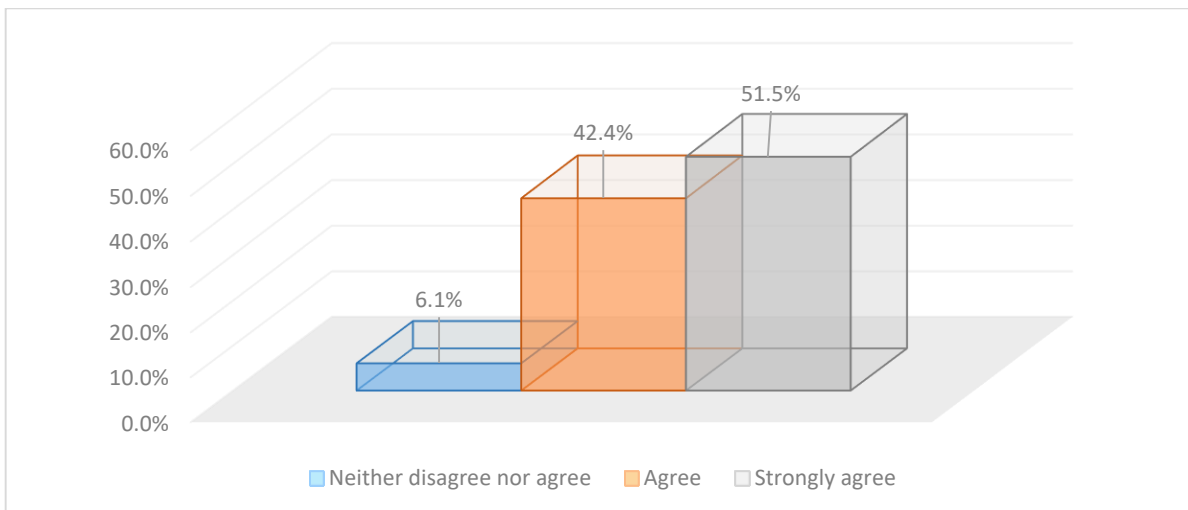


Figure 5.24: Incorporation of web technologies consistent with library's innovative culture

The respondents were also asked to indicate the degree to which they agreed or disagreed with the statement that *their libraries incorporate web technologies into services to meet institutional expectations*. The results in Figure 5.25 below shows that 42.4% of the respondents strongly agreed and 48.5% agreed with this statement. These results show that 90.9% of the respondents either agreed or strongly agreed with the statement. By contrast, only 6.1% disagreed and none strongly disagreed that they incorporate web technologies into the library services to meet institutional expectations. A small proportion of the respondents (3.0%) indicated that they neither disagreed nor agreed.

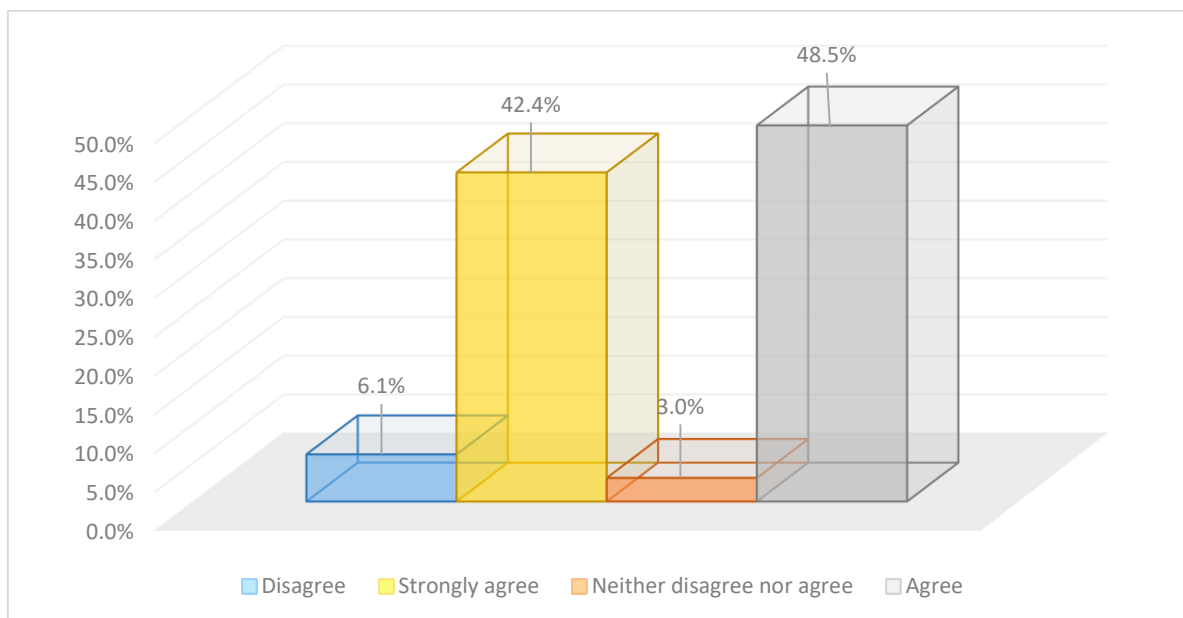


Figure 5.25: Library incorporates web technologies to meet institutional expectations

The respondents were further asked whether their libraries incorporate web technologies into library services *to comply with the library's policy*. Figure 5.26 below shows that 48.5% of the respondents agreed and 30.3% strongly agreed with this statement. Only 9.1% disagreed and none strongly disagreed with the above statement, and 12.1% declared that they neither disagreed nor agreed.

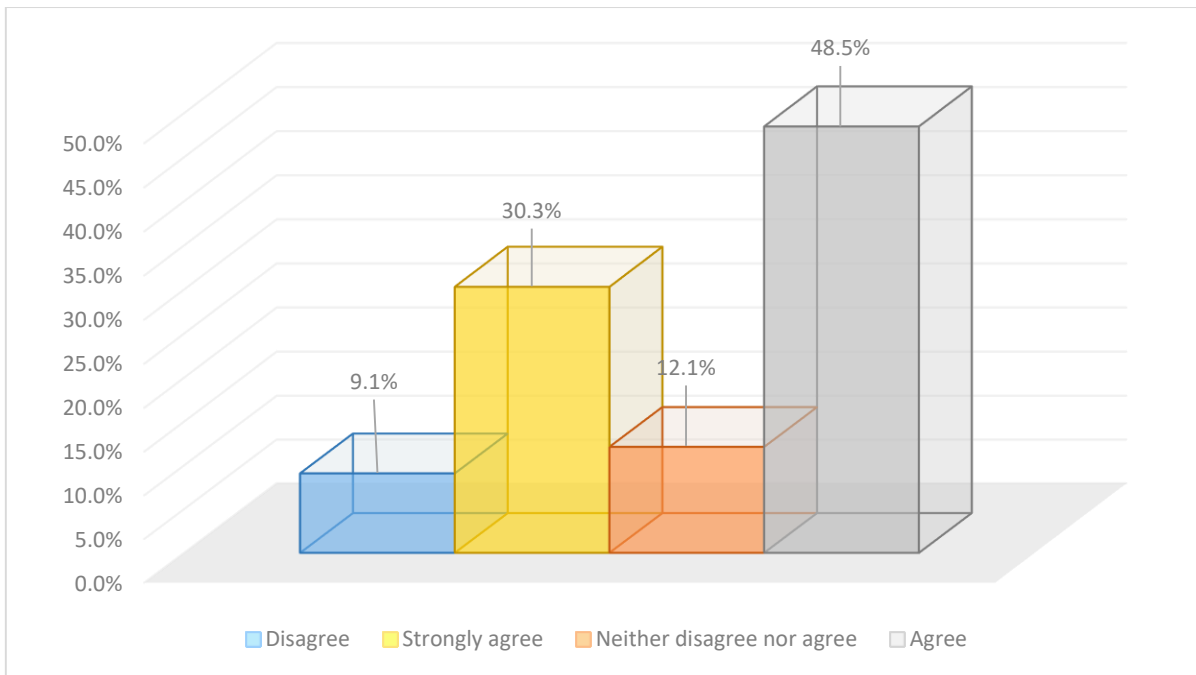


Figure 5.26: Incorporation of web technologies in compliance with library policy

The respondents were also asked to indicate their level of agreement or disagreement with the statement that *overall, library users support the incorporation of web technologies into library services*. As shown in Figure 5.27 below, a large proportion of the respondents (66.7%) agreed and 24.2% strongly agreed with the statement. None disagreed or strongly disagreed with the statement and only 9.1% of the respondents asserted that they neither disagreed nor agreed.

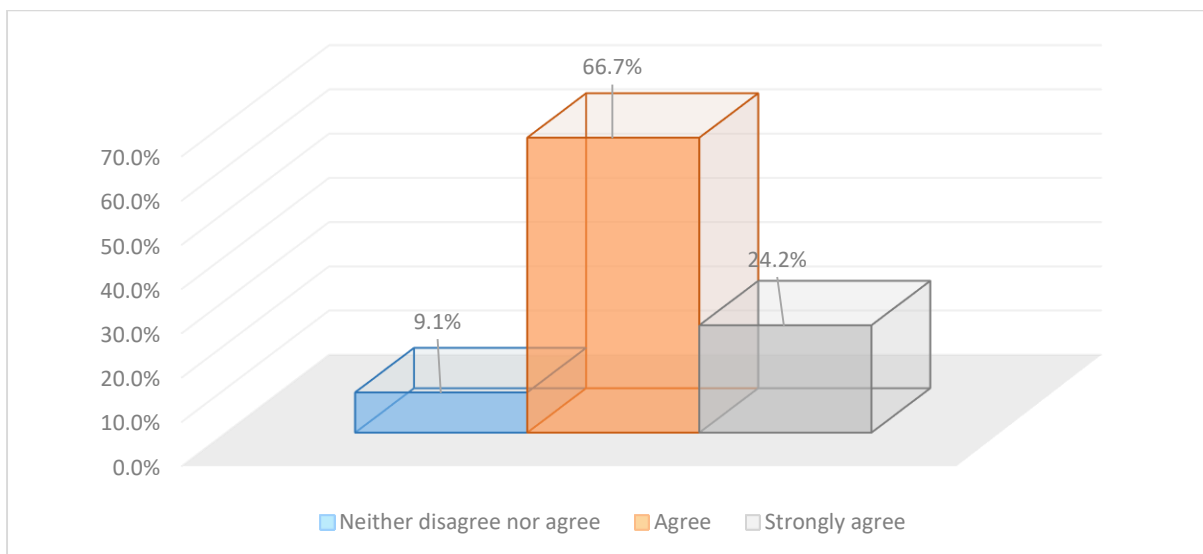


Figure 5.27: Users support of library incorporation of web technologies

### 5.1.3.4 Facilitating conditions

For an organisation to reap the benefits of any technology, it is essential to have the necessary infrastructure that supports the effective utilisation of such a technology. In this study, a question about facilitating conditions assessed the degree to which the respondents believed that there was sufficient organisational and technical infrastructure to support the library's incorporation of web technologies. Analysis of various aspects relating to the facilitating conditions construct were carried out and are presented below. While the first set of results report on the support provided by the library, the second set indicates the support provided by the parent university.

The respondents were asked to indicate their level of agreement or disagreement about whether *their library has good Internet connection to facilitate the utilisation of web technologies by the users*. As presented in Figure 5.28 below, 48.5% of the respondents agreed and 36.4% strongly agreed with the statement. Respondents who disagreed accounted for 6.1% and none strongly disagreed, while 9.0% said that they neither disagreed nor agreed.

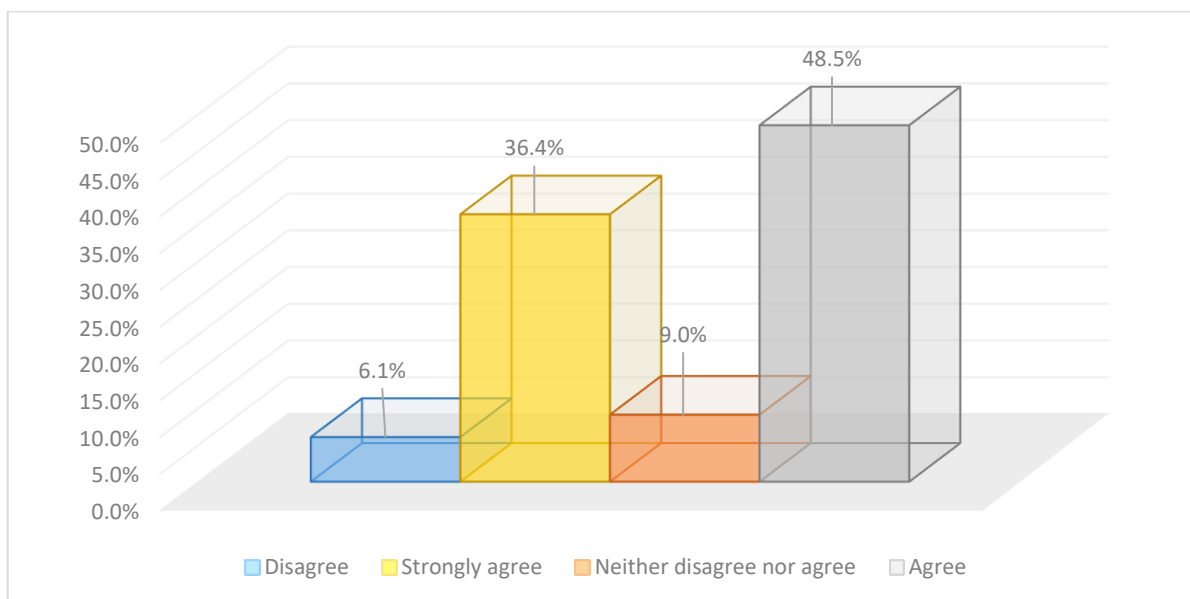


Figure 5.28: Good Internet connection to facilitate library users' usage of web technologies

Regarding *the provision of sufficient computers by the library for students' use*, the results presented in Figure 5.29 below reveal that 45.5% of the respondents agreed and 15.1% strongly agreed that their libraries provide enough computers to enable the users to utilise web technologies. In comparison, 15.2% and 12.1% respectively disagreed and strongly disagreed with the statement. Another 12.1% indicated that they neither disagreed nor agreed.

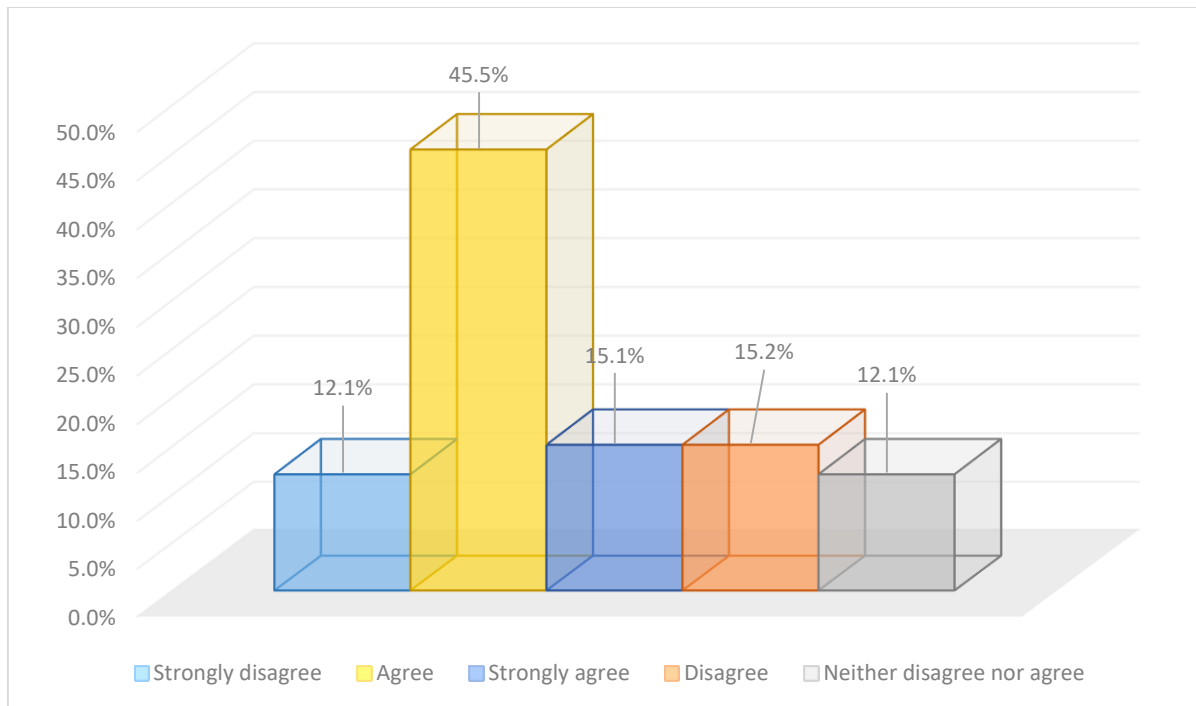


Figure 5.29: Sufficient computers for students' use of web technologies

The respondents were also questioned to indicate the degree to which they agreed or disagreed with the statement that *their libraries organise regular training sessions to equip the users with the necessary skills for the utilisation of web technologies*. The results displayed in Figure 5.30 below show that 45.5% of the respondents agreed and 27.2% strongly agreed with the statement. In contrast, only 9.1% disagreed and none strongly disagreed with the statement, while 18.2% indicated that they neither disagreed nor agreed.

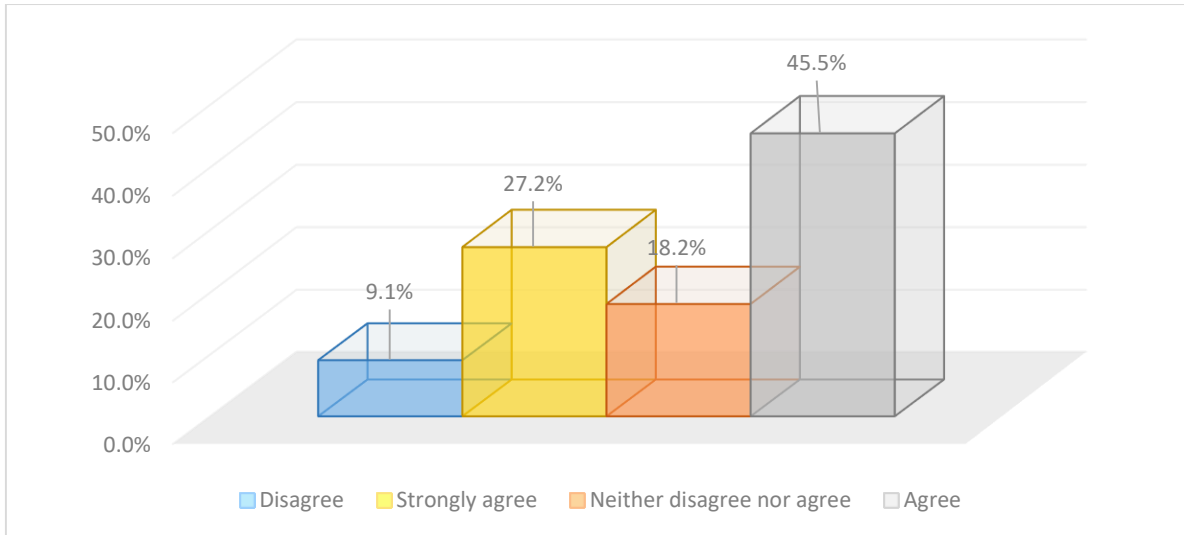


Figure 5.30: Library provision of web technologies training to users

An analysis on the degree to which the respondents agreed or disagreed with the statement that *their libraries have assigned specific staff members to help the users with problems relating to the utilisation of web technologies* was also performed. The results, as depicted in Figure 5.31 below, indicate that 54.5% of the respondents agreed and 30.3% strongly agreed with the statement. Only 3.0% disagreed and none strongly disagreed with the statement, while 12.2% asserted that they neither disagreed nor agreed.

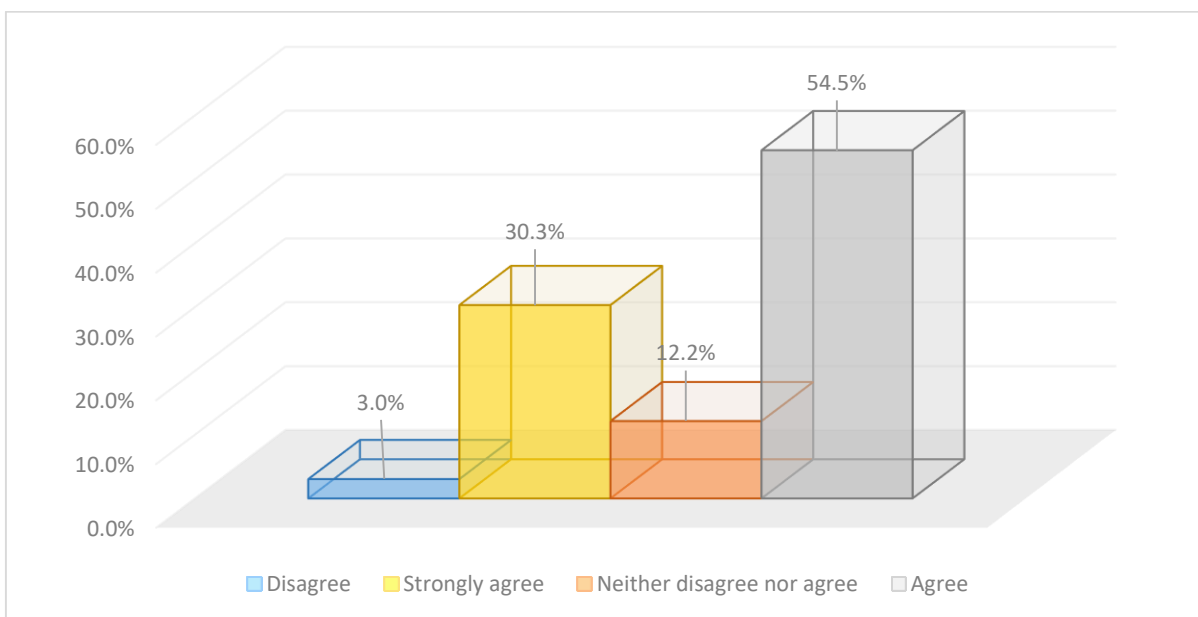


Figure 5.31: Library ICT staff dedicated to support users with usage of web technologies

The respondents were also asked *about the policy governing web technologies*. As shown in Figure 5.32 below, 30.3% of the respondents agreed and 6.1% strongly agreed that their libraries have a policy framework to govern the use of web technologies. In contrast, 24.2% disagreed, and 3.0% strongly disagreed with the statement. Surprisingly, a sizable minority (36.4%) of the respondents indicated that they neither disagreed nor agreed.

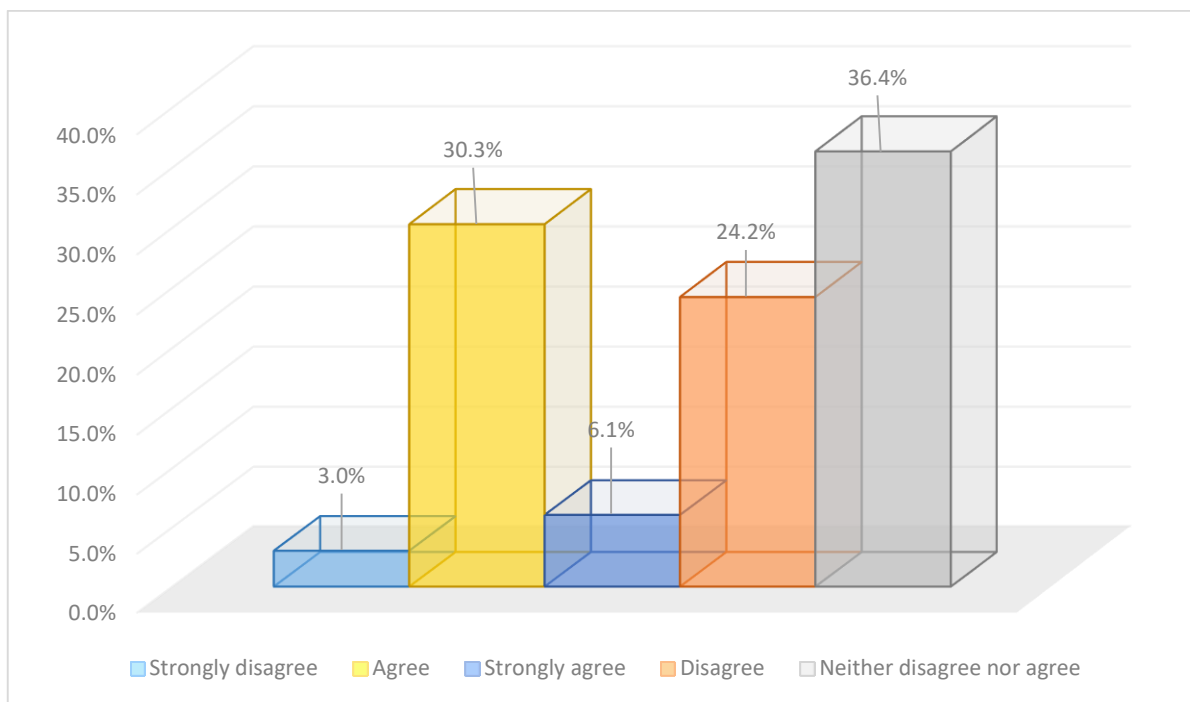


Figure 5.32: Existence of library policy framework to govern the use of web technologies

It also emerged from the data analysis that 42.4% of the respondents agreed and 15.2% strongly agreed that their *libraries guide users to protect their personal information* when utilising the web technologies (Figure 5.33 below). In contrast, 12.1% disagreed and none strongly disagreed with this statement, while 30.3% indicated that they neither disagreed nor agreed.

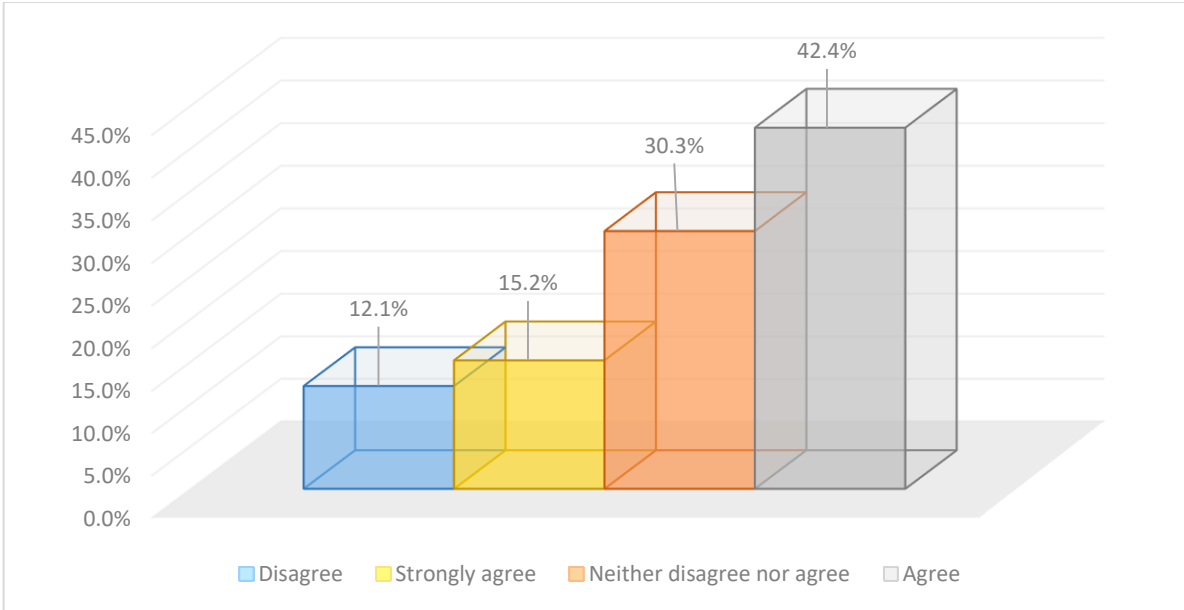


Figure 5.33: Library guidance of users to protect personal information on web technologies

With respect to *security concerns and privacy*, 45.5% of the respondents agreed and 6.1% strongly agreed that their libraries provide guidance on user awareness of security and privacy issues associated with the use of web technologies (Figure 5.34 below). In contrast, 18.1% disagreed and none strongly disagreed with the statement, while 30.3% stated that they neither disagreed nor agreed.

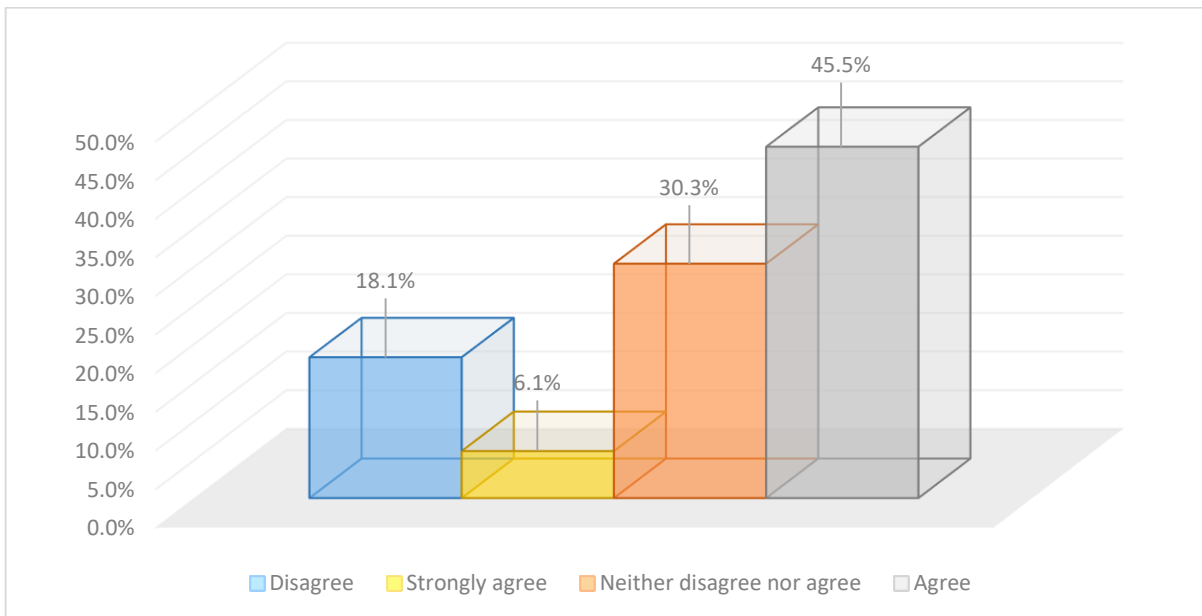


Figure 5.34: Library awareness guidance for users of web technology security and privacy issues

The respondents were also questioned to indicate the degree to which they agreed or disagreed with the statement that *their universities provide good information and communication technology (ICT) infrastructure to support the library's incorporation of web technologies*. As can be seen in Figure 5.35 below, more than half of the respondents (51.5%) agreed and (27.3%) strongly agreed with this statement, showing that 78.8% of the respondents either agreed or strongly agreed with the statement. In contrast, only 12.1% disagreed and none strongly disagreed, and 9.1% indicated that they neither disagreed nor agreed.

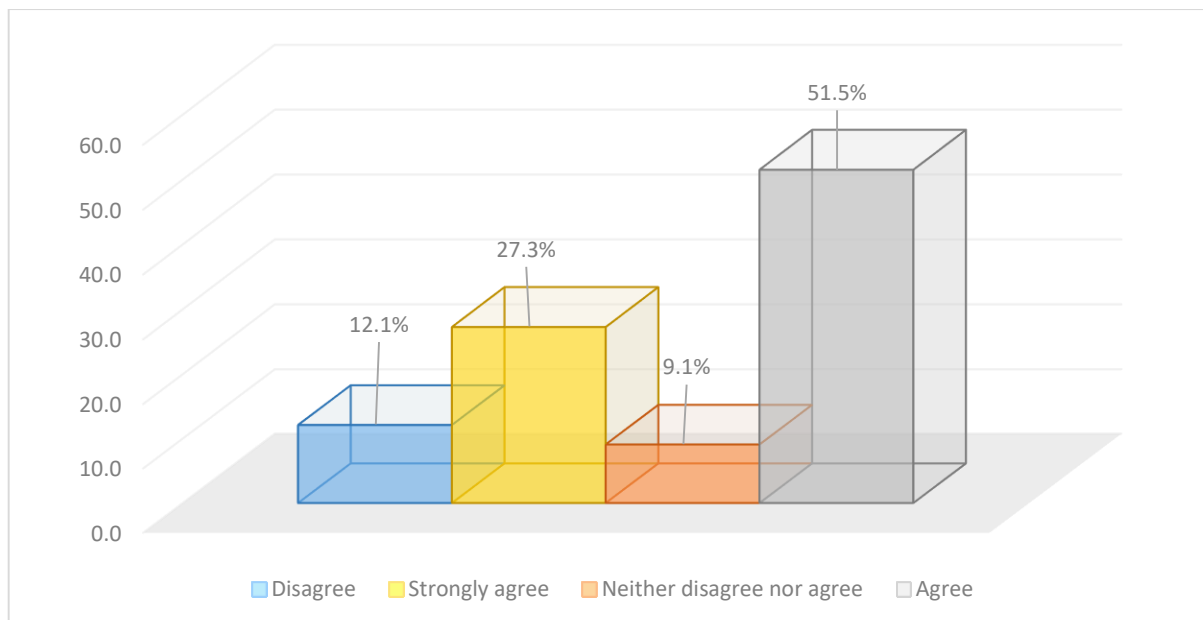


Figure 5.35: University ICT infrastructure to support library's incorporation of web technologies

The respondents were further asked to indicate their level of agreement or disagreement with the statement that *their university has a policy framework to govern the incorporation of web technologies into library services*.

Figure 5.36 below shows that 36.4% of the respondents agreed and 21.1% strongly agreed with the above statement. Those who disagreed accounted for 15.2% and none strongly disagreed, while 27.3% said that they neither disagreed nor agreed.

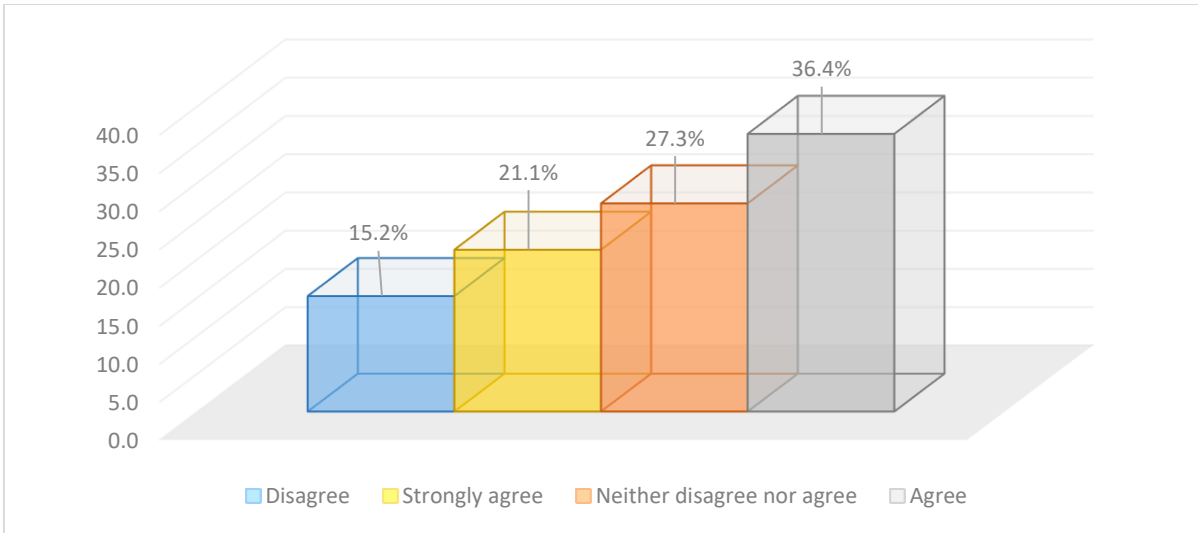


Figure 5.36: Existence of university policy to govern library's incorporation of web technologies

Wireless fidelity (Wi-Fi) plays an important role in enabling the utilisation of web technologies. It emerged from the data analysis (Figure 5.37 below) that the majority of the respondents (51.5%) strongly agreed and (42.4%) agreed that their universities provide Wi-Fi across their campuses to facilitate access to information through web technologies. These results represent a great majority of respondents (93.9%) who either agreed or strongly agreed with the statement. In contrast, only a small proportion of the respondents (6.1%) disagreed, and none strongly disagreed with the statement. None of the respondents was neutral about the statement.

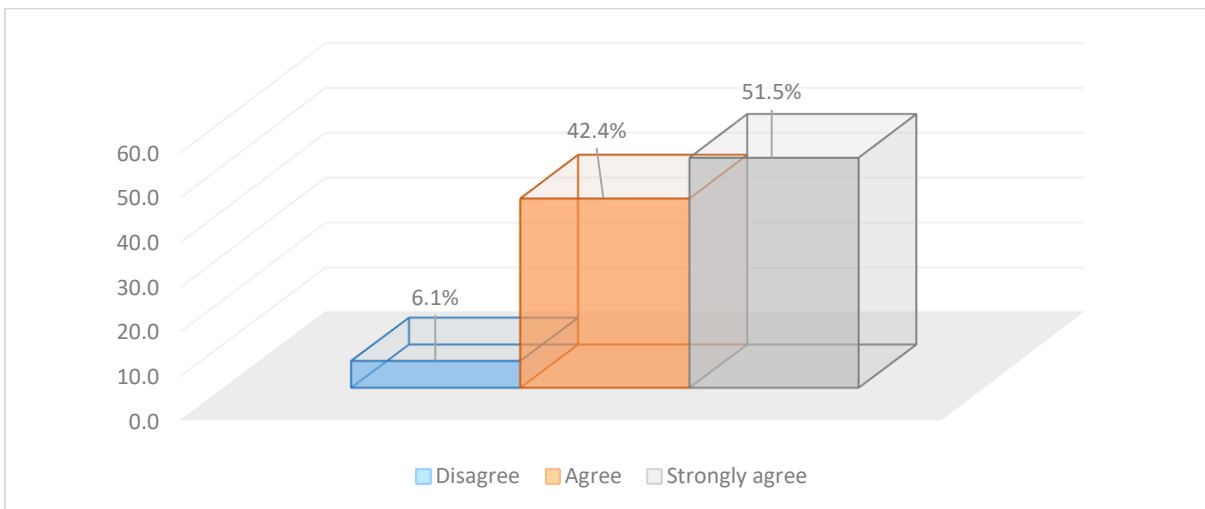


Figure 5.37: University Wi-Fi to facilitate access to information via web technologies

The results pertaining to the provision of computers by the university to facilitate the usage of web technologies are depicted in Figure 5.38 below. It is evident from these results that 45.5% of the respondents agreed and 6.1% strongly agreed that their university has sufficient budgeted funds to buy computers in order to facilitate the utilisation of web technologies. This is compared to 21.2% and 9.1% who disagreed and strongly disagreed, respectively. The respondents who neither disagreed nor agreed accounted for 18.1%.

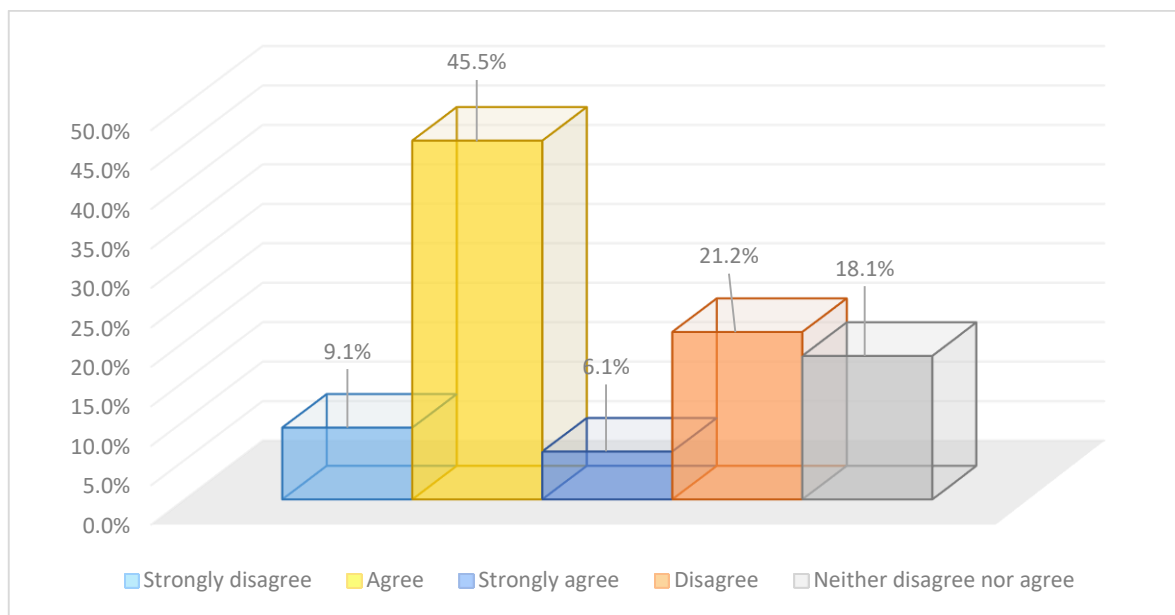


Figure 5.38: University provision of computers to facilitate the use of web technologies

The respondents were further asked whether their university prevents the incorporation of web technologies into library services because such technologies slow down the Internet speed.

Figure 5.39 below shows that 48.5% of the respondents strongly disagreed and 36.4% disagreed with statement, indicating that the great majority of the respondents (84.9%) disagreed. Only 6.1% of the respondents agreed and none strongly agreed, while 9.0% stated that they neither disagreed nor agreed.

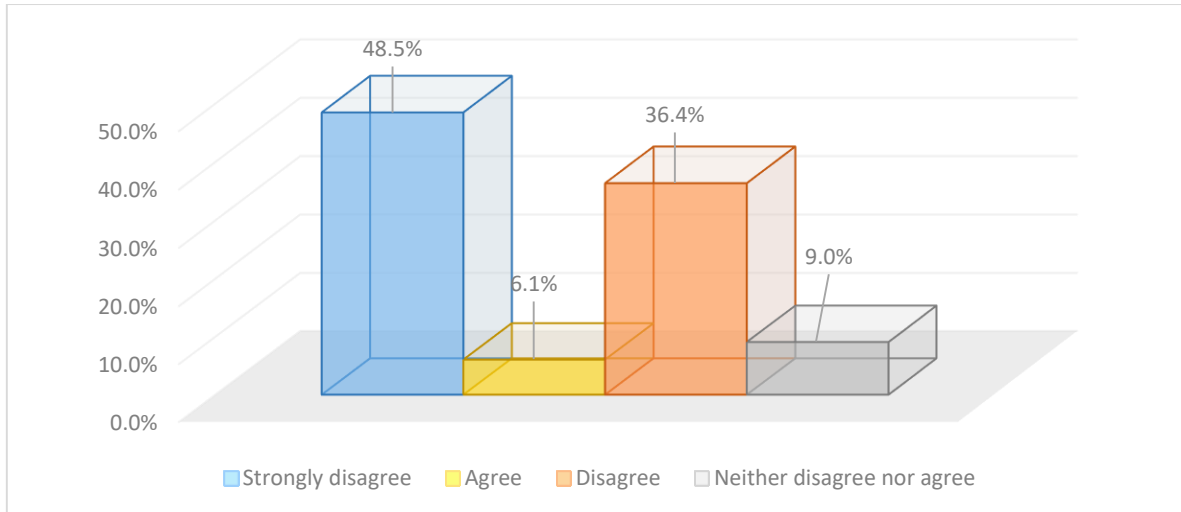


Figure 5.39: University prevention of web technologies owing to slow internet speed

The respondents were asked to indicate the degree to which they agreed or disagreed with the statement that *web technology processes at the university are informed by user-centric principles*. As shown in Figure 5.40 below, the results indicate that 48.5% of the respondents agreed and 18.2% strongly agreed with the statement, while none disagreed nor strongly disagreed and 33.3% said they neither disagreed nor agreed.

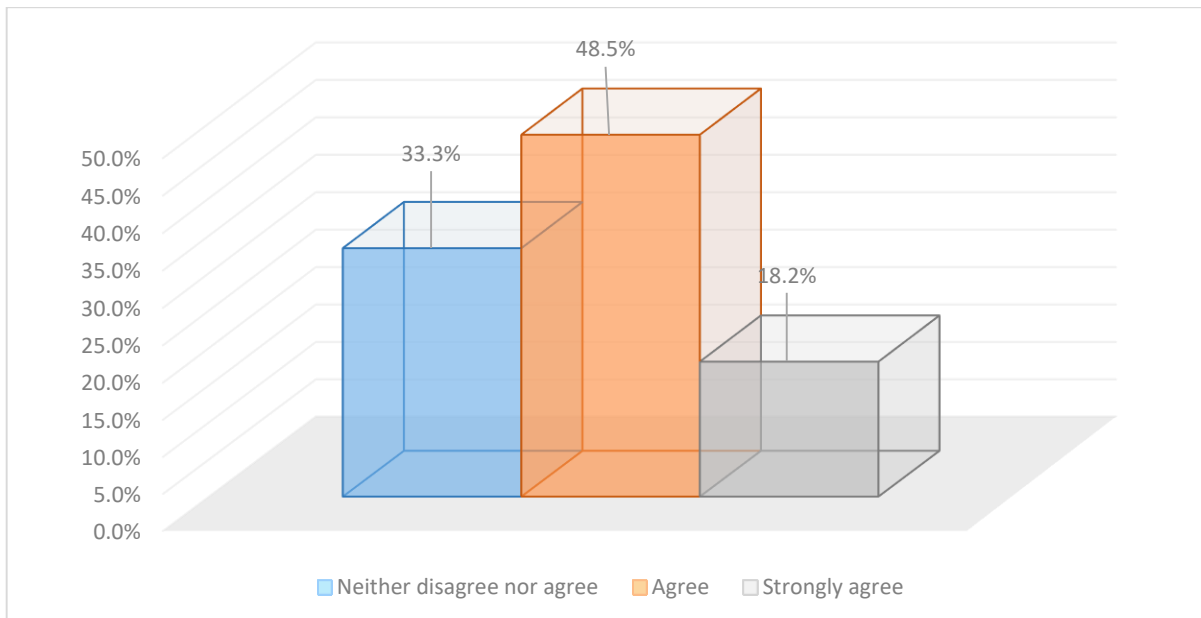


Figure 5.40: Web technology processes at university are informed by user-centric principles

### 5.1.4 Objective 3: Provision of user-centred library services enhanced by web technologies

The respondents were requested to indicate the factors that they thought were important in the provision of user-centred library services enhanced by web technologies. Since this is a multi-choice questions, the respondents could choose as many responses as applied. The results in Table 5.3 below show that user needs and expectations, as well as user friendliness, accounted for 8.7% each. Responses to the question on the quick discoverability of information from the entire library collections and 24/7 accessibility of library services were also equally divided with 8.5% each.

Interactivity of web technologies accounted for 8.2%, followed by effectiveness in promoting library services and effectiveness in providing online information literacy instruction which also equally shared 7.9% each. The delivery of customised information and effectiveness in sharing information were equally divided with 7.4% each. The effectiveness in providing online reference services accounted for 7.1%, followed by the cost-effectiveness of interaction between users and librarians (6.9%) and then the user-centric content architecture (6.1%).

Table 5.3: Important factors for library user-centric services enhanced by web technologies

<b>FACTORS</b>	<b>RESPONSES N</b>
User needs and expectations	33
Quick discoverability of information from the entire library collections	32
Cost-effective interaction between users and librarians	26
User-friendliness	33
Protection of personal information	25
24/7 accessibility of library services	32
Interactivity of web technologies	31
Delivery of customised information	28
Effectiveness in sharing information	28
Effectiveness in promoting library services	30

Effectiveness in providing online information literacy instruction	30
Effectiveness in providing online reference services	27
User-centric content architecture	23
Total	378

Source: Field data, 2021

The respondents cited other factors not included in the questionnaire which they regarded as important in the provision of library user-centred services enhanced by web technologies. These include the provision of ‘just in time’ information; the regular update of web technologies because of new developments and user information needs; 24/7 interactive service for users; evidence-based research to inform the incorporation of web technologies; and the provision of online tutorials for information literacy instruction, which is effective in the Covid-19 era.

### **5.1.5 General comments on the incorporation of web technologies into library services**

The respondents were given the opportunity to make additional comments relating to the incorporation of web technologies into library services. They provided divergent views, including a suggestion for university libraries to incorporate web technologies in order to meet users’ expectations because most users join universities with prior knowledge of web tools. It was also proposed that university libraries should incorporate web tools that are mobile-compliant to enable students to access library resources via their smartphones. E-learning is fast becoming the mode of learning, catapulted by health pandemics like Covid-19. Therefore, the role that web technologies play in supporting online teaching and learning was underscored.

Concerns were also raised about poor ICT infrastructure that hinders the effective use of web technologies in some university libraries. While librarians recognise the benefits offered by

web technologies, their ideas are not always implemented owing to a lack of funding. The lack of ICT skills among librarians was also highlighted. It was noted that obtaining IT support from the university’s centralised IT department often takes time. Hence, there is a need to reskill librarians with ICT skills.

## 5.2 Qualitative results

This section presents the results of the qualitative phase of this study. While one set of qualitative data was collected by means of individual interviews with six librarians, another set of data was collected from four focus group discussions (FGDs) conducted with undergraduate and postgraduate students from the sampled universities. See Chapter 4, Table 4 for the number of students who participated in the focus group discussions. The interview guide (see Appendix 3) and FGD guide (see Appendices 6 and 7 for undergraduate and postgraduate students respectively), developed and employed to collect qualitative data, were based on the constructs of the UTAUT model (Venkatesh, Morris, Davis & Davis, 2003) and Library 2.0 theory (Maness, 2006) that underpin this study. Table 5.4 shows the relationship between the research questions raised by this study and the theories, constructs, units of analysis and appropriate research instruments that were employed to collect qualitative data.

Table 5.4: Research questions and corresponding theory, constructs, units of analysis and appropriate research instrument for qualitative

<b>RESEARCH QUESTION</b>	<b>THEORY</b>	<b>CONSTRUCT</b>	<b>RESPONDENTS</b>	<b>RESEARCH METHOD</b>
1. What web technologies are incorporated into the services of university libraries in the Southern African Development Community region?	UTAUT	<ul style="list-style-type: none"> <li>• Performance expectancy</li> <li>• Social influence</li> </ul>	• Librarians	Interviews
			<ul style="list-style-type: none"> <li>• Undergraduate students</li> <li>• Postgraduate students</li> </ul>	FGDs

2. What factors influence university libraries in the Southern African Development Community region to incorporate web technologies into their services?	UTAUT	<ul style="list-style-type: none"> <li>• Performance expectancy</li> <li>• Efforts expectancy</li> <li>• Social influence</li> <li>• Facilitating conditions.</li> </ul>	• Librarians	Interviews
			<ul style="list-style-type: none"> <li>• Undergraduate students</li> <li>• Postgraduate students</li> </ul>	FGDs
3. How can these factors be used to develop a user-centred model for implementing web-based library services?	Library 2.0	<ul style="list-style-type: none"> <li>• User-centredness</li> <li>• Multimedia experience</li> <li>• Communally innovative</li> </ul>	• Librarians	Interviews
			<ul style="list-style-type: none"> <li>• Undergraduate students</li> <li>• Postgraduate students</li> </ul>	FGDs
4. What are the perceptions of users towards the library services enhanced by web technologies?	Library 2.0	<ul style="list-style-type: none"> <li>• User-centredness</li> <li>• Multimedia experience</li> <li>• Communally innovative</li> </ul>	• Librarians	Interviews
			<ul style="list-style-type: none"> <li>• Undergraduate students</li> <li>• Postgraduate students</li> </ul>	FGDs

The procedure followed to analyse qualitative data involved organising the data, reading through the data, coding and generating themes, understanding and interpreting the data and, finally, presenting the results in an appropriate report (Marshall & Rossman, 2011:209). The data analysis strategy adopted in this study followed a deductive qualitative data analysis approach which, according to Patton (2015:542), involves a predetermined framework that guides the data analysis. Consistent with the deductive approach, the qualitative data were analysed based on the corresponding interviews and FGDs which served as frameworks for analysis. These frameworks were based on the constructs derived from UTAUT (Venkatesh, Morris, Davis & Davis, 2003) and Library 2.0 theory (Maness, 2006). The subsequent section starts by presenting the individual interview results.

### **5.2.1 Results of the interviews with librarians**

This section presents the results of the individual interviews conducted with six librarians from selected universities in the SADC region. The results are presented in accordance with the research questions of this study, the constructs from the underpinning theories, namely, UTAUT (Venkatesh, Morris, Davis & Davis, 2003) and Library 2.0 theory (Maness, 2006).

#### **5.2.1.1 Web technologies incorporated by university libraries: librarians' responses**

The respondents were asked to specify the web technologies their university libraries have incorporated into their services. The results revealed that a variety of web technologies have been incorporated by university libraries. These include library web-scale discovery tools such as Primo, the EBSCOhost discovery tool and WorldCat which facilitate information discovery from the entire library digital collections through a one-search interface.

The Sierra, Alma and KOHA library management systems were employed to manage and organise library content and information resources. DSpace software was used for managing institutional repositories, the SciVal tool was employed to measure and analyse universities' research performance based on research publications indexed in the Scopus abstract and citation database. The results further showed that SpringShare was used for libguides content creation and management. A lesser-known tool within the library sector known as Asana was used for content management by one university library. Participants also reported the incorporation of RemoteX and EZproxy to facilitate off-campus access to library licensed electronic resources.

The results also brought to light that some university libraries used Google drive and GitHub as collaborative work tools, which their parent university subscribe to at the institutional level.

Zoom and Microsoft Teams were also reported to be widely used for virtual meetings and for delivering information literacy instruction to students. It also came to the fore that while Instant Messaging (IM), Chat tools and WhatsApp were employed for librarian–user interactions, Facebook, Twitter, RSS, podcasts and YouTube were used mainly for current awareness and for promoting library services and resources.

#### **5.2.1.2 Factors influencing librarians’ usage of web technologies**

The factors that influenced librarians to use web technologies were based on the UTUAT constructs, namely, performance expectancy, effort expectancy, social influence and facilitating conditions (Venkatesh, Morris, Davis & Davis, 2003), one of the theories underpinning this study. These constructs constitute the main themes framing the results of the data analysis discussed and presented in the Sections 5.2.1.2.1 to 5.2.1.2.4 below.

##### **5.2.1.2.1 Librarians’ perspectives on performance expectancy of web technologies**

Based on the performance expectancy definition (see Chapter 2, Section 2.3.5.1), librarians were asked to discuss how useful the web technologies are to library services. The results revealed a consensus by librarians that web technologies are useful in providing online services to meet the library users’ information needs. As one librarian remarked “*Web technologies are extremely useful because they help improve the online library services. For example, the reference service that was only offered physically inside the library is now provided online via web technologies*”. Other librarians indicated the usefulness of RSS feeds in providing selective dissemination of information (SDI) to lecturers and postgraduate students. Librarians also indicated that web technologies are useful in improving digital reference services and user education; promoting library services; improving access to educational information; and improving work performance.

With regard to digital reference services, the data analysis revealed that web technologies facilitate real-time interaction between users and librarians. The effectiveness of Instant Messaging (IM) in enabling students to ask questions and obtain immediate feedback from librarians was highlighted. It was also reported that during the Covid-19 lockdowns, university libraries completely relied on appropriate web technologies to provide reference service. As one librarian stated *“When the library closed during the Covid-19 lockdowns, I and my colleagues created WhatsApp groups to offer reference services to students. We had to adjust to new ways of doing things”*. Most librarians also indicated that there was a surge in the use of the Ask-a-librarian service during this period.

The analysis of data further revealed that librarians employed web technologies to facilitate the delivery of online information literacy instruction. They used YouTube, Zoom and Microsoft Teams to impart information skills to students and offer library orientation to new intakes. The use of these tools intensified during the Covid-19 lockdowns. As one librarian asserted *“While Covid-19 is a deadly pandemic, it increased my usage of web technologies to support students. I used Zoom to teach the information literacy (IL) module”*. In order to mitigate the effect of Covid-19, Zoom was also used by librarians to orientate first-year students to library services. Some librarians also indicated that they employed a web tool known as Camtasia to create videos of library training material for postgraduate students.

With respect to improving the promotion of library services, the data analysis showed that librarians mostly employed Facebook and Twitter to promote library services. One library created the position of Marketing Librarian, with the incumbent being tasked to promote library services via web technologies. Describing this position, a librarian said,

*Our Marketing Librarian publicises so much library information on Facebook and Twitter. If a student posts a negative message about the*

*library, the Marketing Librarian uses Facebook or Twitter to give feedback. I think through experience, the Marketing Librarian has gained a good understanding of students' plights and how to solve their problems.*

Surprisingly, one librarian doubted the usefulness of Facebook in library services and said, *"I have no interest in Facebook, I think it is a negative platform and phenomenon, and I am very much against its usage in university libraries because it is used for many immoral things"*. Nevertheless, the overall finding was that librarians found Facebook useful for the purpose of promoting library services and current awareness.

With regard to improving access to educational materials, the data analysis demonstrated that library web-scale discovery tools and licensed e-resources have improved access to information that supports learning, teaching and research. These tools proved their usefulness yet again during the Covid-19 lockdowns because access to library materials in print format was completely suspended. Digitisation of library print materials also intensified during the Covid-19 lockdowns. As one librarian asserted, *"During the Covid-19 lockdown, some users asked the library to digitise print publications in the Special Collections. A few librarians worked from office to digitise some of these materials and uploaded them on the institution repository and this helped the users a lot"*. It was also reported that some libraries have put in place restrictive measures such that these materials may not be loaned out because they are rare, hard to replace if they get lost and are vulnerable to tear and wear.

It was reported that because of the usefulness of accessing educational information through web technologies, some university libraries have shifted their acquisition priorities to focus more on eBooks. This shift is motivated by the fact that eBooks can be accessed online by many readers at the same time thus broadening access to educational materials. One librarian

reported that their library uses a free online data repository known as ZivaHub to provide access to research data and scholarly outputs.

With respect to improving work performance, the data analysis revealed a consensus among librarians that web technologies have improved efficiency in their work. As one librarian stated, *“When we were working on the library strategy with colleagues in our department, one of our colleagues who is tech savvy shared the draft on Google docs for all of us to edit and make comments, and this made our collaborative work faster, easy and more convenient”*. Another librarian commented that, *“I use emails a lot because our library is a multi-branch library. If I need support from the IT [Information Technology] team, I just send them an email or a WhatsApp message and then one IT personnel comes to my office to attend to my problem immediately”*.

However, librarians also underscored the importance of evaluating web technologies before they are incorporated by university libraries, as this will determine their effectiveness for library services and work. Accordingly, it should be the usefulness that determines whether a particular web technology is appropriate to fulfil a specific library’s function. Overall, the results showed that web technologies are useful in improving librarians’ work performance.

#### **5.2.1.2.2 Librarians’ perspectives on the effort expectancy of web technologies**

Based on the effort expectancy definition (see Chapter 2, Section, 2.3.5.2), librarians were asked to discuss how easy has it been for them to use web technologies in library services. They were also asked to describe the difficulties they faced when doing so. The data analysis revealed that while some librarians found most web technologies easy to use, others indicated the opposite. One librarian who found web technologies easy to use affirmed that *“I find web*

*technologies easy to use and manage complex processes in few seconds. For example, I have used the SciVal tool to generate faculties' research productivity reports*". It was observed by a few librarians that web technologies are not only easy to use, but they make possible things that were never possible previously, such as conducting online interviews.

The data analysis also revealed that not all web technologies are easy to use. A few librarians reported that sometimes the skills for using a specific web technology may be lacking. As one participant asserted, *"I must admit that I faced difficulties in using podcasts to promote library services. It has always been a learning curve for me and now I invest a lot of time in learning how to use some web technologies"*. It was also brought to light that librarians who are early adopters of web technologies learn very fast, while the laggards take time to overcome the lack of skills. Overall, the results demonstrated that only a few librarians lacked the necessary skills to use certain web technologies effectively.

#### **5.2.1.2.3 Librarians' perspectives on the social influence of web technologies**

In line with the definition of social influence (see Chapter 2, Section 2.3.5.3), librarians were asked to describe how their library users and fellow librarians influenced their use of web technologies. The data analysis demonstrated a consensus among the librarians that the library users (students and lecturers) and fellow librarians have had a major influence on librarians' utilisation of web technologies, with some librarians indicating that students have a strong voice in library matters and make influential suggestions for improving library services. Young students prefer to use web technologies to access library online resources and this has influenced librarians to use such tools. As one librarian stated *"Young students are exposed to web tools and smartphones at a very young age. They prefer online information not hard copies*

*of books. As a result, we are amending our collection development policy, to concentrate on eBooks and e-journals subscriptions”.*

The data analysis also indicated that academic staff influence librarians to use certain web tools. As one participant asserted *“The library subscribed to the trend module to analyse research trends, which helps postgraduate students to choose research topics and identify supervisors. This subscription was influenced by a professor”*. It also came to the fore that some librarians are discouraged from using certain web tools, even if they are recommended by users, because one must memorise passwords to access web technologies.

The data analysis further revealed that librarians influenced each other’s usage of certain web technologies. As one participant commented, *“A few weeks ago, our university librarian circulated to all library staff a hyperlink with online libguides from another library, and advised us to develop similar libguides so that we conform to best practices”*. Librarians acknowledged that leading university libraries are a good source for learning new trends.

The data analysis also revealed several other means through which librarians are influenced to use web technologies. These include professional networks, benchmarking and professional conferences and webinars. Librarians constantly review the library and information technology literature to keep themselves abreast of the latest developments in web technologies.

#### **5.2.1.2.4 Librarians’ perspectives on facilitating conditions for web technology usage**

Based on the definition of facilitating conditions (see Chapter 2, Section 2.3.5.4), librarians were asked to discuss the ways in which their university and libraries facilitated their use of web technologies. They were further asked to indicate whether their university libraries have

policy frameworks to guide their use of web technologies. The data analysis indicated mixed results. Some librarians were satisfied with ICT infrastructure and equipment, and the training provided by their libraries to use web technologies effectively. Others expressed serious concerns about the inadequacy of ICT infrastructure and equipment, the lack of training to use web technologies effectively, and the lack of a policy framework to govern the incorporation and use of web technologies.

It also came to the fore that librarians from well-resourced universities were satisfied with ICT infrastructure (Wi-Fi and wired Internet). As one librarian said

*Wi-Fi is accessible within the library and outside and so I can use my laptops or smartphone outside the office and link up to the university network and access library services and resources, and unlike other university departments, the library has a generator that ensures continued power supply, especially during the load shedding periods. Besides, the wired [Ethernet] Internet connection is up to good standards leading to a very good experience of using web technologies to serve the library users.*

On the other hand, librarians from poorly resourced universities were frustrated by poor ICT infrastructure that caused intermittent disruptions in Internet connectivity. This became evident when one librarian remarked, *“The main problem in our library is Internet bandwidth, even now I am connected to this Zoom interviews through my private mobile phone because I experienced problem with the slow Internet connectivity at the office”*. This assertion was further corroborated by other librarians, who described the slow speed of the Internet connection as the main problem in their libraries. Other ICT challenges cited by some librarians include out-dated computers, and the lack of assistive technologies to support students with special needs. In this respect, one librarian commented that *“I have experienced some challenges to support our students who are visually impaired because of the lack of appropriate technologies”*. The data analysis also revealed that some university libraries face financial constraints that have diminished their capacity to acquire modern ICT infrastructure and

equipment. To address this, some university libraries sought financial support from external donors.

Regarding training, the data analysis revealed mixed results with a few librarians not being satisfied with the training provided by their libraries. However, the majority of librarians indicated that their libraries provided regular training on the use of web technologies. As one librarian stated, *“Our library provides regular in-house training, and this is important because web technologies changes very fast”*. It was also reported that some university libraries used a peer mentoring model, whereby a knowledgeable librarian gives mentorship to other librarians. One librarian asserted, *“The mentoring programme in our library enjoys the support of library management and those who are well-versed in the usage of web technologies mentor other staff”*.

It was also reported that some university libraries organise regular training sessions before a specific web technology is incorporated into the library services. A specific example was given whereby Elsevier provided training for library staff before the subscription to the SciVal tool. The results further revealed that some librarians wanted their libraries to provide more training on the use of web technologies. Young librarians were described as technologically savvy who quickly learn to use web technologies. In contrast, the older generation of librarians were described as conservative taking time to acquaint themselves with such technologies. Hence the need for more training for this group of librarians.

With respect to a policy framework to govern the usage of web technologies, the data analysis showed that many university libraries do not have such a policy even though they acknowledged that it is absolutely necessary. Nevertheless, it was reported that some university

libraries have started to develop policies for web technology usage. As one librarian stated, *“The library has no policy, but it is now busy formulating an ICT policy that will cover aspects of web technology usage. An appropriate policy framework is really needed to guide us on how to use web technologies in an ethical manner and for work purposes”*. In the absence of policy, some university libraries are dependent on the overall university ICT governance policy for guidance on the use of web technologies. Most librarians also emphasised that a policy framework is important because it will guide the usage of social media and guard against the unethical use of such tools. Moreover, some librarians felt that such a policy can be used by the library as a leverage to lobby for technical and financial support for adequate ICT infrastructure for their libraries.

### **5.2.1.3 Librarians’ perspectives on user-centred services for web technologies**

Librarians were requested to discuss their understanding of the user-centred concept in a library setting. They were also asked to give their thoughts on what their university libraries should do to improve user-centred services for web technologies. The data analysis showed that librarians understand this concept, as evidenced by the following statement by one librarian: *“I think for me user-centred library service means a service where a library creates and offers library services with the users in mind.”* Others emphasised that a user-centred library service is about understanding the user information needs and developing library services collectively *with* the users as opposed to developing library services *for* the users. One librarian cited the following example as a manifestation of the user-centred concept in libraries: *I use RSS feeds to send alerts of new publications and acquisitions to lecturers and postgraduate students.”*

With respect to the question of what university libraries should do to create user-centred services with web technologies, most librarians emphasised that

- firstly, university libraries have to assess and gain a better understanding of their users' information needs
- secondly, they should understand the capability of a web technology before incorporating it into library services, and
- thirdly, they should match or align the capability of a web technology to users' specified needs.

Most librarians indicated that these steps would allow university libraries to make informed decisions on the incorporation of web technologies in their services. In addition, some librarians argued that library priorities should be informed by users' needs, and the key question to ask is how libraries should go about developing a culture of assessing these needs regularly so that library web-based services are customised accordingly. As one librarian stated: *"We can incorporate as many web technologies as possible but if we do not tailor such tools to the user information needs, it will be fruitless efforts."* Some librarians also underscored the point that university libraries face competition from other information service providers such as Google, and that it is no longer enough for university libraries just to provide information services with web technologies. Such services should be user-friendly, otherwise library users will ignore them and satisfy their information needs elsewhere.

One librarian cited the following example to illustrate how a web-based service which was created for students ended up being little used: *"The university has created email accounts for students, which the library has also used to share information with students. But students have been reluctant to use their university email accounts, preferring to use their private emails. So the question is, what can be done to attract students to use their university email accounts?"*

To find the answer to such a question, one needs to obtain the students' opinions, and this can

be achieved by engaging students by different means, such as conducting periodic surveys and FGDs. Overall, librarians stated that it is important for university libraries to incorporate web technologies that save time, and that can easily be accessed anywhere, anytime.

#### **5.2.1.4 Librarians' perceptions of library services enhanced with web technologies**

The participants were asked to discuss their overall experience of using web technologies incorporated into their university library services. The results demonstrated that librarians regard web technologies as vital tools in 21st century library services. Most librarians asserted that while library web-based OPAC and e-resources facilitate the discovery of information, social media allows for a swift interaction with the users.

Moreover, the results showed that web technologies helped libraries to reach out to the users, especially during the Covid-19 lockdowns. Consistent with this, one librarian pointed out, *“During the Covid-19 lockdown, the library continued to provide services via web tools and the library website became the focal point for the users to access online library services”*. Other librarians commented that because of web technologies, library users were able to access electronic library resources 24/7 while in the comfort of their homes. Some librarians also opined that web technologies have changed some students' perception about the library being merely a warehouse full of books.

The results further indicated that librarians have adopted a cautious approach to the use of different web technologies with different groups of library users. For example, while some librarians were comfortable with using WhatsApp to interact with students, others felt that it was not an appropriate tool for doing so. As one librarian remarked, *“I found it overwhelming to use my personal phone to interact with students via WhatsApp. Instead, I prefer to use email*

*as an official communication tool when I share or exchange library information with students”.*

Overall, participants hold positive perceptions on the usage of web technologies to enhance library services, stressing that there is a need to promote such tools in order to overcome technophobia among some librarians.

### **5.2.2 Results from the focus group discussions**

This section presents the results from the four FGDs conducted with undergraduate and postgraduate students from selected universities in the SADC region. For the undergraduate students, two FGDs were conducted, where one group consisted of ten students and the other group comprised six students. For the postgraduate students, two FGDs were also conducted, one group comprised nine students and the other group comprised five students. The results are presented in accordance with the research questions of this study and the constructs of the underpinning theories, namely, UTAUT (Venkatesh, Morris, Davis & Davis, 2003) and the Library 2.0 theory (Maness, 2006). These results are integrated in such a manner that quotes are attributed to either undergraduate or postgraduate students.

#### **5.2.2.1 Students’ responses in relation to the web technologies incorporated by their libraries**

The students were asked to discuss the types of web technology their university libraries have incorporated into their services. The results revealed that both undergraduate and postgraduate students were aware of e-resources, OPAC, IM and RSS feeds at their respective university libraries. However, most of them were not familiar with the term ‘library discovery tools’, and some postgraduate students were not aware of the chat services provided by their libraries.

In addition, most students indicated that their libraries have Facebook and Twitter accounts. As one undergraduate student said, *“I know that our library is on Facebook and I visit it about twice a week”*. This is congruent with the following remark made by a postgraduate student: *“Our library has a Twitter page that I check occasionally.”* The free version of YouTube was also mentioned by a handful of students.

#### **5.2.2.2 Factors influencing students’ use of web technologies**

The questions that sought to investigate the factors that influenced students’ use of web technologies were based on the theories underpinning this study, namely, UTAUT (Venkatesh, Morris, Davis & Davis, 2003) and Library 2.0 theory (Maness, 2006). Accordingly, the FGD guides for the undergraduate and postgraduate students were developed in line with the constructs of these theories. These constructs relate to the web technologies incorporated by the university libraries and constitute the main themes upon which students were requested to give their views. The results are presented in Sections 5.2.2.2.1 to 5.2.2.2.4 below.

##### **5.2.2.2.1 Students’ perspectives on performance expectancy in relation to web technologies**

Students were asked to discuss how useful the web technologies incorporated by their libraries are for their educational and research information needs. The results revealed that undergraduate and postgraduate students hold different perspectives on the usefulness of web technologies in helping them to access academic and research information. Undergraduate students mainly described the usefulness of OPAC in helping them to locate books from the library to complete their assignments. As one undergraduate student commented, *“Searching for books in our library without knowing the exact location is time consuming, so [the] OPAC helps us to search for the location of books that we want”*. In contrast, most of the postgraduate

students recounted their positive experiences in using licensed library e-resources to obtain journal articles. In this respect, one postgraduate student said, *“Web technologies are very useful because they enable us to access e-journals and other materials that we need for our research”*.

The data analysis further indicated mixed results with regard to accessing information for study and research during the Covid-19 lockdowns. In this regard, one undergraduate student stated that *“During Covid-19 lockdown, the university was closed, and we went home in the rural areas where access to Internet was limited. So some of us faced difficulties in using web technologies to get library materials”*. The results also demonstrated that some students counteracted this challenge by frequently going to the nearest towns for Internet access. Students who had Internet access throughout the lockdowns affirmed the usefulness of web technologies in helping them to continue accessing library resources. As one postgraduate student remarked, *“During Covid-19 lockdown, the university and the library closed completely, but learning continued and deadlines had to be met. The only option to access library resources was to use library e-resources that was made possible by web technologies”*. Some postgraduate students also commended their university libraries for introducing online tutorials to guide them in searching for e-resources in the library.

The results further revealed that students viewed online library chat, Ask-a-librarian services and WhatsApp as web technologies that empowered them to add their voices to discussions about library developments. As one postgraduate student asserted, *“I just want to emphasise that the Ask-a-librarian service is a good service as it enabled us to make suggestions to librarians”*. This is consistent with the following comment made by an undergraduate student: *“I think Ask-a-librarian is one of the best services the library has introduced, and I hope it*

*continues because I know many of my classmates use it to ask questions about library resources.*” Most students indicated that this service made it possible for them to receive immediate feedback from librarians.

The results also demonstrated that students used their libraries’ Facebook and Twitter pages for current awareness purposes. They reported that they visited these social media sites to keep abreast of the latest information from their libraries, especially library opening hours during examinations. It was also reported that many young students visited Facebook and Twitter frequently. As such, university libraries should follow students on these social media, otherwise they will become irrelevant for young students who make up a large proportion of the university population. In addition, many students stated that they also post information on the library Facebook page, mainly to commend the library for good service and also to express their dissatisfaction if they experience poor service from their libraries.

There were also dissenting voices from some postgraduate students regarding the usage of Facebook in university libraries. As one postgraduate student said, *“Facebook is just overrated by some young people, it is not good in the university environment because it is being used to bully people and some students just post anything they want, including information that may destroy other people’s lives”*. Despite this negative comment about Facebook, students valued its usefulness in sharing and exchanging information and suggested that students should be educated to use it in a responsible manner.

The results also indicated that students used Zoom and Microsoft Teams to facilitate collaborative learning especially during the remote learning widely introduced during the Covid-19 pandemic. Postgraduate students reported more frequent usage of these tools. As one

postgraduate student said, *“During the shutdown Zoom became the norm in discussing research issues with fellow students and also in consulting supervisors”*. A few undergraduates also reported their use of Zoom to work on group assignments. Moreover, many students expressed their satisfaction that web technologies had brought information and education to their doorstep. Overall, the results revealed that both undergraduate and postgraduate students appreciated the usefulness of many web technologies incorporated by university libraries.

#### **5.2.2.2.2 Students’ perspectives on effort expectancy in their use of web technologies**

In line with the effort expectancy definition (see Chapter 2, Section 2.3.5.2), the students were asked to describe the effort required to use the web technologies incorporated into their library services. The data analysis indicated mixed reactions, with some students finding web technologies easy to use, whereas others describing the difficulties they face in using these tools. It emerged that young students felt comfortable in using web tools, as expressed by one undergraduate student: *“Many web tools are quite easy to learn and use. You know, most young students have grown up with technologies and this means when they come to varsity they are already familiar with web tools.”*

Most of the students reported that web technologies and smartphones were extremely convenient in finding study books and materials in today's world. Unlike few students who said that some web technologies are difficult to work with, many students feel these tools tend to be user-friendly and easy to use because they have help screens that guide them when they are stuck. Nevertheless, some students acknowledged that ongoing training will always be needed. As one postgraduate student pointed out, *“Web tools are easy to use, but continuous training is needed to upgrade our skills because technologies change fast”*. Some students said that

they receive regular training from librarians, making it easy to search the digital library collections.

The results further revealed that the few students who found certain web technologies difficult to use were mostly postgraduates. As one postgraduate student noted, *“I sometimes struggle to get relevant articles from the library databases because I do not have the skills to search these databases. And because of limited time I always ask librarians to help me”*. It was also disclosed that some postgraduate students really struggled to use certain web technologies, and as a result they often go to the physical library to obtain printed material. It also came to light that sometimes postgraduate students feel intimidated by web technologies, a problem known as technophobia. Moreover, others are discouraged from using web technologies because they are required to remember their passwords when logging on to web tools. However, even those who have expressed difficulties in using web technologies were in agreement that the benefits offered by web technologies far outweigh the difficulties they experienced. Overall, students felt empowered by web technologies, and they urged librarians to promote and publicise these tools.

#### **5.2.2.2.3 Students’ perspectives on the social influence of web technologies**

Based on the definition of social influence (see Chapter 2, Section 2.3.5.3), students were asked to indicate who influenced them to use the web technologies incorporated by their libraries. The results revealed that students are not only influenced by stakeholders but also by technological environment. As one postgraduate student remarked, *“The society we live in is driven by technology and this has influenced us to use web technologies too”*. In addition, an undergraduate student stated that *“It is not only people who influenced my usage of web technologies. We are living in a dynamic, changing world, an interconnected global village,*

*and this has influenced my usage of web technologies and these tools are key to contemporary higher education”.*

The results further showed that both undergraduate and postgraduate students were influenced by fellow students, their lecturers and librarians to use the web technologies incorporated by their libraries. In this respect, one undergraduate student asserted that *“My classmates have influenced me to use the library OPAC but our lecturers have also referred us to use an online platform with past examination papers on the library website”*. It also emerged that during the Covid-19 lockdowns, the usage of web technologies in teaching and learning intensified and this has had a major influence on students to use the web technologies incorporated by their libraries. Some students regarded Covid-19 lockdowns as a wake-up call, as they have influenced many students to use web technologies to access library resources.

#### **5.2.2.2.4 Students’ perspectives on facilitating conditions for the use of web technologies**

Based on the definition of facilitating conditions (see Chapter 2, Section 2.3.5.4), students were asked to discuss how their universities and libraries facilitate their usage of web technologies. The results revealed mixed results, with some students not being satisfied with the ICT infrastructure in their libraries, although others were satisfied. Those that were dissatisfied complained mainly about slow Internet connectivity and out-dated and inadequate ICT equipment. As one undergraduate student said, *“We are not satisfied with the ICT equipment in the library because some are outdated and very slow. Another problem is that there are few computers in the library, leading to a struggle to get a computer to type assignments and access online library resources”*. These sentiments were echoed by some postgraduate students, who stated that they generally used their personal phones to access library digital collections because the computers provided by their libraries were out-dated. Some students also

complained about the cost of Internet data and suggested that their universities should negotiate with Internet service providers for affordable prices.

The results also demonstrated the digital divide in some African countries. As one postgraduate student stated, *“The lack of up-to-date Internet infrastructure is a national problem that has to be addressed by government”*. Similarly, some students were concerned about the reliability of the power supplier, arguing that it is another national problem that negatively affects higher education. The results further indicated that some students were satisfied with their library’s investment in ICT infrastructure to facilitate their usage of web technologies. As one postgraduate asserted, *“The library is trying its level best to support our postgraduate studies. Wi-Fi in the library and on campus is up to standard and this enables us to access e-journals, eBooks, and online theses and dissertations on the library website”*. Some students also indicated that their university library provided sufficient computers for students. These results revealed that the situation regarding ICT infrastructure and equipment varies across universities in the SADC region.

With regard to training, the results showed that while some students were satisfied with the training provided by librarians to effectively use the web technologies incorporated by their libraries, others were dissatisfied. As one postgraduate student commented, *“Librarians offer regular training to students to use web tools in the library. As an example, recently the library introduced a new library system and we were trained to search for books and training materials are now accessible online”*. Other students also reported that they were satisfied with orientation sessions librarians give to first-year students. Most students indicated their preference for online tutorials on information skills so that they can consult such tutorials when they face difficulties in using online library resources.

Students who were dissatisfied with training provided by their libraries suggested that the frequency of library training should be increased. As one undergraduate student asserted, “*To facilitate students’ effective usage of web tools, the library should schedule monthly training programmes*”. In addition, many of the students would like to have a dedicated staff member in their libraries to assist them when they face difficulties in using web technologies. Some students also indicated that the Information Literacy (IL) instruction offered by their library is too short. It also came to the fore that some students access free online library training materials from other university libraries. Nevertheless, they recommended that their libraries should develop appropriate training materials, taking into consideration the different levels of students’ ICT competencies.

### **5.2.2.3 Students’ perspectives on user-centred services enhanced by web technologies**

Consistent with the definition of user-centred used in this study (see Chapter 2, Section 1.9), students were asked to give their perspectives on user-centred services in a library setting. They were also asked to make suggestions on what their university libraries should do to improve user-centred services for web technologies. The results revealed that both undergraduate and postgraduate students have a good understanding of the concept of user-centred service. As one undergraduate student explained, “*The main focus of user-centred services is the customer. For example, if the library adopts a web technology, it should do this in consultation with students because user experience is important in user-centred services*”. This statement is congruent with the following remarks made by a postgraduate student: “*User-centred service can be defined as [the] service that takes into account the students’ information needs. In libraries, it is about quality information services, providing the right information to students at the right time. Time is very important for postgraduate students as we are under pressure.*”

Some students also stated that user-centred service is about customising service to specific groups of students depending on their programme of study, describing further that user-centred services in the library context should have the following attributes:

- Provide information resources that are up-to-date and relevant to the curricula
- Have competent staff who can support students with relevant information
- Assess student needs regularly to inform the improvement of library services.

One postgraduate student gave the following example of a service that was not consistent with the concept of user-centred services in their library: *“We have asked librarians to digitise research materials in the archives, but they are very slow in doing so. In that sense, the library does not offer user-centred services.”*

The question about what the library should do to create user-centred services with web technologies generated some valuable suggestions from both undergraduate and postgraduate students. One postgraduate student suggested that the library should use RSS feeds to alert postgraduate students to new publications. Other postgraduate students urged the library to upload tutorials on how to search electronic databases online. This would allow these students to learn information searching skills at their own pace. Most students were enthusiastic about web technologies and their applications in library services. As one undergraduate student proposed, *“I suggest that the library should buy online books and journals so that web technologies in our library become more meaningful to students”*.

The students also advised the library to incorporate web technologies that are easy to navigate and that help students to access the information with minimum effort. They further suggested that online reference and Ask-a-librarian services should be continued because they conform

to the idea of user-centred services. There was also a suggestion that the suggestion box in one of the libraries should be changed from a physical box to an electronic one. Overall, the results revealed that university libraries should regularly consult students to inform the implementation of user-centred services enhanced by web technologies.

#### **5.2.2.4 Students' perceptions of library services enhanced with web technologies**

Students were asked to discuss their perceptions and experiences of using web technologies incorporated by their libraries. The results demonstrated that many students hold positive perceptions of web technologies incorporated by their libraries. As one undergraduate student said, "*We are living in a world dominated by technologies and most of the web technologies like OPAC, Ask-a-librarian services in the library save us a lot of time.*" In addition, most postgraduate students asserted that the library databases have the latest relevant articles and that they perceive these tools as very important for their research projects. The results further showed that while most students consider web technologies useful in meeting their information needs, some expressed their dissatisfaction with the poor ICT infrastructure and equipment in their libraries. Overall, students have positive perceptions about the web technologies incorporated by their libraries. The next chapter interprets and presents the results in an integrative manner.

## CHAPTER 6

### DISCUSSION AND INTERPRETATION OF KEY FINDINGS

#### 6.0 Introduction

This chapter discusses and interprets the key findings of the study. The discussion is based on the questions/objectives of the study as stated in the preceding chapter. In this chapter, the results gleaned from both the quantitative and the qualitative data are integrated to form the consolidated findings of the study. This integration follows Creswell's approach which proposes that the quantitative results be reported first before the qualitative findings are discussed to either corroborate or contradict the quantitative results (Creswell, 2014:222).

The findings are presented in line with the research questions raised by the study. Therefore, the chapter commences by presenting the findings concerning the web technologies incorporated by the university libraries investigated by this study. It then turns to a discussion of the factors that influenced these libraries to incorporate web technologies. Thereafter, it shifts the focus to discuss the findings on user-centred services in the library context, as well as the librarians' and users' perceptions of library services enhanced by web technologies.

The findings of this study have been discussed in relation to the relevant literature, as well as in relation to the constructs of the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh & others, 2003) and Library 2.0 theory (Maness, 2006) which underpin this study. The constructs are performance expectancy; effort expectancy; social influence; facilitating conditions; user centredness; and users' perceptions of library services enhanced with web technologies. These constructs are reflected in the research instruments (see Appendices 1, 3, 6 and 7) and constitute the basis upon which the discussion of the findings is

organised in this chapter. Interesting insights that emerged from the qualitative data have also been integrated into appropriate sections of this chapter.

## **6.1 Research question 1: Web technologies incorporation by university libraries**

This section presents the findings of Research Question 1 of this study. The findings of this study showed that university libraries have incorporated a variety of web technologies in their quest to provide improved and effective information services and resources to their users. In the discussion that follows, these web technologies have been grouped into different categories based on the purpose of their deployment as discussed in Sections 6.2.1 to 6.2.4.

### **6.1.1 Web technologies incorporated for the discovery of library information**

The quantitative results revealed that EbscoHost discovery and WorldCat discovery were the most frequently employed web-scale discovery tools. Other discovery tools used include ExLibris Primo, and Summon discovery (see Chapter 5, Table 5.2). These findings were confirmed by the qualitative results (see Chapter 5, Section 5.2.1.1), indicating that most university libraries in this study have moved away from the traditional OPAC to web-scale library discovery tools. These findings are also corroborated by previous research (Djenno & others, 2014:269; Nichols & others, 2017:91; Allison & Mering, 2018:4; Hamlett & Georgas, 2019:231; Wang, 2020:4; Balaji & others, 2021:14). The shift to web-scale discovery tools may be attributed to the advantages they offer compared to the traditional OPAC.

The traditional OPAC only searches the library catalogue for books and journals to provide bibliographic details and the location of materials. In contrast, web-scale library discovery tools comprise a single and unified search interface, enabling the simultaneous search of all library collections, selected electronic databases, institutional repositories, and eBook collections

(Hamlett & Georgas, 2019:231-232). Thus, web-scale library discovery tools make it easier for library users to search the entire library content, rather than searching different library collections via distinct search interfaces (Wells, 2016:93). Typically, the library users need particular information to fill a particular information gap at a particular point in time. If the library can provide a single search interface to the users, they are likely to find such a feature useful and convenient. Web-scale library discovery tools offer library users a one-stop-shop kind of service and convenience. These tools have transformed the information searching process to support research (Nichols & others, 2017:85).

### **6.1.2 Web technologies incorporated for information sharing and promoting services**

Information sharing and promoting library services play a critical role in increasing the visibility and highlighting the relevance of university libraries. The visibility of libraries is vital to offset the competition they face in the digital information landscape. If university libraries fail to promote their services, users will resort to alternative information sources such as Google (Jones & Harvey, 2019:4). The quantitative results of this study found that Facebook (recently renamed Meta) and Twitter were the main web tools incorporated by the university libraries studied. These were followed by YouTube, Really Simple Syndication (RSS) feeds; and Wikis. The least often used web technology was Pinterest (see Chapter 5, Table 5.2).

These findings were corroborated by the qualitative results, as the librarians interviewed confirmed that their university libraries have incorporated some of these web technologies. In addition, the interviews brought to the fore additional web technologies incorporated by their libraries, including GitHub, a collaborative tool; Asana, a content management tool; and RemoteX and EZproxy to facilitate off-campus access to licensed electronic library resources. Similarly, the results from the focus group discussions with undergraduate and postgraduate

students confirmed some of these, suggesting that most of the university libraries in the sample follow current global trends by embracing a variety of web technologies to improve user services and efficiency in their work.

The findings of Williams, Dhoest and Saunderson (2019) are inconsistent with the findings of this study. They found that the University of Limpopo Library has not incorporated social media owing to a restrictive institutional policy (Williams, Dhoest & Saunderson, 2019:486). However, several previous research (Harrison and others, 2017:253; Choi & Joo, 2018:356; Al-Qallaf & Ridha, 2019:102; Williams, 2020:142) have found that many university libraries have incorporated social media to share information with library users and to promote library services. Moreover, Maturure and Rakemane (2021:192) observe that libraries have been increasing their adoption of web technologies to market library services and interact with users. These contradictory findings suggest that each university library operates within its own context, and Williams, Dhoest and Saunderson (2019:492) ascribed these contradictory findings to poor ICT infrastructure that slows down the Internet speed. Overall, Facebook and Twitter were found to be popular social media in university libraries, and this may be attributed to the extensive usage of these tools by a large number digital natives who constitute the majority of university students and possibly university library users.

An unexpected finding was that RSS feeds were not prominent in the university libraries investigated in this study. Previous studies in Nigeria (Echezona, Nwegbu & Eke, 2016:7; Akwang, 2021:5) reported similar findings. The RSS feeds tool can send alerts to library users about new publications and libguides (Blummer & Kenton, 2014:89), and it can allow for the automatic distribution of customised information services and resources to library users. Consequently, this tool ought to feature prominently among web technologies incorporated by

university libraries. The RSS feeds tool conforms to the core tenets of user-centred services and selective dissemination of information. It can further be used to counteract information overload. For these reasons, it was expected to be among the top web technologies incorporated in university libraries in the sample.

### **6.1.3 Web technologies incorporated for interactive library services**

Interactive library services not only afford librarians and users an opportunity to interact effectively, but also have the potential to strengthen the library–user relationships. Equally important, they can help to propagate the value that the library adds to teaching, learning and research within the university. The findings of this study showed that university libraries have incorporated web chat tools to facilitate synchronous communication between librarians and library users. Specifically, this study found that the university libraries in the sample have incorporated Instant Messaging (IM), Ask-a-Librarian service, Chatbot, AskUs and the digital reference service (see Chapter 5, Section 5.1.2). These findings concur with the results of previous studies (Strothmann, McCain & Scrivener, 2009:267; Ramos & Abrigo, 2012:11; Côté, Kochkina & Mawhinney, 2016:41; Dempsey, 2019:678; Walsh & Rana, 2020:239; Rafiq & others, 2021:5). Web chat tools are important because they provide real-time interaction with the users, depending on the time such a service is manned by librarians.

The qualitative results from the focus group discussion with students showed that some postgraduate students were not aware of the interactive services introduced by their libraries (see Chapter 5, Section 5.2.2.1). This finding suggests the need for university libraries to market chat services among postgraduate students, as consulting librarians to get prompt support and assistance can save them time.

#### **6.1.4 Web technologies incorporated for content management**

The study found that university libraries in the sample have incorporated a number of content management systems. These include Sierra, Alma and KOHA library management systems, as well as Dspace, to manage institutional repositories and SciVal tool to measure university research productivity and WordPress (see Chapter 5, Section 5.1.2). These findings demonstrate that they have employed modern web tools to organise, manage their collections and give users access to information sources.

The study also revealed that the university libraries in the study have incorporated the SpringShare application to develop Libguides that provide subject information services targeted to specific faculty and academic department. Previous research (Connell, 2013:48; Bangani & Tshetsha, 2019:112; Logan & Spence, 2021:3; McDonald & Burkhardt, 2021:8; Neuhaus & others, 2021:114) reported similar results. This study also found that some university libraries incorporated ProQuest 360 core to manage e-resources subscriptions, and SFX link resolver to broaden access to full-text e-resources.

In answering Research Question 1, this study concludes that university libraries sampled in the SADC region have incorporated a variety of web technologies to facilitate information discovery; information sharing and promoting library services; interaction between librarians and library users; and content management. These findings show the librarians' commitment to deploying appropriate modern web tools to implement innovative services for the benefit of the users. It is therefore evident that most university libraries surveyed conform to best practice as they have employed modern web technologies in the execution of their core mandate of supporting teaching, learning and research at their respective universities.

## **6.2 Research question 2: Factors influencing the incorporation of web technologies**

Based on the UTAUT (Venkatesh & others, 2003) constructs (Performance expectancy), the study revealed how these factors influenced university libraries to incorporate web technologies, as well as the factors that influenced librarians and library users to use the web technologies incorporated by their libraries. The findings are discussed in Sections 6.3.1 to 6.6.4.

### **6.2.1 Performance expectancy**

The UTAUT construct of performance expectancy is one of the key influential factors in the adoption and use of technologies. The results from the quantitative data revealed that the majority of university libraries (96.9%) either agreed or strongly agreed that web technologies are useful tools in improving library user services (see Chapter 5, Figure 5.1). This finding was confirmed by qualitative results that indicated that both librarians and students found web technologies useful in library services (see Chapter 5 Sections 5.2.1.2.1 and 5.2.2.2.1 for the interviews with librarians and the student focus group discussions (FGDs) respectively). These results are consistent with those of Izuagbe and others (2019:403), whose study, however, focused on social media. Similarly, Williams, Saunderson and Dhoest (2021:90), whose study also concerned social media, found that students believe that web technologies are useful in promoting library services.

Overall, this study found that web technologies have had a profound impact on library services and are useful in improving information literacy skills, improving access to information, improving work performance, and improving reference services. The study also revealed security concerns about the usage of web technologies. These aspects constitute the sub-headings under which the findings are discussed in Sections 6.3.1.1 to 6.3.1.5.

### **6.2.1.1 Improving information literacy skills**

The proliferation of information in the electronic environment has not diminished the need for information literacy skills. It has become more critical and the need for information literacy (IL) instruction for students cannot be overemphasised. In the context of this study, information literacy is viewed as meta-literacy, an inclusive concept that encompasses digital media literacy, digital literacy, visual literacy, information fluency and cyber literacy (Mackey & Jacobson, 2011:63-66). Students require academic information skills to enable them to discern credible information sources from non-credible ones. They also need to possess the necessary competencies to access, evaluate and use ethically the vast information available in the digital environment. Web technologies offer opportunities to librarians to deliver IL instruction virtually.

The quantitative results indicate that a great majority of university libraries (91%) affirmed that web technologies improve the delivery of IL instruction to library users (see Chapter 5, Figure 5.4). The qualitative results of this study confirmed this finding (see Chapter 5, Section 5.2.1.2.1). Likewise, Guo and Huang (2021:3) reported similar results in China where university libraries use web tools to deliver IL instruction. Shire and McKinney (2021:137) found that university librarians in the United Kingdom used web technologies to improve IL instruction. In addition, Julien, Gross and Latham (2018:185) reported that digital technologies have improved IL instruction. Because web technologies are so prevalent in students' educational and social lives, delivering IL instruction via appropriate web technologies may attract more students to participate in IL instruction.

The findings of this study also revealed that a large proportion of librarians (66.7%) either agreed or strongly agreed that using web technologies does not lead to information overload

(see Chapter 5, Figure 5.10). In contrast, a few postgraduate students indicated that they are sometimes overwhelmed by a lot of unsolicited information reaching their email and WhatsApp accounts (see Chapter 5, Section 5.2.2.2.1). Jones and Harvey (2019:12) observed that the amount of information reaching people via social media could be overwhelming. While these contradictory findings reflect the reality of the information upsurge in today's world, what matters is the individual's judgement on the usefulness of the information he or she receives at a particular point in time. Unlike students, librarians are information specialists. As such, they possess the necessary information evaluation skills to quickly distinguish between the useful and irrelevant information that reaches them. The skills possessed by librarians help them to quickly discard information that is not useful to them.

It is generally acknowledged that the Covid-19 pandemic has negatively affected face-to-face teaching. The findings of this study also reveal that audio-visual web technologies such as YouTube, Zoom and Microsoft Teams were extensively used to deliver information skills to students during the closure of universities imposed as a result of the Covid-19 pandemic (see Chapter 5, Section 5.2.1.2.1). As in many parts of the world, online teaching and learning gained momentum in Southern Africa owing to the Covid-19 health protocols and regulations that required educational institutions to close.

Given the ongoing Covid-19 pandemic, which was accompanied by new developments in web technologies and changing information-seeking behaviours by university students and staff, the need for digital library services is likely to continue. Thus, librarians should capitalise on the lessons learnt during this period to infuse technology in IL instruction. It emerged that some librarians employed a web tool known as Camtasia to create and share library training videos with postgraduate students. This tool was also used by the University of Colorado Boulder

Library for video conferencing to engage students during the Covid-19 shutdown (Ibacache, Koob & Vance, 2021:6). These findings suggest that librarians go to great lengths to embrace innovative technologies in order to facilitate the efficient delivery of IL instruction to students.

#### **6.2.1.2 Improving access to information**

Web technologies have drastically improved access to information, which is one of the core activities of university libraries. Being information service providers, university libraries can take advantage of web technologies to transform their services to the benefit of their users. Web technologies have been helpful in discovering information from library collections, as demonstrated by a great majority of university libraries (97%) in the quantitative results of this study (see Chapter 5, Figure 5.2).

The above finding was substantiated by the qualitative results of this study which revealed positive views by librarians and students that web discovery tools have improved access to relevant information in library collections (see Chapter 5, Sections 5.2.1.2.1 and 5.2.2.2.1 librarians' interviews and student FGDs respectively). Calvert (2015:94) reported an increase in the usage of library e-resources at the Western Carolina University after the introduction of the EbscoHost discovery tool. This increased usage of e-resources may be attributed to the improvement that this discovery tool has made to facilitating access to information in library collections.

University libraries are no longer the only sources of information for university staff and students. Web technologies and the widespread use of online information have made the information landscape more competitive. Hence, for university libraries to remain relevant they have to enhance the sharing of information and increase their outreach activities. The results

revealed that all university libraries investigated by this study (100%) indicated that web technologies have enhanced the creating and sharing of information, and 87.9% reported that these tools have enhanced library outreach activities (see Chapter 5, Figure 5.5 and Figure 5.6 respectively). One library has introduced the position of Marketing Librarian. The incumbent has responsibility for the library outreach activities, constantly engaging students and monitoring their views about library services through social media. To have a dedicated staff member to perform these functions is commendable and may be characterised as a user-centred approach to meet library users' expectations. This can also help improve the library's image and reputation among the user community.

Unlike previous research (Abok & Kwanya, 2016:150; Magoi, Aspura & Abrizah, 2019:383) which generally reported extensive use of social media in academic libraries, the qualitative data in this study yielded mixed results, with some librarians and students asserting that social media are indeed useful, while others stated that not all web technologies are suitable for creating and sharing information in academic institutions (see Chapter 5, Sections 5.2.1.2.1 and 5.2.2.2.1 librarian interviews and student FGDs respectively). A minority of librarians and students expressed their reservations regarding the usage of Facebook in university settings, reasoning that this tool is overrated because some students use it for cyberbullying and posting immoral information that has the potential of ruining other's people lives.

Disapproval of some social media may be ascribed to the uncontrolled nature of publishing on such platforms, raising questions about privacy issues and the reliability of the information posted there (Izuagbe & others, 2019:396). Overall, the majority of librarians and students held positive views about the usage of social media in university libraries. Ifijeh and Yusuf (2020:4)

note that social media offer university libraries an opportunity to interact easily with users and also help to promote library services.

Apart from the e-resources and institutional repositories, this study found that one university library had been using a free online data repository known as ZivaHub to provide access to and share educational and research publications with students (see Chapter 5, Section 5.2.1.2.1). This demonstrates the wide variety of web technologies that university librarians have employed to widen access to educational information for their users. The present study established that the use of the library e-resources intensified during the remote learning instituted when universities closed down as a result of the Covid-19 pandemic lockdowns. The study further revealed that one university library could not provide access to materials in their Special Collections during the Covid-19 lockdowns. As a responsive entity, this university library responded to these students' concern by embarking on a digitisation project and through this effort they succeeded in making these materials accessible online.

### **6.2.1.3 Improving work performance**

The findings of this study show that librarians have embraced web technologies to improve their internal working processes and to achieve efficiency in their work (see Chapter 5, Section 5.2.1.2.1). Web technologies have enabled librarians to hold virtual meetings, improve teamwork and make communication fast and efficient. Owing to Covid-19 health protocols and guidelines, librarians have shifted their meetings to web conferencing, using mostly Zoom and Microsoft Teams. These findings concur with previous research (Gotschall & others, 2021:12; Harnegie, 2021:174) which reported the use of Zoom, Microsoft Teams and other web technologies for work purposes as a response to the Covid-19 lockdowns.

The findings of this study also highlighted the importance of evaluating web technologies before they are incorporated by university libraries, as this will determine their effectiveness for library services and work. This suggests that it should be the usefulness that should determine whether a particular web technology is appropriate to fulfil a specific and well-defined function in the library. The findings of this study also revealed that Google docs was used for collaborative work, allowing librarians to work together and fulfil their tasks even when they are dispersed at different locations. Furthermore, these tools proved useful even prior to the Covid-19 restrictions, especially in multi-branch university libraries. This study further found that the majority of librarians (69.7%) either agreed or strongly agreed that web technologies save them time as they enable tasks to be completed quickly, with only 9% of librarians believing that the use of web technologies is time consuming (see Chapter 5, Figure 5.9). Jones and Harvey (2019:11) also reported that 19% of the librarians in their study regarded the use of social media as time consuming. Time is an important resource and the more it is used productively the more achievements are realised.

#### **6.2.1.4 Improving reference services**

Reference services are one of the key interactive services offered by university libraries. This study showed that a large proportion of university libraries (93.9%) reported that web technologies have made it possible to interact with the users, as reflected in the quantitative results (see Chapter 5, Figure 5.3). The qualitative results also support this finding, with librarians confirming that digital reference and online chat services proved useful in enabling librarians and users to interact in real-time, especially during the remote work instituted in response to Covid-19. Similarly, Matizirofa and others (2021:366) reported that the University of Pretoria responded to Covid-19 lockdowns by improving digital reference services.

This study also revealed that students applauded the Ask-a-librarian service provided through SpringShare, pointing out that it saves them a lot of time. While university libraries have introduced digital reference services prior to the Covid-19 pandemic, this study found that the usage of such services increased during Covid-19 shutdowns (see Chapter 5, Sections 5.2.1.2.1 and 5.2.2.2.1 librarians' interviews and student FGDs respectively). Previous research (Gerbig & others, 2021:6; Kathuria, 2021:112) corroborated these findings, in some cases reporting that the reference service interactions doubled compared to the pre-Covid-19 period.

#### **6.2.1.5 Security concerns over web technologies**

Security issues in an online environment are not only a concern for university libraries but are also a global problem affecting all users of online information. The findings of this study demonstrate that security concerns do not deter the majority of librarians (60.6%) from incorporating web technologies into university libraries' services (see Chapter 5, Figure 5.7). The study also found that more than half of librarians (51.6%) either disagreed or strongly disagreed that there is much risk in sharing information with users via web technologies (see Chapter 5, Figure 5.8). These findings may be attributed to librarians' beliefs in the security measures put in place by parent universities to thwart security threats as they arise. This study also found that more than half of university libraries (57.6%) investigated by this study guide their users to protect their personal information when using the web technologies. This is compared to 42.4% who reported to the contrary (see Chapter 5, Figure 5.33).

For many years, libraries have been strong advocates for protecting personal information and confidentiality (Maceli, 2018:195; McGeary, 2019:189). Izuagbe and others (2019:395) highlighted some challenges associated with the use of social media, including user privacy, false identity and the uncontrolled nature of publishing on these platforms and argued further

that this may affect the perceived usefulness of these tools. This study found that 51.6% of university libraries surveyed provide user awareness about web technology security and privacy issues while, in contrast, 48.4% did not provide such awareness (see Chapter 5, Figure 5.34 below). These findings suggest that there are still many university libraries that do not educate users about online security risks. While it may be assumed that library users are aware of online security issues, the need for university libraries to educate the users on these matters should not be neglected. University libraries are well positioned to be at the forefront of educating the users about the risks associated with the use of web technologies, and this could be part of IL instruction. Topics to cover may include sensitising students to hacking, online identity theft and potential misuse of personal data. Overall, this study concludes that the UTAUT construct of performance expectancy and related aspects have had a significant influence on the incorporation of web technologies by university libraries surveyed and on the usage of these tools by librarians and students at these universities. The next section will discuss the findings relating to the effort expectancy construct.

### **6.3 Effort expectancy**

Effort expectancy is an important factor in technology acceptance theories and is concerned with the degree of ease associated with the use of technology. This study found that the majority of librarians (78.8%) either agreed or strongly agreed that web technologies are easy to use in the delivery of library services (see Chapter 5, Figure 5.13). In addition, most librarians (69.7%) either agreed or strongly agreed that it is easy to learn and use web technologies in outreach services (see Chapter 5, Figures 5.14). More than half of the librarians (54.6%) also affirmed (either agreed or strongly agreed) that web technologies are easy to understand (see Chapter 5, Figure 5.16), while 60.6% stated that these tools are easy to navigate (see Chapter

5, Figure 5.17). Akwang (2021:4) corroborated these findings in a study that revealed that the majority of librarians in Akwa Ibom State in Nigeria found web technologies easy to use.

However, as with Akwang's study, this study also showed that a few librarians did not find web technologies easy to learn and use (Akwang, 2021:6). These contradictory findings may be ascribed to the lack of requisite ICT skills among some librarians. Although the age factor was not examined in this study, it may also explain these inconsistent results because young librarians are usually well-versed in web technologies compared to their counterparts who are older. Digital natives have grown up using web technologies and are already familiar with their features. The term 'digital natives' refers to people born from the mid-'80s onwards, who generally access information through the Internet (Mbambo-Thata, 2021:32). Conversely, members of the older generation sometimes feel intimidated by web technologies, a problem known as technophobia. However, it is important to stress that for librarians to derive maximum benefits from web technologies, they should invest enough time in learning web technology functionalities and features.

The qualitative results from this study also confirmed the finding that web technologies are easy to use, and only a few librarians and students found certain web technologies difficult to use (see Chapter 5, Sections 5.2.1.2.2 and 5.2.2.2.2 for librarians and students' qualitative results respectively). The few librarians and postgraduate students who experienced difficulty in using web technologies did so owing to a lack of skills and practice, as they indicated that they do not use these tools frequently. These findings again point to the need for training and regular usage of web technologies because practice makes perfect. In order to gain the necessary skills to effectively use web technologies, it is imperative for librarians and students to actually use such tools regularly.

Increased library users' expectations coupled with the shift towards online teaching and learning, call for university libraries to organise training for librarians before a certain web technology is incorporated into the library services. In addition, web technologies have help screens and self-help tutorials that can guide librarians and students who are facing difficulties in using these tools. In the pursuit of continuous professional development, it is imperative to motivate librarians to develop a culture of life-long learning. Overall, the findings of effort expectancy in this study conclude that the majority of librarians and students find web technologies easy to use.

#### **6.4 Social influence**

University students and staff constitute the key stakeholders of university libraries. It is therefore imperative for university libraries to understand the influence that these stakeholders have on their incorporation of web technologies. The quantitative results showed that a majority of librarians (67.7%) either agreed or strongly agreed that the library users have influenced university libraries to incorporate web technologies (see Chapter 5, Figure 5.19). The qualitative results also confirmed that the library users had influenced their libraries to incorporate web technologies (see Chapter 5, Sections 5.2.1.2.3 and 5.2.2.2.3 for the librarian interviews and student FGDs respectively). This study also revealed that students have unique expectations that influenced some university libraries to amend their collection development policy to place emphasis on the acquisition of more e-resources. These findings are in agreement with a study conducted in Nigeria that found that library users expect librarians to use web technologies (Akwang 2021:4).

The findings of this study also established that the majority of university libraries (90.9%) indicated that they enjoy strong support from their university management to incorporate web

technologies (see Chapter 5, Figure 5.20). In contrast, Akwang (2021:4) found that academic libraries in Akwa Ibon State in Nigeria do not enjoy similar support. Williams, Dhoest and Saunderson (2019:486) also reported that library staff at the University of Limpopo in South Africa were not using social media for work purposes because of restrictive institutional policy. These inconsistent findings may be attributed to poor Internet connectivity at some universities. Moreover, the cited studies focused only on Web 2.0 tools and social media. Some universities discouraged the use of social media because their Internet capacity is not robust enough to sustain heavy Internet traffic. All these aspects influenced librarians and students investigated by this study to use web technologies.

This study has also revealed that professional networks, benchmarking, conferences and webinars influenced librarians to incorporate web technologies. The latest trends in the literature and websites of prominent university libraries in the world were also reported to have had a major influence on the university libraries investigated by this study to incorporate web technologies (see Chapter 5, Section 5.2.1.2.3). Keeping abreast of the latest developments in the literature was also mentioned as one of the influential factors, as it enables librarians to conform to best practice relating to the use of web technologies in library services. The findings of this study also revealed that librarians influenced each other to incorporate web technologies (see Chapter 5, Figures 5.21 and 5.22). Image and reputation have a major bearing on the credibility of services offered by any organisation. In this regard, this study found that a large proportion of librarians (97%) either agreed or strongly agreed that web technologies improved the image and reputation of their university libraries (see Chapter 5, Figure 5.23). This study also revealed several other factors that influenced librarians to incorporate web technologies. These include to promote the library's innovative culture (see Chapter 5, Figure 5.24) and meet

institutional expectations (see Chapter 5, Figure 5.25), as well as to comply with their university library policy (see Chapter 5, Figure 5.26).

The qualitative results from the FGDs with students demonstrated that social influence is a key determinant in students' use of the web technologies incorporated by their university libraries (see Chapter 5, Section 5.2.2.2.3). This finding is congruent with those of the study by Pinigas, Cleopas and Phiri (2018:188), who reported that social influence has had a major effect on students' adoption of e-resources in university libraries in Zimbabwe. This study also revealed that both undergraduate and postgraduate students' usage of web technologies was influenced mainly by fellow students, their lecturers and librarians, the technological environment, and the Covid-19 health protocols. Like many other aspects of life, education is now being driven by web technologies that can influence students to use such tools for educational purposes. Furthermore, the Covid-19 pandemic has had a major impact on education, leading to more reliance on web technologies for teaching, learning and research. Since all these activities require credible sources of information, web technologies are instrumental in helping university libraries to provide access to scholarly information.

Overall, the findings of this study indicate that university libraries are influenced by numerous factors to incorporate web technologies. These include students and staff information searching behaviours, fellow librarians, and the proliferation of online information. In addition, students were influenced to use web technologies by fellow students, lecturers, librarians, the Covid-19 pandemic and the ICT environment. This is a clear indication that the university libraries investigated by this study have incorporated web technologies because the users support such developments.

## **6.5 Facilitating conditions**

For an organisation to reap the benefits of any technology, it is essential to create a conducive environment to support the effective use of such a technology. This section discusses and interprets the findings relating to facilitating conditions that can lead to the successful usage of web technologies incorporated by the university libraries investigated by this study. The findings are organised and discussed under the following subheadings: ICT infrastructure and equipment to facilitate the usage of web technologies; policy framework to govern the usage of web technologies; training offered to librarians and students to facilitate the use of web technologies; and user support in the use of web technologies.

### **6.5.1 ICT Infrastructure and equipment to facilitate the usage of web technologies**

It is generally acknowledged that ICT infrastructure and equipment play an important role in the provision of and access to digital content. Universities are well positioned to bridge the digital divide by investing in modern ICT infrastructure to facilitate ease of access to their library resources. The quantitative results of this study revealed that most librarians either agreed or strongly agreed that their university libraries have up-to-date Internet connectivity (84.9%) and sufficient computers (60.7%) to facilitate the usage of web technologies by their users (see Chapter 5, Figures 5.28 and 5.29 respectively). While the qualitative results also confirmed these findings, there was a handful of librarians and students who expressed serious concerns about the inadequacy of ICT infrastructure and computers at their university libraries (see Chapter 5, Sections 5.2.1.2.4 and 5.2.2.2.4 for librarians' interviews and student FGDs respectively).

A study carried out by Enakrire and Ocholla (2017:7) also reported mixed results, revealing that university libraries in Nigeria faced more ICT infrastructure challenges than their

counterparts in South Africa. Moreover, Williams (2020:145) found that outdated ICT infrastructure hampered the use of web technologies in some university libraries in South Africa. Similarly, Williams, Dhoest and Saunderson (2019:490) found that the University of Limpopo Library has not adopted social media, ascribing this to out-dated ICT infrastructure and poor Internet connectivity.

Adzobu, Okyere and Banji (2021:368) observed a shortage of computers for students' use at the University of Cape Coast in Ghana. These findings suggest that ICT infrastructure and equipment in university libraries surveyed by this study, and in Africa vary, with libraries from well-resourced universities faring well in providing modern ICT to facilitate effective use of web technologies. Chisita and Chizoma (2021:111) noted that the Covid-19 pandemic highlighted the digital divide among universities in South Africa, with libraries in well-resourced universities coping well in terms of the digital content offered to their users.

Wi-Fi plays an important role in enabling the utilisation of web technologies to access information. This study found that the majority of librarians (93.9%) either agreed or strongly agreed that their university libraries have good Wi-Fi to enable users to connect to the Internet to use web technologies (see Chapter 5, Figure 5.37). However, the few university libraries that reported poor ICT infrastructure and outdated ICT equipment expressed their frustrations with inadequate financial support from their parent universities. This has led to slow Internet connectivity and the inaccessibility of ICT equipment.

Asogwa (2014:616) found similar challenges relating to poor ICT infrastructure, poor Internet connectivity and low bandwidth in university libraries in Nigeria. Library services are now driven by web technologies but when the Internet speed is slow, it negatively affects library

service delivery. The ICT challenges are negatively affecting both librarians and students, preventing them from effectively reaping the benefits offered by web technologies. However, this study found that some university libraries were seeking external financial support for ICT equipment to supplement their university's budget allocation.

Libraries have always advocated for inclusiveness and equity in providing services to their users. However, the findings of this study revealed that some university libraries lacked assistive technologies to support library users who are visually impaired. Mutula and Majinge (2016:527) urge university libraries to acquire appropriate assistive technologies that would enable visually impaired users to access information for their studies. It is advisable that university libraries work closely with the Registrar's Office and other relevant offices within their universities to identify students with special needs on registration so that appropriate technologies can be acquired to support them.

The findings of this study also showed that during the Covid-19 lockdown students were sent home, although teaching and learning continued online. During this period some students could not afford Internet data to access digital library content or to participate in virtual lectures. This problem manifested itself even among students from universities with good Internet connectivity because some of them went home to rural areas. A study conducted in Ghana also revealed that students grappled with poor Internet connection during the online learning instituted during the Covid-19 lockdown (Adarkwah, 2021:1674).

These findings may be attributed to a poor economic situation in the countries concerned, and demonstrate that the digital divide still prevails in some parts of Africa. Some students have called upon their universities to negotiate affordable prices for Internet devices and data with

suppliers. Some students also reported frequent electrical power failures that interrupt access to library online resources. This finding is consistent with the study that investigated the adoption of ICTs in two academic libraries in Malawi (Selemani & Chawinga, 2017:56). However, this study also found that one university library has a generator to supply power during electricity power failure.

### **6.5.2 Policy framework governing the usage of web technologies**

Policies set out principles, procedures and regulations to provide a framework governing certain aspects of an organisation. The quantitative results of this study showed that only 36.4% of the university libraries investigated by this study have policy frameworks to govern the usage of the web technologies they have incorporated into their services and operations (see Chapter 5, Figure 5.32). This is compared to 57.6% that reported that their universities have a policy that governs the library's incorporation of web technologies (see Chapter 5, Figure 5.36). These findings are incongruent with the qualitative results from the librarians interviewed, as they all indicated that their university libraries have no policy to govern the usage of web technologies (see Chapter 5, Section 5.2.1.2.4). These inconsistent results may be attributed to the fact that only six librarians were interviewed and it is possible that all the interviewees were from university libraries without policy frameworks to govern the usage of web technologies.

While the results showed that a policy framework to govern and regulate the usage of web technologies is essential, all librarians interviewed acknowledged the absence of such a policy at their libraries. However, some university libraries have become aware of this anomaly and have started to formulate policy that will guide both library users and librarians to use the web technologies incorporated by their libraries ethically. Oghenovo, Oghenetega and Jackson

(2012:15) advise university libraries in Nigeria to formulate ICT policies for governing the incorporation and use of technologies. Odero and Mutula (2007:78) offer the same advice to university libraries in Kenya. In the absence of a library policy on web technologies, most university libraries are relying on the overall university ICT governance policy to guide them and their users on the use of these technologies. However, developing library-specific policy has merit and can lead to many benefits, including using such a policy as a leverage to motivate for more technical and financial support from parent universities.

### **6.5.3 Training offered to librarians and students to facilitate the use of web technologies**

Upskilling and reskilling of librarians and students are a cornerstone of life-long learning. Because web technologies develop and change at a very fast pace, the lack of regular information skill training at some university libraries may hinder the effective use of certain web technologies. Jones and Harvey (2019:1) emphasise the need for developing appropriate competencies and skills among librarians to enable them to use web technologies effectively. Therefore, librarians and students alike should take the opportunities made available to them to update their skills in order to use web technologies meaningfully. The quantitative results of this study revealed that most librarians (72.7%) either agreed or strongly agreed that their university libraries organise regular training on web technologies for their users (see Chapter 5, Figure 5.30). While the qualitative results of this study corroborated these results (see Chapter 5, Section 5.2.2.2.4), a few students suggested that their university libraries should organise more regular training. This suggestion is justified given the fact that web technologies change rapidly. The results of this study contradict those of Shire and McKinney (2021:135) who reported that many librarians in UK universities did not get adequate training to use web technologies.

The issue on user training offered by the library was extensively discussed with both undergraduate and postgraduate students. While some students valued the information literacy instruction offered by their libraries, others felt that the courses were too short and infrequent at their university libraries (see Chapter 5, Section 5.2.2.2.4). These findings suggest that the frequency of delivering information literacy instruction to students needs to be increased. Besides, most students indicated that they want to see more online tutorials on searching the electronic library databases. They argued that this would enable them to consult such tutorials whenever they are facing difficulties in searching digital content in the library collections.

Therefore, it is advisable that university libraries put as many library training modules online as possible. This will allow students to learn information skills at a time that is convenient for them, for example when they need information for their assignments and research projects. The study also revealed that university libraries surveyed by this study employed YouTube and SpringShare Libguides to offer online library instruction. This concurs with the findings by Blummer and Kenton (2015:88), who reported that community college libraries in the USA used YouTube to deliver IL instruction to the library users. This study also found that some students consult online information literacy instruction from other university libraries. This finding indicates the lack of online library training at some university libraries investigated by this study. It also points to the need for university libraries to forge memorandums of understanding (MoUs) in order to develop and offer students online library tutorials in a collaborative manner. The results of this study also demonstrated that Millennials learn to use web technologies much faster than their adult counterparts. This may be attributed to Millennials being tech savvy because they were probably exposed to web technologies at a young age. Therefore, any training programme should take into consideration such a factor by developing online training that enable all the students to learn at their own pace.

The requisite training will undoubtedly have an impact on the usage of web technologies by librarians and library users. The results of this study show that most university libraries have instituted in-house continuous professional development for staff (see Chapter 5, Section 5.2.1.2.4). Some university libraries take advantage of students' semester breaks to implement training programmes for staff. In contrast, others follow the peer-to-peer learning approach and peer mentoring model, whereby an experienced and knowledgeable librarian engages in a systematic programme for mentoring junior librarians throughout the year. This is consistent with the study conducted in Ghana that reported the use of mentoring approach to upskill librarians (Cobblah & Van der Walt, 2017:383).

The results of this study also revealed that some university libraries surveyed in this study organise staff training before a new web technology is incorporated into the library services. This is normally carried out by the supplier or vendor of that specific web technology who will then carry out ongoing training as part of continuous support. These kinds of skill upgrading projects are extremely critical as they enable librarians to keep abreast of new developments in web technologies. Overall, this study demonstrated that while there are some shortcomings such as infrequent training, university libraries investigated by this study organise training for librarians to upgrade their skills in web technologies and offer IL instruction to library users.

#### **6.5.4 User support in the use of web technologies**

Library support for users is very important for troubleshooting technical problems that the users may encounter when using the web technologies incorporated by university libraries. The quantitative results of this study revealed that the majority of university libraries (84.8%) have assigned specific staff members to help users with problems relating to the utilisation of web technologies (see Chapter 5, Figure 5.31). In contrast, Odero and Mutula (2007:72) found few

university libraries in Kenya with ICT support teams. The qualitative results of this study revealed that most students were unaware of a dedicated library staff member to support them with the usage of web technologies (see Chapter 5, Section 5.2.2.2.4). This problem can be addressed by creating more awareness and widely publicising the dedicated staff assigned to assist students with web technologies.

The university library services were greatly affected by the Covid-19 pandemic, as revealed by the qualitative results of this study (see Chapter 5, Section 5.2.2.2.1). While students had to go home when their universities closed down in response to Covid-19 health regulations and protocols, they had to continue their studies through remote learning. This presented students with challenges relating to Internet connectivity and the associated costs, especially students whose homes were in the rural areas. As a result, some students struggled to access digital content from their libraries. This finding concurs with the results of a study carried out in Ghana that found that students at tertiary institutions were struggling to continue with online learning during Covid-19 because they could not afford the cost of Internet data bundles (Adarkwah, 2021:1673). In contrast, Mbambo-Thata (2021:33) reported that in order to bridge the digital divide, the National University of Lesotho provided Internet data bundles to students to enable them to access the digital library collections and also participate in online learning. This strategy could help many students even during the post-Covid-19 era.

Despite the Covid-19 restrictions, some students were creative, visiting family members in towns close by to access the Internet in order to obtain online library resources and also to participate in online classes. While most university libraries have hybrid collections comprising digital and print items, it was the digital collections that supported students' learning and research during the Covid-19 lockdowns. The results of this study revealed that materials in

Special Collections in some university libraries were not accessible because they were only available in print format. Being committed to support library users amid the Covid-19 pandemic, some librarians undertook to digitise some of these materials, a development that was appreciated by students.

The constraints relating to Internet access prevented students at some university libraries investigated by this study from accessing library resources during the Covid-19 lockdowns. However, Chisita and Chizoma (2021:111) revealed that digital resources facilitated university libraries in South Africa to continue providing services. Students who did not have problems with access to the Internet expressed their satisfaction with their university libraries' online resources, and the library website became centre stage for library support services. This study also showed that web technologies enabled students to exchange pertinent information with their lecturers, librarians and fellow students.

Postgraduate students also valued institutional repositories and e-resources at their respective libraries, asserting that they contain useful information for their research. Meanwhile, undergraduate students expressed their satisfaction with the library's provision of eBooks and past examination papers online. The study revealed that the usage of the library digital collections increased during remote learning. Similarly, previous research (Mbambo-Thata, 2021:33) reported the increased usage of library digital content at the National University of Lesotho during the Covid-19 pandemic.

During the lockdowns, librarians supported students by creating WhatsApp groups to interact with students, intensifying online reference services, imparting information instruction and delivering library orientation via Zoom, YouTube and Microsoft Teams, as well as using emails

to send research articles to students. These findings are consistent with the results of a study that investigated the strategies put in place by the Bindura University of Science Education in Zimbabwe (Tsekea & Chigwada, 2020:59). Overall, the findings of this study demonstrate that most university libraries surveyed in this study have the necessary facilitating conditions to support the effective usage of web technologies. Nevertheless, there are some universities that need to improve ICT infrastructure and procure new ICT equipment to enable both librarians and library users to successfully reap the benefits offered by the web technologies incorporated by the libraries.

### **6.6 Research question 3: perception of user of library services enhanced by web technologies**

Developments in ICTs have now broadened the options from which university staff and students can access scholarly information. Consequently, university libraries face competition from providers of online information (Wang, 2006:607), and these competitors are continuously striving to make their information services more user-centred. With amplified competition, university libraries should pay close attention to their users' needs in order to inform the development and provision of user-centred services enhanced by web technologies.

User-centred library services are meant to provide quality and timely services to meet the user's information needs (Mayende, Awuor & Namande, 2021:221). Therefore, the user is key in devising user-centred services with web technologies. The mere presence of web technologies in a library, without the consideration of user information needs, does not necessarily attract users to the libraries. For any library service to qualify as user-centred, it should either match or exceed the information needs and expectations of the end user. Hence, delivering user-

centred services enhanced by web technologies to the university community should become one of the strategic issues in university libraries.

The quantitative results of this study demonstrated that the majority of librarians (90.9%) either agreed or strongly agreed that user-centricity is the most important principle underlying their university libraries' incorporation of web technologies into services, compared to only 3% who did not believe so (see Chapter 5, Figure 5.11). The analysis of the qualitative data corroborated these findings, as librarians confirmed that the incorporation of web technologies into library services is largely motivated by university libraries' commitment to improve the quality of information services, thus making such services user-centred. The selective dissemination of information (SDI) to different groups of students and staff was cited as a good example of user-centred services. In this respect, university libraries employed RSS feeds to share customised information with lecturers and postgraduate students (see Chapter 5, Sections 5.2.1.3). These findings are congruent with Echezona and Chigbu (2018:100) who found that librarians in Nigerian university libraries believe that digital library services are user-centred and they entice users to the library.

This study also established a number of factors that librarians believe are essential in the provision of user-centred library services enhanced by web technologies (see Chapter 5, Table 5.3). The capability of web technologies to effectively meet the users' information needs and expectations; the user-friendly features in web technologies; the rapid discoverability of information; and 24/7 accessibility of library services were rated high. Other important factors that received satisfactory ratings were the interactivity features of a particular web technology, and its effectiveness in promoting library services, and in providing online information literacy instruction and online reference services, as well as user-centric content architecture of a

particular web technology. These findings demonstrate a shift in library focus from collections alone to user-centred services (Tempelman-Kluit & Pearce, 2014:616).

The study further revealed that both librarians and students have a good, common understanding of the user-centred concept and how it can be applied in library contexts. They highlighted key elements of services that can be characterised as user-centred in university libraries, including understanding user information needs; creating library services *with* the users rather than developing such services *for* the users; and offering library services with the users in mind. Similarly, students were able to articulate effectively their understanding of the user-centred service concept, showing a common understanding with librarians. They described a user-centred university library as one that regularly consults students to gather their views to make evidence-based decisions about the development of library services.

Other key elements of user-centred services mentioned by students include placing more focus on students, customising information resources to students' information needs; the ability to deliver the right information at the right time; providing up-to-date and relevant information; and having competent librarians. There were, however, a few postgraduate students who complained about their library being slow in digitising research materials in the archives, arguing that this defeats the purpose of providing user-centred services. This may be attributed to either the lack of skilled personnel to perform the digitisation task or the lack of appropriate digitisation equipment.

Overall, the findings of this study revealed that web technologies are regarded as vital tools in creating user-centred library services. It is important for university libraries to incorporate web technologies that save the users' time, and that can easily be accessed anywhere, anytime.

When user-centred service becomes a culture in a library, it will result in a better understanding of the information needs of the user community.

### **6.6.1 Employing web technologies to create user-centred library services**

The findings of this study revealed that university libraries need to take several important steps in using web technologies to create user-centred services (see Chapter 5, Sections 5.2.1.3 and 5.2.2.3 for results from librarians' interviews and student FGDs respectively). These steps include:

- Regularly assessing user information needs
- Gaining an understanding of the strengths of each web technology for incorporation
- Matching or aligning the capability of each web technology to identified user needs.

What all these ideas suggest is the need for extensive and regular interactions between library staff and users. McLaughlin (2015:57) asserts that “more library user and library personnel interaction is needed to evolve library improvements from a library-centric to a user-centred design approach”. While university libraries are not usually involved in designing web technologies, they should carefully select those that add real value to library services – user inputs are important in this process. This can be achieved by inviting library users to comment on any web technology before it is incorporated into the university library services. If afforded such an opportunity, the users will make inputs that may be valuable to the planning process involved in incorporating a specific web technology. In addition, involving users in planning the incorporation of web technologies creates user awareness about what to expect in terms of new web technologies.

This study further demonstrated that librarians understand and recognise the competition facing the library sector, hence the importance of devoting enough time and other necessary resources to constantly assess the library user's information needs in order to meet such needs in a user-centred manner. Gathering data pertaining to the usage of library resources has informed libraries to deliver user-centred services (Mannion, 2019:184). Failure to gather data that reveal user information needs and usage of library resources may lead to the provision of irrelevant services and resources to the users. In turn, library users may opt to obtain the information they need elsewhere. The consequence of this is that the university library becomes irrelevant in the eyes of the users it was established to serve.

The students made valuable suggestions that will enable university libraries to use web technologies to create user-centred services. The prominent ones include employing RSS feeds to alert students to new publications and acquisitions; uploading information literacy tutorials online, especially for postgraduate students; acquiring more eBooks and e-journals that will serve students better, particularly during COVID lockdowns; and incorporating web technologies that are mobile-compliant to enable students to access library resources via their smartphones.

Despite the challenges faced by some students in using the Internet, most students urged their university libraries to incorporate web technologies that are easy to navigate and that help students to access information with minimum effort. Students also considered the automation of reference services and having librarians managing the chat services in the evenings as important factors in creating user-centred services. The results of this study also showed that some university libraries have suggestion boxes fixed in the physical library. Accordingly,

students proposed that these be changed to online suggestion platforms to enable them to give their suggestions online, irrespective of their location.

### **6.7 Students' perceptions of library services enhanced with web technologies**

Students constitute the majority of users of university libraries. As such, it is important to assess their perceptions of the web-based services offered by their libraries. The results of this study demonstrated that the majority of students hold positive perceptions about web technologies incorporated by their libraries (see Chapter 5, Section 5.2.2.4). Similarly, Kiana and Mabeifam (2020:19) found that students at a private university in Namibia had positive perceptions of the library services offered with web technologies. The students investigated in this study emphasised that tertiary education and the information services provided by university libraries are driven by web technologies. Licensed library e-resources, eBook institutional repositories and discovery tools were cited by students as web-based services that help them to get the information they need for their assignments and research projects. These online resources save them time in obtaining relevant information, and most students applauded their university libraries for providing digital content that proved useful during the Covid-19 lockdowns.

In addition, students considered interactive services such as Ask-a-librarian and chat services and social media such as Facebook and Twitter as useful tools that help them to reach out to librarians more efficiently. The few students who expressed dissatisfaction with services enhanced by web technologies alluded to challenges relating to poor ICT infrastructure and inadequate equipment in their university libraries. These findings suggest that the level of ICT infrastructure varies in university libraries investigated by this study, with some universities having invested in up-to-date ICT infrastructure, while others are still struggling to do so. In line with this, Williams, Saunderson, and Dhoest (2021:89) reported a disparity in ICT

infrastructure at the University of Limpopo and University of Antwerp that negatively affected students at the University of Limpopo in their use of social media.

Overall, this study uncovered the incidence and scope of the web technologies incorporated by university libraries in the SADC region. It also revealed the factors that influenced these libraries to incorporate web technologies into services, as well as the factors that influenced librarians and students to use web technologies. This study further highlighted the importance of user-centred services in university libraries and the students' perceptions of library services enhanced by web technologies. The next chapter summarise the key findings and present the conclusions of the study. It also proposes a user-centred model for the incorporation of web technologies into libraries services based on the findings of this study, the UTAUT (Venkatesh & others, 2003) and Library 2.0 theory (Maness, 2006), as well as the latest trends in the literature. In addition, this chapter gives recommendations to improve user-centred services enhanced by web technologies in university libraries and give suggestions for areas of further research.

## CHAPTER 7

### SUMMARY OF THE FINDINGS, CONCLUSION AND RECOMMENDATIONS

#### **7.0 Introduction**

The aim of this study was to investigate the incorporation of web technologies into the services of university libraries in the Southern African Development Community (SADC) region in order to develop a user-centred model for the deployment of web technologies. This chapter provides the summary of the findings and conclusions, logically presented in accordance with the research questions raised by this study. In line with the aim of this study (see Chapter, Section 1.3), the chapter also presents the proposed user-centred model for the incorporation of web technologies in library services. The Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh & others, 2003) and Library 2.0 theory (Maness, 2006), as presented in Chapter 3 of this study, give context to the conclusions of the study and the proposed user-centred model for the incorporation of web technologies into library services.

The user-centred model proposed represents the contribution of this study to the body of knowledge relating to the incorporation of web technologies by university libraries. The chapter also presents implications of the study for knowledge, policy and practice. It further presents the recommendations aimed at improving the incorporation of web technologies for delivering user-centred library services to users. The chapter also presents suggestions for further related research, and concludes with a summary, highlighting the main conclusions that emerged from the study.

#### **7.1 Summary of the key findings and conclusions of the study**

As indicated above, the conclusions of this study are enumerated below and structured in accordance with the research questions of the study (see Chapter 1, Section 1.4).

### **7.1.1 Web technologies incorporated by university libraries**

Objective 1 of this study was achieved by ascertaining the web technologies incorporated by university libraries in the SADC region. Most of these libraries have employed numerous web technologies to fulfil several functions, such as information discovery, information sharing and promoting library services, interactive library services, and library content management. Regarding the information discovery, the results revealed that most of the university libraries have employed a number of web-scale discovery tools, including EbscoHost discovery, WorldCat discovery, ExLibris Primo and Summon discovery. Web technologies employed for sharing information and promoting library services include Facebook, Twitter, YouTube, Podcast, Vodcast, Padlets, Pinterest, GitHub, Wikis Really Simple Syndication (RSS). In addition, RemoteX and EZproxy were employed to facilitate off-campus access to library licensed electronic resources. This demonstrates that these university libraries follow current global trends by incorporating a variety of web technologies to improve access to information, promote library services, and share and exchange information with the user community.

Concerning the interactive library services, the results showed that most university libraries have employed Instant Messaging (IM), and offer Ask-a-librarian services, Chatbot, AskUs and digital reference services. These web technologies facilitate real-time interaction between librarians and the users. There is, however, a need to promote chat services for all library users, especially postgraduate students who were found to be largely unaware of these services. For content management, university libraries have incorporated Sierra, Alma and KOHA library management systems, Dspace to manage institutional repositories and SciVal tool to measure university research productivity. These web technologies enable university libraries to organise and manage their collections and provide users with access to scholarly information sources and resources.

Based on the results, this study concludes that the majority of university libraries in the SADC region have embraced and incorporated modern web technologies in service delivery to support teaching, learning and research at their respective universities.

### **7.1.2 Factors influencing university libraries to incorporate web technologies**

Objective two of this study was attained by determining how four factors influenced the university libraries to incorporate web technologies. Concerning performance expectancy, the results revealed that university libraries in the SADC region consider web technologies as useful tools in improving library information literacy instruction; improving access to information; improving work performance; and improving reference services. This study also revealed that web technologies were useful in facilitating access to digital information during the closure of universities as a result of the Covid-19 pandemic. Nevertheless, there were a few reservations about using Facebook in the library context. However, this did not have an adverse effect on university libraries' incorporation of such a tool for promoting their services. Therefore, this study concludes that the UTAUT construct of performance expectancy influenced university libraries in the SADC region to incorporate web technologies to fulfil their core mandate.

Regarding effort expectancy, the results ascertained that the majority of librarians and students found web technologies easy to use. There were, however, a few librarians and students who found some of these tools difficult to use. In this respect, the study revealed a need for the improvement of digital literacy skills, especially among postgraduate students and older librarians. Therefore, the study concludes that the UTAUT construct of effort expectancy influenced librarians' and students' usage of web technologies.

On social influence, the results showed that librarians were influenced by many sources to use web technologies. These include other librarians, the library users, best practices from other libraries, and latest trends in the literature. By contrast, students were mainly influenced to use web technologies by their fellow students and lecturers, librarians, and the developments in information and communication technologies (ICTs). Thus, this study concludes that the UTAUT construct of social influence has had a major influence on both librarians and students' usage of web technologies.

With respect to facilitating conditions, the study found that most of the university libraries in the SADC region have an enabling infrastructure to incorporate and use web technologies. However, there were a few university libraries that were still struggling to secure robust and adequate ICT infrastructure and equipment. This has negatively affected the effective use of online library services, especially during the lockdowns instituted to mitigate the effect of the Covid-19 pandemic. While most librarians and students carried on with their work and studies respectively without major hassles during the Covid-19 pandemic, a few others experienced serious challenges in performing their duties and/or continuing with their studies. Therefore, this study concludes that the UTAUT construct of facilitating conditions influenced librarians' and students' usage of web technologies.

In summary, this study concludes that all the UTAUT constructs, namely, performance expectancy, effort expectancy, social influence, and facilitating conditions have influenced university libraries' incorporation of web technologies and librarians' and students' usage of these tools.

### **7.1.3 User perceptions of web technologies**

Objective 3 of this study was accomplished by eliciting insights from librarians and students about the perspectives on the use of web technologies incorporated by their university libraries. This study found that except for a few postgraduate students who did not support the use of Facebook in university libraries, most of the students have positive perceptions towards many web technologies, subsequently sharing their positive experiences of using web technologies to access information from the library. The study therefore concludes that the majority of students consider web technologies as vital tools that enable them to access the information they need for their studies and research projects, and to share and publish information with their fellow students, their lecturers and librarians. Students also regard web technologies as key tools that facilitate efficient interaction with librarians.

### **7.1.4 User-centred services enhanced with web technologies**

This study found that librarians and students have a good understanding of the concept of user-centredness and its application in university libraries. They cited several factors that exemplify user-centred services enhanced by web technologies in a library setting. These include user needs and expectations; user-friendly features of web technology; quick discoverability of information; 24/7 access to library services; synchronous interactivity; effectiveness in promoting library services; effectiveness in delivering online information literacy instruction; delivery of customised information; effectiveness in sharing information; effectiveness in providing online reference services; user-centric content architecture; just in time delivery of information; and evidence-based research to inform the incorporation and use of web technologies.

In addition, librarians and students effectively articulated their perspectives on what university libraries should do to create user-centred services with web technologies. These include assessing user information needs regularly; evaluating the strengths and weaknesses of each web technology; and aligning the capability of each web technology to identified user needs. Therefore, this study concludes that all the UTAUT constructs and the Library 2.0 construct of user-centredness, as well as the above-mentioned factors, can be used to develop a user-centred model for the incorporation and use of web technologies by university libraries.

## **7.2 Implications of the study for knowledge, policy and practice**

The results of this study brought to the fore valuable insights that have implications for knowledge, policy and practice.

The first major contribution to knowledge by this study is the proposed user-centred model for the incorporation of web technologies to implement user-centred services in university libraries. The model can be employed in its fullest or can be modified to guide university libraries when they incorporate web technologies, taking into account the user-centred principles.

The second vital contribution pertains to the finding that university libraries have incorporated numerous web technologies to facilitate the delivery of user-centred services. Of great importance, was also the findings that some of the students were not aware of the information discovery tools offered by their libraries, and that some lacked the skills to effectively use web technologies. The implication arising from these findings is the need for university libraries to promote the discovery tools they have incorporated. There is also a need to organise regular

trainings to equip students with the necessary skills so that they can effectively use web technologies incorporated by their libraries.

The third important contribution to knowledge is the re-affirmation that combining distinct research methods and theoretical models has the potential to gain an in-depth understanding of the incorporation of web technologies to provide online user-centred library services. An in-depth understanding of students' perceptions of web technologies is very important. This has practical implications for planning, implementing and evaluating the effectiveness of web technologies incorporated by university library, and the use of such technologies to provide user-centred library services. Establishing that the UTAUT and Library 2.0 are suitable in investigating the incorporation of web technologies in libraries to implement user-centred services was also an important contribution to knowledge.

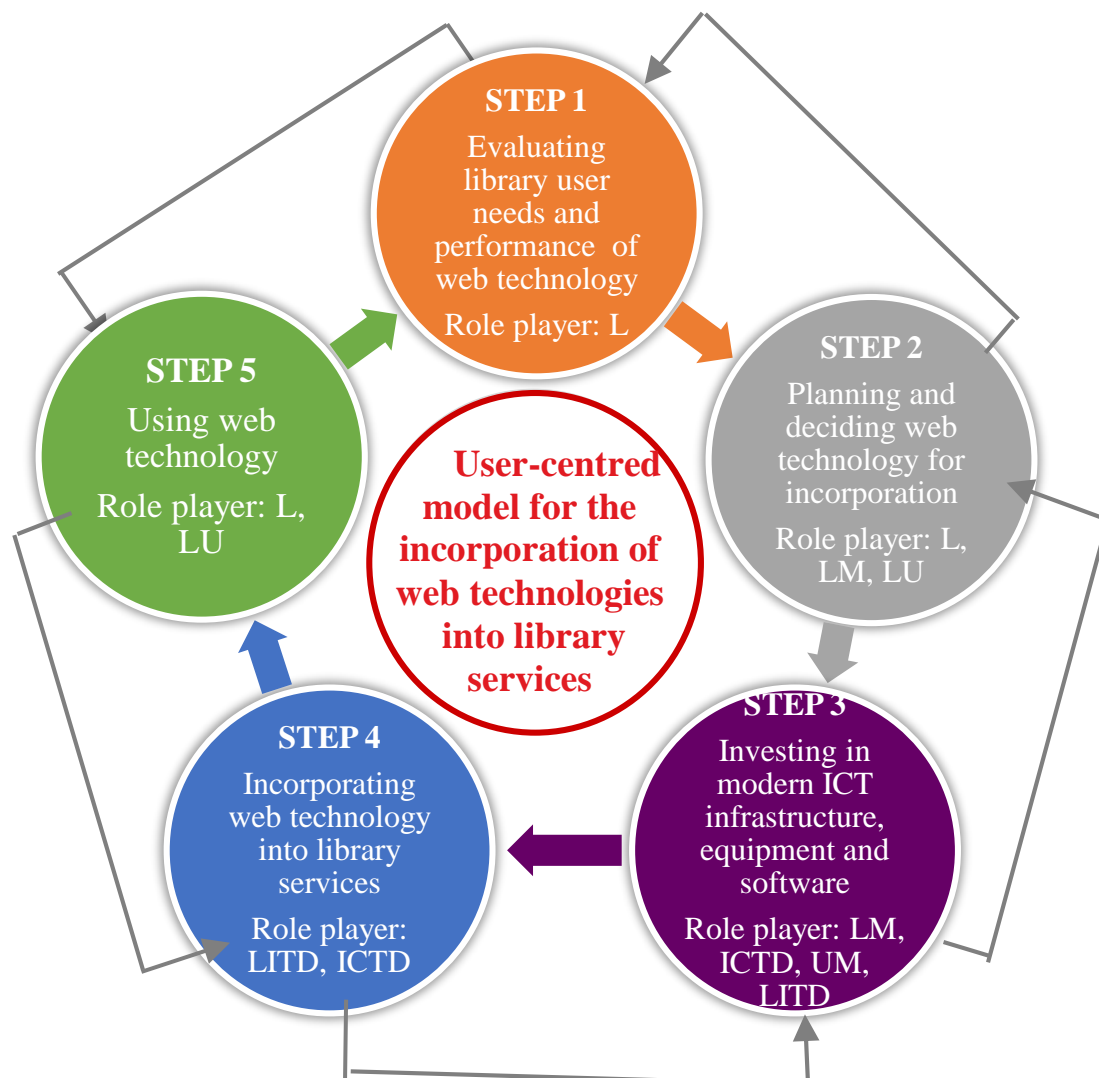
The fourth contribution pertains to practical implication for policy making. The results of the study revealed that most university libraries in the SADC do not have policy frameworks to govern the incorporation and use of web technologies. Furthermore, the results revealed that librarians agreed that it is important for libraries to have their own policy framework on web technologies. Consequently, they recommended that university libraries should develop their own policy frameworks to govern the incorporation of web technologies, and ultimately facilitate ethical usage of web technologies.

Finally, the results of the study highlighted a shortage of computer equipment in some university libraries to enable students to access online information via web technologies. This situation is largely prevailing due to financial constraints. The shortage of computer equipment prevents students from reaping the benefit offered by web technologies incorporated by their

university libraries. This finding has practical implication, as it suggests that university libraries need to redouble their efforts in seeking external funding to supplement their limited budgets.

### 7.3 User-centred model for the incorporation of web technologies into university libraries

This section presents the proposed user-centred model for the incorporation of web technologies into the services of university libraries. The model is graphically presented in Figure 7.1 and an explanation on how the model works is provided.



#### ABBREVIATIONS

ICTD	University Information and Communication Technology Department	LM	Library Management
L	Librarians	LU	Library Users
LITD	Library Information Technology Department	UM	University Management

As depicted in Figure 7.1, the model comprises five steps to be undertaken in the incorporation of web technologies in order to implement user-centred library services enhanced by web technologies. These steps are:

Figure 7.1: User-centred model for the incorporation of web technologies in library services technology

- Step 2: Planning and deciding on the web technology for incorporation into library services
- Step 3: Investing in modern ICT infrastructure, equipment and software
- Step 4: Incorporating web technologies into library services
- Step 5: Using web technologies.

The thick arrow denotes the order of moving from one step to another in the model. It shows that in implementing the model, one cannot, for example, move from Step 4 to Step 1. However, the process of moving between the five steps is iterative, as depicted by the thin arrow. While it is not shown in the graph, monitoring and evaluation is embedded in all the steps of the model. Furthermore, the abbreviations in the graph refer to the role players in each step. The different role players are represented in the graph as follows.

- ICTD Information and Communication Technology Department
- L Librarians
- LITD Library Information Technology Department
- LM Library Management
- LU Library Users
- UM University Management

To make the model effective, there are a series of activities to be carried out by different role players within each of these steps, as enumerated in Table 7.1 below. While the university library has the primary responsibility of ensuring that the model is implemented for the benefit of the users, all other players have complementary roles. They play distinct, but in some cases overlapping, roles to ensure the effective implementation of the model.

Table 7.1: Roles played by different players in implementing the user-centred model

Role Player	Role
<b>Library Management and Librarians</b>	<ul style="list-style-type: none"> <li>• Understanding the user information needs and expectations through systematic assessments, employing appropriate methods such as surveys, focus group discussions, interviews and observations</li> <li>• Developing policy to govern the usage of the web technologies</li> <li>• Ensuring compliance with the policy on web technologies</li> <li>• Incorporating appropriate web technologies that fit the purpose of well-defined library functions</li> <li>• Imparting information and giving digital literacy instruction to users</li> <li>• Marketing and promoting library services enhanced with web technologies</li> <li>• Creating awareness among users about the security and privacy issues associated with the use of web technologies</li> <li>• Customising and tailoring web-based information services and resources to different user groups</li> <li>• Acquiring computer equipment and relevant software for both librarians and users</li> <li>• Ensuring subscription to and the timely renewal of electronic resources and software where applicable</li> <li>• Monitoring and evaluating appropriateness of web technologies</li> </ul>
<b>Library Users</b>	<ul style="list-style-type: none"> <li>• Using web technologies incorporated by their university libraries</li> <li>• Providing feedback on the usefulness of web technologies incorporated by their university libraries</li> <li>• Learning requisite skills to use web technologies effectively</li> <li>• Recommending appropriate web technologies to the university library</li> <li>• Complying with ICT and web technology policies</li> </ul>
<b>University Management</b>	<ul style="list-style-type: none"> <li>• Evaluating and approving a relevant policy framework to guide the use of web technologies</li> <li>• Providing funding for ICT infrastructure</li> <li>• Providing funding for computer equipment and software</li> </ul>

	<ul style="list-style-type: none"> <li>• Supporting the university library and library users to use web technologies</li> </ul>
<b>University and Library Information and Communication Technologies Departments</b>	<ul style="list-style-type: none"> <li>• Formulating and reviewing ICT and web technology policies</li> <li>• Ensuring compliance with approved policies</li> <li>• Investing and procuring appropriate ICT infrastructure and equipment</li> <li>• Maintaining ICT infrastructure and equipment</li> <li>• Negotiating affordable rates for Internet services, including mobile devices and the cost of data, with internet service providers</li> </ul>

## **7.4 Recommendations**

The usage of web technologies is now pervasive in all spheres of life and university libraries are no exception to this. While university libraries have been deploying web technologies in their services for many years, the Covid-19 pandemic of the last few years has intensified the usage of these tools. Most library users are likely to continue their preference for accessing online resources that are offered via web technologies. Accordingly, it should be the library users who inform the incorporation of web technologies by university libraries.

The recommendations offered below are based on the findings and conclusions of this study, and are intended to improve the incorporation of web technologies into university library services and the actual usage of these tools by librarians and students.

### **7.4.1 User needs assessments and the evaluation of web technology capability**

To enable university libraries to provide user-centred web-based services in a sustainable and meaningful manner, it is recommended that they conduct regular user needs assessments, employing several research methodologies. It is further recommended that an evaluation of the appropriateness of each web technology be carried out before it is incorporated into the library services. This will enable university libraries to match the incorporation of each web technology to well-defined user needs, and ultimately provide user-centred web-based services.

#### **7.4.2 Creating awareness about guidelines and discovery tools among students**

The results of this study revealed that most of the students were not aware about the discovery tools offered by their university libraries. This lack of awareness defeats the whole purpose of investing in discovery tools because they are meant to broaden access to information and make information easily accessible to users. It is therefore recommended that university libraries should formulate marketing strategies of their discovery tools and widely publicise such tools to the student community. In addition, university libraries are urged to assign the responsibility of marketing and promoting library services to one of their librarians and also consider creating a position of marketing librarian in their structures.

#### **7.4.3 Training workshops**

The findings of this study highlighted the need for university libraries to provide regular training on the usage of web technologies, especially for postgraduate students and librarians. It is recognised that web technologies change at a very fast pace and this justifies regular training for all stakeholders. Therefore, in conformity with the principle of life-long learning, it is vitally important for university libraries to organise regular training workshops for both librarians and students, irrespective of whether they are undergraduates or postgraduates.

Blended training programmes involving face-to-face and online tutorials should be prioritised by university libraries, as this will equip librarians and students with the necessary skills to fully exploit the benefits offered by the web technologies incorporated by university libraries. Librarians and students can access online tutorials at the point when they actually need them. This will also enable them to learn at their own pace.

#### **7.4.4 Policy framework**

The necessity for a policy framework to govern the usage of web technologies in university libraries cannot be over-emphasised. Most librarians concurred regarding the lack of such policy in their university libraries and indicated that they rely mainly on the university-wide ICT policy, which may not cover all aspects of the library comprehensively. In view of this, it is recommended that university libraries should develop a policy framework to guide users on the ethical use of the web technologies they have incorporated. Ethical usage of resources can form part of the library information skills imparted to students.

#### **7.4.5 Monitoring and evaluation of web technologies**

The web technologies incorporated by university libraries will only be meaningful if they are actually used by librarians and students. Such tools can facilitate greater interaction between librarians and users, broaden access to credible sources of information, and promote library services. Monitoring and evaluation is not only important for actual use but can also help university libraries to update the web technologies they have incorporated with appropriate and relevant information for users. It is therefore recommended that monitoring and evaluation should form part of the implementation plan of web technologies.

#### **7.4.6 Investing in appropriate ICT infrastructure and equipment**

The successful usage of web technologies will depend heavily on the level of facilitating conditions in terms of ICT infrastructure and equipment. University libraries should therefore lobby and motivate for the latest robust Wi-Fi and fixed Internet technologies from their parent universities. University libraries should also invest in appropriate ICT equipment and replace it at the end of its life.

#### **7.4.7 Fundraising**

The results of the study revealed that some university libraries were being challenged by financial constraints due to dwindling funding. University libraries are therefore advised to seek external funding to supplement their university budgetary allocation. This will help to acquire modern ICT equipment to improve the library user experience of using web technologies.

#### **7.5 Further research**

Based on the limitations and unexpected findings of this study, further research in the following topical areas are recommended.

- a) A methodological limitation in this study was the fact that it only employed a questionnaire, interviews and focus group discussions as data collection research instruments. These research instruments rely upon self-reported data from respondents. It is therefore recommended that a further study employing direct observation as a research instrument be conducted to examine how librarians and students actually use web technologies be carried out.
- b) One of the unexpected findings of this study was that the Really Simple Syndication (RSS) feeds was one of the least incorporated web technologies by the university libraries investigated in this study. It would therefore be beneficial to conduct further research to determine why this tool was less frequently adopted by these libraries. This is because RSS enables libraries to disseminate customised information to different library user groups and hence it conforms to the principle of user-centred services.
- c) Another unexpected finding of this study was that one of the university libraries has introduced the position of Marketing Librarian. Accordingly, further research into how such a position adds value to library services is recommended.

- d) Further research is also recommended to investigate the incorporation of assistive technologies into library services to offer user-centred library services enhanced by web technologies to support users with disabilities.
- e) Further research is also recommended to practically test the proposed user-centred model for the incorporation of web technologies into library services.

## **7.6 Conclusion**

This chapter highlighted the key findings and presented the major conclusions of the study. The chapter also proposed a user-centred model for the incorporation of web technologies into library services. This constitutes the original contribution of this study to the body of knowledge relating to the application of web technologies in the context of university libraries. The proposed model outlines the five steps that should be undertaken in order to successfully implement the model. The key role players in the implementation of the model are also indicated.

The chapter highlighted the conclusions of the study which may inform practice. However, the overall conclusions of the study indicated that the constructs in UTAUT and Library 2.0 theory can be used to inform the development of the user-centred model for incorporating user-centred services into university library services. Based on the findings and conclusions of the study, the chapter further made recommendations aimed at creating web-based library services enhanced by web technologies. Finally, the chapter proposed topical areas for further research based on findings emerging from this study.

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## APPENDICES

### 9.1 Appendix 1: Questionnaire

Dear respondent,

My name is Joseph Ndinoshiho, a PhD student registered with the Department of Knowledge and Information Stewardship at the University of Cape Town. I am writing to invite you to complete the questionnaire in the link below. The questionnaire forms part of the empirical research for my dissertation entitled “The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services”. The aim of the study is to investigate the incorporation of web technologies by university libraries in Southern Africa in order to develop a user-centred model for integration into their services.

In the context of this research, the term ‘web technologies’ is defined by the researcher as web-based services offered by the library through application software and web tools that facilitate content discovery, content creation, interactive communication, dissemination and exchange of information in a variety of formats (textual, images, video and audio) over the internet. User-centred services are defined as a “services model that puts the user at the centre of library and information services and outlines transformative processes of meeting his or her needs” (Ugwu & Onyancha, 2017:2).

This questionnaire has undergone the process of ethics clearance by the University of Cape Town. Your participation in this research is voluntary and I will guarantee your anonymity and that of your university. The responses you provide will be used only for the purpose of this research and will be treated with confidentiality. The questionnaire will take about 45 minutes to complete. Please direct this questionnaire to the staff responsible for web technologies or digital services in your library.

The questionnaire may open in your web browser by clicking the link below:

[Questionnaire for the doctoral study entitled "The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services"](#). If the link above does not work, try copying the link below into your web browser:

<https://trn-redcap.uct.ac.za/surveys/?s=PJJE3DCAKT>

Once you have completed all the questions to the best of your ability, please click on the submit button. Your participation in this research will highly be appreciated.

Joseph Ndinoshiho, University of Namibia Library

Email: [jndinoshiho@unam.na](mailto:jndinoshiho@unam.na)

Mobile phone +264 811283440

Supervisor: Associate Prof Mary Nassimbeni, Email: [mary.nassimbeni@uct.ac.za](mailto:mary.nassimbeni@uct.ac.za).

Please answer all the questions to the best of your ability.

#### SECTION 1: DEMOGRAPHIC INFORMATION

1.1 Name of university (*Please select the name of your university*)

*Dropdown list of public universities in SADC*

Mzuzu University	<input type="radio"/>
University of Botswana	<input type="radio"/>
National University of Lesotho	<input type="radio"/>
University of Malawi	<input type="radio"/>
University of Mauritius	<input type="radio"/>
Etc.	

1.2 Staff position/designation: *(Please write down your position in your library)*

--

1.3 What has been your role in the incorporation of web technologies into your university library? *(Please select all that apply)*

Coordinator: Library Digital Services	<input type="radio"/>
Head: User Services	<input type="radio"/>
Coordinator: Library web technologies	<input type="radio"/>
Chairperson: Library web technologies committee	<input type="radio"/>
Other (specify)	

## **SECTION 2: WEB TECHNOLOGIES INCORPORATED IN YOUR LIBRARY SERVICES**

### **2.1 Types of web technologies incorporated in your library services**

2.1.1 Which of the following web technologies has your library incorporated into its services? *(Please select all that apply)*

- Blogs
- EBSCO Host Discovery
- Facebook
- Instagram
- Instant Messaging
- Pinterest
- Primo
- RSS feeds
- Summon Discovery
- Twitter
- Wikis
- WordPress
- WorldCat Discovery
- YouTube

Others <i>(Please specify)</i> :
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## **SECTION 3: FACTORS INFLUENCING YOUR LIBRARY TO INCORPORATE WEB TECHNOLOGIES INTO ITS SERVICES**

**PERFORMANCE EXPECTANCY** – *defined as the degree to which you believe that incorporating web technologies in your library helps to improve user services.*

3.1 Please indicate the degree to which you agree or disagree with the following statements about the incorporation of web technologies into your library services in relation to the concept of performance expectancy as defined above. *(Please select the appropriate box)*

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
1. My library finds web technologies useful in improving user services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Web technologies help users to easily discover information from my library	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Web technologies enable my library to interact with users quickly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Web technologies improve the delivery of information literacy instruction to library users	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Web technologies enhance the creation and sharing of information with users	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Web technologies enhance my library's outreach activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Security concerns discourage my library from incorporating web technologies into services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. There is much risk attached to sharing information with users via web technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. My library staff believe that using web technologies is time consuming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. My library staff believe that using web technologies leads to information overload	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. My library believes that user-centricity is the most important principle underlying the incorporation of web technologies in the library	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Overall, web technologies improve the quality of library user services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**EFFORT EXPECTANCY** – defined as the degree of ease associated with the use of web technologies by library staff.

3.2 Please indicate the degree to which you agree or disagree with the following statements about the usage of web technologies by your library staff in relation to the concept of effort expectancy as defined above. (Please select the appropriate box)

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
1. My library staff find it easy to use web technologies in the delivery of library services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. My library staff find it easy to learn how to use web technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. My library staff find it easy to use web technologies in outreach services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. My library staff find it easy to understand web technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. My library staff find it easy to navigate web technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. My library staff do not require much training to use web technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**SOCIAL INFLUENCE** – defined as the degree to which you perceive that stakeholders believe that your library should incorporate web technologies into your library services.

3.3 Please indicate the degree to which you agree or disagree with the following statements about the incorporation of web technologies into your library services in relation to the concept of social influence as defined above. (Please select the appropriate box)

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
1. Library users exert influence on my library to incorporate web technologies into services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. My university management supports the incorporation of web technologies into library services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Fellow librarians recommend the incorporation of web technologies into my library services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Other libraries influence the incorporation of web technologies into my library services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. My library incorporates web technologies into services to	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

improve its image and reputation					
6. Incorporating web technologies in my library services is consistent with my library's innovative culture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. My library incorporates web technologies into services to meet institutional expectations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. My library incorporates web technologies into services to comply with the library's policy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Overall, users of my library support the incorporation of web technologies into services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**FACILITATING CONDITIONS** – *defined as the degree to which you believe that there is sufficient organisational and technical infrastructure to support the incorporation of web technologies into your library services.*

3.4 Please indicate the degree to which you agree or disagree with the following statements about the support you get from your university to facilitate the incorporation of web technologies into your library services. *(Please select the appropriate box)*

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
1. My university provides good ICT infrastructure to support the incorporation of web technologies into library services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. My university has an approved policy framework that governs the incorporation of web technologies into library services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. My university provides Wi-Fi across campus to facilitate access to information through web technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. My university provides a sufficient budget for computers to facilitate the utilisation of web technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. My university prevents the incorporation of web	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

technologies into library services because they slow down internet speed					
6. Web technology processes at my university are informed by user-centric principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3.5 Please indicate the degree to which you agree or disagree with the following statements about the support your library provides to users to facilitate the utilisation of web technologies. *(Please select the appropriate box)*

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
1. My library has good internet connection to facilitate the utilisation of web technologies by library users	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. My library provides enough computers to enable users to utilise web technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. My library organises regular training sessions to equip users with skills in the utilisation of web technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. My library has assigned specific staff to help users with problems relating to the utilisation of web technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. My library has a policy that governs the use of web technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. My library guides users to protect their personal information when utilising web technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. My library raises users' awareness of security and privacy issues associated with the use of web technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### **SECTION 4: PROVISION OF USER-CENTRED LIBRARY SERVICES ENHANCED BY WEB TECHNOLOGIES**

4.1 Please indicate the factors you think are important in the provision of library user-centred services enhanced by web technologies. *(Please select all factors that apply)*

1. User needs and expectations	<input type="radio"/>
--------------------------------	-----------------------

2. Quick discoverability of information from the entire library collections	<input type="radio"/>
3. Cost-effective interaction between users and librarians	<input type="radio"/>
4. User-friendliness	<input type="radio"/>
5. Protection of personal information	<input type="radio"/>
6. 24/7 accessibility of library services	<input type="radio"/>
7. Interactivity of web technologies	<input type="radio"/>
8. Delivery of customised information	<input type="radio"/>
9. Effectiveness in sharing information	<input type="radio"/>
10. Effectiveness in promoting library services	<input type="radio"/>
11. Effectiveness in providing online information literacy instruction	<input type="radio"/>
12. Effectiveness in providing online reference services	<input type="radio"/>
13. User-centric content architecture	<input type="radio"/>
14. Others (please specify)	<input type="radio"/>

5. Please write down any other comments relating to the incorporation of web technologies into your library services.

Thank you for taking the time to complete this questionnaire  
Your participation in this study is greatly appreciated.

## 9.2 Appendix 2: Application for permission to collect data via questionnaire to university registrars

Address

Date

Dear,

**Subject:       Application for permission to collect data via a questionnaire**

My name is Joseph Ndinoshiho, a PhD student registered with the Department of Knowledge and Information Stewardship at the University of Cape Town.

I am writing to seek permission and ethics clearance approval to collect data from your library for my Doctoral dissertation entitled “The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services”. The main aim of my dissertation is to investigate the incorporation of web technologies by university libraries in Southern Africa in order to develop a user-centred model for the integration of web technologies into library services. The dissertation is being supervised by Associate Professor Mary Nassimbeni, email: [mary.nassimbeni@uct.ac.za](mailto:mary.nassimbeni@uct.ac.za).

The data will be collected by means of an online questionnaire that I will request you to distribute to the Head of Digital Services or the staff responsible for overseeing the implementation of web technologies in your library. The questionnaire has undergone the process of research ethics clearance by the University of Cape Town. For ease of reference, I attach a copy of the ethics clearance certificate from the University of Cape Town and a sample of the questionnaire that will be distributed online via the Redcap software.

I intend to collect data through an online questionnaire during the months of April and July 2020. If approval is given, please send me an official letter of confirmation. The participation of your library in this research is voluntary and the anonymity of your university will be guaranteed. The responses provided will be used only for the purpose of this research and will be treated with confidentiality.

The findings of the study will be disseminated and shared widely in symposia, conferences and scholarly journals. I should be grateful for your participation and your assistance in obtaining ethics approval from your library/institution. Should you require further information, do not hesitate to contact me.

Thank you for your consideration.

Sincerely,



Joseph Ndinoshiho, University of Namibia Library

Email [jndinoshiho@unam.na](mailto:jndinoshiho@unam.na); Telephone +264 65 206 3874; Mobile +264 811283440

### 9.3 Appendix 3: Interview guide for librarians

Interview guide with user services librarians for the doctoral study entitled “The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services”

Good day and welcome.

Thank you very much for agreeing to take part in this interview. My name is Joseph Ndinoshiho, a PhD student registered with the Department of Knowledge and Information Stewardship at the University of Cape Town. Your participation in this interview forms part of the empirical research for my dissertation entitled “The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services”. The aim of the study is to investigate the incorporation of web technologies by university libraries in Southern Africa in order to develop a user-centred model for their integration, and is being supervised by Associate Professor Mary Nassimbeni, email: [mary.nassimbeni@uct.ac.za](mailto:mary.nassimbeni@uct.ac.za).

The interview guide has undergone the process of ethical clearance by the University of Cape Town. I am pleased that you have consented to participate in this research by signing the informed consent form. Your participation in this research is voluntary and I will guarantee your anonymity. You may withdraw from the discussion at any time without having to give a reason. The responses you provide will be used only for the purpose of this research and will be treated with confidentiality. The interview will take about forty-five minutes to complete. Your participation in this research is highly appreciated. In order to ensure that we have a common understanding, I have given you an information sheet that introduces the topic of our discussion and clarifies key concepts that will form part of our discussion. There are no right or wrong answers. Therefore, please feel free to share your views. I will start our discussion with the following question.

#### **Topic 1: Web technologies incorporated in your library**

1.1 What are the web technologies offered by your library?

#### **Topic 2: Factors influencing your use of web technologies incorporated into your library services**

2.1 How useful are the web technologies in your library services for work purposes?

*(Performance expectancy)*

2.2 Could you please describe how the web technologies offered by your library improve the access, exchange and sharing of educational information with your users? *(Performance expectancy)*

*(Performance expectancy)*

2.3 Please describe how easy it is for you to use web technologies in your library services.

*(Effort expectancy)*

2.4 Please describe the difficulties you face when using web technologies in your library services. *(Effort expectancy)*

2.5 Please describe how your users influence your use of the web technologies offered by your library. *(Social influence)*

2.6 Please describe how your librarian colleagues influence your use of the web technologies in your library services. *(Social influence)*

2.7 How does your library facilitate your use of web technologies? *(Facilitating conditions)*

2.8 Does your library have a policy framework to guide your use of web technologies? *(Facilitating conditions)*

**Topic 3: Librarians’ perceptions of library services enhanced with web technologies**

3.1 What has been your overall experience in using the web technologies incorporated into your library services to interact with your library users?

**Topic 4: Provision of user-centred library services with web technologies**

4.1 What is your understanding of the concept of ‘user-centred services’ in a library setting?

4.2 What do you think your library should do to create or improve user-centred services with web technologies?

**Topic 5: Additional comments**

5.1 Do you have additional comments about the incorporation of web technologies into your library services?

**6. Conclusion**

Do you have any questions about the study?

Thank you once more for making the time to participate in this interview. Your contribution to this research is greatly appreciated. Once the dissertation has been examined, the results of the study may be accessed through the University of Cape Town Open Access Institutional Repository <https://open.uct.ac.za/>.

**Librarian A**

**Date:** \_\_\_\_\_

**Time:** \_\_\_\_\_

Joseph Ndinoshiho

University of Namibia

Email: [jndinoshiho@unam.na](mailto:jndinoshiho@unam.na); Mobile phone +264 811283440

## 9.4 Appendix 4: Informed consent form for librarians

Interview with Librarians for the doctoral study entitled “The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services”

Principal Investigator: Joseph Ndinoshiho

Contact details: Phone +264 811283440. Email: [jndinoshiho@unam.na](mailto:jndinoshiho@unam.na)

Institutional affiliation: University of Cape Town, Faculty of Humanities, Department of Knowledge and Information Stewardship

### 1. Introduction

This form seeks your informed consent to participate in the interviews targeting librarians at selected universities for the empirical research of my dissertation entitled “The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services”. You were selected as a possible participant in the interviews for this study because you can provide information about the adoption and use of web technologies in your university library, thereby providing the necessary research data that will help to answer the research questions raised by this study. Before you sign this form, please ask for any clarification about the interviews and/or the study.

### 2. Purpose of the study

The aim of the study is to investigate the incorporation of web technologies by university libraries in Southern Africa in order to develop a user-centred model for the integration of web technologies into library services. The study is being supervised by Associate Professor Mary Nassimbeni, email: [mary.nassimbeni@uct.ac.za](mailto:mary.nassimbeni@uct.ac.za). For the purpose of this study, the term ‘web technologies’ is defined as web-based services offered by the library through application software and web tools that facilitate content discovery, content creation, interactive communication, dissemination, and exchange of information in a variety of formats (textual, images, video and audio) over the internet.

### 3. Procedures and duration

If you choose to take part in this study, you will be asked to participate in an online interview aimed at eliciting insights into several aspects relating to the use and benefits of web technologies incorporated into your library services. The interviews will be conducted in the English language and its duration will be approximately one hour. In order for the researcher to concentrate on facilitating the conversation as it unfolds, the interviews will be recorded. The recordings will also supplement the notes that will be taken by the researcher, which may not be comprehensive enough due to the researcher’s major focus on facilitating the discussion.

### 4. Benefits and compensation

The anticipated benefit is indirect in the sense that your responses may contribute to the development of a user-centred model for the integration of web technologies into university library services, thus contributing to knowledge and possible improvement in the quality of library and information services. The findings from this research will be disseminated and shared widely in symposia, conferences and scholarly journals.

### 5. Risks and discomforts

There are no known risks or any discomfort arising from your participation in this research.

## 6. Confidentiality

Your responses in the discussion will be treated with strict confidentiality and will be presented anonymously. The quotes from the interviews can be used in the dissertation without identifying such quotes with your name or the name of your university. All the information you provide will be used solely for research purposes. Recordings of the interviews will be securely kept in an encrypted electronic file and notes taken during the discussions will be locked in a secure location. After data analysis is completed, data will be preserved in a University of Cape Town (UCT) data repository, and consequently made accessible for reuse by other researchers in accordance with UCT Research Data Management Policy.

## 7. Voluntary participation

Your participation in this research is entirely voluntary. If you choose to participate, you can withdraw at any time during the interviews, without having to give a reason

## 8. Informed consent

You are required to tick the appropriate box in the form below. If you agree to participate, write your name and sign the form in the space provided below.

Informed consent:

	<i>Please tick the appropriate box</i>	
	<b>Yes</b>	<b>No</b>
I understand my participation in this research is entirely voluntary.		
I understand that I have the right to choose not to participate in this research and will not be victimised in any way.		
I understand that I can withdraw at any time during the interview, without having to give a reason.		
I understand that I am not obliged to answer all the questions.		
I agree that the interview will be recorded.		
The nature, objectives and implications of my participation in the research have been explained to me and I understand them.		

Signed:

Name of Participant: \_\_\_\_\_ Date: \_\_\_\_\_ Signature:  
\_\_\_\_\_

Name of Researcher: \_\_\_\_\_ Date: \_\_\_\_\_ Signature:  
\_\_\_\_\_

You will be given a copy of this consent form to keep.

## 9.5 Appendix 5: Study information sheet given to participants

My name is Joseph Ndinoshiho, a PhD student registered with the Department of Knowledge and Information Stewardship at the University of Cape Town. Your participation in this focus group discussion forms part of the empirical research for my dissertation entitled “The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services”. The objective of this study is to investigate the incorporation of web technologies into the services of university libraries in Southern Africa in order to develop a user-centred model for the deployment of web technologies. The study is being supervised by Associate Professor Mary Nassimbeni, email: [mary.nassimbeni@uct.ac.za](mailto:mary.nassimbeni@uct.ac.za).

I shall be using the following terms which are defined below:

- **Effort expectancy** is defined as the degree of ease associated with the use of web technologies.
- **Facilitating conditions** is defined as the degree to which you believe there is sufficient organisational and technical infrastructure to support the use of the web technologies incorporated into your library services.
- **Incorporation of web technologies** – in this study, incorporation of web technologies refers to the integration and actual usage of web technologies to perform certain tasks relating to library services and operations.
- **Performance expectancy** is defined as the degree to which you believe that using web technologies helps you in accessing the information provided by your library.
- **Social influence** is defined as the degree to which you perceive that stakeholders believe that you should use the web technologies incorporated into your library services.
- **User-centred services** are defined as a “services model that puts the user at the centre of library and information services and outlines transformative processes of meeting his or her needs” (Ugwu & Onyancha, 2017: 2).
- **Web technologies** is defined by the researcher as web-based services offered by the library through application software and web tools that facilitate content discovery, content creation, interactive communication, dissemination, and exchange of information in a variety of formats (textual, images, video and audio) over the internet.

### References

Ugwu, C.I. & Onyancha, O.B. 2017. Organizational factors and knowledge management applications to user-centred services in federal university libraries in Nigeria. *Journal of Librarianship and Information Science*. [Online]. Available: <https://doi.org/10.1177/0961000617726124>. [accessed 25 April 2019].

## 9.6 Appendix 6: Guide for focus group discussion with undergraduate students

Good day and welcome.

Thank you very much for agreeing to take part in this focus group discussion. My name is Joseph Ndinoshiho [jndinoshiho@unam.na](mailto:jndinoshiho@unam.na), a PhD student registered with the Department of Knowledge and Information Stewardship at the University of Cape Town. Your participation in this focus group discussion forms part of the empirical research for my dissertation entitled “The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services”. The aim of the study is to investigate the incorporation of web technologies by university libraries in Southern Africa in order to develop a user-centred model for their integration, and is being supervised by Associate Professor Mary Nassimbeni, email: [mary.nassimbeni@uct.ac.za](mailto:mary.nassimbeni@uct.ac.za).

The focus group discussion guide has undergone the process of ethical clearance by the University of Cape Town. I am pleased that you have consented to participate in this research by signing the informed consent form. Your participation in this research is voluntary and I will guarantee your anonymity. You may withdraw from the discussion at any time without having to give a reason. The responses you provide will be used only for the purpose of this research and will be treated with confidentiality. The focus group discussion will take about one hour. Your participation in this research is highly appreciated.

In order to ensure that we have a common understanding, I have given you an information sheet that introduces the topic of our discussion and clarifies key concepts that will form part of our discussion. There are no right or wrong answers. Therefore, please feel free to share your views. I will start our discussion with the following question.

Topic 1: Web technologies incorporated in your library

1.1 What are the web technologies incorporated into your library services?

Topic 2: Factors influencing your use of the web technologies incorporated into your library services

2.1 How useful are the web technologies incorporated into your library services for your research information needs? (Performance expectancy)

2.2 How would you describe the effort required to use the web technologies incorporated into your library services? (Effort expectancy)

2.3 Who influenced you to use the web technologies offered by your library? (Social influence)

2.4 How does your library facilitate your use of web technologies? (Facilitating conditions)

Topic 3: User perceptions of library services enhanced with web technologies

3.1 What have your overall experiences been in using the web technologies offered by your library?

Topic 4: Provision of user-centred library services with web technologies

4.1 What is your understanding of the concept of ‘user-centred services’ in a library setting?

4.2 What do you think your library should do to create or improve user-centred services with web technologies?

Topic 5: Additional comments

5.1 Do you have additional comments about the web technologies in your library services?

## 6. Conclusion

Do you have any questions about the study?

Thank you once more for making the time to participate in this focus group discussion. Your contribution to this research is highly appreciated.

Name of institution:

---

Date:

---

Time:

---

Joseph Ndinoshiho  
University of Namibia  
Email: [jndinoshiho@unam.na](mailto:jndinoshiho@unam.na)  
Mobile phone +264 811283440

## 9.7 Appendix 7: Guide for focus group discussion with postgraduate students

Good day and welcome.

Thank you very much for agreeing to take part in this focus group discussion. My name is Joseph Ndinoshiho [jndinoshiho@unam.na](mailto:jndinoshiho@unam.na), a PhD student registered with the Department of Knowledge and Information Stewardship at the University of Cape Town. Your participation in this focus group discussion forms part of the empirical research for my dissertation entitled “The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services”. The aim of the study is to investigate the incorporation of web technologies by university libraries in Southern Africa in order to develop a user-centred model for their integration, and is being supervised by Associate Professor Mary Nassimbeni, email: [mary.nassimbeni@uct.ac.za](mailto:mary.nassimbeni@uct.ac.za).

The focus group discussion guide has undergone the process of ethical clearance by the University of Cape Town. I am pleased that you have consented to participate in this research by signing the informed consent form. Your participation in this research is voluntary and I will guarantee your anonymity. You may withdraw from the discussion at any time without having to give a reason. The responses you provide will be used only for the purpose of this research and will be treated with confidentiality. The focus group discussion will take about one hour. Your participation in this research is highly appreciated.

In order to ensure that we have a common understanding, I have given you an information sheet that introduces the topic of our discussion and clarifies key concepts that will form part of our discussion. There are no right or wrong answers. Therefore, please feel free to share your views. I will start our discussion with the following question.

### **Topic 1: Web technologies incorporated in your library**

1.1 What are the web technologies incorporated into your library services?

### **Topic 2: Factors influencing your use of the web technologies incorporated into your library services**

2.1 How useful are the web technologies incorporated into your library services for your research information needs? (*Performance expectancy*)

2.2 How would you describe the effort required to use the web technologies incorporated into your library services? (*Effort expectancy*)

2.3 Who influenced you to use the web technologies offered by your library? (*Social influence*)

2.4 How does your library facilitate your use of web technologies? (*Facilitating conditions*)

### **Topic 3: User perceptions of library services enhanced with web technologies**

3.1 What have been your overall experiences in using the web technologies offered by your library?

### **Topic 4: Provision of user-centred library services with web technologies**

4.1 What is your understanding of the concept of ‘user-centred services’ in a library setting?

4.2 What do you think your library should do to create or improve user-centred services with web technologies?

### **Topic 5: Additional comments**

5.1 Do you have additional comments about the web technologies in your library services?

## 6. Conclusion

Do you have any questions about the study?

Thank you once more for making the time to participate in this focus group discussion. Your contribution to this research is highly appreciated.

Name of institution:

---

**Date:**

---

**Time:**

---

Joseph Ndinoshiho  
University of Namibia  
Email: [jndinoshiho@unam.na](mailto:jndinoshiho@unam.na)  
Mobile phone +264 811283440

## 9.8 Appendix 8: Informed consent form for students

My name is Joseph Ndinoshiho, a PhD student registered with the Department of Knowledge and Information Stewardship at the University of Cape Town. This form seeks your informed consent to participate in the focus group discussion targeting undergraduate and postgraduate students at selected universities for the empirical research for my dissertation entitled “The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services”.

The aim of the study is to investigate the incorporation of web technologies by university libraries in Southern Africa in order to develop a user-centred model for the integration of web technologies into library services. The study is being supervised by Associate Professor Mary Nassimbeni, email: [mary.nassimbeni@uct.ac.za](mailto:mary.nassimbeni@uct.ac.za).

There are no known risks arising from your participating in this research. Your responses in the discussion will be treated with strict confidentiality and will be presented anonymously. The quotes from the discussions can be used in the dissertation without identifying such quotes with your name or the name of your university.

The anticipated benefit is that your responses may contribute to the development of a user centred model for the integration of web technologies into university library services, thus contributing to knowledge and possible improvement in the quality of library and information services. The findings from this research will be disseminated and shared widely in symposia, conferences and scholarly journals.

Informed consent:

	<i>Please tick appropriate box</i>	
	<b>Yes</b>	<b>No</b>
1. I understand my participation in this research is entirely voluntary.		
2. I understand that I have the right to choose not to participate in this research and will not be victimised in any way.		
3. I understand that I can withdraw at any time during the discussion, without having to give a reason.		
4. I understand that I am not obliged to answer all the questions.		
5. I agree that the focus group discussion will be audio recorded.		
6. The nature, objectives and implications of my participation in the research have been explained to me and I understand them.		

Signed:

Name of Participant: \_\_\_\_\_ Date: \_\_\_\_\_ Signature: \_\_\_\_\_

Name of Researcher: \_\_\_\_\_ Date: \_\_\_\_\_ Signature: \_\_\_\_\_

## 9.9 Appendix 9.1: Ethics approval for doctoral research from the University of Cape Town



Department of Knowledge & Information Stewardship  
University of Cape Town  
Upper Campus

Private Bag X1, RONDEBOSCH, 7701 South Africa  
Level 6 Hlanganani, The Chancellor Oppenheimer Library  
Tel: +27 (0) 21 650 4546 Fax: +27 (0) 21 650 2529  
E-mail: [dkis@uct.ac.za](mailto:dkis@uct.ac.za)  
Internet: [www.dkis.uct.ac.za](http://www.dkis.uct.ac.za)

RefNo.: UCTDKI2019 – 12 – 10

24 Feb. 20

Dear Joseph Ndinoshiho,

### **Ethics approval for Doctoral research**

I am pleased to inform you that ethics clearance has been granted by an Ethics Review Committee of the Department of Knowledge and Information Stewardship on behalf of the Faculty of Humanities, UCT, for you to proceed with collecting data for your Doctoral study on **'Incorporation of web technologies by university libraries in Southern Africa to implement user-centred services'**.

As a next step, please ensure that you obtain approval from the relevant ethics committee(s) to collect data at your data collection site(s), as necessary.

We wish you well with your data collection and the completion of your research.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Mzwandile Shongwe'.

Dr Mzwandile Shongwe  
Chair: Department (DKIS) Research Ethics Committee

## 9.10 Appendix 9.1.1: Permission to access UCT staff for research purposes

HR194	<b>ACCESS TO UCT STAFF FOR RESEARCH PURPOSES</b>	 <b>UNIVERSITY OF CAPE TOWN</b> IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD
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### NOTES

- Forms must be downloaded from the UCT website: <http://www.uct.ac.za/depts/sapweb/forms/forms.htm>
- This form must be completed by applicants who are requesting to access UCT staff for the purpose of research.
- A copy of the research proposal as well as the Ethics Committee approval must be attached.
- It is the responsibility of the researcher/s to apply for ethical clearance from the relevant Faculty's Research in Ethics Committee (RIEC).
- If you are requesting staff information, you are required to complete the [HR Information Request Form](#) (HR190) and submit it together with all the required documentation.
- The turnaround time for a reply is **approximately 10 working days unless specified as urgent**.
- Return the completed application form and all the above documentation to Joy Henry via email: [joy.henry@uct.ac.za](mailto:joy.henry@uct.ac.za); or deliver to: For the Attention: Executive Director, Human Resources Department, Bremner Building, Room 214, Lower Campus, UCT.

### SECTION A: APPLICANT DETAILS

Title	Mr	Name	Joseph Ndinoshiho
Telephone number	+264 811283440	Email address	jndinoshiho@unam.na
Student number	NDNJOS001	Staff number	N/A
Visiting researcher ID / passport number	N/A		
Faculty Officer contact details	N/A		
	N/A		
University or institution at which employed or a registered student	University of Cape Town		
Faculty or department in which you are registered or work	Faculty of Humanities, Department of Knowledge & Information Stewardship		
Address (if not UCT)	PO Box 3379, Ongwediva		
	Namibia		
	ERF No. 5123 Buffalo Street, Ongwediva, Namibia		



### SECTION B: SUPERVISOR DETAILS

	Title and name	Telephone number	Email address
Supervisor	Mary Nassimbeni	+27 21 6503092	mary.nassimbeni@uct.ac.za
Co-Supervisor	Jaya Raju	+27 216504546	jaya.raju@uct.ac.za

### SECTION C: APPLICANT'S FIELD OF STUDY (if applicable) / TITLE OF RESEARCH PROJECT / STUDY

Degree	PhD Library and Information Science		
Research project or title	The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services		
Research proposal attached	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Target population (number of UCT staff)	3 librarians (2 to provide qualitative data via interviews and 1 to give quantitative data by means of a questionnaire).		
Amount of time required for an interview and/or questionnaire	40 minutes for the questionnaire and 1 hour for each interview		
Lead Researcher details	Joseph Ndinoshiho		
Proof of ethical clearance status attached	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	

### SECTION D: FOR OFFICE USE (Approval status to be completed by the Executive Director, Human Resources or Nominee)

Support or approval		Role	Signature	Date
Supported?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Joy Henry (Office Co-Ordinator)		14.07.2020
Approved?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Miriam Hoosain (Executive Director: HR)		26.08.2020

## 9.11 Appendix 9.1.2: Permission to access UCT students for research purposes

	<b>RESEARCH ACCESS TO STUDENTS</b>	<b>DSA 100</b>
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### NOTES

- This form must be **FULLY** completed by all applicants who want to access UCT students for the purpose of research or surveys.
- Return the fully completed (a) **DSA 100** application form by email, in the same word format, together with your: (b) **research proposal inclusive of your survey**, (c) **copy of your ethics approval letter / proof** (d) **informed consent letter** to: [Moonira.Khan@uct.ac.za](mailto:Moonira.Khan@uct.ac.za). Cc: [Nadlerah.Pienaar@uct.ac.za](mailto:Nadlerah.Pienaar@uct.ac.za). Your application will be attended to by the Executive Director, Department of Student Affairs (DSA), UCT.
- The turnaround time for a reply is **approximately 10 working days**.
- NB: It is the responsibility of the researcher/s to apply for and to obtain **ethics approval and to comply with amendments that may be requested**; as well as to **obtain** approval to access UCT staff and/or UCT students, from the following, at UCT, respectively: (a) **Ethics**: Chairperson, Faculty Research Ethics Committee' (FREC) for ethics approval, (b) **Staff access**: Executive Director: HR for approval to access UCT staff, and (c) **Student access**: Executive Director: Student Affairs for approval to access UCT students.
- Note**: UCT Senate Research Protocols requires compliance to the above, **even if prior approval has been obtained from any other institution/agency**. UCT's research protocol requirements applies to **all persons, institutions and agencies** from UCT and external to UCT who want to conduct research on human subjects for academic, marketing or service related reasons at UCT.
- Should approval be granted to access UCT students for this research study, such approval is effective for a period of one year from the date of approval (as stated in Section D of this form), and the approval expires automatically on the last day.
- The approving authority reserves the right to revoke an approval based on reasonable grounds and/or new information.

### SECTION A: RESEARCH APPLICANT/S DETAILS

Position	Staff / Student No	Title and Name	Contact Details (Email / Cell / land line)
A.1 Student Number	NDNJOS001	Mr Joseph Ndinoshiho	<a href="mailto:jndinoshiho@unam.na">jndinoshiho@unam.na</a> : +264 811 283440
A.2 Academic / PASS Staff No.			
A.3 Visitor/ Researcher ID No.			
A.4 University at which a student or employee	UCT	Address if <u>not</u> UCT:	
A.5 Faculty/ Department/School	Faculty of Humanities, Department of Knowledge & Information Stewardship		
A.6 APPLICANTS DETAILS If different from above	Title and Name	Tel.	Email


### SECTION B: RESEARCHER/S SUPERVISOR/S DETAILS

Position	Title and Name	Tel.	Email
B.1 Supervisor	A/Prof Mary Nassimbeni	+27 (0) 21 650 3092 +27 827867675	<a href="mailto:mary.nassimbeni@uct.ac.za">mary.nassimbeni@uct.ac.za</a>
B.2 Co-Supervisor/s	Prof Jaya Raju	+27 (0) 21 650 3091	<a href="mailto:jaya.raju@uct.ac.za">jaya.raju@uct.ac.za</a>

### SECTION C: APPLICANT'S RESEARCH STUDY FIELD AND APPROVAL STATUS

C.1 Degree – if applicable	LIS 6020W PhD Library & Information Studies
C.2 Research Project Title	The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services
C.3 Research Proposal	Attached: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
C.4 Target population	UCT Undergraduate and postgraduate students
C.5 Lead Researcher details	If different from applicant:
C.6. Will use research assistant/s	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes: provide a list of names, contact details :
C.7 Research Methodology and Informed consent	Research methodology: Quantitative questionnaire. Informed consent: Yes, consent advised to participants.
C.8 Ethics clearance status from UCT's Faculty Ethics in Research Committee /Chair (EIRC)	Approved by the UCT EIRC: Yes <input checked="" type="checkbox"/> With amendments: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (a) Attach copy of your UCT ethics approval. Attached: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (b) State date / Ref. No / Faculty of your UCT ethics approval: 24/02/2020 Ref. / Faculty: UCTDKI2019-12-10

### SECTION D: APPLICANT/S APPROVAL STATUS FOR ACCESS TO STUDENTS FOR RESEARCH PURPOSE (To be completed by the UCT - ED, DSA or Nominee)

	Approved / With Terms / Not	* Conditional approval with terms	Applicant/s Ref. No.:
D.1 APPROVAL STATUS	(i) Approved <input checked="" type="checkbox"/> (ii) With terms <input type="checkbox"/> (iii) Not approved <input type="checkbox"/>	a) Access to students for this research study must only be undertaken <b>after</b> written ethics approval has been obtained. b) In event any ethics conditions are attached, these must be complied with before access to students.	NDNJOS001 / Mr Joseph Ndinoshiho
D.2 APPROVED BY:	Designation Executive Director Department of Student Affairs	Name <i>Dr Moonira Khan</i>	Signature  Date of Approval 14 July 2020

## 9.12 Appendix 9.2: Permission to conduct research at Stellenbosch University



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jou kennisvenoot ▪ your knowledge partner

### INSTITUTIONAL PERMISSION:

#### AGREEMENT ON USE OF PERSONAL INFORMATION IN RESEARCH

**Name of Researcher:** Joseph Ndinoshiho

**Name of Research Project:** The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services.

**Service Desk ID:** IRPSD-1718

**Date of Issue:** 17 April 2020

The researcher has received institutional permission to proceed with this project as stipulated in the institutional permission application and within the conditions set out in this agreement.

1 WHAT THIS AGREEMENT IS ABOUT	
What is POPI?	<p>1.1 POPI is the Protection of Personal Information Act 4 of 2013.</p> <p>1.2 POPI regulates the entire information life cycle from collection, through use and storage and even the destruction of personal information.</p>
Why is this important to us?	<p>1.3 Even though POPI is important, it is not the primary motivation for this agreement. The privacy of our students and employees are important to us. We want to ensure that no research project poses any risks to their privacy.</p> <p>1.4 However, you are required to familiarise yourself with, and comply with POPI in its entirety.</p>
What is considered to be personal information?	<p>1.5 'Personal information' means information relating to an identifiable, living, individual or company, including, but not limited to:</p> <p>1.5.1 information relating to the race, gender, sex, pregnancy, marital status, national, ethnic or social origin, colour, sexual orientation, age, physical or mental health, well-being, disability, religion, conscience, belief, culture, language and birth of the person;</p> <p>1.5.2 information relating to the education or the medical, financial, criminal or</p>

1

Institutional Permission Standard Agreement: 13 March 2017 V1

	<p>employment history of the person;</p> <p>1.5.3 any identifying number, symbol, e-mail address, physical address, telephone number, location information, online identifier or other particular assignment to the person;</p> <p>1.5.4 the biometric information of the person;</p> <p>1.5.5 the personal opinions, views or preferences of the person;</p> <p>1.5.6 correspondence sent by the person that is implicitly or explicitly of a private or confidential nature or further correspondence that would reveal the contents of the original correspondence;</p> <p>1.5.7 the views or opinions of another individual about the person; and</p> <p>1.5.8 the name of the person if it appears with other personal information relating to the person or if the disclosure of the name itself would reveal information about the person.</p>
<p>Some personal information is more sensitive.</p>	<p>1.6 Some personal information is considered to be sensitive either because:</p> <p>1.6.1 POPI has classified it as sensitive;</p> <p>1.6.2 if the information is disclosed it can be used to defraud someone; or</p> <p>1.6.3 the disclosure of the information will be embarrassing for the research subject.</p> <p>1.7 The following personal information is considered particularly sensitive:</p> <p>1.7.1 Religious or philosophical beliefs;</p> <p>1.7.2 race or ethnic origin;</p> <p>1.7.3 trade union membership;</p> <p>1.7.4 political persuasion;</p> <p>1.7.5 health and health related documentation such as medical scheme documentation;</p> <p>1.7.6 sex life;</p> <p>1.7.7 biometric information;</p> <p>1.7.8 criminal behaviour;</p> <p>1.7.9 personal information of children under the age of 18;</p> <p>1.7.10 financial information such as banking details, details relating to financial</p>

	<p>products such as insurance, pension funds or other investments.</p> <p>1.8 You may make use of this type of information, but must take extra care to ensure that you comply with the rest of the rules in this document.</p>
<b>2 COMMITMENT TO ETHICAL AND LEGAL RESEARCH PRACTICES</b>	
You must commit to the use of ethical and legal research practices.	<p>2.1 You must obtain ethical clearance before commencing with this study.</p> <p>2.2 You commit to only employing ethical and legal research practices.</p>
You must protect the privacy of your research subjects.	<p>2.3 You undertake to protect the privacy of the research subjects throughout the project.</p>
<b>3 RESEARCH SUBJECT PARTICIPATION</b>	
Personal information of identifiable research subjects must not be used without their consent.	<p>3.1 Unless you have obtained a specific exemption for your research project, consent must be obtained in writing from the research subject, before their personal information is gathered.</p>
Research subjects must be able to withdraw from the research project.	<p>3.2 Research subjects must always be able to withdraw from the research project (without any negative consequences) and to insist that you destroy their personal information.</p>
Consent must be specific and informed.	<p>3.3 Unless you have obtained a specific exemption for your research project, the consent must be specific and informed. Before giving consent, the research subject must be informed in writing of:</p> <p>3.3.1 The purpose of the research,</p> <p>3.3.2 what personal information about them will be collected (particularly sensitive personal information),</p> <p>3.3.3 how the personal information will be collected (if not directly from them),</p> <p>3.3.4 the specific purposes for which the personal information will be used,</p> <p>3.3.5 what participation will entail (i.e. what the research subject will have to do),</p> <p>3.3.6 whether the supply of the personal information is voluntary or mandatory for purposes of the research project,</p>

	<p>3.3.7 who the personal information will be shared with,</p> <p>3.3.8 how the personal information will be published,</p> <p>3.3.9 the risks to participation (if any),</p> <p>3.3.10 their rights to access, correct or object to the use of their personal information,</p> <p>3.3.11 their right to withdraw from the research project, and</p> <p>3.3.12 how these rights can be exercised.</p>
Consent must be voluntary.	3.4 Participation in the research project must always be voluntary. You must never pressure or coerce research subjects into participating and persons who choose not to participate must not be penalised.
Using the personal information of children?	<p>3.5 A child is anybody under the age of 18.</p> <p>3.6 Unless you have obtained a specific exemption in writing for your research project, you must obtain</p> <p>3.6.1 the consent of the child's parent or guardian, and</p> <p>3.6.2 if the child is over the age of 7, the assent of the child, before collecting the child's information.</p>
Research subjects have a right to access.	3.7 Research subjects have the right to access their personal information, obtain confirmation of what information is in your possession and who had access to the information. It is strongly recommended that you keep detailed records of access to the information.
Research subjects have a right to object.	<p>3.8 Research subjects have the right to object to the use of their personal information.</p> <p>3.9 Once they have objected, you are not permitted to use the personal information until the dispute has been resolved.</p>
<b>4 COLLECTING PERSONAL INFORMATION</b>	
Only collect what is necessary.	4.1 You must not collect unnecessary or irrelevant personal information from research subjects.
Only collect accurate personal information.	4.2 You have an obligation to ensure that the personal information you collect is accurate. Particularly when you are collecting it from a source other than the

	<p>research subject.</p> <p>4.3 If you have any reason to doubt the quality of the personal information you must verify or validate the personal information before you use it.</p>
<b>5 USING PERSONAL INFORMATION</b>	
Only use the personal information for the purpose for which you collected it.	<p>5.1 Only use the personal information for the purpose for which you collected it.</p> <p>5.2 If your research project requires you to use the personal information for a materially different purpose than the one communicated to the research subject, you must inform the research subjects and Stellenbosch University of this and give participants the option to withdraw from the research project.</p>
Be careful when you share personal information.	<p>5.3 Never share personal information with third parties without making sure that they will also follow these rules.</p> <p>5.4 Always conclude a non-disclosure agreement with the third parties.</p> <p>5.5 Ensure that you transfer the personal information securely.</p>
Personal information must be anonymous whenever possible.	5.6 If the research subject's identity is not relevant for the aims of the research project, the personal information must not be identifiable. In other words, the personal information must be anonymous (de-identified).
Pseudonyms must be used whenever possible.	5.7 If the research subject's identity is relevant for the aims of the research project or is required to co-ordinate, for example, interviews, names and other identifiers such as ID or student numbers must be collected and stored separately from the rest of the research data and research publications. In other words, only you must be able to identify the research subject.
Publication of research	<p>5.8 The identity of your research subjects should not be revealed in any publication.</p> <p>5.9 In the event that your research project requires that the identity of your research subjects must be revealed, you must apply for an exemption from this rule.</p>
<b>6 SECURING PERSONAL INFORMATION</b>	
You are responsible for the confidentiality and security of the personal information	<p>6.1 Information must always be handled in the strictest confidence.</p> <p>6.2 You must ensure the integrity and security of the information in your possession or under your control by taking appropriate and reasonable technical and organisational measures to prevent:</p>

5

Institutional Permission Standard Agreement: 13 March 2017 V1

	<p>6.2.1 Loss of, damage to or unauthorised destruction of information; and</p> <p>6.2.2 unlawful access to or processing of information.</p> <p>6.3 This means that you must take reasonable measures to:</p> <p>6.3.1 Identify all reasonably foreseeable internal and external risks to personal information in your possession or under your control;</p> <p>6.3.2 establish and maintain appropriate safeguards against the risks identified;</p> <p>6.3.3 regularly verify that the safeguards are effectively implemented; and</p> <p>6.3.4 ensure that the safeguards are continually updated in response to new risks or deficiencies in previously implemented safeguards.</p>
Sensitive personal information requires extra care.	6.4 You will be expected to implement additional controls in order to secure sensitive personal information.
Are you sending any personal information overseas?	<p>6.5 If you are sending personal information overseas, you have to make sure that:</p> <p>6.5.1 The information will be protected by the laws of that country;</p> <p>6.5.2 the company or institution to who you are sending have agreed to keep the information confidential, secure and to not use it for any other purpose; or</p> <p>6.5.3 get the specific and informed consent of the research subject to send the information to a country which does not have data protection laws.</p>
Be careful when you use cloud storage.	<p>6.6 Be careful when storing personal information in a cloud. Many clouds are hosted on servers outside of South Africa in countries that do not protect personal information to the same extent as South Africa. The primary example of this is the United States.</p> <p>6.7 It is strongly recommended that you use hosting companies who house their servers in South Africa.</p> <p>6.8 If this is not possible, you must ensure that the hosting company agrees to protect the personal information to the same extent as South Africa.</p>
<b>7 RETENTION AND DESTRUCTION OF PERSONAL INFORMATION</b>	
You are not entitled to retain personal information when you no longer need it for the purposes	7.1 Personal information must not be retained beyond the purpose of the research project, unless you have a legal or other justification for retaining the information.

of the research project.	
If personal information is retained, you must make sure it remains confidential.	<p>7.2 If you do need to retain the personal information, you must assess whether:</p> <p>7.2.1 The records can be de-identified; and/or whether</p> <p>7.2.2 you have to keep all the personal information.</p> <p>7.3 You must ensure that the personal information which you retain remains confidential, secure and is only used for the purposes for which it was collected.</p>
<b>8 INFORMATION BREACH PROCEDURE</b>	
In the event of an information breach you must notify us immediately.	<p>8.1 If there are reasonable grounds to believe that the personal information in your possession or under your control has been accessed by any unauthorised person or has been disclosed, you must notify us immediately.</p> <p>8.2 We will notify the research subjects in order to enable them to take measures to contain the impact of the breach.</p>
This is the procedure you must follow.	<p>8.3 You must follow the following procedure:</p> <p>8.3.1 Contact the Division for Institutional Research and Planning at 021 808 9385 and <a href="mailto:permission@sun.ac.za">permission@sun.ac.za</a>;</p> <p>8.3.2 you will then be required to complete the <b>information</b> breach report form which is attached as Annexure A.</p> <p>8.4 You are required to inform us of a <b>information</b> breach within 24 hours. Ensure that you have access to the required information.</p>
<b>9 MONITORING</b>	
You may be audited.	<p>9.1 We reserve the right to audit your research practices to assess whether you are complying with this agreement.</p> <p>9.2 You are required to give your full co-operation during the auditing process.</p> <p>9.3 We may also request to review:</p> <p>9.3.1 Forms (or other information gathering methods) and notifications to research subjects, as referred to in clause 3;</p> <p>9.3.2 non-disclosure agreements with third parties with whom the personal information is being shared, as referred to in clause 5.4;</p>

	9.3.3 agreements with foreign companies or institutes with whom the personal information is being shared, as referred to in clause 6.5.
<b>10 CHANGES TO RESEARCH</b>	
You need to notify us if any aspect of your collection or use of personal information changes.	<p>10.1 You must notify us in writing if any aspect of your collection or use of personal information changes (e.g. such as your research methodology, recruitment strategy or the purpose for which you use the research).</p> <p>10.2 We may review and require amendments to the proposed changes to ensure compliance with this agreement.</p> <p>10.3 The notification must be sent to <a href="mailto:permission@sun.ac.za">permission@sun.ac.za</a>.</p>
<b>11 CONSEQUENCES OF BREACH</b>	
What are the consequences of breaching this agreement?	<p>11.1 If you do not comply with this agreement, we may take disciplinary action or report such a breach to your home institute.</p> <p>11.2 You may be found guilty of research misconduct and may be censured in accordance with Stellenbosch University or your home institute's disciplinary code.</p>
You may have to compensate us in the event of any legal action.	<p>11.3 Non-compliance with this agreement could also lead to claims against Stellenbosch University in terms of POPI and/or other laws.</p> <p>11.4 Unless you are employed by or studying at Stellenbosch University, you indemnify Stellenbosch University against any claims (including all legal fees) from research subjects or any regulatory authority which are the result of your research project. You may also be held liable for the harm to our reputation should there be an information breach as a result of your non-compliance with this agreement.</p>
<b>12 CONTACT US</b>	
Please contact us if you have any questions.	Should you have any questions relating to this agreement you should contact <a href="mailto:permission@sun.ac.za">permission@sun.ac.za</a> .

**Annexure 'A'**

**Instruction:**

Please send this Notice to [permission@sun.ac.za](mailto:permission@sun.ac.za). If you have any difficulty completing the Notice, please contact the Division for Institutional Research and Planning at 021 808 9385. You must confirm that the Notice was received.

**NOTIFICATION OF INFORMATION BREACH**

Name of Researcher: \_\_\_\_\_

Name of Research Project: \_\_\_\_\_

Service Desk ID: \_\_\_\_\_

A security breach happens when you know (or you **reasonably believe**) that there has been:

- (a) loss of Personal Information ("PI")
- (b) damage to PI
- (c) unauthorised destruction of PI
- (d) unauthorised access to PI
- (e) unauthorised processing of PI

Date and time of security breach:	
Brief description of the security breach (what was lost and how). Please identify the equipment, software and/or physical premises and whether it is by hacking, lost device, public disclosure (email), theft or other means:	
Name of the person/s responsible for the security breach (if known):	
Is the security breach ongoing?	
Describe the steps taken to contain the security breach:	
What steps are being taken to investigate the cause of breach?	

## 9.13 Appendix 9.3: Permission to conduct research at the University of the Western Cape



04 June 2020

### RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT THE UNIVERSITY OF THE WESTERN CAPE

<b>Name of Researcher</b>	: Joseph Ndinoshiho
<b>Research Topic</b>	: The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services
<b>Date of issue</b>	: 04/06/2020
<b>Reference number</b>	: UWCRP040620JN

This serves as acknowledgement that you have obtained and presented the necessary ethical clearance and your institutional permission required to proceed with the above referenced project.

Approval is granted for you to conduct research at the University of the Western Cape for the period **04 June 2020** to **04 June 2021** (or as determined by the validity of your ethics approval). You are required to engage this office in advance if there is a need to continue with research outside of the stipulated period. The manner in which you conduct your research must be guided by the conditions set out in the annexed agreement: *Conditions to guide research conducted at the University of the Western Cape*.

The University of the Western Cape promotes the generation of new knowledge and supports new research. It also has a responsibility to be sensitive to the rights of the students and staff on campus. This office will require of you to respect the rights of students and staff who do not wish to participate in interviews and/or surveys.

It is also incumbent on you to first furnish this office with a copy of the proposed publication should you wish to reference the University's name, spaces, identity, etc. prior to public dissemination.

Please be at liberty to contact this office should you require any assistance to conduct your research or specifically require access to either staff or student contact information.

Yours sincerely

DR AHMED SHAIKJEE  
DEPUTY REGISTRAR  
OFFICE OF THE REGISTRAR



UWCRP040620JN  
Page 1 of 3

**ANNEXURE**

**CONDITIONS TO GUIDE RESEARCH CONDUCTED AT THE UNIVERSITY OF THE WESTERN CAPE**

The onus rests on the researcher/investigator to observe and comply with the conditions set out below with the aim to conduct responsibly ethical research. Clarity must be sought from the authorising office should the interpretation of the conditions be unclear.

**1. ACCOUNTABILITY**

- 1.1. The University reserves the right to audit the research practices of the researcher/ investigator to assess compliance to the conditions of this agreement.
- 1.2. Data collection processes must not be adapted, changed or altered by the researcher/ investigator without written notification issued to the authorising office.
- 1.3. The University reserves to right to cease research if any proposed change to the data collection process is found to be unethical or in contravention of this agreement.
- 1.4. Failure to comply with any one condition in this agreement may result in:
  - 1.4.1. Disciplinary action instituted against a researcher/investigator employed or registered at the University;
  - 1.4.2. The contravention reported to the organisation employing or registering the external researcher/ investigator.

**2. GOVERNANCE**

- 2.1. Approval to conduct research is governed by the Protection of Personal Information Act, No 4 of 2013, which regulates the entire information life cycle from collection, through use and storage and even the destruction of personal information and it is incumbent on the researcher/investigator to understand the implications of the legislation.
- 2.2. The researcher/investigator must employ the necessary measures to conduct research that is ethically and legally sound.

**3. ACQUIRING CONSENT & RIGHTS OF PARTICIPANTS**

- 3.1. It is incumbent on the researcher / investigator to clarify any uncertainties to the participant about the research.
- 3.2. Written consent must be obtained from participants before their personal information is gathered and documented.
- 3.3. Participation in the research must be voluntary and participants must not be pressured or coerced.
- 3.4. Participants have the right to access their personal information, obtain confirmation of what information is in the possession of the researcher / investigator and who had access to the information.
- 3.5. Participants have the right to withdraw from the research and insist that their personal information not be used.

#### 4. DATA AND INFORMATION MANAGEMENT

- 4.1. Due diligence must be afforded by the researcher/investigator to:
- 4.1.1. Mitigate any risks that could compromise the privacy of participants before
  - 4.1.2. during and after the research is conducted;
  - 4.1.3. Collect only information that is relevant to the aim of the research;
  - 4.1.4. Verify all personal information collected about a participant if the information is supplied by a source other than the participant;
  - 4.1.5. Refrain from sharing participant information with a third party;
  - 4.1.6. Apply for an exemption if the identity of participants should be revealed in the interest of the research aims.
- 4.2. The researcher/investigator must employ appropriate, reasonable and technical measures to protect, prevent loss of and unlawful or unauthorised access of research information.

**Should you have any questions relating to this agreement please contact:**

[ashaikjee@uwc.ac.za](mailto:ashaikjee@uwc.ac.za), or  
[researchperm@uwc.ac.za](mailto:researchperm@uwc.ac.za)



## 9.14 Appendix 9.4: Ethics clearance to collect data at the Cape Peninsula University of Technology



Office of the Director: CPUT Libraries  
Dr E.R.T Chware  
E-mail: [chiwareE@cput.ac.za](mailto:chiwareE@cput.ac.za)  
Tel: 021 959-6320/6322  
Fax: 021 959-6109

12 June 2020

Mr Joseph Ndinoshiho  
Department of Knowledge and Information Stewardship  
University of Cape Town  
South Africa  
Email: [jndinoshiho@uram.na](mailto:jndinoshiho@uram.na)

Dear Mr Ndinoshiho,

### **APPLICATION FOR ETHICS CLEARANCE FOR RESEARCH PURPOSE**

I am pleased to inform you that your application dated 11 March 2020 seeking for ethics clearance to collect data with an online questionnaire at the Cape Peninsula University of Technology for your PhD research has been approved.

In accordance with research ethics standards, the data you will collect at the Cape Peninsula University of Technology library should be treated with confidentiality and should be used solely for the purpose of your PHD research entitled,

**“The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services”.**

I would appreciate if you could share your dissertation with our library, once it has been completed. Let me take this opportunity to wish you success in your research project.

Sincerely

A handwritten signature in black ink, appearing to read "E. Chware", written over a light grey rectangular background.

**Dr Elisha Chware**  
**Director of CPUT Libraries**

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Cape Peninsula University of Technology: Libraries: P O Box 1906, Bellville, 7535: Cape Town, South Africa

## 9.15 Appendix 9.5: Permission to conduct research at the Central University of Technology



■ INSTITUTIONAL PLANNING AND QUALITY ENHANCEMENT

MR JOSEPH NDINOSHIHO

JNDINOSHIHO@UNAM.NA

PERMISSION FOR MR JOSEPH NDINOSHIHO TO CONDUCT IS SURVEY AT THE CENTRAL UNIVERSITY OF TECHNOLOGY FOR HIS PHD STUDY ENTITLED "THE INCORPORATION OF WEB TECHNOLOGIES BY UNIVERSITY LIBRARIES IN SOUTHERN AFRICA TO IMPLEMENT USER-CENTRED SERVICES"

Dear Mr Joseph Ndinoshiho

This is to confirm that you and your team have been granted permission to conduct a survey at the Central University of Technology for your PHD study entitled "The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services"

The conditions of the conditional permission are:

- The survey will not interrupt any of the official activities at The Central University of Technology;
- You will supply us with the copy of your report ;
- The cost of all related activities will be covered by yourself;
- Recruitment of participants is the sole responsibility of yourself;
- Voluntary nature of the potential participants decision to consent to participate should be strictly observed;
- You should not disclose a potential participant's decision to participate or otherwise to any other party;
- Permission does not compel, in any sense, participation of staff members or students in your survey;

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Prof.A Szubarga

Deputy Director: MIS on behalf of Senior Director: Institutional Planning and Quality Enhancement

## 9.16 Appendix 9.6: Authorisation to conduct research at the Durban University of Technology Library



### PERMISSION LETTER

13 May 2020

Joseph Ndinoshiho  
Dept of Knowledge, Information and Stewardship  
University of Cape Town

#### AUTHORISATION TO CONDUCT RESEARCH AT THE DUT LIBRARY

Dear Joseph

This letter serves as authorization for you to conduct the research project entitled, "The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services", at the DUT Library.

Upon review of the request submitted to us by yourself, we are glad to offer you an opportunity to conduct the said study in the Library. The administering of the online questionnaire is approved and will be duly supervised by the Manager: Academic Services. If you have any concerns or require additional information, feel free to contact Mr David Thomas (davidt@dut.ac.za).

Thank you

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Lucille Webster', is written over a horizontal line.

Lucille Webster (Library Director)

## 9.17 Appendix 9.7 Permission to conduct research at the Durban University of Technology



*Directorate for Research and Postgraduate Support  
Durban University of Technology  
Tromso Annexe, Steve Biko Campus  
P.O. Box 1334, Durban 4000  
Tel.: 031-3732576/7  
Fax: 031-3732946*

11<sup>th</sup> May 2020

Mr Joseph Ndinoshiho  
c/o Dpt of Knowledge, Information and stewardship  
University of Cape Town

Dear Mr Ndinoshiho

### **PERMISSION TO CONDUCT RESEARCH AT THE DUT**

Your email correspondence in respect of the above refers. I am pleased to inform you that the Institutional Research and Innovation Committee (IRIC) has granted **Full Permission** for you to conduct your research "The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services" at the Durban University of Technology.

The DUT may impose any other condition it deems appropriate in the circumstances having regard to nature and extent of access to and use of information requested.

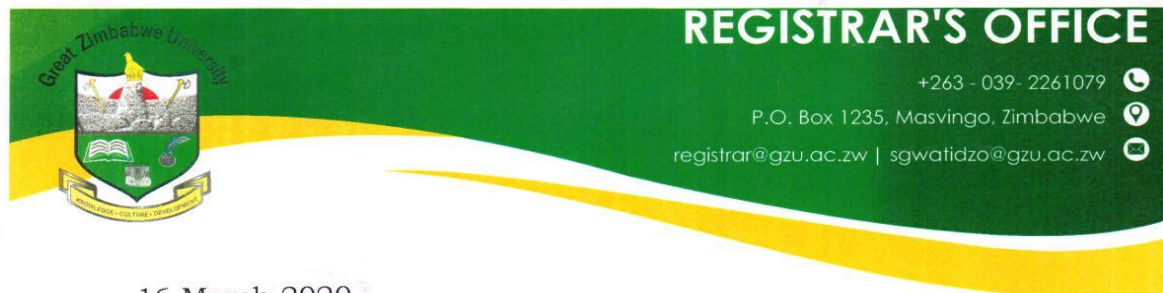
We would be grateful if a summary of your key research findings can be submitted to the IRIC on completion of your studies.

Kindest regards.  
Yours sincerely

A handwritten signature in black ink, appearing to read 'L. Liganiso', positioned above a horizontal line.

DR LINDA ZIKHONA LINGANISO  
DIRECTOR: RESEARCH AND POSTGRADUATE SUPPORT DIRECTORATE

**9.18 Appendix 9.8: Permission for ethics clearance to conduct research at the Great Zimbabwe University**



16 March 2020

Mr Joseph Ndinoshiho  
Department of Knowledge and Information Stewardship  
University of Capetown  
Upper Campus  
Private Bag X1  
RONDEBOSH  
**7701 SOUTH AFRICA**

Dear Sir

**PERMISSION FOR ETHICS CLEARANCE TO CONDUCT RESEARCH WITH GREAT ZIMBABWE UNIVERSITY**

The above matter refers.

This is to confirm that your request has been approved.

It is hoped that your research will benefit the University and it would be appreciated if you could supply the office of the Registrar with a final copy of your study, as the findings would be relevant to the University's strategic planning process.

Sincerely,

**S. Gwatidzo (Mrs)**

cc Librarian



## 9.19 Appendix 9.9: Permission to carry out research at the Harare Institute of Technology



Harare Institute of Technology  
P.O. Box Be 277  
Ganges Road, Belvedere  
Harare, Zimbabwe  
Tel : 263-4-741422/37  
Fax : 263-4-741406  
Email : hr@hit.ac.zw

Registrar's Office

27 August 2020

Mr Joseph Ndinoshilo  
University of Namibia  
Private Bag 13301  
340 Mandume Ndemufayo Avenue  
Pionierspark, Windhoek  
NAMIBIA

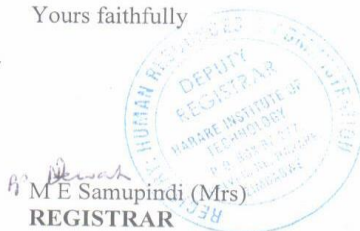
Dear Mr Ndinoshilo

**RE: PERMISSION TO CARRY OUT RESEARCH**

Your letter dated 16 March 2020 in connection with the above matter refers.

Please be advised that you have been granted the permission to carry out your research at the Institute. Kindly submit a copy of your research document to this office upon completing your research.

Yours faithfully

  
M E Samupindi (Mrs)  
REGISTRAR

cc: File copy

## 9.20 Appendix 9.10: Permission to conduct research at Lupane State University



**Lupane State University Campus**  
1<sup>st</sup> Floor Faculty of Agricultural Sciences Building  
LUPANE  
Postal Address: P O BOX 170  
LUPANE  
Tel: +263-0389-261, 269, 488, 571  
Email: [jmakunde@lsu.ac.zw](mailto:jmakunde@lsu.ac.zw)

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### REGISTRAR'S OFFICE

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6 October 2020

Mr Joseph Ndinoshiho  
Department of Knowledge and Information Stewardship  
University of Cape Town  
South Africa  
Email: [jndinoshiho@unam.na](mailto:jndinoshiho@unam.na)

Dear Mr Ndinoshiho,

**APPLICATION FOR PERMISSION TO COLLECT DATA FOR RESEARCH PURPOSE AT LUPANE STATE UNIVERSITY**

I am pleased to inform you that your application dated 02 October 2020 seeking permission to collect research data with an online questionnaire at Lupane State University for your PhD research has been approved.

In accordance with research ethics standards, the data you will collect at the Lupane State University Library should be treated with confidentiality and should be used solely for the purpose of your PHD research entitled,

**“The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services”.**

I would appreciate if you could share your dissertation with our library, once it has been completed. Let me take this opportunity to wish you success in your research project.

Yours faithfully,



**Mr J Makunde**  
**UNIVERSITY REGISTRAR**

## 9.21 Appendix 9.11: Ethics approval to conduct research at the Nelson Mandela University



PO Box 77000, Nelson Mandela University, Port Elizabeth, 6031, South Africa [mandela.ac.za](http://mandela.ac.za)

Chairperson: Research Ethics Committee (Human)  
Tel: +27 (0)41 504 2347  
[Sharlene.Govender@mandela.ac.za](mailto:Sharlene.Govender@mandela.ac.za)

NHREC registration nr: RE C-042508-025

Ref: [H20-RTI-LIS-EAP-001]

1 May 2020 (*subject to National and Institutional response to COVID-19 pandemic*)

Dear Prof Raju

**TITLE: INCORPORATION OF WEB TECHNOLOGIES BY UNIVERSITY LIBRARIES IN SOUTHERN AFRICA TO IMPLEMENT USER-CENTRED SERVICES**

**REF NR: UCTDKI2019-12-10**  
**PRP: Prof J Raju**  
**PI: Ms J Ndinoshiho**

Your application for ethics approval to conduct research at Nelson Mandela University has been considered by the REC-H on the basis that the study has been duly vetted and approved by the University of the Cape Town's Ethics Committee.

Kindly use the following ethics reference number **H20-RTI-LIS-EAP-001** together with your University's ethics clearance number in any correspondence with gatekeepers and participants at the University. Ethics clearance is valid for one year.

Please inform the REC-H, of any changes that may arise during the execution of the study, particularly to the methodology.

It must be noted that the Nelson Mandela University assumes that the Research Ethics Committee responsible for providing the original ethics approval/clearance has undertaken both ethics and scientific review of the protocol according to the National Health Research Ethics Committee (2015) Guidelines, and assumes primary responsibility for oversight with regard to any ethical issues that may arise in the course of the study. The Nelson Mandela University would also wish to be provided with an executive summary of the findings from the research.

We wish you well with the project.

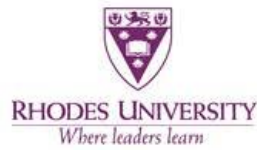
Yours sincerely

A handwritten signature in black ink, appearing to read 'Govender'.

**Dr S Govender**  
**Chairperson: Research Ethics Committee (Human)**

cc: Department of Research Development

## 9.22. Appendix 9.12: Approval to conduct research at Rhodes University



**Human Ethics Sub-Committee**  
**Rhodes University Ethical Standards Committee**  
PO Box 94, Makhanda, 6149 South Africa  
Email: [ethics-committee@ru.ac.za](mailto:ethics-committee@ru.ac.za)

[www.ru.ac.za/research/research/ethics](http://www.ru.ac.za/research/research/ethics)  
NHREC Registration No. REC-241114-045

13 July 2020

Mr. Joseph Ndinoshiho  
University of Cape Town  
Department of Knowledge and Information Stewardship  
**Re:** Research Number UCTDKI20019-12-10  
Reference number: 2020/RU08  
Email: [jndinoshiho@unam.na](mailto:jndinoshiho@unam.na)

**For the Research Project:** "The Incorporation of Web Technologies by University Libraries in Southern Africa"

This letter confirms that the above research proposal has been reviewed and **FINAL APPROVAL GRANTED** by the Rhodes University Ethical Standards Committee - Human Ethics (HE) Committee.

Gatekeepers from, Rhodes University - Human Resource Director has been received.

Please ensure that the Ethical Standards Committee is notified should any substantive change(s) be made, for whatever reason, during the research process. This approval is valid for 1 year from the date issued.

Sincerely,



**Prof Arthur Webb**  
**Chair: Human Ethics sub-committee, RUSEC-HE**

## 9.23 Appendix 9.13: Permission to conduct research at the National University of Lesotho

### THE NATIONAL UNIVERSITY OF LESOTHO

Telephone: +266 52213907  
+266 22340264  
+266 22340601  
Fax: +266 22340000  
Website: <http://www.nul.ls>



P O Roma 180  
Lesotho  
Africa

OFFICE OF THE REGISTRAR

30<sup>th</sup> July 2020

REF: REG/ADM-1.37

Mr Joseph Ndinshiho  
University Librarian  
University of Namibia  
Private Bag 13301  
340 Mandume Ndemufayo Ave  
Pionerspark, Windhoek  
Namibia

Dear Sir

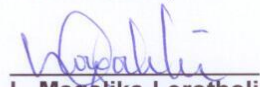
**Re: Request to collect data at the National University of Lesotho**

The National University of Lesotho (NUL) is in receipt of your application to conduct a study at this institution. **"The title of the study is The incorporation of web technologies by University Libraries in Southern Africa to implement user-centred services"**.

After careful consideration of all relevant facts, the University has agreed to allow you to continue with your study as requested. It is hoped that the research outcome will be beneficial to both the institution of Higher learning and the country at large.

By copy of this letter the University Librarian is requested to assist you to carry out your assignment.

Yours sincerely

  
L. Maqalika-Lerotholi  
Registrar

Cc: University Librarian

## 9.24 Appendix 9.14: Permission to conduct research at the University of Botswana



Office of the Deputy Vice Chancellor (Academic Affairs)

### Office of Research and Development

Corner of Notwane  
and Mobuto Road,  
Gaborone, Botswana

Pvt Bag 00708  
Gaborone  
Botswana

Tel: [267] 355 2900  
Fax: [267] 395 7573  
E-mail: [research@mopipi.ub.bw](mailto:research@mopipi.ub.bw)

7<sup>th</sup> October 2020

UBR/RES/IRB/SOC/091

Private Bag 13301,  
340 Mandume Ndemufayo Ave,  
Pionierspark,  
Windhoek, NAMIBIA

---

### RE: PERMISSION TO CONDUCT RESEARCH

**Project Title: "The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services."**

**Researcher(s):** Joseph Ndinoshiho

I am glad to inform you that approval has been granted for the above study to be conducted at the University of Botswana (UB). Since the study is to be conducted within the confines of UB, the study has accordingly been exempted from Government Research Permit requirements. In reaching the above decisions, it was noted the above study involves minimal risk. Before proceeding with the study, you are required to observe and ensure the following conditions and requirements:

1. The study will only be conducted within the confines of UB following the approved proposal version. No investigations will be conducted outside UB as part of the study before permission is sought from the Office of Research and Development as necessary.
2. Approval will be for a period of 12 months with the following dates:

Approval Date: **7<sup>th</sup> October, 2020**

Expiration Date: **6<sup>th</sup> October, 2021**

After the expiration date, this project may only continue upon renewal. For purposes of renewal, a progress report should be submitted to ORD one month before the expiration date.

3. **Modifications:** Prior approval is required before implementing any significant changes to the project protocol.
4. If you have been awarded internal (UB) or external funding for the above project:
  - a. It is your responsibility to notify and provide the Grants and Contracts office at ORD and the external funding agency (for externally funded projects) with a copy of this letter as soon as possible. An award letter will not be issued and your funds will not be released until the Grants and Contracts office has received a copy of this approval letter.
  - b. You are required to notify the Commercialization office at ORD in advance of publishing or disseminating any results, including Intellectual Property, arising from

performing this project according to the requirements established in the award letter or grant contract/agreement associated with this project.

5. At the end of this project, you are required to submit a Final Report on the project on a format provided by the Office of Research and Development.

If you have any questions about the information in this letter, please contact the Office of Research and Development at Tel: +267 3552900, E-mail: [ORD@ub.ac.bw](mailto:ORD@ub.ac.bw). Contact information is also available at [www.ub.bw](http://www.ub.bw).

Sincerely,



The Secretariat, University of Botswana Institutional Review Board  
Office of Research and Development

## 9.25 Appendix 9.15: Permission to conduct research at the University of Eswatini



### UNIVERSITY OF ESWATINI

Private Bag No.4 Kwaluseni M201, Eswatini  
Tel. (+268) 2517 0110 Fax (+268) 2517 0001  
E-mail: [zngcobo@uniswa.sz](mailto:zngcobo@uniswa.sz)

#### LIBRARIAN

Z.G. Ngcobo, B.A. + CCE (UBLS), MLS,(Dalhousie), PhD (Pittsburgh)

Lib/K/237  
7<sup>th</sup> May, 2020

Dear Joseph,

**Re: Permission to collect data via a Questionnaire.**

This is to acknowledge receipt of your letter on the above subject. Please be informed that we wish to grant you permission to proceed with the data collection exercise for your research study on "The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services". Please note that we do not have a position designated as **digital services**. However, I suggest that you send the questionnaire to all the staff members who appear on the University of Eswatini Library website. You may also access their e-mail addresses by clicking on their names.

Kindly be informed that the country is on lockdown and the University is not in session and this may affect your data collection exercise.

For further information you may contact the Librarian's office through her personal secretary who may be reached at [sharon@uniswa.sz](mailto:sharon@uniswa.sz).

Wishing you the best in your research. Remember to stay safe during this time of the COVID- 19 pandemic.

Sincerely,

A handwritten signature in black ink, appearing to read 'Z.G. Ngcobo'.

Z. G. Ngcobo

## 9.26 Appendix 9.16: Permission to conduct research at the University of KwaZulu-Natal



15 October 2020

Mr Joseph Ndinoshiho  
University of Namibia  
Email: [jndinoshiho@unam.na](mailto:jndinoshiho@unam.na)

Dear Mr Ndinoshiho

### RE: PERMISSION TO CONDUCT RESEARCH

Gatekeeper's permission is hereby granted for you to conduct research at the University of KwaZulu-Natal (UKZN) towards your postgraduate studies, provided Ethical clearance has been obtained. We note the title of your research project is:

*"The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services."*

It is noted that you will be constituting your sample as follows:

- With a request for responses on the website. The questionnaire must be placed on the notice system <http://notices.ukzn.ac.za>. A copy of this letter (Gatekeeper's approval) must be simultaneously sent to ([govenderlog@ukzn.ac.za](mailto:govenderlog@ukzn.ac.za)) or ([ramkissoobh@ukzn.ac.za](mailto:ramkissoobh@ukzn.ac.za)).

Please ensure that the following appears on your questionnaire/attached to your notice:

- Ethical clearance approval letter;
- Research title and details of the research, the researcher and the supervisor;
- Consent form is attached to the notice/questionnaire and to be signed by user before he/she fills in questionnaire;
- gatekeepers approval by the Registrar.

You are not authorized to contact staff and students using the 'Microsoft Outlook' address book. Identity numbers and email addresses of individuals are not a matter of public record and are protected according to Section 14 of the South African Constitution, as well as the PAIA and POPI Act. For the release of such information over to yourself for research purposes, the University of KwaZulu-Natal will need express consent from the relevant data subjects. Data collected must be treated with due confidentiality and anonymity.

Yours sincerely

DR KE CLELAND  
REGISTRAR (ACTING)

#### Office of the Registrar

Postal Address: Private Bag X54001, Durban, South Africa  
Telephone: +27 (0) 31 260 8005/2206 E-mail: [registrar@ukzn.ac.za](mailto:registrar@ukzn.ac.za)  
Website: [www.ukzn.ac.za](http://www.ukzn.ac.za)



Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

INSPIRING GREATNESS

## 9.27 Appendix 9.17: Permission to conduct research at the University of Limpopo



**University of Limpopo  
Office of the Registrar**

Private Bag X1106, Sovenga, 0727, South Africa

Tel: (015) 268 2407, Fax: (015) 268 3048, Email: [Kwena.Masha@ul.ac.za](mailto:Kwena.Masha@ul.ac.za)/[Retha.Balie@ul.ac.za](mailto:Retha.Balie@ul.ac.za)

21 October 2020

J Ndinoshiho

Email: [jndinoshiho@unam.na](mailto:jndinoshiho@unam.na)

Dear Mr. Ndinoshiho,

**GATEKEEPER PERMISSION TO CONDUCT RESEARCH**

**TITLE: THE INCORPORATION OF WEB TECHNOLOGIES BY UNIVERSITY LIBRARIES  
IN SOUTHERN AFRICA TO IMPLEMENT USER-CENTRED SERVICES**

**RESEARCHER: Joseph Ndinoshiho (NDNJOS001)**  
**MAIN SUPERVISOR: Associate Professor Mary Nassimbeni**  
**CO-SUPERVISOR: Prof. Jaya Raju**  
**INSTITUTION: University of Cape Town**

Kindly be informed that Gatekeeper permission is granted to you to conduct research at the University of Limpopo entitled: **"The incorporation of Web Technologies by University Libraries in Southern Africa to implement User-Centred Services."**

Kind regards,

**PROF. JK MASHA  
UNIVERSITY REGISTRAR**

Cc. Prof. RN Madadzhe: Deputy Vice-Chancellor: Teaching and Learning  
Dr. T Mabila, Director: Research Development and Administration  
Prof. P Masoko – Chairperson: Research and Ethics Committee  
Ms A Ngobe – TREC Secretariat

*Finding solutions for Africa*

## 9.28 Appendix 9.18: Permission to conduct research at the University of Namibia

### **CENTRE FOR RESEARCH AND PUBLICATIONS**

*Office of the Pro-Vice Chancellor: Research Innovation and Development*

UNIVERSITY OF NAMIBIA, Private Bag, 13301 Windhoek, Namibia

340 Mandume Ndemufayo Avenue, Pioneers Park, Office D090 ☎ +264-61-2064624 ✉ [research@unam.na](mailto:research@unam.na) Fax+264-61-206 4624



23 June 2020

Dear Mr. **Joseph Ndinoshiho**,

#### **PERMISSION TO CONDUCT RESEARCH ACTIVITIES AT THE UNIVERSITY OF NAMIBIA (UNAM)**

Your application to conduct research at UNAM entitled: **"The incorporation of web technologies by University libraries in Southern Africa to implement user-centred services"** was considered based on ethical evaluation from your institution. Hence, permission is hereby granted with the following conditions:

1. During the course of your research activities at UNAM, you will observe the required procedures, norms and ethical conduct in accordance with the relevant Research Policies and Guidelines. If unsure, please consult *the Centre for Research and Publications* at UNAM for guidance. Any deviations and amendments to the original documents submitted (i.e. research proposal, interview guide, consent forms, etc.) must be submitted again for approval, before the research activities can commence.
2. **The results of the findings will be shared with the PVC: Research, Innovation and Development, and the Centre for Research and Publications, before they are disseminated or published in the public domain.**
3. Upon completion, a copy of the Research Report must be lodged with the UNAM Library for our records.
4. Proper, full acknowledgements of the University of Namibia and all participants /respondents shall be done in the Research Report and any subsequent publications arising from this research.

If you are agreeable to the above conditions, please sign and date a copy of this letter and return it the Centre for Research and Publications (Email: [research@unam.na](mailto:research@unam.na) ). If you have any queries, do not hesitate to contact the Centre for Research and Publications.

Wishing you all the best with your research.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Hileni M. Kapenda'.

Dr. Hileni M. Kapenda

**Director:** Centre for Research & Publications

**I accept and agree to all the conditions**

JOSEPH NAINOSHIHO

[Handwritten Signature]

23-06-2020

Full Name and Surname

Signature

Date

## 9.29 Appendix 9.19: Approval to conduct research at the University of Pretoria



### Faculty of Humanities

Fakulteit Geesteswetenskappe  
Lefapha la Bomotheo



31 July 2020

Dear JM Ndinoshiho

**Project Title:** The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services  
**Researcher:** JM Ndinoshiho  
**Supervisor(s):**  
**Department:** External department  
**Reference number:** 05101949 (HUM016/0620)  
**Degree:** Doctoral

I have pleasure in informing you that the above application was **approved** by the Research Ethics Committee on 31 July 2020. Data collection may therefore commence.

Please note that this approval is based on the assumption that the research will be carried out along the lines laid out in the proposal. Should the actual research depart significantly from the proposed research, it will be necessary to apply for a new research approval and ethical clearance.

We wish you success with the project.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Pikirayi'.

**Prof Innocent Pikirayi**  
**Deputy Dean: Postgraduate Studies and Research Ethics**  
**Faculty of Humanities**  
**UNIVERSITY OF PRETORIA**  
**e-mail: PGHumanities@up.ac.za**

Fakulteit Geesteswetenskappe  
Lefapha la Bomotheo

**Research Ethics Committee Members:** Prof I Pikirayi (Deputy Dean); Prof KL Harris; Mr A Bizos; Dr A-M de Beer; Dr A dos Santos; Ms KT Govinder; Andrew; Dr P Gutura; Dr E Johnson; Prof D Maree; Mr A Mohamed; Dr I Noomé; Dr C Ruttergill; Prof D Reyburn; Prof M Soer; Prof E Taljard; Prof V Thebe; Ms B Tsebe; Ms D Mokalapa

### 9.30 Appendix 9.20: Permission to conduct research at the University of Venda

Research and Innovation  
Office of the Director

Date: 18<sup>th</sup> March 2020

Mr J Ndinoshiho

University of Cape Town  
Department of Knowledge and Information Stewardship

Dear Mr J Ndinoshiho

**Permission to conduct Research at the University of Venda**


You are hereby granted permission to conduct research at the University of Venda.

The research will be based on your Doctoral research titled: ***Incorporation of web technologies by university libraries in Southern Africa to implement user-centred services*** registered at the University of Cape Town.

The conditions are that all the data pertaining to University of Venda will be treated in accordance with the Ethical Principles and that will be shared with the University. In addition, consent should be sought by you as a researcher from participants.

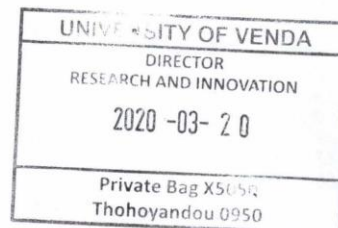
Attached is our policy on ethics.

Thank you



Senior Prof. G.E. Ekosse  
Director Research and Innovation

Cc: Prof JE Crafford (DVC Academic)



UNIVERSITY OF VENDA  
PRIVATE BAG X5050, THOHOYANDOU, 0950. LIMPOPO PROVINCE, SOUTH AFRICA  
TELEPHONE 015 962 8313 / 8504. FAX 015 962 9060  
Email: [research@univen.ac.za](mailto:research@univen.ac.za)

**"A quality driven, financially sustainable, rural-based comprehensive University"**

## 9.31 Appendix 9.21: Permission to conduct research at the University of Zambia



THE UNIVERSITY OF ZAMBIA  
UNIVERSITY OF ZAMBIA LIBRARY

P O Box 32379  
Lusaka  
Zambia

Tel +260 211 250845  
Fax +260 211 250845

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Friday, October 02, 2020

Joseph Ndinoshiho,  
University of Namibia Library,  
Email [jndinoshiho@unam.na](mailto:jndinoshiho@unam.na),  
Telephone +264 65 206 3874,  
Mobile +264 81128344,  
Windhoek,  
**NAMIBIA.**

Dear Sir,


**RE: APPLICATION FOR PERMISSION TO COLLECT DATA FOR RESEARCH PURPOSE  
AT THE UNIVERSITY OF ZAMBIA LIBRARY**

Reference is made to the letter dated 2<sup>nd</sup> October, 2020 on the matter captioned above.

This serves to inform you that your request to undertake research on: "**The incorporation of web technologies by university libraries in Southern Africa to implement user-centred service**" as part of your PhD study from the University of Cape Town, South Africa has been granted.

If you should need any further assistance, please don't hesitate to get in touch with us.

Thank you,



Christine W. Kanyengo  
**UNIVERSITY LIBRARIAN**

**CC. Deputy University Librarian**

## 9.32 Appendix 9.22: Ethics clearance to conduct research at the University of Johannesburg



20 March 2020

Mr Joseph Ndinoshiho  
Department of Knowledge and Information Stewardship  
University of Cape Town  
South Africa  
Email: [jndinoshiho@unam.na](mailto:jndinoshiho@unam.na)

Dear Mr Ndinoshiho,

### **APPLICATION FOR ETHICS CLEARANCE FOR RESEARCH PURPOSE**

I am pleased to inform you that your application dated 11 March 2020 seeking for ethics clearance to collect data with an online questionnaire at the University of Johannesburg for your PhD research has been approved.

In accordance with research ethics standards, the data you will collect at the University of Johannesburg library should be treated with confidentiality and should be used solely for the purpose of your PHD research entitled,

**“The incorporation of web technologies by university libraries in Southern Africa to implement user-centred services”.**

I would appreciate if you could share your dissertation with our library, once it has been completed. Let me take this opportunity to wish you success in your research project.

Sincerely

Prof Maria Frahm-Arp  
Executive Director: Library and Information Centre  
University of Johannesburg

## 9.33 Appendix 9.23: Permission to conduct research at the Botswana International University of Science and Technology

**Ndinoshiho, Joseph**

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**From:** Lebele, Ayanda <lebelea@biust.ac.bw>  
**Sent:** Thursday, 7 May 2020 5:23 pm  
**To:** Ochieng Aoyi; Joseph Chuma; Ndinoshiho, Joseph  
**Cc:** Leah Gaborone  
**Subject:** Re: FW: Application for permission to collect data via a questionnaire

Dear Joseph Ndinoshiho,

The permit has long been granted and shared.

Regards

**Dr. Ayanda AB Lebele**  
Director Library Services  
Botswana International University of Science and Technology  
Private Bag 16  
Palapye, Botswana  
+267 72777341/ +267 4931381  
[lebelea@biust.ac.bw](mailto:lebelea@biust.ac.bw)



On Wed, Mar 25, 2020 at 2:37 PM Lebele, Ayanda <[lebelea@biust.ac.bw](mailto:lebelea@biust.ac.bw)> wrote:  
Dear Prof

Please find a draft for your approval and signature so that we assist the researcher.

**Dr. Ayanda AB Lebele**  
Director Library Services  
Botswana International University of Science and Technology  
Private Bag 16  
Palapye, Botswana  
+267 72777341/ +267 4931381  
[lebelea@biust.ac.bw](mailto:lebelea@biust.ac.bw)



On Mon, Mar 16, 2020 at 8:29 AM Lebele, Ayanda <[lebelea@biust.ac.bw](mailto:lebelea@biust.ac.bw)> wrote:  
Dear Prof Chuma